Employment participation of European couples: polarisation, non-standard-employment and gender and social inequalities.

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A thesis submitted for the degree of Doctor of Philosophy in Social Policy

Michaelmas Term 2023.

To those lost along the way, especially my dear grandparents, Françoise, Yves, and Christian.

Acknowledgements

I joined Oxford's Department of Social Policy and Intervention as a one-year MSc student in 2017, which turned into a two-year MPhil, which turned into a DPhil application. I now find myself writing these end of DPhil acknowledgements in December 2023. Many people, professionally and personally, helped me along the way, and I am indebted and grateful to them.

Academically, I was lucky to benefit from the outstanding supervision of Professor Bess Bukodi. Bess was already my MPhil supervisor, and that was the main reason I applied to Oxford for the DPhil. I thank her for having believed in my project, as well as the time and dedication she put into supervising my research and the clarity of her advice: I was always amazed at how improved my work was coming out of our meetings. I also wish to thank her for the balance she finds between her high standards and her understanding of personal and professional circumstances. I also received extremely useful feedback from Dr. Tim Vlandas and Professor Brian Nolan at the Transfer of Status, and from Dr. Selçuk Beduk, and Professor Brian Nolan at the Confirmation of Status. This latter milestone was particularly important in helping me turn raw empirical analyses into a content that made sense to me and any external reader, and conveyed a clear message and policy recommendations. I also thank the organisers of the Social Inequality Research Group at DSPI for the numerous opportunities to present my work and receive advice.

On a personal level, there are so many people who helped me that I do not know where to begin. My family has been supporting and encouraging me from the start. I could not have done it without the constant love and support from my mum, Anne, and my dad Jean-Marie, who both shaped my intellectual appetite from a young age, taught me to

understand things from different perspectives and disciplines, to be open-minded, and encouraged my taste for knowledge and excellence, albeit in a different path to theirs. I could not have done it without the friendship, love, and intellectual stimulation provided by my brother Jean-Baptiste. And of course, I could not have done it without the love and help at all times and in all respects from someone who has been my unconditional, number one supporter, from the very beginning of my life, my sister Marie. The DPhil years have also been those in which her partner Yachar has truly become part of the family, and his taste and talent for research made my endeavour less lonely.

The last year of my DPhil was a particularly tough one at times in terms of my mental health, but meeting someone as wonderful, supportive and bright as Catherine made it all worth it. Throughout this difficult episode, not the only one in my academic path, and as ever in the good and bad moments of life, I could also rely on the unconditional help and love from my close friends. The “Team” of Clems, Matt, Rémy, Kirsteen, Nuria, Eponine and Yara of course, with whom I shared so much through the years. Eponine and Yara, who were with me in London at the time, have been particularly amazing when I struggled early in 2023. Inès and Eva as well and obviously, two people I wished I saw more of, but who have always been there when I needed it and who I am proud to call my dear friends. And of course, the whole Conti family, Sandrine, JC, Pauline and César, who in addition to Clems, have always welcomed me so kindly and treated me as one of their own, anytime I needed it, throughout the DPhil and way before that.

I want to express my love and gratefulness to all these people. I feel extremely privileged to have such amazing people surrounding me.

I also want to mention my affection and gratefulness to everyone I shared the football pitch with at the St Anne's College Football Club, particularly the mighty 2017-2020 MGA generation. College football has been the highlight of my time at Oxford and helped me keep sane. The fact that we still see each other and play together regularly, despite the different directions that our lives took, is testament to a deep friendship, a success off the pitch that matches our past on-field wins.

It is hard to pin-down exactly what attracted me to the subject of this thesis, but I doubt that a focus on gender inequality was fortuitous. My life and intellectual interests have been shaped by generations of powerful, outstanding, norm-defying women. My maternal great-grandmother was a mathematics "Agrégée", qualified to teach maths at university in 1930s France – in many ways preceding the trend of women becoming more educated than men that this thesis highlights many times. My maternal grandmother did the same in geography, while my paternal grandmother was a Spanish secondary school teacher. They were strong and bright working women at times in which, as I learnt throughout this thesis, it was even less easy for women and mothers to work full-time than it is now. My mother broke ceilings in the senior French Civil Service, as she became the first woman to lead the French Development Agency (l'Agence Française de Développement). My sister, finally, is not just my wonderful older sister, but also a remarkable medical doctor for whom I am full of admiration. If research is standing on the shoulders of giants, then, above and beyond all the bibliography in this thesis, these female family shoulders are the shoulders I want to emphasise, and this thesis is dedicated to them.

Abstract

Most working-age heterosexual couples in Europe have left the male-single-earner model behind, and dual-earning has become the main form of couple employment participation. The literature documents two key related phenomena. The first is polarisation: employment participation across couples has increasingly been polarising between dual-earning and dual-workless couples, as dual-earning became the norm. The second is non-standard-employment: forms of work that depart from full-time permanent jobs have reshaped couple employment patterns, notably as a female complement to a male standard job. There are, however, many gaps in these literatures. Most obviously, they are largely separate: we do not know how polarisation and non-standard-employment relate and interact to shape the evolution of couple employment patterns. In a world of rising non-standard-employment, conceiving polarisation merely as couples that have access to employment and others which do not, without any consideration of employment quality, seems increasingly outdated. Another limitation is the time scope: we know very little about polarisation evolutions in the past two decades, despite much relevant social and economic changes over this period. Finally, research has over-emphasised the role of non-standard-employment as a complement to a standard job in couples. Is the evolution in couple employment participation still characterised by increasing polarisation across Europe, could this have changed and why? How do polarisation and non-standard-employment relate to each other empirically, and how do they jointly account for changing couple employment patterns? To what extent has the use of non-standard-employment in couples switched from being a complement to a standard job, to being the sole source of labour income? I take advantage of the historical and geographical depth of the EU-LFS to answer the first two questions, with data for 27 and 11 countries respectively, as early as 1983. The third chapter is a case study of Germany, using SOEP data to assess how dual-workless couples may have increasingly turned into couples relying solely on non-standard employment following labour market reform. This thesis makes a number of contributions. Methodologically, I propose various extensions to current techniques used to assess polarisation and its implications, such that they can incorporate the distinction between different forms of employment. Substantially, I show that, while polarisation is higher than forty years ago in Europe, the last two decades saw a strong slow-down and potential reversal of the trend, as rising female employment started fuelling the rise of female-single-earning couples more strongly. I also find that dual-workless couples are being replaced by couples whose only source of income is from non-standard-employment, both types of couples sharing human capital disadvantages. Further, I show that standard-employment is the form of employment that has become particularly unevenly distributed over time, although different models of inequality in employment access – across all couples, across dual-earning couples only, and within dual-earning couples – emerge in Europe. Finally, I document the rise of couples relying solely on non-standard-employment in Germany, and the increasingly segmented nature of couple employment there, but fail to find any links to the Hartz reforms, perhaps because more means-tested benefits made exits from dual-worklessness less likely. Overall, this thesis links two separate literatures to an unprecedented extent, overcoming some of their respective limits, and more generally brings together insights from economics, sociology and social policy, to better understand the evolutions of couple employment patterns and their implications for society and policy.

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List of abbreviations

AWE: Added-Worker Effect

DWE: Discouraged-Worker Effect

EMTR: EffectiveMarginal Tax Rate

EU: European Union

EU-LFS: European Union Labour Force Survey

MISSOC: Mutual Information System on Social Protection

PTR: Participation Tax Rate

OECD: Organisation for Economic Co-operation and Development

SA: Social Assistance

SOEP: Socio-Economic Panel (German)

UB: Unemployment Benefits

UI: Unemployment Insurance

UA: Unemployment Assistance

VOC: Varieties of Capitalism

PART I: BACKGROUND

1. Introduction

1.1. Background and research questions

The vast majority of heterosexual couples in contemporary Europe are dual-earning (Harkness et al. 1997, Crompton 1999, Lewis et al. 2008). This represents a drastic change in a limited period of time: as recently as the early 1980s, the dominant model in most European countries still was male-single-earning (ibid).

The rise in dual-earning corresponds to a constant increase in women's employment rates over the period. The role of women within the European heterosexual couple drastically changed, from a predominant focus on unpaid household work, to a strong participation in the labour market. The rise in women's employment is a multifaceted phenomenon, but a key correlate is the rise in women's educational achievement. European women have become, on average, more educated than European men, and this rise in education over time has led more (partnered) women into the labour market (Charles 2011, Gregory 2011, Klesment and van Bavel 2017).

This thesis aims to improve our understanding of the evolutions in couple employment participation over the years, by refining our understanding of two key trends that have accompanied these evolutions, and, crucially, of how these two key trends relate to each other, in shaping couple employment participation and the implications of changing couple employment patterns, in Europe in the 21st century.

The first trend is polarisation. The rise in dual-earning has come with a polarisation of couple employment, whereby couple employment participation has been increasingly divided between couples in which both partners are in employment, and couples in which

none are employed. This resulted from partnered women being more likely to join employment in couples with a male partner also employed, rather than as the sole-earner. As employment access within couples became more gender equal – more couples with men and women working – employment access across couples became more unequally distributed (Gregg and Wadsworth 2001, 2008, de Beer 2007, Cantillon 2011), with potential links to rising income inequality (Gregg and Wadsworth 2001, 2003).

The second trend is the rise in non-standard employment. The last four decades have witnessed the rise of these forms of employment, that depart from the traditional norm of full-time, open-ended work (Kalleberg 2000). Typical forms of non-standard employment include part-time and temporary work, though other forms of employment, such as solo-self-employment are often included under the umbrella (Allmendinger et al. 2013).

The rise of non-standard employment is closely linked to the rise in women's employment participation. Non-standard employment is gendered, and, across Europe, disproportionately taken-up by women (OECD 2015, Eurostat 2023). Many dual-earning European couples are organised around the "one-and-a-half" earning model, with the male partner in standard employment, and the female partner in non-standard work (Lewis et al. 2008). Under the umbrella of dual-earning, inequalities in the type of work performed by partnered men and women in Europe subsist.

As I will detail further throughout the chapters reviewing past research and highlighting the contributions of this thesis, key gaps in the literature, on polarisation, the rise of non-standard-employment, and how they relate to each other, exist.

Results from the literature suggest that European societies are characterised by polarisation, but the empirical findings documenting it are dated, do not cover many countries, especially amongst those that joined the EU more recently, and have missed ongoing or recent evolutions such as the continued rise in female employment and education, more flexible labour markets, or the 2008 economic crisis and subsequent recovery. Polarisation may have slowed-down or accelerated, and it may not exist everywhere to the same extent, so an update to our knowledge on the issue is needed to know how much, in 2023, European societies still polarise between dual-earning and dual-workless– particularly given the importance in policy debates and research of the latter type of couple, and on the other hand, the assumed role of dual-earning couples in buffering couples against employment shocks.

Further, the literatures on polarisation and non-standard employment have stayed almost entirely separate. We do not know what form of employment contributes to polarisation, we do not know if standard employment or non-standard employment are evenly distributed across couples. We do not know if more dual-earning comes with both forms of inequality – within couple in terms of access to standard employment, and across couples, in terms of access to employment and standard employment especially – only one, if there are countries highly equal on both counts, or highly unequal on both dimensions. More fundamentally, we conceive polarisation in terms of access to employment, broadly defined. This thesis shows that, in a time of increasing non-standard employment, it is the distribution and polarisation of good quality employment that increasingly matters.

Finally, we conceive non-standard employment in couples primarily as a complement to a standard job, but this thesis will show that it has also increasingly become the only

source of labour earnings in European couples. We still know very little about this phenomenon, its rise, prevalence, and determinants, despite the potential disadvantages, such as higher poverty risks, associated to non-standard employment as the only source of labour income in a household (OECD 2015). In a context of increasing labour market flexibility and labour market policy increasingly aiming to put jobless people (back) into work (Boeri and van Ours 2013), it could be that an increasing number of couples find themselves on the fringe of the labour market, solely relying on non-standard employment, rather than being dual-workless. The household context matters with regards to non-standard employment and the associated poverty outcomes, and needs to be explored more (Nolan and Marx 1999, Horemans et al. 2016).

So, the overall research puzzle that this thesis aims to tackle is how polarisation and non-standard employment relate to each other, and have evolved to shape the evolution of couple employment participation in Europe over the past four decades. The geographical area studied by this thesis is the European Union, including the UK but not Croatia (for data reasons), and the thesis will interchangeably use "European Union" and "Europe". This thesis will tackle three overarching research questions. These research questions cut across the three empirical chapters, and each empirical chapter further tackles its own, chapter-specific, set of questions derived from these three big ones:

RQ1: Is the evolution of couple employment participation still characterised by increasing polarisation across Europe, and why may this have changed?

RQ2: How do polarisation and non-standard-employment relate to each other empirically, and how do they jointly account for changing couple employment patterns?

RQ3: To what extent has the use of non-standard-employment in couples switched from being a complement to a standard job, to being the sole source of labour income?

The first research question updates our knowledge of polarisation, by studying an unprecedented historical window of observation, and range of countries. It grounds the discussion and introduces factors that may have affected the evolution in polarisation trends, including the rise in non-standard employment and couples that solely rely on non-standard employment as a source of labour income, sectoral evolutions of the economy and the differentiated impact of the 2008 crisis on partnered men and women, and the changing human capital profiles of couples.

The second and third questions build on these findings. The second, exploring further the idea that polarisation research should not just study ILO-defined employment, with no notion of employment quality, extends existing polarisation indicators to formally capture the interrelationship between polarisation and standard and non-standard-employment, studying the distribution of each type of employment and their contributions to rising polarisation and the overall rise of dual-earning. It shows that different European countries have followed different models of inequality, some choosing to locate the rising inequality in standard employment access, induced by more dual-earning, within couples, other following a model in which this inequality is located across couples.

The third focuses on disadvantaged couples, exploring further the issue of couples whose only source of market income is from non-standard-employment ("non-standard-earning couples", thereafter), an under-identified phenomenon in the literature, one that the empirical analyses carried in response to the first overarching research question of this thesis, emphasise. It analyses how dual-workless couples may have been turning into non-

standard-earning couples over time, as labour markets become more flexible, taking the Hartz reforms in Germany as a case study.

The thesis therefore forms a coherent whole, with research questions logically following each other and building on key gaps in the literature and on original empirical results found in the course of the empirical analyses, particularly those of the first empirical chapter (Chapter 9). Taken together, they help refine our understanding of the evolutions in couple employment participation, as shaped by polarisation, non-standard employment, and their interaction, and more fundamentally, they highlight the inequalities still associated to couple employment participation in contemporary Europe, gender inequality in employment access within couples, and social inequality in access to good quality employment across couples. The results further shed light on the role of the household regarding employment issues.

This thesis advances our knowledge of these issues by building on different strands of literature, mainly from economics, sociology and social policy, and by bridging gaps between sets of literature, notably the polarisation and non-standard employment literatures, that had seldom interacted until now. The thesis is also relevant to the literature studying the links between welfare-states and couple employment participation. It studies a wide range of countries, with all welfare-state types represented, and helps refine our knowledge of the overlap (or lack thereof) between welfare-state types and couple employment outcomes.

1.2. Why focus on couples only?

Couples may have become a more selective population over time: in my data, the proportion of partnered people in the 25-55 population across 27 European countries in

2019, is still on average a strong majority (60%), but this is down from around 72% at the start of the 1980s (Appendix A.2). If joblessness shifts towards new household structures, like single-headed households, it could explain changes in the distribution of employment and non-employment across couples over time.

But overall, couples remain the predominant form of partnership arrangement. As such, they are the most likely to have an influence on overall polarisation trends across all households. The polarisation of employment across couples only is still worth studying because of how predominant this form of household is, such that in and of itself, its polarisation has important social repercussions. Moreover, and crucially, previous findings in the literature, detailed more in Chapter 6, emphasise the central role of couple employment polarisation in the rise of overall polarisation across all household types, rather than the shift towards new household structures (Gregg and Wadsworth 2001, Corluy and Vandebroucke 2013).

More fundamentally, a key dimension tackled in this thesis relates to understanding better the gender dynamics, within heterosexual couples, of rising female employment, and exploring the inequalities hidden behind the catch-all category of dual-earning. In fact, linking this dimension of inequality – within couples in terms of access to (standard) employment – with another dimension of inequality, the polarisation of (standard) employment across all couples, is a key endeavour of this thesis, which further justifies the focus on couples specifically.

The thesis explores the role of female employment in couples in times of crisis and as a buffer against employment shocks, which again justifies the focus on couples. It also revisits the role of non-standard employment – emphasising that households relying

solely on non-standard-employment as a source of labour income is not a phenomenon limited to, say, a single-mother working part-time, but increasingly affects couples too. In doing so, it challenges long held views about couple employment patterns.

Finally, this thesis increases the complexity of polarisation indices, as detailed in Chapter 8, by adapting them the study of employment quality. Computing indicators that in addition to different forms of employment, would distinguish between different household types, would introduce a level of complexity that would dilute the empirical analyses and interpretation of the results too much.

The restriction of the focus of this thesis to couples only, is therefore an active decision, and an acknowledged limitation. This thesis does not capture the full extent of polarisation at the household level. It leaves as a future research endeavour the task of combining more complex polarisation indices with a more encompassing household study.

1.3. Structure of the thesis

This thesis is divided into four big parts, each containing individual chapters. Part I, the background part, comprises this introductory chapter, and Chapter 2. Chapter 2 introduces basic facts about couple employment participations in Europe over time, and key factors that affect it. It is not intended as an exhaustive review of all the relevant elements, but simply as a scene-setter regarding the core facts needed to understand the rest of the thesis.

Part II, the previous work part, includes Chapters 3 to 7. Chapter 3 describes the theoretical framework that underpins this thesis, that gives the basis to empirically study the evolution of couple employment participation. The chapter contrasts the Beckerian

microeconomics of the family framework, and the perspective developed by the "couple careers" sociological strand, and their respective implications regarding inequality in employment access within and across couples.

Chapter 4 describes how these two frameworks, to be useful empirically, need to be supplemented by the two key concepts that cut across this thesis: the polarisation of couple employment patterns, and the rise of non-standard employment. It defines these two concepts and explains why they are relevant across the rest of the thesis.

Chapter 5 moves the discussion to the country level. Although the theoretical frameworks and the two key concepts are useful in general to study couple employment participation, the discussion would not be complete without reviewing country contexts and policy factors which may affect the way in which couples decide to participate in the labour market.

After reviewing the theoretical frameworks, the two key concepts guiding this thesis, and how the country level may matter, Chapter 6 moves away from the more theoretical side, and reviews the key empirical results in past research, in all the areas outlined in the previous chapters.

Chapter 7 summarises the two key insights from Chapters 3-6, and outlines the gaps in the literature as it stands. Based on these gaps, it summarises the contribution of this thesis, in general, and empirical chapter by empirical chapter.

Part III, the empirical part, begins with Chapter 8. In this chapter, I describe the overarching analytical strategy guiding the empirical work in this thesis. I discuss practical issues regarding the operationalisation of the key concepts, non-standard employment and polarisation, in practice. I introduce the datasets used and the key

variables that cut across the three empirical chapters, and briefly outline the empirical methods that will be used in each empirical chapter. Each of these empirical chapter also includes an analytical strategy section that will describe chapter-relevant methodological considerations in more details.

Chapter 9 is the first empirical chapter: it updates and challenges existing results regarding the evolution of the polarisation over time in Europe, showing that the rise in polarisation has actually slowed-down or started reversing over the past two decades. It offers potential mechanisms for it, and exposes an evolution of couple employment patterns away from dual-worklessness, towards couples who rely solely on non-standard employment as a source of labour income.

Chapter 10 is the second empirical chapter. It explores the rise in dual-earning over time by linking formally the notions of polarisation and non-standard employment. As both these notions are individually associated with a rise in dual-earning in the literature, but are seldom studied together, the chapter maps-out the empirical regularities between polarisation and non-standard employment in Europe, formally links the two notions by extending existing polarisation indicators so that they can handle a distinction between standard and non-standard-employment, and studies how these two variables have contributed to the rise of dual-earning over time. It shows that the rise of dual-earning in European countries implies a trade-off, as it comes with at least one of the following three forms of inequality: more polarisation of employment across all couples, a less even distribution of standard and non-standard-employment across dual-earning couples specifically, or a gender inequality in access to standard and non-standard employment within dual-earning couples.

Chapter 11 is the third and final empirical chapter of this thesis. Its premise is the Chapter 9 finding that couples relying solely on non-standard employment as their source of labour income have been on the rise in Europe and overtook dual-workless couples as a share of all couples. Studying Germany, this chapter aims to uncover the links between dual-worklessness and non-standard-earning-couples, and whether reforms making the labour market more flexible could have contributed to dual-workless couples increasingly joining the labour market as non-standard-earning couples. Although the roll-out of the Hartz IV package does not enable a causal design strictly speaking, the chapter finds a negative association between the post-reform years and the probability of dual-workless couples exiting dual-worklessness, contrasting with a positive effect found for individual workless people. This could be due to the specific negative effect of the reform on couples, such as reinforced means-testing, and/or to the changing profile of couples receiving unemployment benefits after the reform. The chapter also shows that the most important determinant of the type of exits made by dual-workless couple is their previous status: those that solely relied on non-standard-employment are much more likely to exit to another non-standard-earning arrangement, emphasising the porosity between dual-worklessness and non-standard-earning couples.

Chapter 12 concludes. It summarises the key theoretical and empirical contributions made by this thesis, in light of the existing literature. It emphasises the limits of the work shown in this thesis and reflects on avenues for future research. Finally, it offers policy recommendations regarding various aims of policy-makers, on gender equality, female employment, and social inequality.

The fourth part of the thesis contains the supplementary material to each empirical chapter and the bibliography.

1.4. Summary: what this thesis tackles

The overarching aim of this thesis is to better understand the evolution of couple employment participation in Europe over the past four decades, in light of two phenomena that this section has introduced: the polarisation of couple employment participation, and the rise of non-standard employment and of its prevalence in couples.

This matters for a variety of reasons. Polarisation can induce a form of inequality across couples, as access to employment, or lack thereof, clusters in couples, potentially fuelling social inequality. Non-standard employment can induce a form of gender inequality within couples, as it is disproportionately taken-up by women. As we shall see, it also induces potential risks for couples relying solely on non-standard employment as their source of labour income. As couples remain the main form of household in Europe, studying them is crucial with regards to social and gender inequality.

A key dimension to the argument made in this thesis, and in the empirical results found, resides precisely in linking the two phenomena: up until now, both remained in almost exclusively separate strands of literature, and, as the chapters reviewing past research explain in details, this constitutes a limit to understanding each phenomenon, and, more broadly, the evolution of couple employment participation. Both phenomena are interrelated deeply and cannot be understood in isolation.

This thesis shows that the polarisation of couple employment participation is only partially understood if no notion of standard or non-standard employment is applied, and that polarisation should be conceived not merely in terms of couples' access to employment, but in terms of access to good quality employment. In that regard, it shows

that the rise of dual-earning and of the clustering of employment in dual-earning couples mostly comes from standard employment clustering in couples.

It also shows that at the other end, it is not just worklessness that clusters in couples: non-standard employment has started doing so too, with a rise in couples relying solely on non-standard employment as a source of labour income, referred to as "non-standard-earning couples" in this thesis. It shows that the rise of dual-earning has come with a trade-off: no country has managed to oversee an increase in dual-earning rates, without avoiding either a rise in polarisation, or a rise in non-standard employment, each inducing different forms of inequality. Finally, the German case study that concludes the empirical part shows porosity between dual-worklessness and couples solely relying on non-standard employment as a source of labour income, and that more work is needed to understand the relationship between labour market reform and non-standard-earning couples.

2. The evolution of couple employment patterns across European countries: basic facts

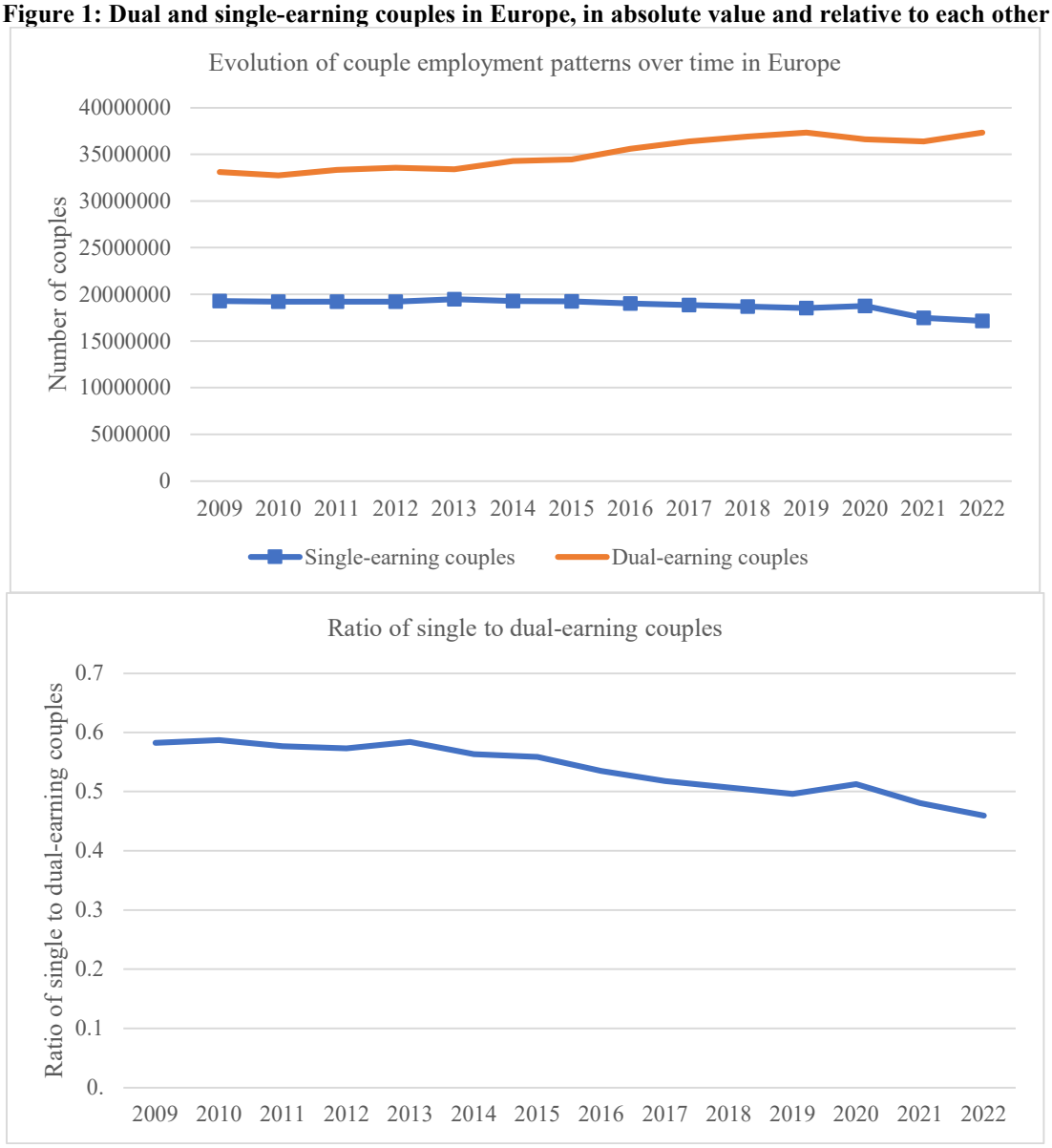
2.1. Dual-earning and the rise in female labour force participation

The main evolution that characterises the evolution in couple employment participation across working-age heterosexual couples in Europe over the past decades is the rise in the dual-earning couple, and the decline in male-single-earning couples. Note that these statistics are based on the ILO-definition of employment – someone is considered employed if they have worked at least an hour in the past week, which therefore does not incorporate notions of employment intensity and quality.

This is an issue this thesis discusses at length, but for now, let us abstract from it and consider that, in the past decade alone, in the EU, the total number of adult dual-earning couples has increased by 13 percentage points over the period, while the number of adult single-earning couples has fallen by 11 percentage points, (Eurostat 2023), continuing a trend began decades earlier (Crompton 1999). This means that, expressing the number of single-earning couples as a share of the number of dual-earning couples, the relative importance of single-earning in couple employment participation has decreased over the last decade. The number of single-earning couples used to be 58% of that of dual-earning, it is now 47%.

The data further showed that the phenomenon cut across all countries: everywhere, dual-earning couples are on the rise, single-earning represents only a fraction of dual-earning, and the relative importance of dual-earning compared to single-earning increases.

Figure 1: Dual and single-earning couples in Europe, in absolute value and relative to each other



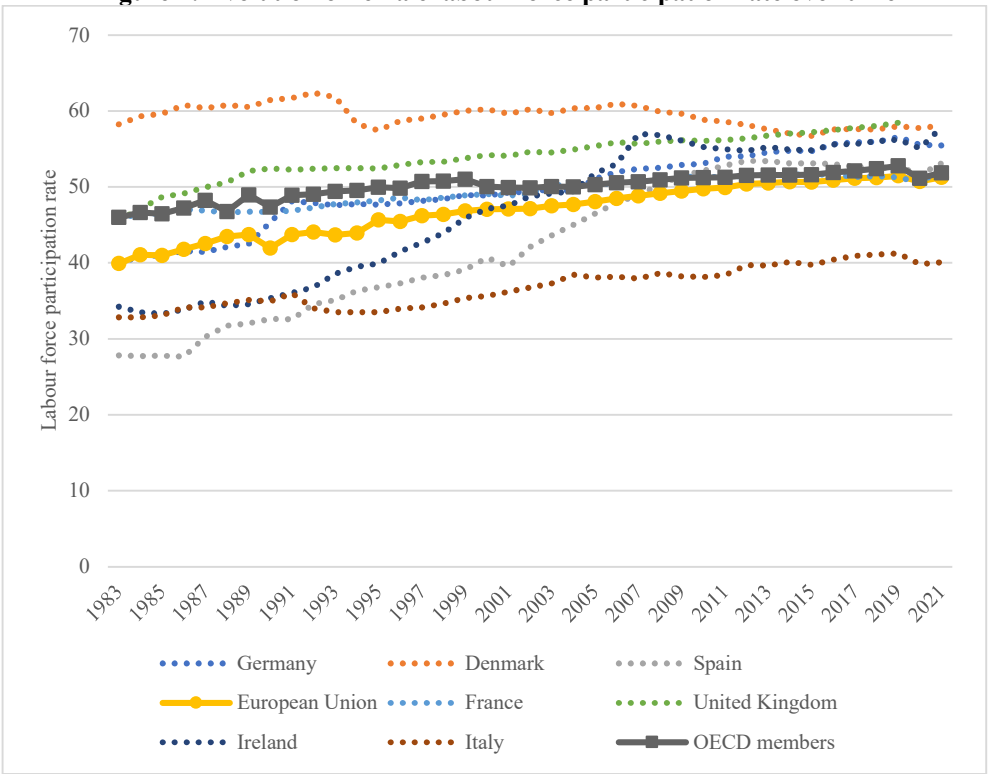
Note: the top graph represents the evolutions of the number of adult single-earning couple, with only one person employed, and adult dual-earning couples, with both persons employed, in the total EU population over the last decades. The bottom graph expresses this number of single-earning couples as a proportion of the number of dual-earning couples.
Source: Eurostat (2023*). Number of households by household composition, number of children and working status within households (and author's own calculations based on them for bottom graph).* Eurostat Data Browser.

The rise to prominence of the dual-earning model corresponds to the increase in the labour force participation, and relatedly, in the employment participation, of women over the past decades. Employment, in the early post-war decades, was strongly male dominated. Although gaps remain between men and women on the labour market, over time women have strongly closed the labour force participation gap with men, and this evolution directly influenced the evolution of couple employment away from single-earning and towards dual-earning.

World Bank/ILO data (2023) show that the labour force participation of women has risen in EU and OECD countries over the past four decades. This has led to a decrease in the labour force participation gap between men and women. On average, in 1990, in the EU, the labour force participation of women was 67% that of men. 30 years later, it is 82%, a 15-percentage points rise.

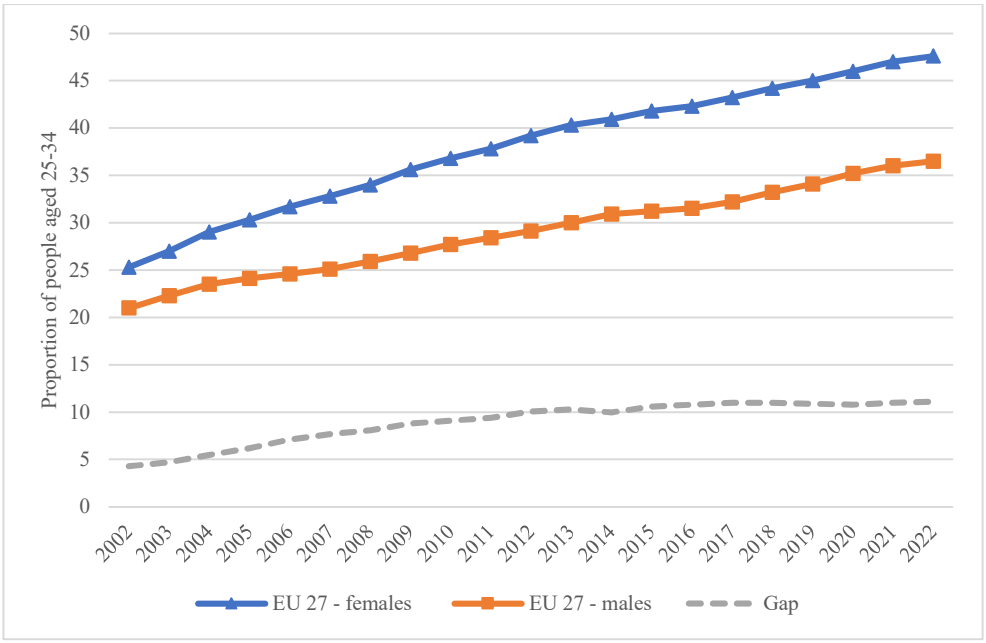
A key contributor to the rise of female employment has been the rise of mothers' employment. Traditionally, research has emphasised a "motherhood penalty" whereby mothers have had significantly lower employment rates and wages that childless women (Harkness and Waldfogel 1999). This penalty still exists everywhere, and is a key fact of gender-related employment issues (Grimshaw and Rubery 2015). Nonetheless maternal employment rate has been on the rise across the OECD over the past decades (OECD 2023), such that 71% of mothers in the OECD are employed in 2021. In the UK, the employment rate of working-age mothers has risen from 50% in 1975, to 72% in 2015. These increases should not hide, however, important disparities remaining across countries (Grimshaw and Rubery 2015).

Figure 2: Evolution of female labour force participation rate over time



Note: this graph represents the % of women aged 15+ who are in the Labour force, i.e., employed or unemployed rather than inactive (which means being jobless and not actively seeking work).
Source: World Bank (using ILO data) (2023). *Labor Force Participation Rate, female.* World Bank Data.

Figure 3: Percentage of female and male aged 25-34 achieving tertiary education on average in the EU over time



Note: this graph represents the percentage of females aged 25-34 and of males aged 25-34 on average across the current EU-27 who have achieved tertiary education.
Source: Eurostat (2023). Tertiary educational attainment by sex. Eurostat Data Browser.

The rise in female employment has been extensively studied and documented, and is a multifaceted phenomenon with different causes. It is beyond the scope of this section to review them all, but one that seems particularly relevant in the context of male and female employment participation, and couple employment participation, is the continued rise in female educational achievement, and in women achieving better educational outcomes than men (Eurostat 2023.

Eurostat data show that, over the past 20 years, on average in the EU-27, young women (aged 25-34) are consistently more likely to achieve tertiary education than young men, and that the gap has in fact widened over time. Analysis from the OECD (2019) shows that this tertiary education gap exists in every OECD country.

So, women work more, in proportions that resemble men's ever more over time, and have become more educated than men. Is this enough to speak of increasing equality in couple employment patterns? An important caveat emerges if we look into the type of employment held by (partnered) men and women.

2.2. The rise of non-standard employment and its impact on couple employment participation

A key evolution in the area of employment is the increasing prevalence of employment described as "non-standard". I will define non-standard-employment more precisely in Chapter 4, and describe in Chapter 8 how I operationalise it for the purpose of empirical analyses. For now, let us note that the OECD (2015) includes part-time work, temporary work, and self-employment under the umbrella of non-standard-employment.

The OECD (2015) shows that non-standard work, as it defines it, represents one-third of total employment across its member countries. Nearly half of the employment growth

since the 1990s and up to the global economic crisis in the OECD has been in the form of non-standard work. This proportion reaches 60% if the 1990-2015 period is studied, making non-standard-employment the main fuel to job growth over these years.

The main contributors to the rise of non-standard employment are part-time and temporary employment (ibid). Part-time employment increased in more than half of the OECD countries between the 1990s and the economic crisis. Temporary employment has increased in more than three-quarters of the OECD countries studied over the period, while the trends in self-employment are more mixed.

Of course, there are variations in the intensity of the trend, and prevalence today of non-standard employment across countries. In 2022 in the EU, 17% of employed people aged 20-64 were working part-time, a share reaching 38.4% in the Netherlands, 30.1% in Austria, 27.9% in Germany, 23% in Belgium or 20.9% in Denmark, but by contrast decreasing to below 4% in Bulgaria, Slovakia, or Romania (Eurostat 2023). Regarding temporary work, 12.1% of people aged 15-64 were in such form of employment in 2022 in the EU, with, again, important variations across countries. The highest shares were found in the Netherlands (23.2 %) and in Spain (18.1 %), contrasting with the rates found in in Lithuania (1.6 %), Romania (1.8 %), Latvia (2.4 %) and Estonia (2.8 %) (Eurostat 2023). Post-communist economies typically record the lowest rates of non-standard employment. In some countries with low non-standard employment, such as Greece, Bulgaria or Romania, (solo)-self-employment is particularly important as a form of non-standard work (OECD 2015).

Non-standard employment is crucial if one is to understand the rise in the employment of women, and associated changes in couple employment participations. Employment in

Europe today is more female than forty years ago, more non-standard than forty years ago, and both phenomena reinforce each other. Non-standard employment, especially part-time employment, is disproportionately taken-up by women.

Just under a third of EU women aged 20-64 were working part-time in 2022, roughly 10 percentage point more than men. Women were also slightly more likely to be in temporary work than men (13.4% of employed women versus 11% of employed men aged 15-64) (Eurostat 2023). There are important variations by country: the countries in which overall part-time employment rates tend to be highest, also tend to have the most important share of employed women working part-time: 60.6% in the Netherlands, 51% in Austria, 47.3% in Germany, a share falling below 5% in Bulgaria and Romania.

The rise in non-standard employment can be understood in line with the rising flexibilization of labour markets in Europe, and sectoral evolutions of European economies – points we shall come back to later in this chapter. But within the household, its gendered dimension can be linked to the unequal distribution of unpaid household tasks between men and women. An established fact in the area of couple employment patterns is that women do more household work than men.

Data from the European Institute for Gender Equality (2016) show that, in 2016, on average across the then EU-28, women spent nearly 7 hours more per week than men on cooking and unpaid household work, outside of paid work. This gap does not even include caring activities for children, where the discrepancy is even more pronounced: in 2016, on average across the EU-28, women spent 18 hours more per week caring for children outside of paid work. Strikingly, these gaps, although their sizes vary by country, exist in all European countries.

Women have always done more than men in the realm of unpaid household work – but they have not always done paid work as much as they are now. Non-standard employment can therefore be an answer for women seeking to solve the dilemma between the ever-present burden of household work, and paid market work, because it offers more flexibility and possibility to combine both.

Lewis et al. (2008) establish a clear link between household duties and the difference in paid market work supplied by men and women. For instance, they show that part-time work increases for women with children compared to childless women. More generally, they document the widespread use of non-standard employment amongst women in European heterosexual couples as a complement to a standard job in couples.

Taken together, these elements help us understand why the importance of non-standard employment, and its gendered dimensions, are a caveat to the growing equality between men and women on the labour market that rising female employment seems to imply. Non-standard employment is associated to the unequal division of tasks between men and women. Moreover, there is comprehensive evidence showing that non-standard jobs yield lower earnings and social protection entitlements than standard jobs, on average (OECD 2015), again a point that I discuss further in Chapter 4.

The evolutions in employment over the past decades in Europe have therefore favoured the rise of dual-earning, via the rise of female employment, with non-standard employment a strong contributor to both. While a lot of research focuses on these dimensions, and while employment is important to understand couples' labour market participation, non-employment is also a key dimension. At the other end of the scale, workless couples should be studied too.

2.3. Workless couples in Europe

It could be easy to see the evolutions of the past four decades in terms of couple employment under the prism or rising employment. But at the same time, these decades have seen the increasing documentation of another phenomenon: household worklessness, i.e., households of working-age in which no adult is in paid market work, amongst which workless couples are a prominent part.

This phenomenon has been documented in the context of increasing de-industrialisation and rising female employment (Berthoud 2007). This context underpinned the idea that losses of (predominantly male) industrial jobs in economically depressed regions, where female partners would struggle to find employment if they wanted, led to workless households on the one-hand, while rising female employment in households with a male partner also working led to multi-earning households on the other (ibid).

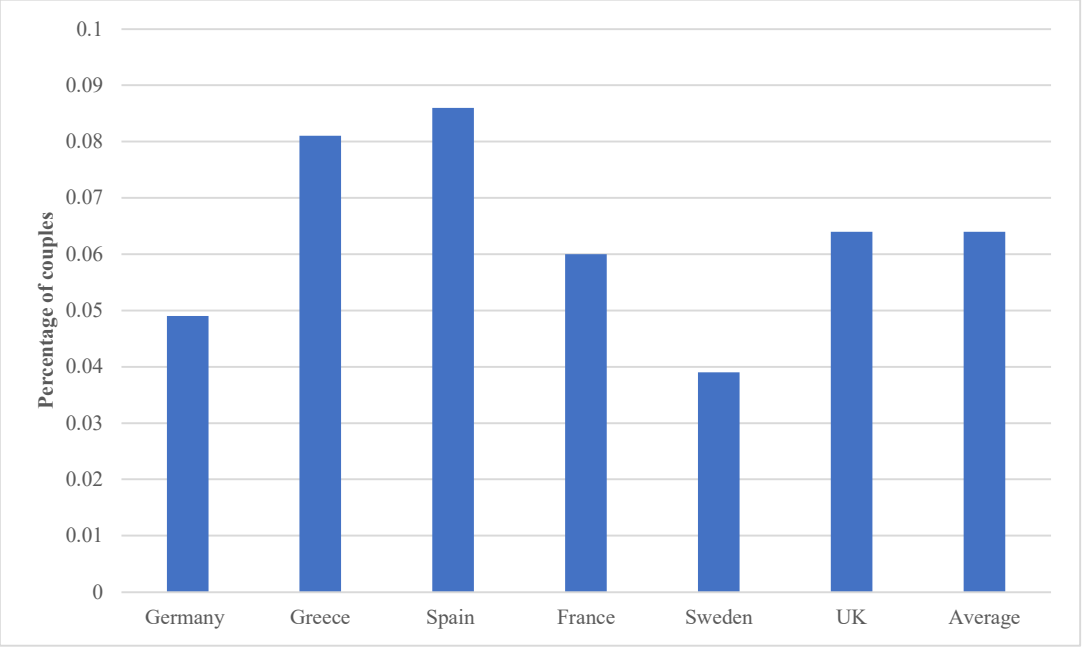
In the 1980s, a European Commission study carried by Professor J.J. Sexton (1988) on the 10 countries of the then European Community, shows that 18% of European households were completely out of the labour force (inactive), and 4% of European households had someone unemployed with nobody else in work, meaning that more than one in five European household were workless. In 1985, more than 20% of the unemployed lived in a household with at least another jobless person.

In a couple perspective, this translated into a much lower employment rate (and a much higher joblessness rate) for women married to unemployed men than for women married to an employed man. In 1985, on average across the European Community, the employment rate, unemployment rate, and inactivity rates were respectively 49.4%, 4.5% and 46.1% for women married to employed men. Corresponding figures were 34.6%,

13.1% and 52.3% for wives of unemployed men, and 24.1%, 13.1% and 62.8% for wives of inactive men.

Therefore, it seems that while employment has increasingly been coming in couples, illustrated by the rise of dual-earning, non-employment, in its various forms, has also increasingly been coming in couples. De Graaf-Zijl and Nolan (2011) show that, in the mid-2000s, nearly 10% of Europeans live in a jobless household. This is close to Eurofound data (2017), which show that more than 10% of Europeans live in a household with less than 1000 euros per person per year in labour income, mostly households in which no adult is employed. Data presented by Gregg, Scutella and Wadsworth (2010) show that in advanced economies, the rate of households that are workless has increased over time, and that couples are very important in explaining this household joblessness. On couples specifically, Harkonen (2007), provides data on dual-joblessness rates amongst couples of working age around the turn of the millennium in a dozen of European countries. These rates range from 2.2% in Denmark to just over 10% in Ireland, with an average around 5% hiding important variations across European countries. More recently, data from Dotti-Sani (2018) for the 2005-2012 period shows the rate of dual-joblessness amongst working-age couples as follows:

Figure 4: Dual-workless couple rates in Europe on average, 2005-2012



Note: this graph shows the proportion of couples with both partners aged above 18 and up to 60 that are dual-workless, i.e., in which both partners are workless, on average over the 2005-2012 period.
Source: Dotti Sani, G.M. (2018) 'The economic crisis and changes in work–family arrangements in six European countries', *Journal of European Social Policy,* 28, 177-193.

The exact estimates and figures may vary from study to study depending on what is estimated (workless household rate, workless couple rate, individuals living in workless households) and the age range, but the take-away is that the household context matters when considering joblessness, and within the household context, the couple is key. The broader point is that when considering couple employment participation, looking at employment, and the type of employment, is crucial, but is not the full picture: looking at the other end, at non-employment in couples, is also important to get an accurate idea of the evolution of couple employment patterns over the last decades.

2.4. Macro level factors and structural evolutions

It is beyond the scope of this section to establish an exhaustive literature review of the macro-level and structural factors that have affected the employment landscape for men and women over the past four decades. As a much more limited effort, trying to establish

basic key facts to set the overall scene, three of them emerge as indispensable to mention. On a sectoral level, the transformation of European economies away from industry and towards services. On a policy level, the increasing liberalisation of the labour market. On a conjunctural level, the economic crisis of 2008. It is also worth noting now that this thesis studies a time period that stops just before the Covid-19 pandemic. While the object of this thesis – couple employment participation – is certainly worth studying under the lights of the pandemic in future research, here it is not relevant.

2.4.1. The rise of services and the decline of industry

World Bank data (2023) show that the service sector is the dominant one, in terms of share of GDP, in the EU, and has been for the past thirty years, ascertaining its dominance over the industry sector in that time. However, things have not always been like that. Data for France, which are available for a longer time period, show that at the start of the 1960s, the gap between industry and services is much narrower – and that, taken together, agriculture and industry represented nearly as much as services in terms of contribution to GDP. Data analysed by Rogerson (2008) for Belgium, France, Germany, Italy and the Netherlands, show a similar picture in terms of employment: in the 1950s, the goods-producing sectors accounted for more employment than services, but this has sharply reversed over the next 50 years.

This sectoral transformation is crucial to the understanding of rising female employment. Analysis of the EU by Eurofound (2020) shows that occupations in Europe are very gender segregated, with women dominating service sector occupations such as social work, retail trade, cleaning and helping, or care work. Eurofound and the European Commission Joint Research Centre (2021) also show that the declining sectors,

manufacturing especially, are and always have been male dominated in terms of employment. On the other hand, female employment gains have happened predominantly in service sectors, particularly public services, but also some areas of private services. Logically, female employment growth has largely outpaced male employment growth in the last two decades (ibid).

The rise of the service sector, and of female employment in that sector, also ties in with the increasing prevalence of non-standard employment. Eurofound and the European Commission Joint Research Centre (ibid) show that occupations employing females disproportionately also tend to have a higher prevalence of part-time work, than occupations dominated by men.

2.4.2. The flexibilization of labour markets

Labour market policy has many tools at its disposal: unemployment benefits, minimum wage, employment protection laws, labour taxes and social contributions, regulation of working hours, active labour market policy, to name the main ones (Boeri and van Ours 2013). More flexible labour market policy aims at increasing the supply of employment and/or decrease the price of labour (ibid).

Very schematically, non-flexible labour markets typically have generous unemployment benefits, a set minimum wage, strict regulations in terms of laying-off employees, significant taxes on labour, strict regulations of contracts, little active labour market policy. More flexible labour markets typically have less generous unemployment benefits, aiming to put the workless back into work, lower or no minimum wages, allowing firms to set wages more freely, fewer impediments to firms' ability to fire and hire people, a more direct relationship between gross and net earnings, regulations that

encourage part-time, temporary, or other forms of non-standard employment relationships, and active labour market policies aiming at increasing employment rates.

Of course, in practice, the reality of countries' labour market institutions, and complementarities between them, is more complex than being either fully flexible or not flexible in all areas, but this simplification enables to understand the intuition behind "labour market flexibilization". Presenting Fondazione Rodolfo Debenedetti/IZA data on EU countries' labour and social policy reforms between 1980 and 2007, Boeri and van Ours (2013) find that the majority of labour market reforms over the period have gone towards more flexibilization, and that the share of reforms aiming at more flexibility rather than the reverse increases over time.

Analysing OECD data (2023) confirms that picture (Figure 5). The replacement rate of previous income offered by unemployment benefits has decreased over time across Europe and the OECD, and, for all household situations analysed here, the 2022 replacement rate is lower than 20 years ago. Of course, it is impossible to be exhaustive and take into account every single possible situation in terms of household composition, unemployment duration, and previous earnings of the unemployed claimant. But here, whether the unemployed claimant, previously earning the average wage, is single or in a couple, and unemployed for 6 or 12 months, the conclusion is the same. Moreover, the decrease in the generosity of unemployment benefits holds across a strong majority of the countries. Still in line with the flexibilization of labour markets, Employment Protection Laws have become less strict over time in EU countries that are part of the OECD, over the last 30 years, and on average (Figure 6 - OECD 2023).

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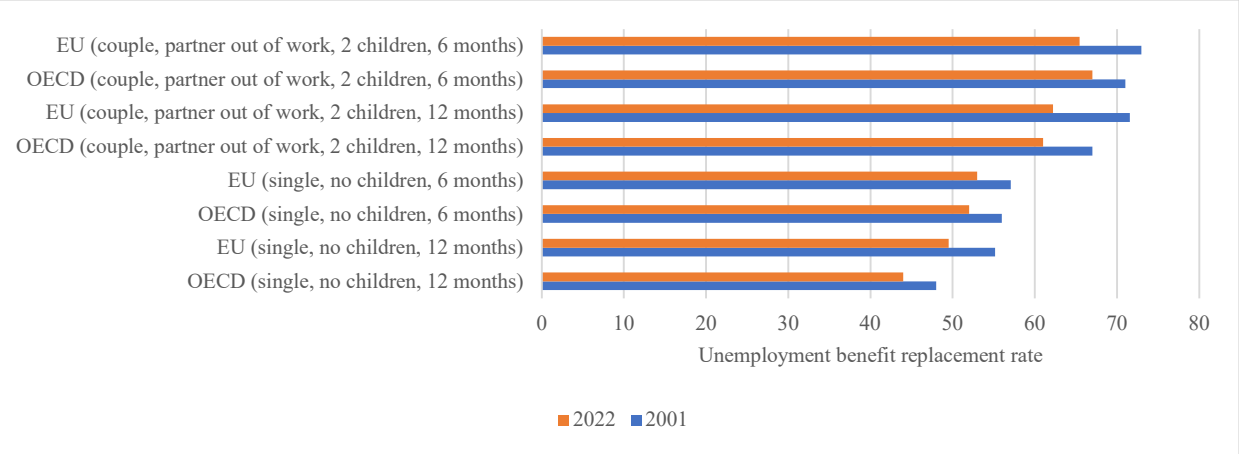
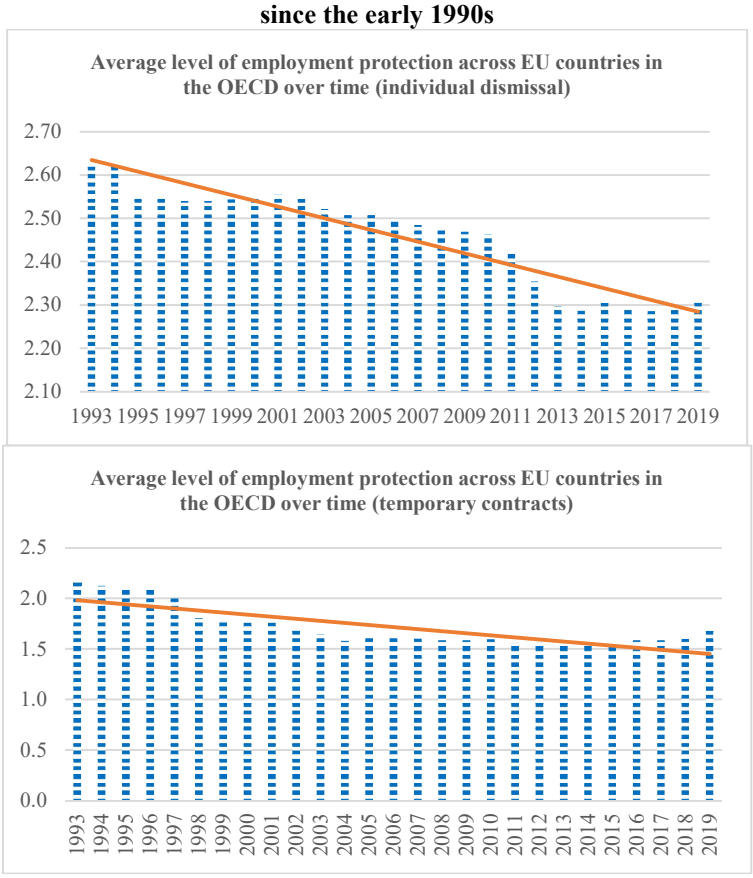
Figure 5: Evolution in unemployment benefit replacement rates over time in the EU and the OECD



Note: this graph represents the evolution over two decades of the net replacement rate that unemployment benefits provide, i.e., the share of income pre-unemployment that unemployment benefits allow to maintain, on average in the EU and the OECD, for a range of different household types and durations of unemployment.
Source: OECD (2023). Net replacement rate in unemployment. OECD statistics.

Figure 6: Evolution of the strictness of employment protection laws in European OECD countries since the early 1990s



Note: these graph indices compiled by the OECD on the strictness of employment protection laws (EPL) on average across EU that are members of the OECD, on the left-hand-side with regards to the regulation of individual dismissals, on the right-hand-side with regards to regulations surrounding the use of temporary contracts. The indices range from 1 (least strict) to 6 (strictest).
Source: OECD (2023). Strictness of Employment Protection. OECD statistics.

This hides, however, more variation across countries than in the case of unemployment benefits, with a non-negligible number of countries having actually made EPL stricter over the period. Nonetheless, 11 countries out of the 18 studied have made EPL looser over the last thirty years.

Finally, we have already explored the rise in non-standard employment in the previous subsection. The rise in non-standard employment is consistent with the greater flexibility of European labour markets. And indeed, they coincide with a policy willingness to render labour markets more flexible: as OECD data (2023) show, the strictness of the regulation surrounding temporary contracts, regulating dimensions such as the type and duration of work that temporary employment could be used for, or the pay conditions of temporary workers, have got looser over the years, on average, in Europe

2.4.3. The 2008 economic crisis

It would be beyond the scope of this sub-section to detail every single episode of recession or economic fluctuations in all European countries over the past forty years. But, by all accounts, the 2008 crisis and the following "Great Recession", deserve a mention. GDP in the EU fell by 4.3% according to World Bank data in 2009, the sharpest fall by far in the 1970-2019 period, only recently beaten by the pandemic-induced recession (World Bank 2023). At the same time, unemployment rose in the EU, from 7.2% in 2008 to 9.1% in 2009, and kept rising until 2011, reaching a peak of 11.3% (OECD 2023, World Bank 2023).

The crisis is relevant to the evolution of gendered and couple employment patterns, because it predominantly had employment consequences in male-dominated sectors, such as blue-collar manufacturing employment, or construction (Eurofound/Joint Research

Centre 2021). Female employment, on the other hand, was more sheltered, and some sectors in which they are overrepresented, like education or health, often heavily publicly funded, continued to grow (Eurofound 2021).

Because of the sheer size of the employment shock, but also because of its gendered dimension, the 2008 crisis therefore has implications for the phenomenon studied in this thesis. As detailed in Chapter 3, a potential response for the female partners of displaced male workers could be to increase their labour supply (Lundberg 1985), which, given the scale of job losses, may have led to a rebalancing of couple employment patterns.

Moreover, a significant part of the employment recovery in the decade following the crisis has been through non-standard employment: the OECD (2015) shows that, while non-standard employment explains just under half of the employment growth since the 1990s and up to the global 2008 crisis, this proportion rises to 60% if the post-crisis years are included. As we have seen, non-standard-employment is disproportionately taken-up by women, which further potential consequences on couple employment participation.

2.5. Summary: setting the scene

The past four decades have witnessed the rise of female labour force and employment participation, which has moved European societies away from male-single-earning, and towards dual-earning, when it comes to couple employment participation.

A significant part of this rising female employment has taken the form of non-standard employment, particularly part-time work. This means that dual-earning can still hide unequal situations between men and women within heterosexual couples, many being organised around the "one-and-a-half" earning model, with the man in standard work and the woman in non-standard work.

At the other end of the scale, the phenomenon of household and couple worklessness has increasingly been documented. Employment seems to come in couple, but so does non-employment. This hints at a key concept: the polarisation of couple employment participation.

These developments have taken place in a context of sectoral transformation of European economies, away from industry and towards the production and consumption of services, a sectoral shift that is tightly linked to rising female employment. European labour markets have become more flexible, as labour market policy increasingly became geared towards increasing labour force and employment participation, again affecting women's incentives to enter employment. The period also witnessed the biggest economic crisis in nearly a century, which reshaped, at least temporarily, male and female employment patterns in Europe.

I intended this subsection as a basic introduction to the overall context and key facts surrounding the object of study of this thesis, couple employment participation. It is not exhaustive: other factors, such as the evolution of social norms and gender attitudes, changes in family policy and childcare, for instance, could have been mentioned. But they relate in many ways to the structural and policy transformations already discussed, and are explored in greater depth in the literature review section. This subsection has also generally concentrated on general trends at European level. There are, of course, potential differences, in levels or in the intensity of the trends, across European countries. But what this section highlights are factors that, generally speaking, have been common to all or most European countries, especially those without past experience of Communism. It helps introduce the general contexts in which particular nuances or differences can then be studied, as is the case in the empirical work of this thesis.

PART II: PAST RESEARCH

3. Theoretical framework

To ground expectations with regards to the evolutions of couple employment patterns, it is necessary to first go back to frameworks predicting the division of tasks between partners in a couple. In that regard, two competing frameworks, with drastically different implications, emerge: one from economics, and more precisely the microeconomics of the family as pioneered by Becker (1973, 1974, 1981), and the other from sociology, in particular the strand of the literature looking at couple careers and the joint success of couples on the labour market. These frameworks help introduce the concept of polarisation, and lay the basis to understand the empirical evolutions in couple employment patterns since the early 1980s, including with regards to non-standard employment.

3.1. The Beckerian perspective: specialisation

3.1.1. The Beckerian model

The seminal foray into the division of tasks between the partners of a heterosexual couple comes from the work of Becker (1973, 1974, 1981), who interprets behaviours such as childbearing, marriage and divorce as active choices by maximising agents rather than passive responses to social or cultural forces (Pollak 2003). Becker analyses the gains to marriage, in the context of household utility not coming merely from the consumption of market goods, but also from the production of household commodities – a good conversation, or the quantity or quality of children are given as examples. In his view, members of the household maximise utility for the household as a whole.

In that perspective, the gains to marriage come from the optimal specialisation of each partner into the area of labour they are most productive in: the partner comparatively more productive in the labour market area should do relatively more paid labour market work, and the partner comparatively more productive in the household work area should do relatively more household work.

Becker distinguishes between labour market (wage potential) and non-labour market (intelligence, health) traits. In his view, the optimal arrangement is assortative mating on non-labour market traits, but heterogeneous mating on labour market traits, to foster the optimal specialisation of partners. The overarching aim of marriage and forming a family in this case, is raising children (Blossfeld and Drobnic 2001), which will lead to further specialisation of both partners. This would be typically exemplified by the wife withdrawing from the labour force completely upon the birth of the first child. As already discussed in Chapter 2, and further evidenced in the following chapters, especially Chapter 6, there is indeed, across Europe and the OECD, a "motherhood gap/penalty" whereby mothers are less likely to be employed than childless women, which would fit with this Beckerian specialisation perspective.

Although theoretically, the partners should specialise purely based on who is most productive in a given area, which should be gender-blind, in practice Becker's work is rooted in a gendered world. Women and men invest early, because of early socialisation and the prevailing gender norms, into household skills and labour market skills respectively, and this fosters a gendered division of tasks (Blossfeld and Drorbnic, 2001). Becker takes as evidence of his theory the high rate of married women who are out of the labour force, combined with matching on non-labour market traits such as parental wealth, intelligence, age, religion or height.

The implications of the Beckerian model are twofold, in terms of the division of the access to employment. Within couple, it results in a strong inequality: the predominant model is a male breadwinner model, with women at best being secondary earners, and often confined to household work. But across couples, it is rather egalitarian: assuming no unemployment for now, in a world in which every couple is single-earning, there is employment in every couple (at the expense of one member of the couple).

The Beckerian model has been widely discussed and criticised. Theoretical debates have flourished in microeconomics, with the main alternative emerging as the "bargaining model" (Blossfeld and Drobnic 2001, Pollak 2003, Harkonen 2006, Blundell et al. 2007), in light of the imperfect pooling of income within households, which constitutes a different approach to conceptualising the way households allocate their time and resources.

In this model, partners maximise their own individual utility function – albeit with some degree of concern for the other's welfare. The division of tasks is subject to bargaining, with household work generating disutility. The gendered division of tasks is maintained through husbands' generally higher earnings, their role as the main income provider affording them the upper hand in the bargaining (Blossfeld and Drobnic 2001), perpetuating gender inequality within couples.

The Beckerian model was also criticised by feminist perspectives, because of its implication in terms of gender inequality, the economic dependency that women would be subject to, or the vulnerability of the couple to an exogenous shock to the working partner (Oppenheimer 1997). Some view the traditional male-breadwinner model as caused by, and perpetuating, the patriarchy (Sokoloff 1988), with males extracting

advantages from leaving housework to women. The male-single-earner model can also be seen as "doing gender": men perform "men-like" activities, women do "feminine" tasks, both entrenched in social gender norms (Berk 1985, Blossfeld and Drobnic 2001).

Yet, the Beckerian model is an accurate picture of developed economies a few decades ago, dominated by the norm of male-single-earning (Crompton 1999, Bredemaier and Juessen, 2013). The data used in this thesis conform that as recently as the mid-1980s, the main form of couple employment participation was male breadwinning (Chapter 9). European couples seemed to be specialising in paid labour market work and unpaid household work according to the predictions of Becker.

Overall, the Beckerian theoretical framework has two main implications for the purpose of this thesis:

- The specialisation of each partner in unpaid household work and paid labour market work leads to the male-single-earner model and gender inequality within couples.
- This model, however, ensures that employment is evenly shared across couples, with at least one employed member per couple (at the expense of the other).

3.1.2. What may have changed since the 1970s: challenges to Beckerian parameters

Becker's model was vindicated empirially in societies in which women, and especially married women and mothers, had a low participation to the labour force. But since the 1970s, there has been a constant expansion of women's educational attainment – to the point where they have now, on average, higher educational attainment than men in the OECD and the EU (OECD 2019). This has translated into much higher rates of female

employment over time, as seen in Chapter 1. Becker treated this as exogenous and linked to the general educational expansion and the rise in well-paid service sector jobs, and saw it as threatening the stability of the family (Blossfeld and Drobnic 2001).

The implications are indeed strong for his model: if the gains to marriage and specialisation of both partners reside in their differential labour market traits, any equalisation in factors relating to their employment propensity, is an important change. As Goldin's (2006) famous "quiet revolution" argument exposes, in the case of the USA, the relationship of women to the labour market has considerably evolved in the past century. Considered outright inappropriate for most women at the start of the XXth century, work became progressively accessible to women, who joined the labour-market massively around the middle of the last century.

Although the description of women as secondary earners with little attachment to the labour market, other than to provide a small complement to household income if needed, has been accurate, Goldin argues that society changed. Elements such as later age for marriage (allowing women to build a career before it), higher female educational achievement, and a change of perception of the job-market from being valued instrumentally (for the wage) to being valued intrinsically (for the career fulfilment it gives), have made the Beckerian framework by and large obsolete.

Women have become less responsive both to their own and to their partner's wage (and, in this sense, their labour supply becomes more "like men") as a determinant of whether and how much they work. Gender roles are less traditionally distributed: many women have a high educational achievement and high-level careers. Similar arguments about a stronger attachment to the labour-market, and much less dependence on men, can be

found in Blau and Kahn (2007) and MClelland et al (2014). These long-run changes are also key to explain the rising employment of mothers, a key contributor to overall rising female employment, as motherhood and a career are less and less seen as mutually exclusive (Roantree and Vira 2018, OECD 2023).

These evolutions should lead to fewer men marrying "downwards" and women marrying "upwards" in terms of their labour market traits, as these traits equalise over time between genders. It should increase overall homogamous marriages, as well as couples in which the female is the main breadwinner (Blossfeld and Drobnic 2001). Indeed, partnership formation and marriage can be analysed as a market, whereby individuals seek the optimal partner to achieve a surplus compared to being single (Chiappori 2020). In this market, people seek to form partnerships by matching on certain characteristics, one of the most studied being education/human capital, which relates to employment propensity (Blau et al. 2000, Dupuy and Galichon 2014, Chiappori 2020). Investments in education are therefore important in the likelihood of finding a partner in a search model, especially if there are frictions (imperfect information) (Chiappori et al. 2009, Chiappori 2020), but they can also help foster, in a bargaining perspective, a better bargaining power within the household once formed, in terms of shaping a favourable division of paid and unpaid labour (Chiappori et al. 2009).

Who marries who, and how are the benefits of marriage split between the partners, are therefore the two key questions, that analyses of marriage markets tackle. The rise in female education switches the gains to partnership away from specialisation, towards utility derived from joint consumption, such as quality shared leisure time, or investment in household public goods, such as the education of children (Lundberg and Pollak 2015), in a way that may even increase social reproduction and inequality from generation to

generation (ibid). Marriage becomes less gender specialised, and more "hedonistic", with such joint enjoyment of shared consumption and a more even labour market participation (ibid, Chiappori 2020), especially as new technologies reduce the time that needs to be spent on household work, further decreasing specialisation as a potential objective in marriage markets. Evidence for the fact that homogamy is important (educated people tend to marry educated people), and that within this homogamy, people who have gone to the same college tend to marry, reinforces this view (Kirkebøen et al. 2022).

The rise in female education is therefore crucial to the understanding of new forms of household behaviour, but also of incentives to get education for women in the first place: in a world of low female education and high male education, women have low incentives to get education as they can marry upwards. But as more women get education, not getting an education becomes more costly in that regard, increasing the education premium for women not just in terms of intra-household allocation of benefits, but in terms of partnership formation in the first place (Chiappori et al. 2009). Further, with the erosion of gender norms and the higher availability of technology for household tasks, higher educated women are more able to translate their high education into actual labour market participation and high earnings, increasing their labour market return and relative position in the household, maintaining further their incentives to gain more education. In fact, as women now overachieve in terms of education compared to men, their bargaining power keeps strengthening, up to the point that we may see women marrying downwards, i.e. marrying lesser educated men.

In addition to, and interaction with, the rising educational profiles of women, sociologists have documented trends towards eroding traditional gender norms and liberalisation of views regarding female work (Charles 2011). Some argue that this is the natural product

of gender-based discrimination being too inefficient for modern capitalism (Jackson 1998). Others emphasise the causal power of changing cultural norms independent of their efficiency, with gender equality at the heart of Western ideals of progress (Baker and Letendre 2005, Charles 2011). In any case, female work is viewed much less negatively than it used to.

Note that Becker may be wrong in assuming these changes are exogenous. The point is that, overall, even if accepting the Beckerian premise that gains to marriage comes from specialisation, and specialisation comes from differences in human capital investments between partners, if these differences decrease exogenously, then couple employment patterns should change drastically.

3.2. The gains to marriage revisited – joint success and status similarity

Complementary to the analyses of marriage markets, which, in light of the rising education of women, have revisited the gains to education and marriage, some perspectives coming from sociology have fundamentally challenged the idea that gains to marriage reside in the specialisation of one partner in paid labour market work and in the other in unpaid household work, with implications in terms of the predicted couple employment patterns.

If anything, in that perspective, the gains from marriage come, from, rather than specialisation, the joint success of both partners on the labour market (Hout 1982, Bernasco, de Graaf and Ultee 1998, Henz and Sundstrom 2001, Blossfeld and Drobnic 2001, Harkonen 2006). Both partners can contribute to the income, standard of living, and social status of the couple, and could be looking to mutually foster each other's labour market success (Bukodi and Robert 2002). Even more so as women become increasingly

educated, and their potential to contribute to such joint success rises as a result – this is the aspect under which this sociological approach is very compatible with the analyses of marriage markets documented above.

Sociologists tend to think of the (labour market) resources of one's relatives as potential substitutes to one's own resources, such that being partnered with people who have a high level of resources can benefit one's chances to succeed in their plans (Bernasco et al. 1998, Bernardi 1999, 2001). This can also happen in a marriage market perspective, whereas the economic surplus to marriage increasingly shifts away from specialisation and towards joint consumption, with less gendered labour market participation. At this stage, it is important to note, however, that the level of "joint labour market success" may depend on how exactly this success is defined: after all, it would differ widely if defined in terms of raw employment participation, in terms of the level, prestige and type of occupation, in terms of hours worked etc. For instance, Verbakel and de Graaf (2009) show that having a male partner with higher economic resources has a positive effect on women's occupational achievement, but a negative effect on how many hours they work.

The fact that a couple can be both homogamous (in terms of employment status and the occupational prestige of this job) and specialised (in terms of one partner working fewer paid hours and doing more unpaid household work) is a key point for the purpose of this thesis, to which I come back to in greater details when introducing the notion of non-standard employment. But for now, the take-away is that the quality of relationships and networks, and the resources that a partner can provide in that regard, often described as social capital in sociology, are resources that partners can put in common to help each other get a job and satisfy a desire for status similarity, joint success, and common consumption of household goods.

Accordingly, it would make sense for people to seek and form partnerships with people who share similar characteristics, including in terms of labour market potential and resources, which is very different from the Beckerian prediction (Bernardi 1999, Cancian and Reed 1998, Blossfeld and Drobnic 2001, Verbakel and de Graaf 2009, Bredemeier and Juessen 2013).

Homogamy in terms of labour market potential could then foster homogamy in employment statuses in couples. All the more so since homogamy can then sustain homogamy: having a partner in employment increases the other partner's chances to be employed (Bukodi and Robert 2002, Verbakel and De Graaf 2009). Employment provides an individual with connections, knowledge, skills, and opportunities, that can then be shared with the partner. And the trust and frequency of relations, that characterise a couple relationship, create an environment that is particularly favourable to the transmission of such resources (Bernardi 1999). Because, in this perspective, partners have a vested interest in promoting each other's' careers, which constitutes the real gain to marriage, an employed partner, with a better connection to the labour market and resources, will foster the employment success of the other partner. So, a positive association is expected in terms of labour market statuses.

Another channel through which a positive association is expected is through "status-similarity" (Bukodi and Robert 2002). This argument is often formulated in terms of occupation: there is evidence that spouses tend to prefer to be in similar occupations, perhaps because this further facilitates the enhancement of each other's careers. It can also be seen as generating similar interests and attitudes, which make marriages and partnerships more stable. Although the argument is often framed in terms of occupational preference, a variation could apply to the more general employment status. It is possible

to infer from this occupational argument that people will have a preference for both being employed.

Overall, the idea is that the gains to marriage come from joint success on the labour market, fostering homogamous partnership and employment statuses, broadly defined. The implications of this approach for the purpose of this thesis differ drastically from the Beckerian perspective:

- The desire for status similarity and joint success on the labour market fosters couples in which partners share labour market traits and outcomes, leading to dual-earning couples instead of the male-single-earner model, and to greater equality within the two partners of a couple.
- This model, however, may lead to a less even distribution of employment at the societal level, across all couples: if labour market resources and outcomes come in couple, the reverse does too, and while dual-earning exists, dual-worklessness may emerge at the other end.

This latter aspect is now explored. The discussion until now has focused predominantly on couples that have access to employment – contrasting the male-single-earner model that follows from Becker's approach and the dual-earning model that the sociological approach predicts. But what do our theoretical perspectives have to say, if at all, on couples where no employment is found?

3.3. Perspectives on dual-worklessness

3.3.1. The specialisation of partners and the added-worker effect

The Beckerian model predicts that partners in a couple would specialise in unpaid household work and the other in paid labour market work. This unequal division of tasks implies that there is a primary and a secondary earner, whose role is to provide, if needed, a complement of income to the primary earner. The secondary earner is most often the female partner in Beckerian perspectives. Secondary earners (women) are expected to be much more responsive to changes in their partner's income than primary earners (men) would be for a similar change in their partner's earning (Blundell and Walker 1986).

Indeed, while men usually allocate their time between leisure and work, women, due to the gendered division of roles, substitute their time between paid market work, leisure, and unpaid household work (McClelland and Mok 2012, McClelland et al 2014). They have, as a result of the lower amount of time they can devote to the labour market, a lower participation in it (if at all), and only get involved to provide a complementary wage if needed (Goldin 2006). This means, in that view, that they have more room than men to adjust their employment participation, both at the intensive and extensive margins - respectively, decisions about how much to work, and whether to work at all (Blundell et al. 2011, Blundell et al. 2013).

The expected effect of an increase in male partner's wage on women's hours of work is negative: the household becomes wealthier as a result (income effect, the wage increase means that more is earned for a given amount of work), and part of it is transferred to the female partner. She, hence, also enjoys this income effect and reduces her hours of work (Blundell et al 2007). Although this effect can operate both at the intensive and extensive levels, in the traditional male-single-earner model, the latter is most often considered.

What does that mean when the primary earner becomes unemployed? We should witness an "added-worker" effect (Lundberg 1985, Gianelli and Micklewright 1995, Stephens 2002, Bredtmann et al. 2018). Unemployment can constitute an important source of decrease in income, sometimes lasting even after the spell ended, as post-unemployment earnings may never fully recover the pre-unemployment levels (Gangl 2006). If women work less when their male partner earns more, as described previously, they should work more when he earns less, as is the case with unemployment.

In fact, in this framework, women's labour supply could almost be conceptualised as a form of private, household-insurance against labour-market risks experienced by the primary earner, unemployment being one of them (Attanasio et al. 2005). By extension, the employment rate, or at least the labour force participation rate, of women living with a jobless partner, in working-age couples, should be higher than the employment rate of women living with an employed partner.

The AWE is primarily conceptualised in the case of a non-working woman entering the labour market, but can also be thought to apply at the intensive margin, as in the case of an employed woman increasing her hours after the partner becomes unemployed (Bredtmann et al. 2018). The AWE can also be seen, rather than as a mere compensation for a short-term income shock, as a long-term reaction from the secondary earner who updates their risk perception with regards to their partner's joblessness and steps-up their labour supply as a result (Stephens 2002).

Overall, extending the Beckeiran framework to dual-worklessness predicts that dual-worklessness is a marginal and short-lived phenomenon. Rational couples, keen to ensure consumption smoothing, will make sure to maintain a constant level of income and may

trigger for that the increased participation of the secondary earner, until the situation gets back to normal.

There are arguments against the added-worker effect that do not fundamentally challenge the premise and microeconomic framework on which it is based, but emphasise the constraints that a secondary earner trying to step-up their labour supply may face, or put forward parameters that the original framework had not included which alter people's expected behaviours.

For instance, the local labour demand may be low: if the main earner is out of work, it may just be that it is hard to find employment locally (Cooke 1987). This may even lead to a Discouraged Worker Effect (DWE), whereby the primary earner being out of work acts as a signal that jobs are scarce and hard to find, discouraging the other partner (Benati 2001). This other partner, as a result, remains inactive, or, if they were unemployed, moves from unemployment to inactivity, i.e., stops actively searching for a job (Fuchs and Weber 2017).

Another line of argument proposes that the added-worker effect should be small in a life-cycle perspective, as long as the income loss from partner unemployment is small compared to that partner's life-time earning prospects (Gruber and Cullen 1996), because the secondary earner already has their labour supply adapted to the primary earner's unemployment risk. In other words, partners of people prone to unemployment or joblessness more generally, work more in the first place as they are aware of the risk. The added-worker effect would therefore be more likely to exist when the employment loss is unexpected, or with imperfect information.

It could also be that the two partners see their leisure time as complement (to be enjoyed together), and that one partner working less induces the other to also reduce their labour supply (Blundell and Macurdy 1999, Stephens 2002), although this is more likely to apply to older couples considering early retirement options (Blau 1997, Blau and Riphahn 1999).

Finally, a powerful view comes from the identity economics branch of microeconomic literature, as pioneered by Akerloff and Kranton (2000). The idea, here, is to incorporate identity perspectives to make sense of behaviours that would otherwise not be seen as rational by more traditional economic models. People have deep-rooted identities, and if they take actions that depart from these identities, that are seen as an identity threat, it generates utility losses, not only for them, but also for other people who are used to the behaviours dictated by classic social norms.

In this view, the AWE is not a given. It would imply a powerful reversal of roles: suddenly, women become a, if not the main, breadwinner. Some women might be reluctant to do it, perhaps because it threatens the identity they constructed as household worker, but more likely, because it threatens the man's identity as the main breadwinner. This generates utility losses, which are further reinforced by "retaliation" actions, which the authors say are undertaken by groups of people who feel threatened in their identity when a non-usual action is taken by someone else. For men, this may take the form of not undertaking more household work, even if they have lost employment and the female partner is the main breadwinner.

These insights from identity economics match some sociological theories, that conceptualise gender as being "performed" in everyday behaviours. (Sokoloff 1988,

Harkonen 2007). The absence of added-worker effect, leading to dual-worklessness, could be linked to what sociologists have described, in this perspective, as a "macho-effect" (Harkonen 2007).

All these counterarguments tend to form part of a perspective according to which the added-worker effect could be a rational response in theory, but the conditions for it to happen in practice are not always met. It does then admit the possibility for dual-worklessness to exist, in the perspective of a primary earner losing their job and the secondary earner being constrained in their ability to step-in.

3.3.2. Homogamy and dual-worklessness

Dual-worklessness is more of a structural phenomenon, rather than a mere inability for the partner of a workless person to step-into the labour market under certain conditions, in the perspective that the gains to marriage come from the desire to foster joint success on the labour market.

This perspective predicts homogamous employment outcomes (Bernasco et al. 1998). They may just be the by-product of people coupling-up with partners that have similar characteristics (ibid, Ultee et al. 1988, Harkonen 2007). In this case, better-off couples, in terms of their employment propensity, will be dual-earning, as we have seen, and worse-off couples could be dual-workless, if both partners share low employment propensities.

In addition, the mechanisms already exposed to foster success on the labour market for dual-earning couples, work in the opposite direction for worse-off couples. That is, besides the mere sharing of characteristics that make both partners prone to dual-worklessness, there are independent partner effects that, one the one hand, can foster joint

success on the labour market, but on the other hand can foster a joint lack of success (Ultee et al. 1988).

Partners with high levels of resources in terms of education, income, wealth, have a high social capital that they can share with their partner to help foster their success, but the reverse then implies that partners with low resources cannot do as much. (Ultee et al. 1988, Bernardi 1999, Bernasco et al. 1988, Verbakel and de Graaf 2009). And the mere fact of being employed constitutes a resource, like access to networks, informal knowledge about vacancies or application processes, which means that being workless and having a workless partner can generate a vicious circle in which exiting dual-worklessness is difficult (ibid).

Of course, these mechanisms may interact with those given in the previous subsection. For instance, local labour demand in the context of a rapidly de-industrialising region may be an important factor behind dual-worklessness (Berthoud 2007), further reinforced by the time spent outside the labour market by both partners, with a depreciation of skills and a diminution of their social capital, networks, and ability to find employment.

The broader point is that employment is a scarce resource. All European societies exhibit some degree of involuntary joblessness. The couple becomes a medium to capture this scarce resource, but couples are unequally armed to access employment, and this generates inequality. Employment and non-employment come in couples as a result.

Table 1 summarises the insights from both perspectives.

Table 1: Summary of the two main theoretical perspectives

Theoretical framework	Implications for: equality in employment access between partners in the couple	Implications for: equality in the distribution of employment across couples	Typical couple type(s) associated to this model
Beckerian specialisation	Unequal	Equal	Male-single-earner
Couple careers	Equal	Unequal	Dual-earning versus dual-workless couples.

Note: this table summarises the two main theoretical perspectives discussed until now, to the author's understanding.

In a Beckerian society, the locus of inequality is within the couple, and its concrete manifestation is gender inequality between the male and the female, as exemplified by the male-single-earner model. In a homogamous society, the locus of inequality is across couples, and its concrete manifestation is in the social inequality in employment access between dual-earning and dual-workless couples.

These two perspectives lay the foundations for the two key concepts guiding the empirical endeavour of this thesis: one, polarisation, captures the evolution of European countries from one model of society to the other. The other, non-standard-employment, refines our understanding of these evolutions, by adding nuances between complete specialisation and complete homogamy.

4. The core concepts: polarisation and non-standard-employment

4.1. Polarisation

The concept of polarisation aims to capture the locus of inequality, as described in Table 1, and any evolution of said locus of inequality. The study of polarisation has been pioneered at the end of the 1990s until the end of the 2000s by economists Paul Gregg and Jonathan Wadsworth (1996, 2001, 2008). They derived a simple and compelling polarisation indicator, and although they use it to study the distribution of employment across all household types, it is easily adaptable to studying couples specifically.

The intuition behind their indicator is to compare a counterfactual in which employment is completely randomly and equally distributed across households and the real, empirical distribution of work across households. They work with ILO-defined employment (someone is employed if they have worked at least an hour in the previous week), so let us keep that in mind for now.

Let us consider a world with i=1;2;3;…..I individuals. They live in h=1;2;3;….H households. Each household has k=1;2;3….K people living in that household. In the counterfactual model, each individual has the same probability of being non-employed. This probability is the aggregate non-employment rate. In a society with a 25% non-employment rate, this counterfactual scenario assumes that any single individual in that society has a 0.25 probability of being jobless, independent of the employment situation of other people living in the same household.

Formally, if μ denotes the aggregate non-employment rate, then the counterfactual workless household rate γk, for every household h with k adults is given by:

$$\gamma_k = \mu^k$$

Equation (1)

Therefore, a single-person household's counterfactual probability of being jobless is just μ, the aggregate non-employment rate. For a couple, it is the square of the non-employment rate. The aggregate counterfactual household joblessness rate simply is a weighted average of the counterfactual workless rates obtained for each household of size k, weighted by the proportion sk of households of size k in the population:

$$\bar{\gamma} = \sum_{k=1}^{K} s_k \gamma_k = \sum_{k=1}^{K} s_k \mu^k$$

Equation (2)

As the population of interest here is couples, I discard other forms of households and only focus on households with two adults living in partnership. Therefore, while keeping the same overall approach as Gregg and Wadsworth, there is no need for a weighted average to account for the relative proportions of households of different sizes, and the aggregate counterfactual couple dual joblessness rate is given by:

$$\gamma_2 = \mu^2$$

Equation (3)

And by construction, using the exact same logic to derive it, the counterfactual couple dual earner rate α is given by

$$\alpha_2 = (1 - \mu)^2$$

Equation (4)

As $(1-\mu)$ is equal to the aggregate employment rate θ, this is equivalent to saying that the counterfactual dual-earning rate, under the assumption of random allocation of employment across couples, is the square of the employment rate.

The polarisation indicator aims to compare how unequally or equally distributed employment actually is in the population of couples, when compared to this "predicted rate" based upon the idea of a random distribution of employment. If we define dw the workless couple rate in the population of couples, and de the dual earner rate in the population of couples, then the polarisation indicator ρ is given by

$$\rho_{dw} = dw - \gamma_2$$

Equation (5)

and by

$$\rho_{de} = de - \alpha_2$$

Equation (6)

For dual workless and dual earner couples respectively.

A positive value for equation (5) means that there are more dual workless couples in society than would have been expected given a random allocation of non-employment. Positive polarisation therefore signals an "excess" of dual joblessness. Equally, a positive value for (6) means that there is an "excess" of dual earner couples. A negative value, on the other hand, signals a shortage of a given couple type in practice, compared to what we could have expected, if employment hand been randomly distributed.

Negative polarisation corresponds to a male-single-earning, Beckerian society, whereby the locus of inequality is within couples, rather than across them. Positive polarisation corresponds to a society in which couples are homogamous in terms of labour market resources and outcomes, and inequality is located across couples, rather than within them.

To see why, let us illustrate with a simple example. Imagine a society with four couples (eight individuals) and an individual employment rate of 50% (four employed individuals, four jobless). If the four jobs were randomly distributed, we would expect one of these couples to be dual-earner (50% squared gives us the expected dual-earning rate, 25%), two to be single-earner, and one to be dual-workless.

In a pure male-single-earner society, we would have four male-single-earner couples, no dual-workless couples, and no dual-earner couple. The difference between the actual (0) and the counterfactual (0.25) rates of dual-earning (-0.25) is negative. The same holds for dual-workless couples. On the other hand, we have an excess of (male)-single-earning couples compared to the counterfactual. The absence of dual-workless couples is at the expense of women, who are all workless.

In a pure polarised society, characterised by employment and non-employment clustering in couples, we would have two dual-earning couples and two workless couples. The difference between the actual (0.5) and counterfactual (0.25) rates of dual-earning is positive: 0.25. Again, the same holds for dual-worklessness, while we have a shortfall of single-earning couples compared to the counterfactual.

The key interest of the Gregg and Wadsworth polarisation indicators, relative to just comparing, say, the rate of dual-earning couples to the rate of dual-workless couples, is that they put these rates into the perspective of the overall rate of employment available

to partnered people. A 10% dual-workless rate can be meaningful on its own, but tells us much more if individual non-employment is only 5%. The same goes for employment and dual-earning. For a given number of jobs, these jobs can be distributed in very different ways, and the implications can differ widely as a result.

So, the Gregg and Wadsworth approach neatly captures the locus of inequality, and is very helpful to study the distribution of employment across and within couples. But it suffers from a clear shortcoming, in its current derivation and in how it has been empirically applied: an overfocus on the dual-workless polarisation indicator, which led to neglect the dual-earning one, and therefore neglect the associated questions of employment quality.

As a result, the empirical divide between dual-earning and dual-workless couples, and the conceptual distinction between a Beckerian, specialised society, and a homogamous, polarised society, may be over simplistic, because two partners of a dual-earning couples may still be unequal in terms of the work they perform; and because deprived couples today may not necessarily be fully workless, but may be found in precarious employment. To study these issues, we need to introduce the concept of non-standard-employment.

4.2. Non-standard employment

4.2.1. What is non-standard-employment?

The OECD (2015) defines non-standard employment as:

"All employment relationships that do not conform to the "norm" of full-time, regular, open-ended employment with a single employer (as opposed to multiple employers) over a long-time span. Such a broad definition of non-standard employment includes three

partly overlapping types: a) self-employment (own-12 account workers); b) temporary or fixed-term contracts; and c) part-time work".

Although what exactly should be included under the umbrella of non-standard employment is still debated, and subject to evolutions, the broad idea that standard employment constitutes full-time, permanent work, and that non-standard employment constitutes deviation from this model is commonly accepted in academic research (Kalleberg 2000).

This deviation matters because of the centrality of the standard employment model as defined above in the post-Second World War context (Emmenneger et al. 2012). Standard employment of that kind was a normative reference during the development of Western welfare states and the growth and reconstruction period after 1945 (Horemans 2018). The notions of standard and male employment were very closely linked in a time of male-single-earning.

The most commonly discussed forms of non-standard employment are part-time work and temporary work (Horemans 2018). Self-employment is sometimes included, as in the OECD definition, but this is not uncontroversial, and a distinction is sometimes made between solo-self-employment (considered non-standard) and self-employed people with employees (considered standard). Newer forms of employment relating to the gig economy or zero-hour contracts, can also be included or distinguished as their own categories (Eurofound 2020).

Non-standard employment is typically associated to disadvantages, both in terms of the labour market prospects it induces, and in the socioeconomic profiles of the people who take them-up. It typically comes with lower earnings compared to standard employment

(Manning and Petrongolo 2008, OECD 2015, Horemans et al. 2016, Horemans 2018, Nightingale 2019, Westhoff 2022).

Part of it is related to the fact that, as Horemans (2018) puts it, non-standard workers do not realise their full-work potential, for instance for part-time workers not working as much as they could, or temporary workers not being employed all year. But there is also an overlap with low hourly pay: non-standard work, especially temporary and part-time work for which this phenomenon is particularly documented, comes with a "low-pay penalty" in hourly earnings, on average (Manning and Petrongolo 2008, OECD 2015, Westhoff 2022).

In a perspective that conceptualizes labour markets as segmented, with core workers in stable, full-time jobs and outsiders in precarious jobs, non-standard-workers would be located precisely in that outsider segment, hence the low pay (Westhoff 2022). This segment is characterized by low bargaining power, employers using the work in flexible staffing strategies, with fewer training opportunities and development of human capital, all of which contribute to lower pay (OECD 2015, ibid). Non-standard workers are also worse-off in terms of their job characteristics, on average, with, especially for temporary workers and the self-employed, less job stability, more earnings volatility, and a worse access to the social protection system (OECD 2015).

Non-standard-employment also disproportionately affects groups that are structurally disadvantaged on the labour market: women, young people, immigrants, people with lower skills or education, (OECD 2015, Eurostat 2023). This of course, in part, relates to the aforementioned issue of earnings: part of the earnings gap between standard and non-

standard employment is explained by the socioeconomic characteristics of the people holding non-standard work.

Of course, non-standard employment is a vast category. A Premier League professional footballer and someone working for the summer at a campsite, two professions in which temporary employment is frequent, could hardly be said to be in a comparable situation. Part-time work hides a variety of situations too, and distinctions within it could be made: the ILO defines short part-time as working less than 20 hours per week, marginal part-time as working fewer than 15 hours per week, and substantial part-time as working 20 to 30 hours per week (Messenger and Wallot 2015).

Besides differences within each category, there are differences between them too, as in many ways, part-time work could be seen as less insecure (in terms of earnings, job stability, or social security entitlements) than temporary work or solo self-employment (OECD 2015, Weshoff 2022). And, there are differences across countries, in terms of what exactly the implications of different forms of non-standard employment for life outcomes are.

But the broad point is that on average, non-standard-employment constitutes a flexible source of employment, associated with disadvantage, both in terms of the outcomes it generates, and the people who tend to take it up. As described, non-standard employment is disproportionately, in Europe, female, which is especially true for part-time employment. This means that the rise in women's employment, over the past four decades, and the improvement on paper that it represents, must come with the caveat that inequalities subsist in terms of the type of work performed by partnered men and women.

This of course has implications for our understanding of the evolutions of couple employment patterns, which is what we now turn to.

4.2.2. Why may we find non-standard employment in couples?

In the perspective of couples, the flexible nature of non-standard employment can be a strategy for women to combine household work and paid work, in a context in which they are still disproportionately burdened with such household work, due in part to gender norms (Blossfeld and Drobnic 2001, Bettio and Plantenga 2004). This may be particularly relevant in the context of motherhood, and having to care for young children, a task still subject to strong gender norms (ibid, Kaufman 2017). Inequality in access to paid employment can take subtler forms than "purely employed" versus "purely workless" linked to the increasing need to distinguish between standard and non-standard-employment (Gornick, Meyer and Ross 1997, Korpi 2000, Lewis et al. 2008, Gornick and Meyers 2009),

More generally, the Beckerian model predicts a linear relationship between a partner's share of paid market work and of unpaid household work – this is the premise for successful specialisation. So, theoretically, women's hours of unpaid work should decrease in line with their increasing labour market involvement (Booth and Van Ours, 2008, 2009). This, however, underestimates the powerful effect of gender and social norms, which trump what seemingly rational, utility-maximising behaviour would predict at face value (Akerloff and Kranton 2000).

Esping-Andersen et al. (2013) argued that in the context of a social equilibrium evolving towards greater gender equality, the move away from male-single-earning would not necessarily be a smooth ride to dual-earning couples with both partners in standard

employment. The fuzziness of gender norms regarding concrete issues of paid market work and household tasks, would result in ill-defined couple arrangements and high use of non-standard work in couples (ibid, Conolly et al. 2016).

Finally, the rise in non-standard-employment is tightly related to the rise in service-sector employment, which is also closely related to the rise in female employment (Charles 2011). This could be related to the marketisation of household tasks, increasing the demand for paid market work to perform them; the fact that women are seen to have a comparative advantage in "soft-skills", which are more important in services job (Gregory 2011); or to the fact that males reject what they perceive as "women's jobs" in this sector (Charles 2011). As seen in chapter 1, there is a strong link in practice between the prevalence of non-standard forms of employment and service sector female-dominated occupations.

Overall, the rise in non-standard-employment means that the picture may not be as clear-cut as an opposition between strong specialisation in paid-work and household work, characteristic of male-single-earning societies, and homogamous employment outcomes. The gendered use of non-standard-employment creates nuances, whereby couples can be homogamous, in the sense of both partners being employed, and specialised, in the sense of the male being in standard work and the female in non-standard work. The degree of male domination in employment access within heterosexual couples may have changed more in degree than in nature.

So, a clear expectation in the literature would be to find non-standard employment in couples as a (female) complement to a (male) standard job. But what this thesis will

explore empirically in detail is also the extent to which non-standard employment may be found as the sole source of labour income in couples.

This aspect has been much less studied. But, drawing on other strands of literature warrants exploring it. In particular, the literature on in-work poverty emphasises how poverty as a phenomenon is increasingly associated to being in work – rather than being restricted to a phenomenon associated to household worklessness (Lohmann 2018, Salverda 2018, Nolan and Maitre 2021).

A key driver relates to the "activation turn" – the centrality of achieving high employment rates in the policy objectives of 21st century Europe, which led to policies aiming to put jobless people back into work, including low-paid work (Seikel and Spannagel 2018), and which is discussed more in following chapters.

The in-work poverty literature is crucial in making the case for linking individual employment outcomes to the household context (Marx and Nolan 2014). Indeed, whether a low-paid person is in a poor household depends on whether there is any other source of earnings in the household, and the level of earnings of this source (Lohmann 2018, Maitre et al. 2018, Salverda 2018).

This is where employment quality comes into play. Because non-standard forms of employment are associated to lower earnings, how they integrate within the wider household labour supply is crucial, because a non-standard worker is likely to need more sources of income supplements to his own wage to avoid being poor (Horemans 2018). The OECD (2015) shows that households whose only source of labour income is from non-standard employment have much greater poverty risks than households where

standard employment is found, poverty risks that are in fact more akin to those of workless households.

The "couple careers" theoretical perspective emphasises the likelihood of homogamous employment outcomes in couples. If this stems from homogamous formations of couples in terms of their employability, and from couples' desire for status similarity, it is possible that the argument could extend from raw employment status to the quality of employment, with advantaged couples capturing standard employment, and disadvantaged couples capturing non-standard employment, in a policy context in which taking-up low-paid work is encouraged and labour markets become more flexible.

This would be especially salient in the context of rising non-standard work: the scarce resource no longer is employment but standard employment, for which the couple could become a medium to acquire it. Westhoff (2024) emphasises how non-standard forms of employment may accumulate in couples as labour market dualize, particularly with regards to temporary employment, which has been growing recently, an argument echoing Horemans (2018) and Fritsch and Verwiebe (2018), who, in the case of Germany, show that dual-earning is no longer necessarily a buffer against poverty if both earners are in precarious, non-standard forms of work.

So, the household is a crucial context to analyse the type and quality of employment held by individuals and how it may complete the type and quality of employment held by other members of the household. The rise of non-standard employment means that the dichotomy between employment and non-employment is outdated, and may reshape couple employment patterns such that non-standard employment may no longer be only used as a complement to a standard job in couples, but may possibly be the sole source

of labour income in some of them. The rise of temporary employment as a share of all jobs and of non-standard jobs in particular is crucial in that regard, as it is less likely to be "voluntarily" taken-up by couples as a complement to a permanent job (contrarily to a full-time/part-time divide in couples) and more likely to foster labour market dualization (Westhoff 2024). In any case, the relevant cleavage may increasingly be between couples with standard employment and others without (0ECD 2015), and this is another dimension in which integrating the study of polarisation and of non-standard employment would be crucial. This thesis aims to look at all the different ways in which non-standard employment could be used in couples: as a complement to a standard job, or as the sole source of labour income in a couple.

4.3. Polarisation and polarisation

A reader familiar with the economic literature may have expected "polarisation" to refer to a different phenomenon to the one described here, instead describing the process according to which an economy destroys middle-pay, medium-skilled occupations, and whereby job growth increasingly concentrates simultaneously in the upper tail of the occupational ladder/wage distribution and in the lower tail (Goos and Manning 2007).

This phenomenon, attributed to the higher proportion of routine, automatable tasks in these middling occupations, has been extensively documented in the case of the US labour market and in Europe (Autor et al. 2009, Goos and Manning 2007, Goos et al. 2009). Although there has been some debate, with proponents of skill-biased technological change arguing instead for inequality being primarily driven by a rise in upper-end occupations (Katz and Autor 1999, Goos and Manning 2007), the idea is generally widespread and accepted.

To my knowledge, no study has ever aimed at linking both forms of polarisation - the household employment polarisation constituting the focus of this thesis, and the job structure/wage polarisation. The former concentrates on the household level, while the latter tends to focus either on aggregate occupations, or on the individual level.

The focus on household employment polarisation in this thesis stems from the focal point being the rise of female employment, and how it has affected household-level employment patterns, linking gender inequality in employment access, and social inequality in the distribution of such employment. To refine these considerations, I take the almost unprecedented step in the literature to redefine this household employment polarisation in terms of employment quality, because, if one is to study the evolution of household employment patterns in light of rising female employment, one cannot abstract from issues of employment quality, particularly related to part-time work.

Therefore, there are two distinct phenomena referred to as "polarisation" in the literature. But the fact that the one I study in this thesis, employment polarisation across households, can be refined, as I do throughout, to incorporate employment quality, suggests that there is potential to integrate the polarisation I study, to wage/occupational polarisation studied in a different strand of the literature. I do not attempt to do so in this thesis, mainly for data reasons: I chose the best possible data source to study European-level evolutions in couple employment patterns over as long a period of time as possible (the EU-LFS, as described in Chapter 8), but the trade-off is that these data do not include good quality earnings variables. The aims of linking both polarisation phenomena, though, is a clear path for future research, a point I come back to in the concluding chapter.

So far, the discussion in Chapters 3 and 4 has centred around a general argument, without distinguishing between different country contexts. But couple employment patterns may be affected by national and institutional contexts, and vary accordingly, which is what the next chapter turns to.

5. Couple employment patterns in the country and policy contexts

When discussing policies that affect couple employment patterns, this section primarily reviews policies that are linked to female employment. Of course, one could argue that couple employment patterns would also be shaped by policies affecting male employment. But this thesis analyses couple employment patterns, and their evolution over time, from the initial empirical premise (and theoretical, if one thinks of the Beckerian framework) that the male would be the breadwinner. There is also a lot less variation across countries in male employment rates, which tend to be high everywhere (see Chapter 9).

This is not to say that male employment is not affected by policy, but to say that the transitions tend to happen involuntarily, for instance when men lose full-time employment and become unemployed (Blossfeld and Drobnic 2001, Blundell et al. 2007). Given the still important cross-country variations in female employment rates, the still real employment rate gap between men and women, the fact that women face many more choices, constraints, and potential transitions from one labour market state to another during the course of their career, and the fact that women working has for a long time not been the norm, this section predominantly focuses on policies that may explain why women work, or not. The discussion touches upon factors more related to male employment when discussing policy determinants of dual-worklessness and segmented labour markets, towards the end.

5.1. Welfare-states and familialism

Esping-Andersen (1990) famously proposed a typology of European welfare-states, based on how much they enable "decommodification" (i.e., enable people to maintain a living outside the paid labour market), "stratification" (i.e., the degree to which the welfare-state maintains, increases or reduces social inequality), and on the public-private-family mix in the provision of welfare.

Along these three dimensions, he identified conceptually three ideal-types of welfare-states, which he then matched empirically to real-world countries. The liberal welfare-states rely comparatively more on the market to provide welfare, which will tend to yield income inequality. Typical cases include the UK, Ireland, and, outside Europe, the USA. The conservative welfare-states follow a social insurance model that can protect people against fluctuations in the market, but tends to reproduce social standings in entitlements to social protection. Typical cases include Germany or France. The social-democratic welfare-state goes the furthest in terms of redistribution and enabling people to maintain a living outside the market while reducing inequality. Typical cases include Sweden or Denmark.

There have been many refinements in the subsequent literature, such as the addition of the Mediterranean welfare-state, or of post-Communist welfare-states (Arts and Gelissen 2002). This literature has also contested the classification of a given country in a given welfare-state ideal type, as many cases are less clear-cut than initially assumed (ibid).

A prominent critique for our purposes came from feminist perspectives, which emphasised the gender-blindness of Esping-Andersen's approach and classification, in terms of gender equality and outcomes such as the gender pay gap, access to employment

for women, or division of tasks in heterosexual couples (Lewis 1992, Orloff 1996, Sainsbury 1999). The critiques emphasised the male perspective underpinning the implicit ideals Esping-Andersen aspired to, such as decommodification, as they highlighted that for women, emancipation may precisely reside in the ability to enter gainful employment and reach some degree of financial autonomy (ibid). In the context of the motherhood gap, with women dropping out of the labour force upon giving birth and the lower employment rates for mothers than for childless women and men (Grimshaw and Rubery 2015), this ability to gain autonomy via work is further reduced.

These shortcomings have led to a flourishing strand of research attempting to be more gender sensitive, and a key dimension studied in that regard was the impact of certain policies on the division of tasks within households, couples in particular. The organisation of care services, for the children and the elderly, emerged as a crucial dimension, more precisely the extent to which the state relieves the family (and within the family, most often, the female partner) from the care work, or to the contrary, encourages care work to take place within the family. The tension between earning and caring is central in this literature (Gornick and Meyers 2003, Ferragina 2017).

Antonnen and Sipilä (1996), analysing social care services in Europe, identify two distinctly opposite models: public care services in the Scandinavian model, versus family-based care in the Mediterranean model. They argue that the models have very different implications for partnered women and mothers' gainful employment opportunities, and that these opportunities would be greater in the Scandinavian model, spurring further research on the topic (Korpi 2000, Bettio and Plantenga 2004).

Sarceno and Keck (2010) attempt to locate countries on two dimensions: the extent to which financial support, legal provision, leaves and services from the state help relieve the family from the care of children, and from the care of the elderly, or to the contrary, encourages this care provision to take place within the family. They identify three ideal types – de-familialism (countries actively relieving families from care duties), supported familialism (countries actively encouraging care to take place within the family) and familialism by default (there are neither publicly provided alternatives to, nor financial support for, family care). Empirically, coherent groupings of countries do not really emerge, as their constellation of policy instruments are often complex and contradictory from one dimension to the other.

So, this literature identifies a few clear-cut approaches to care, in particular the polar opposition on paper between the Scandinavian model and the Mediterranean models, but many countries are hard to classify. Nevertheless, the public provision of quality care services appears as a crucial determinant in enabling female (full-time) employment.

In that regard, there is comprehensive evidence, aside from the literature attempting to identify country clusters, that women's labour supply is facilitated by childcare spending or subsidies, appropriately designed parental leave, but discouraged by generous child benefits (Jaumotte 2003, Genre et al. 2005, Cipollone et al. 2012). Such policies are particularly crucial in light of the "family wage gap", i.e., the lower earnings of mothers compared to childless women (Harkness and Waldfogel 2003). The importance of childcare is such that the EU has established official childcare spending targets to be met by the member-states (European Council 2002).

This new focus on female employment does not stem only from a desire for more gender equality for its intrinsic benefits. Since the turn of the millennium in Europe there has been increasing talk of a "social investment" welfare-state, a supposedly new form of welfare-state fit for the XXst century (Hemerijck 2015, 2017, Taylor-Gooby REF). The main feature of social-investment welfare-states would be a switch from "passive" income-maintenance spending (such as unemployment benefits) to "active" spending (such as active labour market policy training jobseekers), equipping the population with the level of skills needed in the international competition of the knowledge-based economy, while enabling a greater flexibility of the workforce than in old welfare-states (ibid).

The distinction between these forms of spending has been questioned (Nolan 2013), and some view social investment as a form of neo-liberalism in disguise (Laruffa 2018). Nonetheless, a common theme that emerges across the social investment literature, whether critical or embracing it, is the idea that modern welfare-states would need to rely on high employment rates to finance social programmes, and that the employment participation of under-represented groups on the labour market, like women, would be key in this perspective (Esping-Andersen 2002, Sarceno 2015).

This fits with policymakers' clearly stated aim of increasing employment rates in Europe (European Council 2000), and a general endeavour to make labour market more flexibles (Barbieri 2009), and increase women's involvement in paid market work – even if only part-time (Saraceno 2015). Non-standard employment can be seen as providing a stock of "cheap labour", crucial to the economy (King and Rueda 2008). It can be seen as part of the general trend of labour market reforms of the past decades in Europe. I already exposed in chapter 1 the compelling evidence form Boeri and van Ours (2013) showing

the movement of European countries towards labour market flexibilization reforms, and I come back to this move towards labour market flexibilization in section 5.3 when looking at the links between dual-worklessness and labour market policy.

Overall, the literature emphasises distinct types of welfare-states, spurring research into refined distinct models of familialism, with differences across countries in how much partnered women, and especially mothers, are encouraged to work. The recent evolution of the discourse around social investment and increasing employment opportunities, especially for women, to some extent cuts across these welfare-state types, and may erase, to some degree, differences between them, not least because it has been actively promoted at supranational level by the EU. It may also mean that the differences across welfare-states may not be as clear-cut as those in which women do all the unpaid work and the male does all the labour market work, and those in which both partners work full-time, but may rather reflect nuances in how much non-standard-employment has been embraced in a given country as a job creation strategy.

The discussion of welfare-states remains general as, by essence, such literature aims to capture a coherent constellation of policies, rather than focusing on one in particular. We now turn to discussing policy determinants of female employment at a more fine-grained level, focusing primarily on labour market policy, as the discussion of the role of childcare and family policy has already been tackled in the present sub-section.

5.2. Labour market policy determinants of female employment

As seen in Chapter 1, the rise in female employment is tightly linked with European economies becoming dominated by the service sector, which itself is tightly linked with more non-standard employment. The gender segregation of employment across sectors

and occupations is a complex phenomenon, with different explanations, such as the different human capital investments and skills developed by men and women, employer discrimination, and men's ability to use their insider position to keep preferential access to what they perceive to be "male jobs" (Fagan et al. 1999).

Women's employment is also tightly linked to public sector jobs, which have been a key contributor to the growth in female employment in the post-war decades (ibid). Women's public sector employment is, for instance, central to the high overall female employment rate in Nordic countries (Datta Gupta et al 2008, Korpi et al. 2013). But more generally, the share of women in public employment was above 60% in OECD-EU countries (OECD 2019).

Public sector jobs are often seen as more flexible and inducing a better work-life balance, perhaps as part of a package aimed at compensating lower wages than in the private sector, and therefore as more compatible with family life (Datta Gupta et al. 2008 Lanfranchi and Narcy 2015). They may also be associated to easier transitions to and from maternal leaves, leading to lesser income losses around that time than in the private sector (Nielsen et al. 2004).

There are many labour market policies that are not necessarily explicitly gendered but have gendered implications. These gendered implications can be understood in an insider-outsider theoretical perspective. The insider-outsider framework essentially argues that labour markets are not perfectly competitive, but segmented: insiders occupy the permanent, full-time, stable jobs, and outsiders are on the fringe of the labour market, either jobless or in precarious and unstable employment (Rueda 2005, 2006, Biegert 2017a, 2017b).

Insiders are in a powerful bargaining position because the replacement of workers implies transaction costs for employers: insiders can use this asymmetry to raise their wages above what a purely competitive market would yield. Existing unemployment therefore does not push wages downward and outsiders remain on their segment (ibid). In that perspective, women, because of their traditionally lower labour market attachment, linked in large part to the disproportionate household work they do, are outsiders, on average (Genre et al. 2005, Dieckhoff et al. 2015, Biegert 2017a, 2017b), and will therefore be disadvantaged by policies that disadvantage outsiders and favour insiders.

Typical insider-favouring labour market structures and policies include more union density and strict Employment Protection Laws. Unions are traditionally described as defending the interests of the core, insider, often male, workforce (ibid). Employment Protection Laws can be seen as making the labour market less fluid and preventing the turnover of insiders, and therefore, the entry of outsiders, who miss-out on employment opportunities (ibid).

Generous unemployment benefits are also seen as favouring insiders, because the eligibility criteria often require to be an insider (i.e., to have had stable employment), and the presence of these benefits increase the outside options of potential insider recipients, and therefore their bargaining power (ibid, Nelson and Stephens 2008). On the other hand, policies that discriminate less between insiders and outsiders, such as active labour market policies, typically raising the employability of outsiders, would be expected to favour women's entrance in the labour market (Rueda 2006, Vlandas 2013).

In addition, the insider-outsider perspective can also be relevant to understand the perspective of disadvantaged (in terms of labour market resources) men. For instance, we

saw in chapter 1 that while part-time employment was extremely gendered, the gender gap in Europe in terms of temporary employment rates is much smaller. The way that being stuck on the outsider segment for men tends to materialise is as involuntary unemployment and temporary jobs. Labour market policies that affect insider and outsiders are also relevant in this context, in a couple perspective.

It is also important to not interpret this section as an outright plea for labour market flexibilization. As Boeri and van Ours eloquently show (2013), labour market institutions, despite their seemingly market inhibiting features, exist for a reason, and need to be assessed holistically in terms of how they interact with each other, and in terms of their effects in different areas. As often, there are nuances and various views in the debate, both conceptually and empirically, about all these labour market policies, including on their effect on women. There is simply no scope to review them all here, and this sub-section just focused on a particularly prominent framework, which constitutes a benchmark to assess the effects of policies.

Finally, a strong potential determinant of partnered women entering employment relates to the taxation of labour income, in particular, to whether partners in a couple are taxed jointly or separately (Gustafsson and Bruyn-Hundt 1991, Sainsbury 1999, Dingeldey Smith et al. 2003). The design of the taxation system affects the effective marginal tax-rate that a non-working partner would face, in a single-earning couple, if they were to join employment.

This marginal tax-rate is high in a joint taxation system because it is affected by the level of partner's earnings, and effectively is based on the "last-euro" of partner's earnings.

Therefore, taxing partners separately has been argued to be positive for partnered women joining employment (ibid).

Most of the policy determinants described until now have been based on the implicit idea that the norm in couple employment was initially the male-single-earner couple and explored the conditions under which the couple could be made dual-earning. But the literature has also extensively the other end of the scale, dual-worklessness, which is what we now turn to.

5.3. Dual-worklessness, labour market and unemployment benefits

Chapter 3 reviewed the reasons why, at the micro-level, a couple may stay dual-workless. Here, I discuss the most common policy determinants mentioned in the literature. As far as each individual partner is concerned, the previous subsection, when discussing relevant labour market policies in an insider-outsider context and detrimental to outsiders, covered many relevant dimensions that will not be repeated here.

This subsection focuses, instead, on dimensions of mainstream labour market policies that have specific effects on couples. The most discussed policy is the design of the unemployment benefit system, with two parameters put forward (but often discussed separately): the generosity of unemployment benefits, and the degree to which they are household-means-tested.

Standard search theory has been the benchmark to analyse the effect of unemployment benefits on the probability of exiting worklessness for individuals. The replacement rate and the potential duration of benefit entitlement are the two key parameters in these models (Lalive et al. 2006, Tatsiramos, van Ours 2012). The replacement rate is the ratio

of previous net income that unemployment benefits replace (Adam et al. 2006), while benefit duration indicates how long a claimant can receive benefits for.

With regards to the former, decreasing the level of income replacement that out-of-work benefits offer, in a framework in which unemployed people optimise their behaviour by balancing the marginal costs and benefits of job search, decreases the value of being unemployed and the reservation wage of unemployed people, and therefore increases their job search effort and job finding rate (ibid).

However, some perspectives argue against seeing unemployment benefits purely as an income maintenance device, in isolation from the wider economic ecosystem of a country. The "Varieties of Capitalism" (VOC) literature (Hall and Soskice 2001) emphasises that generous unemployment benefits give workers the security to invest in niche, specialised technical skills (Estevez-Abe et al. 2001). Without such generous unemployment benefits, the risks for workers are too high – specialised skills would hinder their chances of finding re-employment quickly, and they would instead invest in more portable skills. This could explain why some very successful economies (Germany, Switzerland, Austria for instance) also have had comparatively generous unemployment benefits.

The broader point is that, in the VOC perspective, unemployment benefits form part of a wider economic system that fosters employment decisions and outcomes for individuals and households that cannot just be analysed under the prism of "more generous means people work less". It does not say that this analysis is necessarily wrong – but it also emphasises that unemployment benefits have effects on employment levels and participation that go beyond the behaviour of unemployed people specifically.

What about the couple level? For couples, unemployment benefits can be conceptualised as crowding-out the couple as a source of insurance to an employment shock (Attanasio et al. 2005): while the partner of a jobless worker could be expected to increase their labour supply to compensate under the added-worker effect, generous unemployment benefits reduce the need to do so (Cullen and Gruber 2000). Decreasing the generosity of unemployment benefits, whether in terms of replacement rates or benefit duration, in this perspective, would reinstate the couple in its role of buffer against employment shock, and would therefore decrease the probability of dual-worklessness.

In a VOC perspective, generous unemployment benefits may mean that couples invest in skills that may be niche but make them employable in a given occupation, reducing dual-worklessness structurally. But if an exogenous shock happens, affecting the occupation of the couple, it could mean both lose their jobs, and they may struggle to find a new one.

The degree of household-means-testing is another dimension of unemployment benefits that is particularly relevant for couples. It has been put forward by people seeking to explain, in the UK context, why women living with unemployed men had a much lower employment rate than women living with employed men – or conversely, why women living with unemployed men were disproportionately likely to be jobless themselves (Cooke 1987, Dex et al. 1995, Bingley and Walker 2001). Indeed, unemployment benefit rules can have different consequences once the household context is taken into account (Atkinson and Micklewright 1991, Chan et al. 2023).

To understand why, two useful concepts are the participation tax rate (PTR) and the Effective Marginal Tax Rate (EMTR) (Adam et al. 2006). The PTR is measured by 1 – {(net income in work – net income out of work) / gross earnings, i.e., one minus the

financial gain to working as a proportion of gross earnings - the proportion of gross earnings taken in tax or reduced benefits (ibid). The EMTR measures how much of a small change in earnings is lost to direct tax payments and foregone state benefit and tax credit entitlements, i.e., for one extra pound of gross earnings, it looks at how much is effectively kept given reductions in benefits and increases in tax liabilities (ibid).

The PTR is a useful measure of whether to work at all, while the EMTR looks more at how much to work: whether it is worth for someone to try and marginally increase their earnings. In both cases, the higher the rate, the lower the work incentive because the less hours worked actually contribute to increasing net earnings (ibid).

Strictly means-tested benefits at the household level act as a work disincentive on both fronts, because one partner taking-up a job correspondingly decreases the unemployment benefit if the household. An unemployed claimant is only eligible to a household-means-tested benefit if the household falls below a legally set threshold of resources. The claimant's benefit is equal to the difference between household resources and the legal threshold.

Let us assume a dual-workless couple whose only source of revenue is a 1000 pounds net unemployment benefit claimed by the formerly employed husband, and that any other source of income would decrease this sum pound for pound. If the female partner was to take a job paying £1700 gross and £1200 net, it would be met with a corresponding decrease of £1000 in the benefit. The participation tax-rate would be 1 – {(net income in work – net income out of work) / gross earnings), i.e. (1 – {(1200 – 1000) / 1700) = 0.88, an extremely high rate that could be very discouraging in terms of entering the labour market.

For the range of earnings between 0 and 1000, the EMTR is effectively 100%, as each extra pound gained by working is met with a corresponding decrease in benefits. Let us assume that the female partner is compelled, due to a conditionality rule in the benefits, to look for work, and finds a marginal part-time job paying £400. The incentives to try and progress to a better paying job are very limited for a certain range of earnings.

In practice, unemployment benefits often rely on earnings disregards, such that not all partner earnings are taken into account to adjust the benefit correspondingly – but these are limited, and in general, means-tested systems can generate strong work disincentives, in workless couples and beyond (Atkinson and Micklewright 1991, Adam et al. 2006).

As we can see, the disincentives to accept a job when the partner is eligible to unemployment benefits is especially strong if the job on offer is low-paid, and likely to entirely or substantially be met with a corresponding decrease in benefits (Boeri and van Ours 2013). The fact that social risks, like joblessness, are concentrated among specific, precarious social groups (Hauserman et al 2016, Eichhorst and Marx 2012), and that individual-level characteristics of each partner are likely to be correlated, increases this risk. If dual-workless couples are couples with low labour market attachment in the first place, the means-tested disincentive may apply very strongly.

Note that means-testing and generosity are not independent dimensions: often, in OECD countries, less generous benefits are more targeted and comes with more means-test (MISSOC database 2023). Therefore, when it comes to couple employment, we may see a trade-off, and contradictory incentives stemming, on the one hand, from the lower generosity, and on the other hand, from the extra means-testing.

This especially salient in two regards: understanding cross-country differences, but also, above and beyond these differences, the common trend towards activation, employment as the overarching aim of policies, and reforms of benefits geared towards this very objective (Barbieri 2009, Eichhorst et al. 2008, Taylor-Gooby 2008).

In Europe the generosity of unemployment benefits varies drastically across countries. Across the OECD, for a newly unemployed claimant formerly earning the average wage and whose partner is workless (no children), replacement rates vary from 26% in the UK to 90% in Luxembourg or 80% in Denmark (and from 57% to 90% if housing benefit, traditionally generous in the UK, is included) (OECD 2024). Similarly, my analysis of MISSOC (MISSOC 2023) information on tax-benefit systems in the EU matches with insights from Gough et al. (1997): the UK and Ireland tend to offer benefits that heavily rely on a strong household means-test, but other places such as Denmark or Sweden offer benefits that are assessed on a much more individual basis.

From a welfare-regime perspective, one could contrast the Liberal countries, with limited generosity and a strong targeting of benefits implying strict means-testing, to the Nordic countries, with more encompassing, universal and generous benefits. Conservative and Mediterranean countries tend to rely on insurance-like benefits in which one's entitlement is proportional to one's previous contributions, but the generosity and coverage is more limited than in Nordic countries, and people who did not contribute enough to be eligible to benefits will have to rely on a strictly means-tested, low generosity social assistance system (Esping-Andersen 1990, Arts and Gelissen 2002). Post-Communist countries have often developed business-friendly social policies as capitalism developed, reducing the generosity of unemployment benefits (Halleröd et al. 2015), although they are a big

and heterogenous group with varying policies, as my own analysis of the MISSOC database confirms (MISSOC 2023).

While these distinctions hold broadly speaking, there can be important heterogeneity within a given cluster of welfare-states. Moreover, all countries, regardless of welfare-state type, have been moving, albeit to different degrees and with different starting points, towards policies aimed at increasing employment rates and labour market participation (European Council 2000, Seikel and Spannagel 2018). This uniformization is partly resulting from common pressures and trends (global competition for products and goods, deindustrialization, rise of the service sector, economic crisis of 2008 and subsequent austerity), and partly (and relatedly) from EU-agenda-setting, with the promotion of higher employment rates as the overarching policy objective (Nolan and Marx 2014, Horemans 2018, Seikel and Spannagel 2018).

It fits into a view of the welfare-state and social policy as "enabling", in the social investment perspective already discussed in section 5.2. The key labour market approach in this paradigm is "activation", i.e., activating the jobless and the workforce to achieve higher employment rates via policies that shift the focus away from passive income maintenance, towards active labour market policies (training, job counselling), stricter conditionality in benefit receipt, benefits designed with work incentives in mind, and other potential job creation measures (tax-breaks to start own firms, public employment creation etc.) (Taylor-Gooby 2008, Vlandas 2013, Clasen et al. 2016).

This is part of the same phenomenon, described in Chapter 4, that led to the rise of non-standard employment, in a move, already described in Chapter 2, towards more flexible labour markets across Europe. This also tends to mean more reliance on assistance,

means-tested benefits, as Gough et al. (1997) had already identified in the 1990s, and as confirmed by Taylor-Gooby (2008), and on less generous unemployment benefits over time, as I have already shown in Chapter 2. The clearest, sharpest example of such a transformation may be the Hartz reforms in Germany (Fritsch and Verwiebe 2018), which the final empirical chapter of this thesis studies.

Most of the literature on dual-worklessness is concerned with unemployment benefits, their generosity and degree of means-testing. But the general switch to activation could matter in other respect. Making it harder to claim unemployment benefits by tightening the eligibility criteria, and monitoring the behaviour of unemployed claimants more closely by, for instance, imposing job-search requirements, are part of the activation toolkit (Seikel and Spannagel 2018).

If the requirements of active labour market policy, or the conditionality attached to receiving unemployment benefits, is extended from the benefit recipient to, say, their inactive partner in the case of a dual-workless couple, this may foster quicker exits from dual-worklessness, but also potentially fewer couples actually claiming benefits in the first place (Chan et al. 2023). Further, in the theoretical perspective that emphasises the importance of having an employed partner in one's employment propensity, as the partner can provide networks, information, a connection to the labour market helping the other out, active labour market policies, which can maintain this connection to the labour market via work placements and human capital maintenance or development, may be especially important for dual-workless couples.

Note that there are potential complementarities in the different policies related to the activation turn. For instance, the design of unemployment benefits may affect the type of

job taken-up after dual-worklessness. With regards to the traditional job-search models, emphasising the potential disincentives of more generous unemployment benefits, two conflicting hypotheses emerge.

As unemployment benefits decrease, so do the reservation wages. Lower quality work, such as some forms of non-standard employment, despite the social disadvantages and lower earnings, could become more attractive when the generosity of unemployment benefits decreases. On the other hand, if less generous unemployment benefits mean people stay jobless for a shorter amount of time, it could also mean that their skills do not depreciate as much as they would have otherwise and that they are able to find better jobs, fostering exits, for instance, to standard jobs instead of non-standard ones (Cottier et al. 2020).

Further, while not formally classed as an activation policy, the general turn towards the social investment state has generally corresponded to the advent of in-work benefits (Nolan and Marx 2014). Typically, these are benefits given to low-earning households to supplement their income, and thereby encourage them to work, by making work clearly more attractive than welfare payments. The most famous examples were/are the Working Tax Credit (WTC) in the United Kingdom and the Earned Income Credit (EITC) in the United States (ibid). To come back to our PTR and EMTR, these programs clearly aim to reduce the PTR and make employment worth it financially. But, at a certain stage, as they are phased-out beyond a certain level of earnings, they may increase the EMTR for a certain range of earnings, potentially constituting a low-paid employment trap. For our purposes, this matters because countries that adopt such system may be successful at reducing dual-worklessness rates, but whether these formerly dual-workless couples manage to make into good quality, well-paid employment is another question: in this

scenario, the high EMTR beyond a certain earning level may push them into working fewer hours, and therefore in non-standard employment. This further vindicates the need to study evolutions in couple employment participation, and in particular whether the relevant cleavage is still dual-earning versus dual-workless, or if it could be more framed into the quality of employment.

Finally, a relevant dimension concerns early retirement provisions in unemployment benefits. When it comes to retirement, couples could make joint decisions, in order to retire at the same time and enjoy common leisure time (Blau 1997, Blau and Riphahn, 1999). Therefore, early retirement provisions could explain dual-worklessness amongst couples, of working age but close to retirement age. This could have been especially pronounced in times like the 1980s or 1990s, where European countries, faced with rising structural unemployment, tried to reduce it artificially and reduce youth unemployment by incentivising the older workers to leave the labour market (Clasen et al. 2006, Hubl 2016).

But the general switch to activation has very much been a switch towards ending early retirement provisions and activating older workers (Biegert 2011, Amable and Françon 2014, Hubl 2016). A similar story holds regarding disability benefits. The 1980s and 1990s saw the rise of disability benefit recipients, sometimes dubbed as "hidden unemployment" (Biegert 2011, Clasen et al. 2016). This is particularly documented in the context of the UK, where deindustrialisation led to job losses in specific regions and economically depressed areas, which, combined with the stringency of unemployment related benefits, led displaced workers to claim disability benefits instead of unemployment benefits (as they were seen as more generous and subject to less conditionality) contributing to employment polarisation across couples (Berthoud 2007).

This may be a factor to keep in mind when analysing the evolutions of polarisation in Europe.

5.4. Summary: policy, polarisation and non-standard employment

The policy context matters for couple employment participation. Policies that encourage women to enter the labour market may foster more dual-earning, and a more definite move away from the male-single-earning model. At the same time, if they are not accompanied by policies that tackle dual-worklessness, they may foster polarisation of societies between dual-earning and dual-workless couples, as those women able to enter employment may be those with the highest ability to do so. In addition, there is a difference between "encouraging female employment" and "encouraging female standard employment". If the revolution of welfare-states with regards to female employment is "incomplete" (Esping-Andersen 2009), it means that nuances with regard to the type of work performed by men and women may subsist and may be affected by the policy context. The rise of the social investment rhetoric, while gender conscious and promoting female employment, remains ambiguous at best when it comes to the division of tasks within couples and gender equality in the type of employment performed by partnered men and women (Saraceno 2015).

This rhetoric, more generally, by emphasising the importance of employment, promotes policies that affect couple employment participation, be it in the general rise of non-standard employment, or in the reforms brought to unemployment benefit systems, in a way that may cut across original welfare-state differences, given its active promotion at EU level. There is, overall, a clear need to understand not just how polarisation and non-

standard employment relate to each other, but how their relationship may vary across different country contexts.

6. Past empirical research

This chapter reviews the empirical evidence regarding the key themes discussed in chapters 3-5, in the European context: polarisation, non-standard-employment, and the policy context. These empirical results should all be understood in light of the main, overarching one: European countries have, generally, moved away from male-single-earning. Dual-earning, broadly speaking and without distinguishing between standard and non-standard-employment, is now the main form of couple employment participation in Europe (Crompton 1999, Lewis et al. 2008).

6.1. Couple resources and polarisation

6.1.1. The rise in polarisation

Empirically over the past forty years, in the context of rising female education, partners in European couples and other developed economies have tended to increasingly share similar levels of education, social class, or income (Bernardi 1999, Cancian and Reed 1998, Blossfeld and Drobnic 2001, Verbakel and de Graaf 2009, Bredemeier and Juessen 2013). As a result of these labour market resources accumulating in couples, there is a very well documented correlation between partners' employment statuses in Europe, while women's earnings are an increasingly important component of family income (Harkness et al. 1997).

As early as 1988, Sexton, studying all the countries of the then European Community, finds that the employment rate of wives falls if the husband is short-term unemployed, and even more so if he is long-term unemployed. Ultee et al. (1988) find similar employment and unemployment homogamy in the cases of Australia, Canada, the

Netherlands and the USA. Non-employment homogamy is also found in the Netherlands (Henkens et al. 1993), Sweden (Nordenmark 1999), and Norway (Halvorsen 1999). England et al. (2012), studying 17 OECD countries, find that women whose husbands are unemployed, or have near-zero earnings, tend to not be employed themselves.

The UK is the most studied European country on the topic, and one in which the employment gap between women whose male partner is jobless and women whose male partner is employed has been consistently established (Cooke 1987, Davies et al 1992, Bingley and Walker 2001) and found to be comparatively large when evaluated against other countries (Dex et al 1995) – although Harkness and Evans (2011) find more resilience of employed British women whose male partners lost their job following the 2008 crisis, compared to 1991 recession, an insight that the empirical work in Chapter 9 explores more.

The fact that women living with jobless male partners are less likely to be employed than women living with employed men, is also coherent with the fact that the evidence surrounding the added-worker effect tends to be mixed at best in Europe. Results vary from near absence of added-worker effect, to added-worker effect present in certain countries and not in others (Gianelli and Micklewright 1995, McGinnity 2002, Prieto-Rodriguez and Rodriguez-Gutierrez 2003, Bredtmann et al. 2014).

More generally, the findings regarding homogamy in employment and non-employment outcomes, laid the ground for the study of polarisation pioneered by Gregg and Wadsworth and the indicator they develop to specifically capture it (2001, 2008). They study all household types, hence why this constitutes a slightly different strand of

literature from the research on homogamous couple outcomes – but the two are nonetheless very close, as couples remain the main form of household in Europe.

The move towards society characterised by "positive polarisation", as defined in Chapter 4 - which for intuitive understanding will from now on be referred to as "rising polarisation" in this thesis, to capture the phenomenon of societies increasingly polarising between workless households and households where all adults are employed - has been studied empirically confirmed by Gregg and Wadsworth (1996, 2001, 2008). They find rising polarisation for all household types in a number of OECD countries between the early 1980s and the mid-2000s.

More recently, Gregg et al. (2010) show that the rate of workless households increased in the UK, Spain, Germany and Australia between 1977 and 2005 (though not in the USA). At the same time, the number of households in which all working-age members work increased strongly, in all these countries (USA included), over the same period. This illustrates the idea that societies increasingly move towards two opposite poles.

Vandenbroucke and Corluy conduct a similar analysis for Western EU countries between 1995 and 2008 (Vandebroucke and Corluy 2013). They find an increasing polarisation trend, with employment increasingly concentrating in certain couples and being absent from others. They also show that this trend increased in Belgium specifically over the last decades, and that household employment polarisation levels, when studied as a snapshot point in time, are variable across European countries (Vandenborucke and Corluy 2015). Berthoud's long-run analysis of the UK (2007) also shows employment increasingly polarising between what he calls "work-rich" (all adults employed) and "work-poor" households (with no adult employed).

So, non-employment increasingly clustered in certain households throughout the 1980s and 1990s, as employment rates rose. Consistently with that, de Beer (2007), studying 15 EU countries since the early 1980s, finds that the increase in individual employment rates over the period had limited effects on poverty and the household activity rate, because most of the people joining employment did so in households were someone else was already in employment – typically, housewives finding work with an employed husband. Cantillon (2011) makes a very similar point: rising employment rates affected workless households relatively little. In the UK, evidence suggests that a key driver of rising female employment was rising maternal employment, and that mothers entering work between 1975 and 2015 were disproportionately likely to do so with a high-earning male partner (Roantree and Vira 2018).

The rise in maternal employment, in general, is key, because historically being a mother has been a key reason behind a woman not working (Grimshaw and Rubery 2015), sustaining the male-single-earner model. There is suggestive evidence, in Europe and developed economies, that highly educated mothers are more likely to be in work than mothers with lower levels of education (Leibowitz, and Klerman 1995, Gutiérrez-Domènech 2005, Harkness 2016). If highly-educated women and mothers are disproportionately likely to be fuelling female and maternal employment, with the rise in homogamy suggesting that they will be partnered to highly educated men, this could be a fuel behind polarisation.

Importantly, the polarisation research studying all forms of households find that rising polarisation results primarily from an increasingly uneven distribution of work within a given household type, especially couples, rather than because of a shift towards household structures perhaps more prone to joblessness like single-headed households.

More recently, Biegert and Ebbinghaus (2020) studied the impact of the 2008 crisis on the distribution of employment across households, with data for 30 European countries between 2007 and 2014. They find that the countries hardest hit by the crisis saw household joblessness increase most dramatically, and that the dominant overall trend was a rise in polarisation, but that how household non-employment levels reacted to the economic shock was very variable across countries. They conclude that short-term economic shocks can induce more polarisation of employment across households, with no clear-welfare-state pattern explaining how this may unfold.

6.1.2. Recent evolutions in couple employment patterns

This subsection is important, because no empirical evidence on polarisation covers the period going from the 1980s to today. The long-run studies are dated, and the studies from more recent years tend to be more medium or short-term focused. But there are conjunctural and structural empirical evolutions of the last two decades that are noteworthy, because they may affect the evolution of polarisation, when put in a long-run perspective, in a way that the current empirical literature on polarisation misses. Much of this relates to the emergence of female-single-earning couples.

Esteve, García-Román and Permanyer (2012) document, in 56 countries, a rise of couples in which the female is more educated than the male, a new phenomenon linked to women generally becoming more educated than men over time (Gregory 2011). Klesment and Van Bavel (2017) show that, in Europe, such couples are associated with a higher likelihood that the female is the couple's main earner. Aside from the higher employability conferred by more education, this rising female education is tightly

interlinked with the evolution of social and gender norms, towards more liberal attitudes with regards to female employment (Charles 2011).

Female-single-earning could therefore constitute a new middle-ground between dual-earning and dual-worklessness, halting polarisation. But recent research points-out the potential precariousness of such couples. Female-single-earning may be related to weaker labour market positions for men, particularly low-skilled men (Harkness and Evans 2011). There, women become the single-earner out of necessity, and are often penalised by the disadvantages that women still suffer from on the labour market (Kowalewska and Vitali 2021).

Kowalewska and Vitali (ibid) find that, in the mid-2010s in Europe, female-single-earning couples earn less on average than male-single-earning couples. The same authors (2023) find that men and women in female-single-earning couples in Europe are less satisfied than those in male-single-earning and dual-earning couples, although this is mostly true of the male partners in these female-single-earning couples. This corresponds to Sanchez-Mira's findings (2021) that males in female-single-earning couples see such an arrangement as temporary, undesired, arrangement, that they would seek to change, but that their female partners identify with a model in which they work, which could be co-earning, but in any case, not them stopping work.

On a conjunctural level, the 2008 crisis, notorious for having hit male employment disproportionately (Mattingly and Smith 2010), may have also played a role. Some papers point to a recent increase in the rates of female-single-earning in countries worst-hit by the crisis (Dotti Sani 2018, Sanchez-Mira and O'Reilly 2019), while Harkness and Evans (2011), in the case of the UK, find a much stronger resilience of partnered female

employment than during the 1991 recession. The crisis may have reinforced polarisation in the short-term due to the economic shock and associated employment losses (Biegert and Ebbinghaus 2020), but whether that constitutes a sustained increase or a short-term fluctuation remains to be seen, as the crisis may in fact have led to reinforcing the role of the female as a breadwinner in the couple.

Another limitation of the current polarisation literature is its focus on ILO-defined employment. Polarisation looks at dual-earning versus dual-workless couples. The distinction between standard and non-standard employment adds many distinctions between these two poles.

6.2. What the polarisation literature ignores: non-standard employment in couples

The empirical evidence in Europe confirms the importance of non-standard-employment in couple employment arrangements in contemporary Europe. The prevalence of part-time employment, at country level, has been found to be associated with a higher overall female employment rate (Genre et al. 2005). Lewis, Campbell and Huerta (2008), studying Western European countries in the mid-2000s, documented just how prevalent the one-and-a-half-earning model is with regards to full-time and part-time employment, with a majority of dual-earning couples arranged around this model in most places, or predicted to soon follow this model. The Nordic countries were the only one that exhibited dual-full-time-earning as the dominant couple type.

Hook (2015) finds very similar clusters of countries, although she adds that the employment patterns of women within couples is also structured by class (which she captures via education). For instance, countries that are divided between dual-full-time-

earning and male breadwinning tend to also be divided along class lines, with highly educated women much more likely to be in a dual-full-time-earning couple. The one-and-a-half countries tend to separate into two clusters, one very defined by how much class affects women's employment patterns, the other where the influence of class is more muted.

Sanchez-Mira and O'Reilly (2019) refine our understanding of the division of tasks in couples, by adding more categories (such a distinguishing between different reasons for female worklessness in male-single-earning couples) and expanding the scope to include more countries. They show that central and eastern European countries tend to have very high rates of dual-full-time work, and that some Nordic countries follow the one-and-a-half model more than what previous research would suggest. They also discuss the impact of the 2008 economic crisis, which has led to an increase in female-single-earning and workless households in countries worst-hit by the crisis, a finding confirmed by Dotti Sani (2018).

Inequality is also empirically, and relatedly, important in household tasks. There is comprehensive empirical evidence, in different European countries, that childbirth is associated to women transitioning away from full-time employment and that part-time employment increasingly represents a way back into the labour market after childbirth (Blossfeld and Drobnic 2001, Dex and McCulloch 2001, Paull 2008, Rodríguez Sánchez et al. 2021).

Indeed, the motherhood gap is very much a fill-time gap: more than employment, what really tends to be lower for mothers than for childless women is full-time employment, which tends to fall upon giving birth (Harkness 2016). This is coherent with the

widespread empirical evidence emphasising the role of public childcare provision in increasing women's employment participation (Jaumotte 2003, Daly and Ferragina 2018).

Men did increase their participation in household work over the years in OECD economies, but most of the equalisation work has come from women reducing their household work input – which remains nonetheless higher for them than for men (Esping-Andersen et al. 2013). Importantly, there is consistent evidence showing that in couples, women do not just perform more household work than men: they also perform more household work than what their share of the paid labour market, or their earnings capacity, would suggest (Blossfled and Drobnic 2001, Harkness 2003, Booth and Van Ours 2008, 2009, Esping-Andersen et al 2013). This contradicts the Beckerian perspective, according to which there should a monotonic, linear relationship between the two (Booth and Van Ours 2008, 2009).

The fact that European societies have had this co-movement, towards homogamy in labour market resources and outcomes, and towards the gendered use of non-standard employment in households and couples, may explain why, despite the evidence of rising polarisation of employment, rising female employment is not found to increase household income inequality – rather the reverse. While a few studies, often dated, find a de-equalizing effect of rising female employment linked to rising social homogamy (Karoly and Burtless 1995, Jenkins 1995, Esping-Andersen 2007), the recent consensus is that women's employment has an equalising effect, as women's earnings tend to be less unequal than men's (Cancian et al. 1992, Harkness et al. 1997, Cancian and Reed 1998, Harkness 2010, Gregory 2011*).* Women may contribute to equalising the distribution of income across couples through being stuck in lower-paid segments of the labour market,

linked for instance to non-standard employment, with less wage dispersion across working partnered women.

Moreover, while the vast majority of the literature studying non-standard employment in the couple context focuses on its role as a complement to a standard (male) job, the OECD (2015) shows potential risks associated to non-standard-employment when it is the only source of labour income in a household, rather than a complement to a standard job. Households solely relying on non-standard-employment have much higher risks of poverty than households in which standard employment is found, risks of poverty that are more akin to those faced by dual-workless households. Horemans et al. (2016) make a similar point: the in-work poverty risks associated to part-time work increased following the 2008 economic crisis, especially amongst involuntary part-time workers, but the household context in which this part-time work is found is key to the overall poverty risks and the policy responses. Nolan and Marx (1999) also emphasise that the extent to which low-paid work turns into concrete poverty risks heavily depends on the household context in which this low-paid work is located.

The OECD study would have included single-headed-households, such that we know very little about the phenomenon for couples specifically. But what it makes clear, is that standard employment is a game-changer for households, and greatly contributes to reducing poverty risks. This is another reason why the absence of distinction between standard and non-standard-employment in the polarisation literature is problematic. If the rise in polarisation is a rise in not just employment, but standard employment clustering in couples, the consequences in terms of inequality and the distribution of poverty risks is not the same than if the clustering of employment in couples is fuelled by the one-and-a-half-earning model, or by dual-non-standard-earning couples.

With regards to couples in which the woman is in non-standard-employment, and the man is in standard employment, the evidence in the literature emphasising the social disadvantages associated to non-standard-employment, discussed in Chapter 4, shows that inequality subsists even in dual-earning couples. The fact that women remain disproportionately likely, compared to men, to be in a job that departs from the full-time, open-ended mode implies some gender inequality. The type of employment held by partners of a dual-earning couple matters.

Fundamentally, this confirms the insight from Chapters 3 and 4: the situation in many European countries may not be as clear-cut as the distinction between the specialisation framework, and the homogamy framework, implies.

The only attempt in the literature, that I am aware of, at linking the polarisation and full-time/part-time divides is Horemans (2016), whose valuable work studies all dual-earning couples in 2011 across Europe, and finds that part-time employment does not tend to cluster in certain dual-earning couples. I will detail in the next chapter and in Chapter 10 the limitations of this attempt, and the many dimensions that I aim to take further in this thesis.

6.3. Couple employment patterns and the country context

The key empirical takeaway from the literature seeking to link couple employment patterns to welfare-state types as initially devised by Esping-Andersen (1990), is the limited fit between couple employment patterns and these welfare-state types, especially once a distinction between standard and non-standard employment is made (Lewis 1992, Lewis et al. 2008).

This is despite Esping-Andersen's attempt (1999) to include the gender and family dimension in his typology – he argued that the initial typology remained essentially robust, and described social-democratic welfare-states as the most likely to enable female employment, and a reconciliation between paid work and household work. This is also despite the clear fact that, although all European countries show a lower employment propensity for mothers compared to childless women, the magnitude of the gap varies strongly across countries, suggesting that variations in policies and attitudes are important in allowing mothers to combine children and work (Harkness and Waldfogel 1999, Gutiérrez-Domènech 2005).

Lewis et al. (2008) do find that the Nordic Social-Democratic countries are distinctive in terms of their comparatively high reliance on the dual-full-time model, and that the Mediterranean countries are distinctive in terms of the resilience of the old male-single-earning model, but the rest of the countries, comprised mostly of Conservative and Liberal welfare-states, mix in an ill-defined way around some variation of the one-and-a-half-earning model.

But Sánchez-Mira and O'Reilly (2019) emphasise that the Social-Democratic welfare-states may not be as homogenous as initially thought, with some exhibiting some important reliance on the one-and-a-half-earning model. On the other hand, while some Mediterranean countries do tend to follow a male-single-earner model, Portugal has a very high rate of dual-full-time-earning (Tavora and Rubery 2013, Sanchez-Mira and O'Reilly 2019).

High rates of one-and-a-half-earning can be found in countries as diverse as Ireland and the UK (Liberal welfare-states), or the Netherlands and Germany (Conservative welfare-

states) (Lewis, Campbell and Huerta 2008). Including women's social class in the analysis does yield some clusters in line with Esping-Andersen, but the fit remains very partial (Hook 2015).

On the other hand, dual-worklessness has been a feature of most European countries that have been studied (with the big caveat that many of them have not been studied), regardless of welfare-state type, albeit to varying degrees of magnitude (Gregg, Scutella and Wadsworth 2010). Polarisation between dual-earning and dual-worklessness has been found to rise all across Western Europe, and to converge across these countries (Corluy and Vandenbroucke 2013).

There are, overall, differences and commonalities across Europe that cut across the classic welfare-state types, and make these types in themselves limited predictors for cross-country variations in couple employment patterns. The refinements of the literature studying familialism have often managed to identify clear-cut examples of polar opposites (high public care, high female employment in Nordic countries, high family care, low female employment in Mediterranean countries), but struggled to classify the majority of the countries in the middle (Saraceno and Keck 2010).

Further, Dotti Sani and Scherer (2018) show that individual and household characteristics are more relevant in determining mothers' employment in countries where the welfare-state is less supportive towards maternal employment. So it could be that there is an interaction between micro-level features and macro-level characteristics that the literature only looking at the welfare-state level may miss.

Overall, the main take-away is as follows: one the one hand, we have a strand of literature emphasising the increasing homogamy of couple employment participation empirically,

and the potential for increased inequality in employment access across couples. On the other, we have a strand of literature that emphasises empirically the remaining degree of gender inequality within couples, once part-time and full-time work are distinguished, nuancing how homogamous in terms of employment outcomes dual-earning couples really are.

While these two forms of inequality have been clearly established separately, how they relate has seldom been studied. This is an even more glaring miss in light of the mixed results regarding the welfare-state context. The welfare-state affects many different dimensions of inequality – across individuals, across households, between gender, within households. It is possible that one may not find the effect they expect of a given welfare-state type on a given equality outcome relating to couple employment, purely because they only look at one dimension of inequality in isolation. The need to integrate better these different aspects is crucial.

6.4. Labour market policy determinants

6.4.1. Female labour supply

Related to the literature emphasising the models of care across countries and their role in shaping female employment, there is an abundant documentation of the fact that women work more when public childcare provision is extensive (Nelson and Stephens 2008, Cipollone et al. 2012, Ferragina 2017). This does not solve everything: a famous experimental study by Correll et al. (2007) shows that employers exhibit negative biases towards mothers, while paternity is, on the other hand, associated to positive assessments by these very employers. Moreover, the use of childcare has been found to be very stratified by social class, with more advantaged families using it more in what has been

described as a "Matthew effect" (van Lancker and Ghysels 2016, Pavolini and van Lancker 2019), which suggests that it is not reaching every mother, and may contribute to the wider stratification and polarisation of employment, facilitating the dual-employment of the most advantaged couples.

From the perspective of labour market rigidity and insider-outsider divide, there is evidence that more rigid labour markets, characterised by generous long-term unemployment benefits which particularly benefit insiders and reinforce their bargaining power, with little accompanying active labour market policies to raise the profile of outsiders, are detrimental to the labour supply of women (Genre et al. 2005, Jeaumotte 2003, Nelson and Stephens 2008).

Biegert (2017a), more generally, finds that women's employment is especially responsive to labour market institutions, compared to men. Beyond women, he finds that disadvantaged social groups are especially responsive to labour market institutions, which therefore matter even more for them, an insight which, for our purposes, is also relevant in the context of dual-workless couples.

Strict employment protection laws are also generally found to be detrimental to female employment (Genre et al. 2005, Dieckhoff et al 2015). But, Dieckhoff et al. (2015) also find evidence contradicting the idea that higher union density would be detrimental to female employment: the role of unions in increasingly representing groups that are usually left-behind is also emphasised.

Finally, the positive effect of separate taxation on female labour supply is confirmed empirically by Gusftasson and Bruyn-Hundt (1991), studying Germany, Sweden and the Netherlands, and by Smith et al (2003). Selin (2014) shows that the 1971 reform in

Sweden, abolishing joint income taxation and instead making taxation individual, contributed strongly to the rise of female employment in Sweden. Dingeldey (2001), however, argues that taxation only matters in a general context of policies going in the same direction rather than in and of itself: only a general constellation of policy, geared towards increasing women's participation, can matter, which explains why Sweden, combining individual taxation with other favourable elements such as generous leaves and childcare, exhibit such high levels of dual earner households.

Generally, however, the consensus in the literature remains that the taxation structure is key at explaining female employment participation, first because in general, labour economics emphasises the role of taxes in affecting the link between hours worked and income actually earned and therefore work incentives. Second, while much of past research shows that male workers are found to respond relatively little to changes in tax rates (Boeri et al 2005), women are found to be much more responsive to tax incentives: their labour supply tends to be quite elastic with respects to wages and net income (Colombino and Del Boca 1990, Boeri et al. 2005).

This is partly related to the distinction between participation decisions (whether to work at all) and decisions in terms of how much to work (Boeri et al. 2005), as women tend to disproportionately be out of the labour force and therefore, tend to be the ones for whom participation decisions are the most salient. In the US, a switch to proportional rather than progressive taxation and to individual rather than household-based tax filling would generate significant gains for female employment (Guner et al 2012). In Italy, Colonna and Marcassa (2015) show that the gendered design of the tax-benefit system is a key determinant behind the comparatively low employment rate of Italian women.

6.4.2. Unemployment benefits and dual-worklessness

Empirically, previous research finds a macro-level association between countries having more generous unemployment benefits and higher levels of unemployment (Nickell and Layard 1999). At the micro-level, , for individuals, cutting the replacement rate of unemployment benefits generally does increase re-employment probabilities for individuals (Lalive, van Ours and Zweimüller 2006), and there is a "spike" at benefit exhaustion. This means that the hazard of exiting unemployment is generally found to sharply increase just before unemployment benefits expire in a variety of advanced economies (Hunt 1995, Card and Levine 2000, Røed and Zhang 2003, Lalive 2007, Caliendo, Tatsiramos and Uhlendorff 2012).

At the couple level, generous unemployment benefits have been found empirically to reduce the need for the partner of a displaced worker to step into the labour market to compensate for the income loss, thereby stifling the labour supply response and expected added-worker effect (Cullen and Gruber 2000, Prieto-Rodriguez and Rodriguez-Gutierrez 2003, Ehlert 2012).

But this stifled labour supply response has also been attributed to the couple-specific incentives stemming from the design of unemployment benefits, particularly the degree of means-testing, which may disincentivise exits from dual-worklessness.

Dex et al. (1995) studied the very means-tested systems of Ireland and the UK, compared to the more individual-based systems of the USA, Denmark and Sweden. They find that the behaviour of women living with an unemployed male partner is consistent with the incentives shaped by the unemployment benefit systems, and that overall, the large degree of means-testing of British and Irish unemployment benefits could be associated to the

lower employment rate of women when the partner is unemployed in these countries. McGinnity (2002) finds consistent results when comparing the very means-tested British system, to Germany, less means-tested. Bredtmann et al. (2018) find a stronger added-worker effect in welfare-state with less means-tested unemployment benefit system.

However, Gianellli and Micklewright (1995) find little support for the means-testing hypothesis, in their study of the labour-market transitions of German women, using both cross-sectional and longitudinal methods: the negative effect of means-testing appears to be especially weak when studying women's employment transitions.

Harkonen (2007) studying exits from dual joblessness depending on whether a couple receives means-tested unemployment benefits, finds that couples receiving means-tested benefits had a lower exit rate from dual joblessness, although it had only a small explanatory power in terms of the cross-country differences in exit from dual joblessness. Hubl (2016) finds that reforms in the UK and Germany that have made unemployment benefits more means-tested, had little impact on dual-workless couples transitioning out of dual-worklessness. So, the empirical evidence on means-testing is not unanimous, although on balance it would appear that more means-tested benefits are indeed related to more dual-worklessness.

Regarding the type of exits made by jobless people, the empirical evidence is mixed. The literature tends to concentrate on individuals, rather than couples, and therefore to focus only on generosity rather than means-testing. Lower generosity of unemployment benefits in Germany after the Hartz IV reforms, is often found to have led jobless people into non-standard-employment (Amable and Françon 2014, Rothe and Wälde 2017). But

Price (2019), one of the most detailed and sophisticated study on the Hartz reforms, contradicts these findings.

Nekoei and Weber (2017) find that extending the duration of UI payments in Austria led unemployed claimants to find better paying jobs, but in the same country, Lalive (2007), and Card et al. (2007) find little evidence for improvements in job quality linked to more generous benefits, while van Ours and Vodopivec (2008) finds that decreasing the generosity of unemployment benefits in Slovenia does not tend to lead claimants into non-standard jobs. Cottier et al. (2020), in the case of Switzerland, find that reducing the duration of unemployment benefits improves earnings post-unemployment due to the reduction in skills depreciation. Farooq et al. (2020), in the context of recent US recessions, find that more generous UI improves the quality of job founds and the duration in the new employment, with positive effects of UI in the US context also found by Centeno and Novo (2006).

Generally, the empirical literature on unemployment benefits and dual-worklessness tends to focus more on the degree of means-testing than on generosity, for which the empirical evidence is scarcer. Empirical studies on the unemployment effect of benefit generosity have tended to focus on the individual level, with the finding described earlier in this subsection that more generous unemployment benefits tend to disincentivise quick exits from unemployment. The degree of means-testing has featured prominently in studies trying to understand why the added-worker effect, posited in theory, was rather elusive in practice. Just like much of the added-worker effect literature followed in the footsteps of Lundberg's seminal contribution (1985), and is therefore often rather dated, recent empirical evidence on means-testing and dual-worklessness is scarcer.

Moreover, it is possible to draw onto research studying in-work benefits: as discussed in previous chapters, increasing employment participation has become a crucial policy objective for European welfare-states, and new forms of benefits, essentially subsidising low-paid work to make it more attractive compared to out of work payments, have emerged. In the USA, empirical evidence suggests that such benefits are effective at getting unmarried women with children into work, but that, in a couple perspective, by tying partners' labour supply together, they tend to increase partnered male employment participation but decrease partnered women's (Eissa and Liebman 1996, Eissa and Hoynes 2004).

Therefore, the generally positive employment effects documented for in-work benefits, primarily in the USA and the UK (e.g., Eissa and Hoynes 2004, Blundell and Shephard 2012, Chetty et al. 2013) may hide gender differences. In addition, while results tend to be positive with regards to participation decisions, they tend to be mixed at best regarding the incentives to increase hours worked (Saez 2002)., because individuals might decide to work fewer hours to gain benefit eligibility. For the purposes of this thesis, this reinforces the need to study the effect of benefits on couples and in a gendered perspective, as well as to study the type of work that dual-workless couples may take-up upon exiting dual-worklessness: the decision to participate matters, but the type of job that they decide to take, or are constrained into taking, is also a key outcome, potentially affected by policy.

Having presented the theoretical frameworks, their contradictory predictions, the key concepts they lead to for the purpose of this thesis (polarisation and non-standard employment), the role of policy and country contexts, and the sometimes-contradictory

empirical evidence surrounding all these elements, I now turn to summarising the gaps in the literature, and the contribution of this thesis to try and bridge them.

7. Contribution of the thesis

7.1. Key gaps in the literature

From the discussion in chapters 3-6, I identify three main gaps in the literature: 1) a lack of knowledge with regards to the evolution of polarisation over time and across countries, 2) a lack of integration between work studying polarisation and work studying the role of non-standard-employment in couples, and 3) a lack of exploration of the new ways in which non-standard employment is being used in couples.

Point 1) relates to the common claim that polarisation in couple employment has been increasing over the past decades. This claim, irrefutable in the empirical papers that put it forward, is nonetheless dated and restricted geographically. Most research on the issue studies a very narrow set of Western European/OECD economies, and studies a period that at most encompasses the late 2000s, and in any case never encompasses a period going from the start of the rise of dual-earning, to today.

This means that, for a lot of European countries, especially the Nordic, Eastern and Central European countries, the evidence about polarisation is scarce. These are countries with different political legacies and welfare-state organisations from those usually studied, and therefore, studying patterns of differences or commonalities in polarisation across Europe and including these understudied countries would refine our understanding of the issue.

The restricted time-window of observation in the literature is also an issue, with the risk of assuming the knowledge of a phenomenon whose long-run evolution has not been studied for nearly fifteen years. The 2008 economic crisis, for instance, may have led to

more female-single-earning couples, due to the crisis hitting male-dominated occupations more, and the added worker effect. More structurally, the continued rise of female educational achievement may have progressively reshaped couple practices. We just cannot assume that because some phenomena, like rising female employment and education, already existed twenty years ago, they have the same consequences today.

Finally, EU countries have been emphasising strongly, in the past two decades, that increasing employment rates is a key policy priority, for instance under the Lisbon strategy (European Council 2000). Labour markets have become more flexible, and groups with traditionally low labour market attachments have been targeted as untapped potential for higher employment (Boeri and Van Ours 2013). Low-skilled workers, housewives would have been key targets, while early retirement provisions have been phased-out, and people with disability have been subject to activation policies, limiting the potential for "hidden unemployment" and household joblessness via disability benefit claims.

In other words, the idea of polarisation partly rests on the idea that there is a somewhat incompressible rate of dual-worklessness. But this may have applied more in the context of heavy deindustrialisation of the 1980s or 1990s, a time in which, more generally, the focus on household worklessness was intimately linked to the perceived association between such worklessness and poverty. Whether it still holds is an empirical matter, especially in a time of rising non-standard employment amongst lower-skilled people: the in-work poverty literature clearly shows that precariousness is a phenomenon increasingly linked to employment, employment quality, and the household level (Lohmann 2018, Horemans 2018).

Precise knowledge of the evolution of polarisation matters in and of itself, but also because if other social outcomes, such as income inequality, or poverty, follow a different trend, it would mean that explanations other than ILO-defined employment polarisation would need to be sought. Moreover, any non-linear evolution in polarisation may shed light on evolutions in couple employment patterns, or in female employment or human capital, which would refine our overall understanding of the rise of dual-earning and couple employment participation. I tackle all these issues in Chapter 9.

Point 2) relates to an almost complete lack of integration between the literature studying the rise of polarisation, and the literature studying the rise of non-standard employment. Both dimensions are key to understand the rise of dual-earning, yet there is almost no attempt to understand how they may relate to each other theoretically and empirically, apart from Horemans (2016), as mentioned in chapter 6 and detailed in Chapter 10.

Despite how important non-standard employment has become in Europe, the vast majority of the polarisation literature ignores it, and studies ILO-defined employment, with no notion of intensity or quality of work in terms of assessing what sort of employment, exactly, is polarising. On the other hand, the literature studying the division of tasks between partners in couples focuses exclusively on inequality within couples, and makes no attempt to relate it to inequality across couples.

Countries could exhibit low polarisation of employment at face value between dual-earning and dual-workless couples, but high polarisation across dual-earning couples specifically, between dual-standard-earning and dual-non-standard-earning couples: it could be that in a time of rising employment rates, fuelled by non-standard employment,

the scarce resource that is unevenly allocated is no longer employment, but standard employment.

Other countries could have both strong inequality within dual-earning couples (with men in standard employment and women in non-standard-employment) and strong inequality across all couples (with dual-earning couples and some dual-workless couples). Or, these inequalities may be substitute. Some countries may manage to increase dual-earning rates while limiting inequality across and within couples; others may not.

The matter is that, by studying each dimension of inequality separately, the literature constantly mis-estimates the level of inequality and the inequality profile of a given country. For instance, it could easily characterise a country as very equal because it has a high full-time dual-earning rate, ignoring that this high full-time dual-earning rate rests on a high level of polarisation, with numerous workless couples at the other end. The country is indeed equal within couples. Whether it should be characterised as socially equal is another question. The importance of integrating notions of non-standard employment into studies of the employment distribution is crucial, in light of the poverty and low-pay risks associated to non-standard employment, especially in the household context (OECD 2015, Horemans et al. 2016).

More fundamentally, Chapter 10 will show that inequality in employment access within couples and across couples, cannot be understood in isolation: they reinforce and shape each other. Inequality in employment access is multi-dimensional, but the fact that these dimensions are seldom studied together may also explain why there is so much divergence and lack of correspondence in the literatures seeking to map couple employment

outcomes to welfare-state types. All these questions are blank canvasses that Chapter 10 will tackle.

Point 3) is based on the premise that on the one hand, the literature on polarisation exclusively conceives polarisation as dual-earning versus dual-workless. On the other hand, the literature on non-standard employment in couples predominantly focuses on its use as a complement to a standard job, in the "one-and-a-half" earning model.

Once we introduce the idea of standard and non-standard employment in polarisation models, it is possible to conceive polarisation not merely in terms of "work versus no work", but of "standard employment versus absence of standard employment". Whether standard and non-standard employment polarise, clustering in couples, is largely under-explored in the literature, but based on the premise that employment outcomes have become homogamous in Europe, it is a hypothesis worth exploring. After all, if couples desire joint labour market success, this desire may not be limited to mere employment status, but may extend to the type of employment performed.

The hypothesis is made all the more salient in the context of more flexible labour markets, increasing conditionality of unemployment benefits, liberalisation of different forms of non-standard work, and other reforms aimed at increasing employment. If people are incentivised to resume employment quicker, and this employment can increasingly take non-standard aspects, we could see more couples relying solely on non-standard employment, rather than non-standard-employment necessarily being a complement to a standard job.

The OECD (2015) shows that certain households rely exclusively on non-standard employment as a source of labour income, and that they are at disproportionate risk of

poverty compared to households where there is standard employment, but their data would include a lot of single-earning households. Nolan and Marx (1999) show that the consequences of low-paid work on poverty risks depends on the extent to which the household relies on this low-paid work, a point echoed by Horemans et al. (2016) in their study of non-standard work following the 2008 economic crisis. Given the pay penalty associated to non-standard employment, non-standard-earning couples need to be studied.

However, these couples have barely been studied. Questions such as their proportion, trends in their prevalence, the porosity with dual-worklessness, the permanency of this arrangement, are all open. The salience of this question increases even more given the findings in chapter 9, showing that dual-worklessness as a share of all couples has decreased, replace by couples whose only source of labour market income is from non-standard-earning. Chapter 11 therefore zooms onto the issue of non-standard-earning couples, and more precisely, of whether labour market flexibilization policies have pushed dual-workless couples to become non-standard-earning.

In light of these three gaps, the rest of this chapter now proposes a short summary of the contributions made in each empirical chapter.

7.2. The end of polarisation? Evolution of the distribution of employment across couples in Europe over the past forty years

This chapter offers an unprecedented historical and geographical window of observation into the issue of the evolution of polarisation over time and across countries. In doing so, it revisits, updates and challenges existing results in the literature.

First, the time period studied in this chapter is new: it uses data going as far back as the early 1980s, all the way to the eve of the Covid-19 pandemic, in 2019. This enables to go

back to a time in which male-single-earning was still widespread, often the norm, in Europe, and to trace back the subsequent evolutions of couple employment patterns as female employment took-off. It also incorporates the years post-2008 crisis, in particular the last decade, which have seldom been studied in a literature on polarisation that often dates back to the early to mid-2000s.

Second, this chapter studies all 27 EU countries (including the UK, minus Croatia). While not all countries have data available since the early 1980s, the chapter still enables to study the issue of polarisation of couple employment over a range of countries that had seldom, if at all, been studied before, particularly Nordic, Central and Eastern European countries. In doing so, the chapter studies commonalities and differences in polarisation trends across the whole of Europe, a fruitful exercise in understanding the phenomenon, in addition to merely establishing results for countries that had not been studied previously.

The chapter computes a polarisation indicator for each year and each country based on the work of economists Paul Gregg and Jonathan Wadsworth (as detailed in Chapter 4), and studies how the level of polarisation has evolved across Europe over time, on average and country by country. The findings are striking: polarisation in Europe has been increasing over time, yes, but at a clearly decreasing rate. It is higher now than forty years ago, but this is mostly the result of the distribution of employment across couples becoming particularly uneven in the 1980s and 1990s. Early in the new millennium, the trend started slowing-down if not reversing.

This updates and refines the idea that polarisation is increasing and higher than in the past. This slow-down in polarisation occurs despite the continuous rise in female

employment. Rising female employment today no longer disproportionately fuels the clustering of employment in couples, materialising into the take-off of female-single-earning couples.

In light of the novelty of these results, the chapter explores potential explanations that could shed light on the slow-down in polarisation in Europe.

At the macro-level, it studies the roles of the 2008 crisis and the sectoral reshaping of European economies, and their interrelationship. It shows mixed results regarding the effect of the 2008 crisis on the polarisation of couple employment: it led to a rebound in the tendency for employment to cluster in couples, but not for the tendency of non-employment to cluster in couples. This is explained by the role that partnered women played as a buffer to dual-worklessness during this crisis, particularly due to their propensity to work in the service sector, sheltered during the crisis relative to (male) industrial jobs.

In the long-run, the main contributor to the increase in polarisation has been service employment, which has been clustering in couples, and deindustrialisation, which disproportionately affected male-single-earning. The fact that deindustrialisation was particularly intense in the 1980s and 1990s may explain why polarisation was very intense then, but less so today.

At the couple level, the main feature of the last two decades is the rise in female-single-earning rates. They have overtaken dual-workless couples as a share of all couples, and have massively narrowed the gap with male-single-earning that existed at the start of the 1980s. The results show that, while polarisation decelerates with time, the rate of increase in female-single-earning accelerates with time. While female overall employment rates

are positively related to economic growth and negatively to the economic crisis, female-single-earning rates are negatively related to economic growth and positively to the economic crisis, further underlining the increased importance of female employment in couples.

In addition, the long-run rise of female educational achievement has had impacts on couples. The rise in female-single-earning couples has been driven by the rise in female-single-earning couples in which the female partner is more educated than the male partner. This is likely to continue, as the chapter clearly shows that on average, partnered women are now more educated than partnered men in Europe.

Finally, dual-workless couples, on which much policy and academic attention has been directed, have actually been declining as a share of all couples, particularly so in the past twenty years, contributing to the deceleration of polarisation. Is it the end of precariousness in employment access across couples? There are grounds to doubt it – indeed, dual-workless couples have been replaced in aggregate (and as measured by polarisation indicators relating to both couple types) by couples whose only source of labour income is from non-standard-employment. This could be related to a change of nature of precariousness in couples, with long-term dual-worklessness linked to a loss of industrial jobs decreasing, and non-standard-earning couples in the service sector increasing. Both couple types share similar disadvantages in terms of human capital.

The richness of the dataset enables to explore how these average European trends play-out country by country. What emerges is a rather coherent picture across Europe. Variations across European countries occur a lot more in terms of level and intensity of the trends exposed, than in terms of nature of the trends in themselves. The nuances do

exist, and are explored in the chapter, but lie below a surface of commonality. These nuances tend to be stronger with regards to post-Communist countries, which is unsurprising given their different legacy with regards to female employment.

This chapters hints at a potential interrelationship between the evolutions of polarisation and non-standard employment, with the rise of couples relying on non-standard work as their sole source of labour income. This finding underpins, in different ways, the empirical endeavours of the next two chapters.

7.3. The inequality trade-off: inequalities across and within couples in the rise of dual-earning

Dual-earning has been rising in Europe. Two variables have risen with it: polarisation and non-standard employment. Yet, they have almost never been studied together: we do not know how polarisation and non-standard employment empirically relate to each other, and how they account for the rise of dual-earning.

It matters because both relate to a form of inequality, in a context of seemingly greater equality induced by rising female employment and dual-earning. Polarisation is a form of inequality across all couples, an inequality in terms of access to employment. Non-standard employment is a form of inequality within couples, an inequality in terms of access to different employment types for the male and female partners in heterosexual couples. Do these inequalities come together? Are they substitute? Do they reinforce each other? Is it necessary to have one, or both, for dual-earning, a socially desirable goal by many accounts, to increase?

Some countries could exhibit a form of dual-inequality (employment clustering in couples, and these couples dividing standard and non-standard-employment along gender

lines). Or they could exhibit new forms of inequalities that the literature does not yet capture (employment being evenly distributed across all couples, but standard employment clustering in some dual-earning couples and non-standard-employment clustering in other dual-earning couples).

Better capturing these dimensions is crucial to reinforce our understanding of inequality in access to (quality) employment between partnered men and women and between couples, and could be important building steps to better understand wider issues of poverty and inequality.

The findings of Chapter 9 also make the link between polarisation and non-standard employment, and more generally, the issue of the distribution of standard and non-standard employment in the context of the rise of dual-earning, crucial. Indeed, Chapter 9 showed that dual-earning had become the ultra-dominant form of couples in Europe, and that dual-worklessness had decreased – such that new forms of polarisation and inequalities within and across dual-earning couples, related to the quality of employment, may be the new frontier of inequality in employment access.

In that light, this chapter identifies three potential layers of inequality: across all couples in terms of employment access, broadly defined, across dual-earning couples specifically, in terms of access to standard employment, and within dual-earning couples, in terms of access to standard employment.

So, chapter 10 explores these inequalities, and offers an unprecedented attempt at linking polarisation and non-standard employment, and linking them and their interrelationship to the rise of dual-earning. It does so by studying a dozen of European countries for which data are available over nearly four decades, since the early 1980s. As detailed in the next

section, it develops a new shift-share equation to decompose the rise of dual-earning and explain it in terms of polarisation, non-standard employment, and their interrelationship.

The chapter has three main empirical endeavours:

Establishing the relationship between evolutions over time in the prevalence of dual-earning couples with at least one partner in non-standard-employment and polarisation of employment across all couples.

Formally linking the two issues by developing polarisation indicators capturing the distinction between standard and non-standard employment and showing how they have been distributed across dual-earning couples over time.

Formally linking the above with the overall evolution in dual-earning rates, to see how this evolution has been shaped by evolutions in standard and non-standard-employment, and the way they are distributed across couples.

It shows that across Europe, the rise in polarisation and the prevalence of dual-earning couples with non-standard-employment is positively correlated: both have risen together over time. But it also finds that the rise in polarisation is actually not because non-standard-employment has become less evenly distributed: it is actually standard-employment that increasingly clusters in couples. Non-standard-employment increases employment level. Standard employment increases how unevenly distributed rising employment is.

However, there are nuances across countries, and different models of inequality, along three lines – inequality across all couples, inequality across dual-earning couples only, inequality within dual-earning couples – are identified. Finally, the chapter finds that rising dual-earning rates induce a trade-off: they must come with either rising polarisation

of couple employment across all couples, or a rise in the use of non-standard-employment in couples, often both, which implies at least one of the three layers of inequality identified. Countries do not differ so much in the fact that they have some inequality related to couple employment, as in the locus of this inequality.

The contribution of this chapter is also methodological. It builds on chapter 1 to further extend polarisation indicators such that they can take into account distinctions between different forms of employment. It develops a new shift-share equation, extending previous research so that this shift-share equation can now also distinguish between different forms of employment and their distribution across couples.

This chapter constitutes an original endeavour to link polarisation and non-standard employment. However, it focuses on one side of the development of couple employment patterns, the rise of dual-earning. The third and final empirical chapter looks at the other side: dual-workless couples, their potential transition to non-standard-earning couples, and the effect of labour market policy.

7.4. Dual-worklessness after an unemployment benefit reform: evidence from Germany

Workless households and couples have featured prominently in the literature, and have sometimes been depicted as incompressible, a feature of polarising societies that was difficult to tackle (Berthoud 2007). But the evidence shown throughout this thesis shows that dual-worklessness, albeit seemingly incompressible in the 1980s and 1990s, has been decreasing in the last two decades across Europe. On the other hand, couples relying solely on non-standard work as a source of labour income (thereafter: non-standard-earning couples) have been on the rise, and have replaced dual-workless couples, on

aggregate. Data shown in chapter 9 shows a strong similarity in the socioeconomic profiles of workless couples and non-standard-earning couples.

This change occurred against the background of changing labour market policy and labour market flexibilization. Chapter 2 documented this trend: European labour markets on average have followed the route of less generous unemployment benefits, looser employment protection, stronger activation, amongst other dimensions, following the overarching aim of increasing employment rates, and the (re)-employment of the jobless. This marks an important departure from welfare-states that, for a long time, had been designed upon the idea of compensating a social risk upon its occurrence, typically with generous support for the jobless.

This third and final empirical chapter aims to link the evolutions in dual-worklessness, in non-standard-earning couples, and in labour markets. It hypothesises that dual-worklessness decreased as labour markets became more flexible, and policy increasingly targeted people remote from the labour market to increase employment rates. It hypotheses further that this labour market flexibilization has led to an increase in the rate at which dual-workless couples transition towards a non-standard-earning arrangement: in a context of flexible labour markets, non-standard-earning would be "the new dual-workless".

Germany illustrates perfectly the shift in labour markets and labour market policy described above. The Hartz reforms, a package of new laws passed between 2003 and 2005, embodies the transformation of a system initially centred towards the compensation of a social risk, towards a system geared towards re-employment as the priority. This chapter therefore studies Germany as a good case to study the transitions of dual-workless

people out of dual-worklessness over time, and as affected by drastic reforms to labour market policy.

To study these hypotheses empirically, this chapter uses longitudinal data from the German Socio-Economic Panel (SOEP). I reconstitute couples and their employment status on a monthly basis. I apply event-history models to study their monthly hazard of exiting dual-worklessness, first in general, and then distinguishing between exits towards a non-standard-earning arrangement, and exits towards an arrangement with at least one partner in standard employment.

The fact that the Hartz IV reform, which is the specific reform package this chapter studies, was rolled-out at a single point in time for all unemployed claimants in all German regions, makes difficult the identification of a clear control and treatment group. In that light, the chapter uses a design akin in spirit to difference-in-differences (DID), comparing workless couples receiving benefits and workless couples who do not, which cannot show causality (due to potential self-selection in the receipt of unemployment benefits), but nonetheless shows a series of interesting original results regarding the evolutions post-Hartz IV of dual-worklessness exits.

The chapter does find that over the 1997-2012 period in Germany, dual-worklessness decreased and transitions away from dual-worklessness increased. Further, it does find that the rate of transitions away from dual-worklessness towards non-standard-earning increased over time, both in absolute value, and relatively to transitions taking place towards arrangements in which at least one of the partners is in standard work.

But while these trends take place over time, it does not seem like the Hartz IV package contributed to them – in fact, rather the reverse. The years post Hartz IV are found to be

associated to a decrease in the propensity of dual-workless couples to exit dual-worklessness when they receive unemployment benefits. This goes through, particularly, a decrease in their propensity to find standard employment.

These results, surprising according to perspectives that conceive unemployment benefit as a disincentive to work and advocate decreasing their generosity to increase employment, could be attributed to a dimension of the Hartz reforms that is overlooked in the literature studying the effect of labour market reform on individuals, but matters in the household and couple context.

It is the fact that unemployment benefits became more strongly means-tested at the household level following the reform, tying partners' labour supply together and potentially trapping dual-workless couples into dual-worklessness. This possibility is reinforced by the fact that the same models carried on the individual workless population shows a positive association between post-Hartz IV years and the probability that they find a job.

Again though, the design cannot show that the Hartz IV package *caused* these results. It is possible that after the reform, despite the wide range of observable control variables used in the models, couples that claim unemployment benefits are systematically different than those who did before. In any case, the results are striking, as a negative effect was certainly not the objective of the reform – for those couples who after the reform, do claim unemployment benefits, the fact that the transition towards employment becomes less likely contradicts the stated aim of the reform.

The chapter also finds that the most important determinant of the type of transitions that dual-workless couples make is their status prior to dual-worklessness. Couples that were

non-standard-earning are disproportionately likely to return to non-standard-earning, compared to couples that had at least someone in standard employment – and vice-versa. This speaks of a form of segmentation of employment at the couple level, of a form of porosity between non-standard-earning and dual-worklessness, which suggests overall that polarisation needs to be conceived not just in terms of mere access to employment, but access to, and permanency in, good quality employment.

PART III: EMPIRICAL WORK

8. Analytical strategy

This chapter presents the broad analytical strategy that guides the empirical work of this thesis, and the data sources used. Of course, which method is used exactly, depends on the chapter-specific research questions, and will be presented in more details in the relevant empirical chapters. Here, I outline the broad approaches that inform the three empirical chapters.

8.1. Operationalising non-standard employment and polarisation in practice

Before getting into the concrete data sources and the exact variables used, I describe briefly a few choices I make with regards to the conceptualisation and operationalisation of non-standard employment and polarisation in practice, as these choices inform the understanding of the more practical issues regarding the data used, and variables these data contain.

8.1.1. Non-standard-employment

I make a number of choices in terms of the operationalisation of non-standard employment based on conceptual considerations, as well as practical issues. If standard work is defined as full-time, permanent work (Kalleberg 2000), then non-standard employment must include part-time and temporary work.

Part-time work can be a contested notion. The OECD defines it as working less than 30 hours per week. The literature sometimes distinguishes between substantial and marginal part-time work (Allmendinger et al. 2013). The ILO, for instance, defines substantial part-time work as 21-34 hours of work per week, short part-time as working 20 hours or less per week, and marginal part-time as working fewer than 15 hours per week (Messenger

and Walot 2015). Moreover, countries may vary in terms of the type of part-time work they offer, and the earnings and social security entitlements part-time jobs generate.

Although ideally, a distinction should be made between different forms of part-time work, this thesis does not engage in it for a variety of practical reasons. The first is the difficulty in establishing a cut-off point that, in a thesis that studies 27 countries and 40 years, definitely separates part-time employment into a category that would be "more non-standard" than the other. It also complicates the derivation of polarisation indices and shift-share equations when attempting to include non-standard employment, and risks diluting the results and messages into pieces that would be hard to make sense of. Finally, as I will detail in the subsection on data and variables, there are practical issues with variables capturing respondents' weekly hours, which make variables created on that basis potentially unreliable.

That said, overall, the operationalisation of part-time work in this thesis, although it lacks nuance, captures what is essential, i.e., a departure from full-time work, which is particularly relevant in the context of couples.

The inclusion of self-employment as a form of non-standard-work is also debated in the literature, with some research work classifying it as standard, other as non-standard, and many circumventing the problem by focusing on employees only. A potential distinction could be made between solo-self-employment (non-standard) and self-employed people who employ other workers (standard).

The lack of clarity regarding self-employment, and the inability to distinguish between solo-self-employment and other forms in my data, means that by default self-employment is considered as standard, but all the analyses, where applicable, are carried again

classifying self-employment as non-standard, for robustness. The reason why the default is to consider self-employment as standard has to do with uncertainty: as non-standard employment is a key object of study in this thesis, I make the choice to classify as non-standard employment what we definitely know is non-standard employment, based on past research. Results can be seen as conservative, in this light.

A host of other, sometimes newer, forms of employment, like zero-hour contracts, agency work, or the gig economy, could be considered as non-standard employment forms of their own, too. Again, data availability is often an issue to get into such levels of details. But in general, they are likely to overlap with at least one of the three forms – part-time, temporary, self-employment – described above.

Further, there is a case to argue against the grouping of part-time and temporary work under a single umbrella called "non-standard employment", but instead to study them separately, as they are rather different forms of employment, that may affect different people and have potentially different implications in terms of outcomes such as earnings or future labour market prospects.

Again, the default here is still to group them. This is not uncommon in the literature by any means and helps with parsimony and the general understanding of results. On a more fundamental level, it captures the spirit of non-standard employment broadly defined, as a departure from full-time, open-ended work, the form of work that characterised much of the advanced capitalist societies early after World War II. Yet, for robustness, where applicable, I carry all analyses again separately for part-time and temporary work, as well as for self-employment as its own category.

8.1.2. Operationalising polarisation

I described in Chapter 4 the concept of polarisation and the derivation of polarisation indicators. In practice I use a slightly different version of these polarisation indicators in Chapter 9 and in Chapter 10.

Indeed, as Gregg and Wadsworth often do in their empirical work, it is possible to normalise the polarisation measures over the business cycle, to enable better comparisons across countries and time, by dividing the polarisation of dual-joblessness measure by the non-employment rate, and the polarisation of dual-earning measure by the employment rate. In these cases, the indicators of polarisation are:

$$\rho_{dw_n} = \frac{dw - \gamma_2}{\mu}$$

Equation (7)

and:

$$\rho_{de_n} = \frac{de - \alpha_2}{(1 - \mu)}$$

Equation (8)

For dual workless and dual earner couples respectively.

These polarisation indicators are used in their normalised version in chapter 9 (focusing on both dual-earning and dual-worklessness) and their non-normalised version in chapter 10 (focusing on dual-earning only). The reason is that, the comparative approach, seeking to establish commonalities and differences across countries and trends over time, is key to chapter 9, and for that purpose, comparisons make more sense using the normalised indicators.

In chapter 10, although there is a comparative element, the main focus is on the mathematical relationships derived by the shift-share equation and decomposing the rise

of dual-earning into a variety of variables, in order to understand their interrelationship. This is more easily done with the non-normalised indicators. Note that in practice, whether one uses an indicator or the other makes very little difference to empirical results, as tested in robustness tests available in the supplementary material.

On a methodological level, this thesis does not just use these polarisation indicators: it also derives new indicators, based on them, that can incorporate distinctions in terms of employment quality. The key one in this thesis is the distinction between standard and non-standard employment. Chapter 9 also looks at the distinction between jobs in different sectors of the economy (services, industry, agriculture), and how they are distributed across couples. The full derivation of this extension is given in Appendix A1 (relevant to the work in Chapter 9) and Appendix B3 (relevant to the work in Chapter 10).

But the broad intuition remains the same: the aim is to compare a counterfactual world in which standard, non-standard, and non-employment are randomly distributed (or, for the sectoral analysis, in which service, industry and agriculture employment are randomly distributed), and the real, empirical rates of each subtype of couples. The difference is the degree of polarisation. For instance, the counterfactual dual-standard-earning couple rate is the square of the standard employment rate. The difference with the actual dual-standard-earning rate tells us how much standard employment clusters in couples as opposed to being evenly distributed across them.

Finally, note that, as explained in Chapter 6, I will use, for ease of language, the idea of "rising polarisation" to describe what, strictly speaking, should be called "polarisation becoming more positive". This captures the intuition behind societies increasingly

polarising between, say, dual-earning and dual-worklessness, or dual-standard and dual-non-standard, that comes with the value of the polarisation indicators increasing and eventually becoming positive and "more positive".

8.2. Data and variables that are key across the three empirical chapters

With the aforementioned operational choices in mind, let us now turn to the practical issues of data and variables.

8.2.1. Chapters 9 and 10 data: the EU-LFS

The dataset used for chapters 9 and 10 is the European Union Labour Force Survey (EU-LFS) in its yearly version, and the dataset used for chapter 11 is the German Socio-Economic Panel (SOEP).

The yearly EU-LFS is a large household sample survey providing yearly results on labour force participation of people aged 15 and over, and on people outside the labour force. The survey covers persons who live in private household, and focuses on issues of employment participation. It therefore has detailed variables on the matter. Its focus on employment, and its availability over 27 European countries and nearly four decades for some of them, make it the ideal dataset to study the issues at hand. Chapter 9 focuses on 27 countries, Chapter focuses on 11 countries, with the geographical and historical ranges of each chapter detailed in their relevant analytical strategy sections.

The EU-LFS allows to reconstitute couples, using household identifiers. The age range for couples studied is detailed in each empirical chapter, as I use a different age range in Chapter 9 and 10, corresponding to the different objects of research of each chapter. Throughout, I keep all couples regardless of whether they are married or not.

With regards to "raw" employment, which does not distinguish between standard and non-standard employment, there is a variable based on the ILO-defined employment status, according to which people are employed if they worked at least an hour in the previous week, unemployed, or inactive.

I then merge the unemployed and inactive dimension, such that people's employment status is a dummy variable: they are employed or non-employed. A distinction between unemployment and inactivity could theoretically be fruitful, but is not always clear-cut in practice, and the dichotomous approach is in line with most past research.

Using this dummy employment variable, each partner within a given couple can have its ILO-employment status coded, which then means that the joint status of the couple can be derived: dual-earners (both partners in employment), male-single-earner (the male only is in employment), female-single-earner (only the female is in employment) and dual-jobless (none are in employment).

Then comes the issue of non-standard and standard employment: we want to make a distinction amongst all the people classified as "employed" according to their ILO-status, remembering that non-standard-employment is defined as part-time and temporary work.

In chapters 9 and 10, I capture part-time work in practice in the EU-LFS using employed individuals' self-reported status between full-time and part-time employment, due to a much higher coverage of respondents in the dataset than the alternative, a variable based on their reported usual weekly working hours. For robustness, where applicable, I also carry the analyses using this alternative variable and defining part-time work as working less than 30 hours per week, in line with experts (Westhoff 2022).

I capture whether employees' contract is permanent or temporary via a dummy variable that the EU-LFS provides. This variable only applies, by definition, to people who have a contract, and therefore does not apply to the self-employed. I capture whether people are self-employed or employees in the robustness analyses, using the variable provided for that in the EU-LFS.

With standard and non-standard employment distinguished, each of the big four couple types defined above using ILO-defined employment can be refined.

The distinction is now between couples with both partners in standard employment ("dual-standard-earning"), couples with a partner in standard-employment and the other in non-standard employment ("one-and-a-half-earning" – as the data will show, the vast majority have the male in standard employment and the female in non-standard employment, and this couple type should therefore be understood with this gendered dimension in mind), single-earner couples with the single-earner in standard employment ("standard-single-earning"), and couples with no standard employment.

This final couple type is the sum of couples that are not jobless but do not have standard employment either ("non-standard-earning" couples, which include single-earner couples in non-standard employment and dual-earner couples with none of the partners in standard employment), and couples that do not have employment altogether (workless couples).

Let us note two data-related points. The first is that, since 2006 the EU-LFS offers a new set of household indicators, more precise than before that year. From 2006 onwards, all couples can be reconstituted; before 2006, certain couples who live with another couple as part, for instance, of a multi-generational household, cannot be identified. For instance,

that would be the case if a woman lives with her partner and her parents in the household; but that instead of being coded as the partner of someone, she is coded as the daughter of someone in that household.

In practice, for most countries, this makes very little difference in the data, but for a few post-Communist countries, there is a small spike in the proportion of partnered people in 2006, related to this data issue – after which, the trend towards decreasing proportions of partnership resumes.

The second is that, while in the vast majority of cases, we see a smooth trend towards decreasing proportion of people in partnership, in a handful of cases for a given country, there are idiosyncratic sharp variations due to sampling – for instance, in Belgium before and after 2011, which is due to a different sampling of young people. Again, this does not affect our understanding of the overall trend regarding partnership rates.

And crucially, none of these data issues affect the actual statistics we are interested in – for instance, we do not see sharp spikes in polarisation indicators or couple employment participation rates related to these varying sampling.

Finally, note that all the empirical analyses are weighted. Individual level statistics are weighted according to the weights provided for each observation by the EU-LFS. Couple-level statistics and statistics on partnered people are weighted by averaging the individual weights for each partner within the couple, hence creating a couple weight.

Why are there individual and couple level statistics? Let us recall that a polarisation indicator, for instance for dual-earning, is defined as the difference between the actual dual-earning rate, and the counterfactual based upon the assumption that employment is

randomly distributed. To obtain the latter, one needs the individual employment rate, as the counterfactual is the square of this individual employment rate.

So, while the analyses and the main dataset is at couple level, using the couple dataset, the counterfactual is constructed also using the EU-LFS, but this time using the individual population. If a chapter studies the partnered people aged 25-55 in the couple dataset, the counterfactual is computed using the individual level 25-55 employment rate, computed across the entire population of that age, regardless of partnership status. The reader is invited to refer themselves Chapter 4, particularly the simplified example using 4 couples and an employment rate of 50%, should they need an intuitive example of the link between the individual employment rate, and couple-level counterfactuals.

Appendices A.2 and B.2 describe the sample sizes for individual and couple populations for each country-year studied Chapters 9 and 10 respectively. For Chapter 9, the average country-year in the dataset has a sample of 14995 couples, for Chapter 10 the figure is 15621. The sizes tend to vary according to country sizes, with the most populous countries having bigger sample sizes than the smaller ones. Overall, the EU-LFS provides sizable sample sizes even at the couple level, allowing to complete analyses of the evolution of couple employment patterns.

8.2.2. Chapter 11 data: the German SOEP

Chapter 11 uses the German Socio-Economic Panel. It studies the period 1997 (the last year of significant reform to the German benefit system before the Hartz reforms) to 2012, in order to build a symmetrical pre-reform and post-reform period of study, as the reform date is key to the object of study of this chapter.

The SOEP is Germany's largest representative and longitudinal survey, with around 30.000 individuals in 11.000 households surveyed each year since 1984 (Goebel et al. 2019). The SOEP provides detailed socioeconomic information on the respondents, particularly with regards to their employment trajectory, which can be reconstituted on a monthly level. Like with the EU-LFS, household identifiers enable to reconstitute couples.

Using these two features – monthly information, that is available at the couple level – I construct a couple-month dataset, and restrict the sample to the population of interest: dual-workless couple-months. Dual-workless couples are defined as couples in which both partners are workless (in the ILO-sense, not even working an hour in the last week), and worklessness is defined as not having a job (regardless of the reason, i.e., it encompasses unemployment and inactivity).

The main specification of this chapter studies working-age dual-workless couples in which both partners are above 25, and excludes those in which both partners are above the age of 57. Although the legal retirement age in Germany has been 65 over the period studied, in practice, for much of these years, early retirement provisions meant that unemployed workers could retire with full pensions as early as 60, and even build a bridge with unemployment benefits towards early retirement as early as 57, which was a common practice (Dlugosz et al. 2009, Amable and Françon 2014).

The sample in this main specification is therefore made of 25072 couple-months observations, corresponding to 1478 dual-workless couples, who generated 2213 dual-worklessness spells, which resulted in 1606 transitions out of dual-worklessness.

The longitudinal dimension of the SOEP allows to follow dual-workless couples over time, and to model their time spent in dual-worklessness as well as their transitions out of dual-worklessness. The details of this modelling, and of the rich set of control variables that are used, are presented in the core of chapter 11. A number of robustness analyses, particularly with regards to sample delimitations, are also carried, again detailed in the core of the chapter.

Finally, as is the case throughout this thesis, a key distinction is made between standard and non-standard employment. At the monthly level in the SOEP, the only dimensions of employment quality that are captured are whether the job is part-time or full-time, and whether the job is a mini-job (very marginal forms of part-time jobs capped at 400euros of earnings per month). Therefore, here, non-standard-employment can only be defined as part-time work or mini-jobs, other relevant dimensions discussed in the literature (temporary work, self-employment) having to be ignored. Any estimates will therefore be conservative, under-estimating the real extent of non-standard employment.

8.3. Introducing the methods used

I will go into the technical details of each method in the relevant empirical chapters, so they are fresh in the reader's mind.

In Chapter 9, I model the evolution of polarisation indicators over time, using fixed-effect panel data regressions with time variables as the main covariates. I then explore potential explanatory mechanisms regarding recent evolutions in the polarisation trends, by either refining the original regression models to add relevant covariates, or by plotting relevant long-term trends that support hypothesised mechanisms.

In Chapter 10, the empirical endeavour relies on two main dimensions. The first is the extension of the polarisation indicators to capture the distribution of standard and non-standard employment across dual-earning couples. The second is to then turn these polarisation indicators into explanatory variables. I develop a new shift-share equation that can explain the rise in dual-earning over time, by decomposing it into the contribution of the level of standard employment and non-standard-employment, and of how evenly or unevenly they are distributed across couples.

In chapter 11, I model the transitions over time of dual-workless couples away from dual-worklessness, and into different employment states, using discrete-time event history methods. These methods allow to compute the likelihood of exiting dual-worklessness in month *m* of a dual-worklessness spell, given that the exit has not happened up to month *m*, and including explanatory covariates. I study how this likelihood, and the destination states, evolve after the Hartz IV reform package, which makes unemployment benefits less generous. The model, in spirit, is similar to difference-in-differences, but the specificities of the reform prevent from making any strictly causal claims.

Having detailed the ways in which I would go about empirically answering the research questions underpinning this thesis, I now begin the empirical part, made of three empirical chapters, and a concluding chapter.

9. The end of polarisation? Four decades of evolutions in the inequality of the employment distribution across European couples

9.1. Introduction

In this chapter, the basis for the research questions lies in the rise of female employment over time (Jaumotte 2003, Genre et al. 2005, Gregory 2011), fuelling dual-earning (Crompton 1999, Dotti Sani 2018), but also increasing the unevenness of the distribution of employment across couples.

To recall, past research tends to suggest that female employment participation has risen the most where their male partner was already in work, yielding warnings that employment would increasingly become concentrated in certain couples (Berthoud 2007, de Beer 2007, Cantillon 2011). But this evidence is often limited to a few Western European countries, and never offers a perspective that encompasses developments going from male-single-earning times, to today.

The need to update our knowledge of polarisation trends is the basis for the first research question in this chapter:

RQ1: What is the evolution of the distribution of employment between European couples in the last four decades, and does it still translate into an increasing polarisation between dual-earner and dual-jobless couples?

This chapter offers an unprecedented window of observation with regards to the evolutions in couple employment that brings new results to the literature. In particular, it shows that, although higher than forty years ago, the tendency for couple employment to

polarise increased at a decreasing rate and in fact slowed-down, potentially even reversed, recently, as dual-worklessness decreased and rising female employment started to translate into higher female-single-earning rates.

In light of the novelty of these results, the chapter adopts an explorative stance about potential explanatory factors, with the aim of building expectations for future causal research. This informs the second research question in chapter:

RQ2: What factors may have influenced the evolutions of the polarisation trends explored in the first research question?

At the macro-level, the chapter explores how long-term sectoral evolutions of European economies, and the medium-term shock of the 2008 crisis and its aftermath, have reshaped couple employment participation. At the couple-level, it explores the rise in female-single-earning, the evolutions in the relative human capital of partnered men and women, and the switch away from dual-worklessness towards couples being on the fringe of the labour market, with non-standard-employment as their only source of labour income.

Finally, there may be differences and commonalities across European countries that may improve our understanding of the issues at stake. The third research question in this chapter therefore is:

RQ3: To what extent are the evolutions presented in RQ1 and RQ2 common or different across European countries?

Section 2 briefly reminds the reader of the relevant past literature Section 3 details the analytical strategy. Section 4 presents the evolution of the polarisation of couple

employment over time in Europe. Section 5 delves into potential explanatory mechanisms. Section 6 presents insights from robustness analyses. Section 7 concludes.

9.2. Past research

Chapters 3-6 detailed extensively the theoretical frameworks, key concepts, and previous empirical results that motivate this thesis and I refer the reader to them for more details. Here, I will just remind briefly that the two key theoretical perspectives that inform much of this thesis and this chapter in particular, are, on the one hand, the Beckerian specialisation framework, and on the other, the couple careers homogamy framework. The former predicts inequality in employment access within couples, but equality across couples. The latter predicts the reverse.

Empirically, the conventional wisdom is that the distribution of employment across couples increasingly polarised over time in Europe, with women disproportionately joining employment in dual-earning couples, female-single-earning being very marginal, and dual-worklessness being somewhat incompressible. European societies polarise between dual-earning and dual-workless couples (Gregg and Wadsworth 2001, 2010, Berthoud 2007, Gregg et al. 2010).

However, the lack of comprehensive coverage of the past two decades in the polarisation literature means that phenomena that are new (the 2008 crisis), or have become more pronounced over that period (the educational advantages of women over men), affecting couple employment patterns and potentially, polarisation, may have been missed. In addition, there are many European countries that have not been empirically studied, such that we ignore the polarisation picture in much of Europe.

In addition, despite how central non-standard employment is in contemporary Europe, much of the polarisation literature does not distinguish between standard and non-standard employment and only focuses on ILO-defined employment. There is only one study linking non-standard employment to questions of polarisation (Horemans 2016), an essential but limited contribution, in which attention is restricted to dual-earning couples only, at a single point in time rather than looking at evolutions over time.

So, this chapter aims to revisit the evolution of couple employment participation, and the polarisation of employment across couples, by studying an unprecedented geographical and historical window of observation. A key contribution of this paper is indeed the combination of data spanning, in certain cases, the past forty years, and covering 27 countries. This makes the analyses of trends a difficult balancing act between trying to establish parsimonious take-aways without getting lost in the meanders of overly detailed country by country analyses, and still establishing country patterns, groupings, and nuances, to better understand the phenomena of interest.

For that purpose, two analytical devices can be used as starting point, to help make sense of the results. The first is the time-span for which data are available (the panel is unbalanced, an issue I come back to in the next section), and the second is the welfare-state typology initially derived by Esping-Andersen (1990) and subsequently refined (Arts and Gelissen 2002), both dimensions overlapping to a significant extent. The countries studied in this paper belongs to five broad types of welfare-states.

The Liberal welfare-states (UK, Ireland) are present in the dataset since the 1980s. They tend to be more residual welfare-states, with welfare support very targeted and means-tested, aimed at basic poverty relief (Esping-Andersen 1990, Gough et al. 1997, Halleröd

et al. 2015). Market relations take a prominent part in determining social outcomes, such that skills and labour market advantages can be important in determining employment outcomes, shaping potentially high inequality. These countries tend to be "familialist by default" (Saraceno and Keck 2010): there is no explicit doctrine asking women to take care of the housework, but no explicit alternative publicly provided either, again leading the market to dictate who can afford childcare and who cannot, and therefore potentially shaping important differentials in (full-time) employment between men and women. The prominence of market outcomes in determining social outcomes suggests that polarisation between dual-earning and dual-worklessness could be strong and increasing with female employment, with part-time employment an important solution for women seeking to combine work and caring for children in the absence of comprehensive public childcare.

Conservative countries (also sometimes described in the literature as "corporatist") like Austria, Belgium, France, Germany, Luxembourg, the Netherlands, tend to rely on social insurance systems in which one gets out of security something proportional to what they contributed (Esping-Andersen 1990, Arts and Gelissen 2022). For most of them, data are available since the 1980s. These systems tend to entrench social statuses and reproduce them in social security entitlements, which, with regards to couple employment outcomes, tends to be favourable to male-breadwinner arrangements (Halleröd et al. 2015). These countries do not tend to offer particularly extensive systems to relive women of unpaid care work, although France and Belgium stand-out in that regards, with rather generous provisions of public care services (Saraceno and Keck 2010). Nonetheless, the gendered dimension of social and labour market policies could act as a brake to rising polarisation over time, with employment being evenly spread across couples as in the male

breadwinner model, and an important use of female non-standard work in couples as a complement to a male standard job.

The final type of welfare-state for which we have data since the 1980s is the Mediterranean welfare-state: Greece, Italy, Spain, Portugal, with Cyprus and Malta joining the dataset later on. This welfare-state type is not initially part of Esping-Andersen's typology and has been suggested as an addition by subsequent literature which emphasises that, although they are close in nature to the Conservative type, they tend to emphasise further the gendered division of labour and the role of the family in providing welfare (Arts and Gelissen 2022). Care work tends, by default, to be located within the family (Saraceno and Keck 2010), and the male breadwinner model has been found, in past research, to be comparatively stronger in these countries (Lewis et al. 2008). All of these elements combine to suggest that any rise in polarisation may be more limited in these countries than anywhere else in Europe, due employment being primarily male, but this should be nuanced by a variety of factors. First, in the case of Portugal, Spain and Greece, joining the EU in the 1980s has come with sustained economic and employment growth which, depending on the way it has been distributed in the population, may have generated polarisation between those who could benefit from it and those who could not. Second, Mediterranean countries tend to have comparatively high unemployment rates: if people who look for work but cannot find it due to market constraints cluster in couples, or if would-be-male-breadwinners are unemployed with a jobless female partner, this could also result in polarisation. This generally relates to the common finding that Mediterranean labour markets tend to be segmented between insiders and outsiders, which may foster polarisation, although the growing share of non-

standard, particularly temporary, work in these countries, suggest that such polarisation could increasingly take the form of standard versus non-standard work (Westhoff 2024).

Two other types of welfare-states join the dataset in the late 1990s/early 2000s and, non-coincidentally, these are the welfare-state types that have been the least studied in the polarisation literature. The first are Nordic (Social-Democratic) welfare-states. These welfare-states tend to be characterised by high male and female employment rates, high dual-earning an important degree of gender inequality embodied in social and labour market policy, encompassing and generous unemployment benefits combined with tailored activation policies (Esping-Andersen 1990, Lewis et al. 2009). Paradoxically, it may still lead to polarisation: despite their good employment outcomes, these countries still have disadvantaged groups, particularly those who are on peripheral labour market positions and not managing to contribute to the social insurance-type benefits (Halleröd et al. 2015) and it is possible that the small number of disadvantaged, workless people, tend to cluster in similar households – remember that polarisation is not just about the size of workless households, but about how big they are compared to the overall non-employment rate in the country. Nordic countries may be better at dealing with this polarisation (ensuring workless households have enough to live with, and do not stay workless too long) but whether it prevents such initial employment polarisation is to be studied. A possibility is that, through activation, they get these disadvantaged couples into low-paid work, that could be non-standard: Sanchez-Mira and O'Reilly (2019) emphasise that non-standard employment is more important in certain Nordic countries than previously thought, such that a relevant cleavage could be in terms of employment quality rather than mere employment.

Finally, we have post-Communist countries. They have been added to the welfare-state typology literature progressively after the fall of Communism and as they joined the EU (Arts and Gelissen 2002), but an important caveat is that, they are a very big group, geographically and culturally diverse, with potential important heterogeneity in their welfare structure and how they have evolved after Communism. A common heritage, however, seems to be a legacy of high female employment rates and therefore high dual-earning, as well as a low prevalence of non-standard employment (Sanchez-Mira and O'Reilly 2019). With social inequalities appearing and rising with the advent of capitalism, especially as many post-Communist countries sought to develop very pro-market policies (Halleröd et al. 2015), an expectation is therefore to find advantaged couples accumulating employment, with workless couples appearing on the other hand, with significant dual-earning/dual-workless polarisation as a result, this cleavage remaining the relevant one in light of the low prevalence of non-standard work.

From the outset, it is crucial that the reader does not take these descriptions as aiming to predict exactly what the outcomes will be: they are a starting grid to interpret results, which, depending on whether they differ or not from this grid, will help to understand our phenomena of interest better. Past literature on polarisation does not study the vast majority of the countries covered in this paper: any prediction is therefore very tentative, and any empirical work very explorative. Past welfare-state literature emphasises important heterogeneity in policy structures in given welfare-state clusters, while past literature on couple employment patterns emphasise clearly that the fit between welfare-state types and couple employment outcomes is extremely partial at best: expectations and empirical research need to be flexible. The reader is invited to use these descriptions of welfare-state types and of when they join the dataset as a tool to understand how the

analysis of country-by country results is done in subsequent sections of this chapter, not as deterministic predictions.

9.3. Analytical strategy

9.3.1. Data and variables

The data are from the yearly-EU-LFS for the 27 EU countries (minus Croatia, including the UK). Data are available as early as 1983 for 11 "early" countries[1], other countries join the dataset throughout the late 1990s and early 2000s.

Only couples (regardless of marital status) in which both partners are between 25 and 55 years old are included, to keep a population of core working-age people and circumvent early retirement policies. In this sample, anyone studying full-time or retired can be reasonably assumed to have made an active choice of being non-employed, compared to being employed. People who do not work because of incapacity or illness are kept in the sample because of the potential for this status to be an alternative to unemployment.

Chapter 8 detailed the derivation of couple employment status according to the ILO-definition of employment, that will be used in this chapter. The only thing to add is that, for dual-workless couples, long-term-dual-workless couples are defined as those in which both partners have been jobless for 12 months or more, adapting the definition of long-term unemployment by the OECD to the object of study of this chapter.

The sectoral employment shifts are explored using the NACE variable which the EU-LFS aggregates into agriculture, industry and services until 2007, and for which aggregation

[1]Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the UK.

needs to be done by the researcher since, based on the one-digit variable[2]. Using this variable, I reconstitute the sector of employment of employed partnered people, and using a similar variable for jobless partnered people, I reconstitute the sector of employment they were formerly working in.

The level of education of partners is captured using an educational achievement variable collapsed to three levels: high (tertiary education), medium (upper-secondary education), and low (lower-secondary education).

I study whether any partner is unable to work due to illness/disability using a variable that captures precisely this dimension in the EU-LFS, as reported by the respondent.

I analyse the extent to which female-single-earning is a desired work arrangement using two variables. The first captures whether women in such couples wish to work less than they currently do: if the difference between the value of the variables indicating their usual weekly working hours and their desired weekly working hours is positive, they are coded as wanting to work less. The second is a dummy variable capturing whether the workless partner wants to work[3].

I have detailed the choices made and trade-offs implied in my operationalisation of non-standard-employment in Chapter 8. To recall, people who work part-time or under a temporary contract are classified as non-standard workers, with various robustness analyses to test the solidity of the results in light of different operational choices.

The chapter studies the extent to which non-standard employment is constrained by the job market, using a variable in the EU-LFS capturing whether part-time work has been

[2] Agriculture: code A. Industry: codes B to F. Services: codes G to U.
[3]This variable includes workless men who are seeking work, as well as workless men not seeking work but saying they would like to work if it was available

taken-up because full-time work was not available, and whether temporary work has been taken-up because permanent work was not available, as reported by the respondent.

In the econometric models (detailed shortly), I control for general economic conditions, using a variable for annual GDP-growth based on World Bank data.

In addition, a key contribution of this chapter is to propose an extension of polarisation indicators that initially only study ILO-employment, to go beyond ILO employment: as I introduce in Chapter 8 and derive in full in Appendix A.1, the same principles can be applied to study the "quality", or the "type" of employment.

In this chapter, I will use this extension to discuss two aspects of employment type and of how they are distributed. The first is the standard/non-standard distinction, and this chapter will study the extent to which the clustering of non-standard employment in couples has replaced the clustering of worklessness in couples.

The second will be with regards to sectoral employment. As discussed in the introduction and Chapter 5, the rise of service employment is crucial to understand the employment participation of (partnered) women and the evolutions of couple employment patterns. In this chapter, I apply the extension of the polarisation indicator to study employment type, to study sectoral employment, in particular the way service employment and industrial employment have been distributed across couples and over time, in the section exploring the evolutions of polarisation in recent years.

Descriptive statistics on all the variables described are available in Appendix A.2, as well as information on the sample size for each country and year on which these statistics are computed, and information on which country is present for each year.

9.3.2. Modelling the evolution over time of polarisation indicators

Appendix A.2 gives the values of the "raw" and normalised polarisation indicators for each country-year. In this specification, I use the normalised indicators as my dependent variables. To see how these polarisation indicators evolve over time, I use a simple fixed-effect polynomial regression model using panel data. I use each polarisation indicator separately as dependent variables. The first year of the panel is 1983 (t=1) and the last year is 2019 (t=37). I include a time variable t and its square to account for non-linearities, forming a quadratic equation. The models are also estimated again including a cubic term, to account for any very recent evolutions in the trend.

Fixed-effects model are equivalent to including a dummy variable for each country: the aim is to get a European trend net of country variations. A variable capturing GDP growth is included, to capture the general economic context. The models, with t denoting the time variable, C the country dummies:

$$P1_t = \alpha + \beta_1 t + \beta_2 t^2 + \beta_3 gdpgrowth + \gamma_2 C_2 + \cdots + \gamma_{27} C_{27} + e_t$$

Equation (9)

$$P2_t = \alpha + \beta_1 t + \beta_2 t^2 + \beta_3 t^3 + \beta_4 gdpgrowth + \gamma_2 C_2 + \cdots + \gamma_{27} C_{27} + e_t$$

Equation (10)

The regressions are based on an unbalanced panel of 687 observations, corresponding to the number of country-year observations.

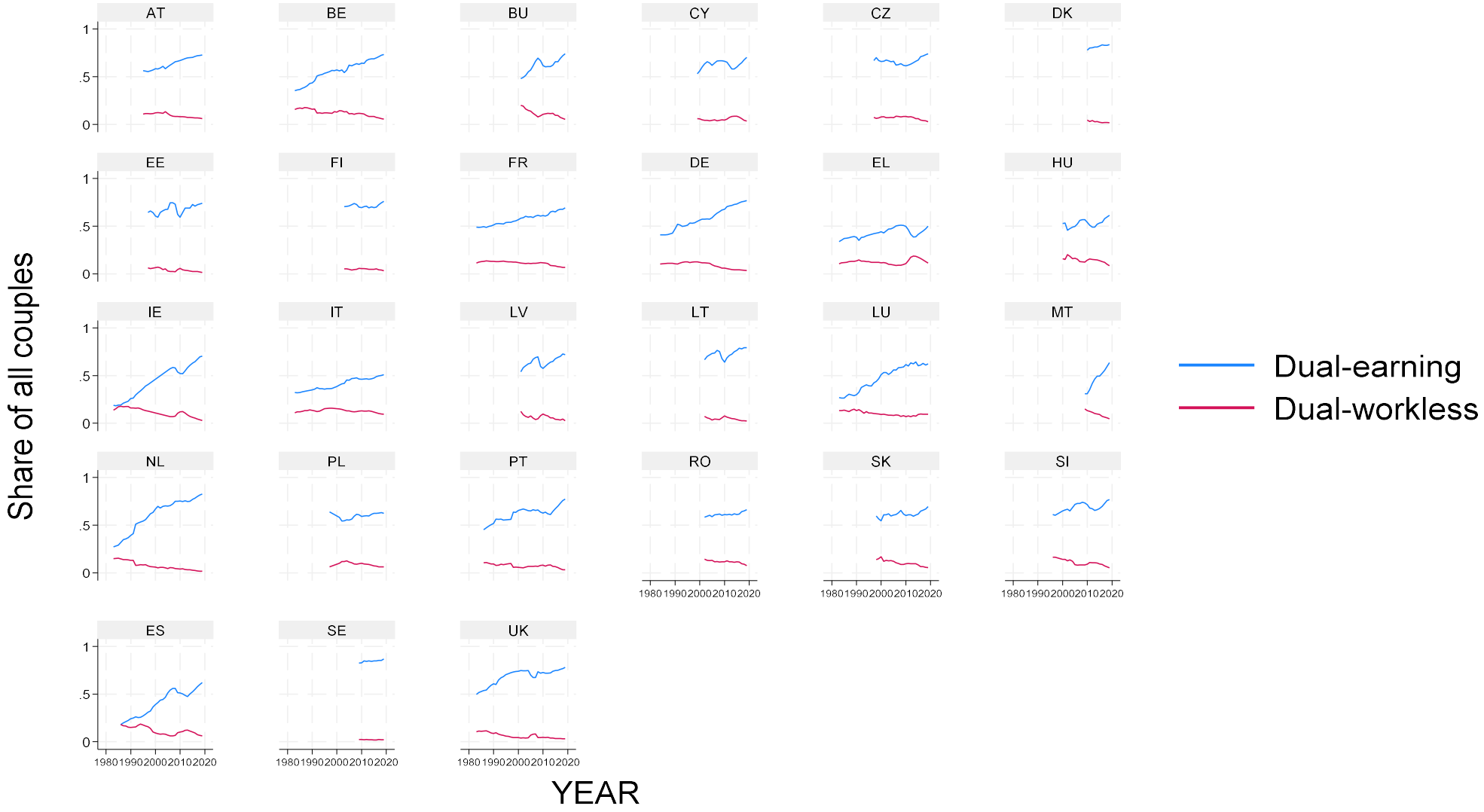
I run a number of robustness analyses. In addition to those described in chapter 8 (estimating the analyses again classifying self-employment as non-standard; using the alternative, hours-based variable for part-time work; running all analyses separately for part-time, temporary and self-employment), I increase the age limit to include partnered

people aged 25-64; I run the analyses using the non-normalised polarisation indicators; crucially, I estimate all analyses again studying the "early countries" only: given the unbalanced nature of the panel, this ensures the time trends exhibited are genuine, and not affected by the inclusion of new countries over time. The fact that all analyses are also estimated country by country can also be seen as a form of robustness test, studying each country's specific evolution over the period of time for which they have data available.

Finally, a limitation of fixed-effects modelling is that they only control for time-invariant factors. Of course, the last forty years have seen changes across countries, particularly in terms of social and labour market policy. Even so, it is important to note that the modelling strategy here follows primarily a descriptive purpose, showing how polarisation evolved over an unprecedented window of observation, rather than aiming to comprehensively and causally explain the variations in its evolutions. Further, the models take into account country contexts in two respects: first by controlling for general economic circumstances in a given country-year via the GDP growth variable, and neutralising the employment/unemployment fluctuations across countries and time via the use of normalised indicators, and second, by providing results separately, country by country, which allows to study the evolution of polarisation in each specific context – as we shall see, this exercise reveals a great deal of commonality across countries.

9.4. Empirical results: the evolution of polarisation over time

Figure 7: proportion of dual-earning and dual-workless couples, by country and over time in Europe



Note: the figure represents the share of couples that are dual-earning and dual-workless, according to the ILO definition of employment, by country and over time in Europe, for the population of partnered people aged 25-55.
Source: author's own calculations using the EU-LFS.

Figure 7 shows the evolution of dual-earning and dual-worklessness only, for parsimony purposes, over time across all countries, while Appendix A3 also incorporates the evolutions in male and female-single-earning. In all countries studied, dual-earning is the main form of couple employment participation, with the male-single-earning now only the second most important form, albeit with important variations in the relative strength of both models across countries. Dual-earning barely represents more than 50% of couples in Italy or Greece, countries where the male-single-earning model has remained comparatively high, but reaches 80% or more in places as varied as the UK, Sweden, Denmark, the Netherlands, Slovenia or Portugal, countries where male-single-earning has become marginal.

Every country witnessed a rise in dual-earning, with differences in starting point and intensity of the trend. The rise has been spectacular in Ireland, Luxembourg, Spain or the Netherlands, countries where the dual-earning rate was comparatively low in the 1980s and which oversaw a strong catching-up. Countries like the UK, France or Portugal, which had higher starting points, also witnessed a rise in dual-earning, but of a lesser magnitude, suggesting some degree of convergence across countries, with Belgium and Germany constituting intermediate cases. On the other hand, Italy and Greece had a relatively low starting point and a weak increase. Data for Nordic countries is available later but shows, as expected, high and stable rates of dual-earning. For Post-Communist countries, the picture is more nuanced: while many do exhibit comparatively high rates of dual-earning, as the legacy of high female employment during the Communist era could lead to expect, there are important variations across them, with places like Poland and Hungary exhibiting stagnating and moderate rates of dual-earning.

Regarding dual-worklessness, the situation in Europe tends to be a decline over time, especially in the last decade to varying extents across countries. All countries still exhibit a positive dual-workless rate, suggesting it is a universal phenomenon in Europe. The general over time picture is quite similar across countries. Italy, Greece, and to some extent, France, stand-out in having dual-workless rates that are actually quite stable over the past four decades. On the other hand, Ireland, Spain, Malta or the Netherlands show a sharper dual-worklessness decrease than many other countries. There is a noticeable rebound in dual-worklessness around the 2008 crisis in a few countries (Ireland, Greece, Spain, the UK, Slovenia, the Baltic countries), but not everywhere, and it tends to be very temporary.

As shown in Appendix A3, in Europe in general and across countries, female-single-earning has been rising over time, especially in the past two decades. Combined with the long-run decline in dual-worklessness, which becomes particularly visible in the data in recent years, this already serves as descriptive evidence suggesting that while a dual-earning versus dual-workless polarisation may have been the state of play in the 1980s and 1990s, the situation today may be more nuanced.

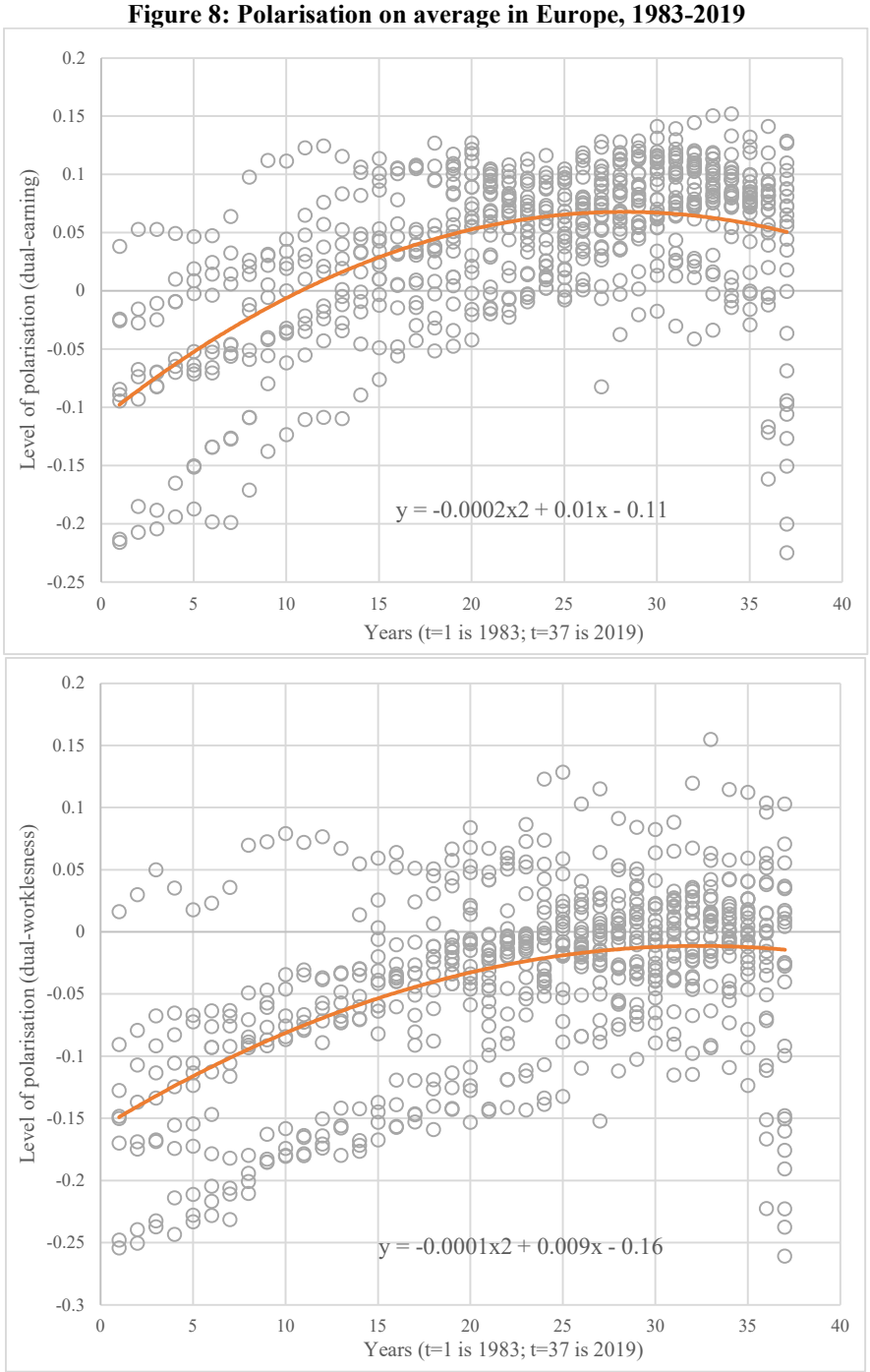
These descriptive rates are a useful introductory picture, but polarisation is better studied in terms of how much dual-earning and dual-worklessness represent in a country compared to how much employment and worklessness there is in that country overall. This is why I now turn to the evolution of the polarisation indicators: they help us understand whether the rise in dual-earning and decline in dual-worklessness were proportional to the rise in employment and decline in non-employment over the period.

Table 2: Regression results for the modelling of the evolution over time of the polarisation indicators for dual-earning and dual joblessness

Variable	*Model 1. Dependent variable: polarization indicator for dual-earning*	*Model 2. Dependent variable: polarization indicator for dual-earning*	*Model 3. Dependent variable: polarization indicator for dual-worklessness*	*Model 4. Dependent variable: polarization indicator for dual-worklessness*
Time t	0.01***	0.01***	0.009***	0.009***
	(0.0005)	*(0.001)*	*(0.0005)*	*(0.001)*
Square of time variable	-0.0002***	-0.0002***	-0.0001***	-0.0002**
	(0.00001)	*(0.00008)*	*(0.00001)*	*(0.00008)*
Cube of time variable		0.000001		0.0000005
		(0.000001)		*(0.000001)*
GDP growth	-0.00004	-0.0001	-0.0004	-0.0004
	(0.0004)	*(0.0004)*	*(0.0004)*	*(0.0004)*
Constant	-0.11***	-0.12***	-0.16***	-0.16***
	(0.006)	*(0.007)*	*(0.005)*	*(0.007)*
Country fixed-effects	YES	YES	YES	YES
N	687	687	687	687
r2 (within)	0.64	0.64	0.6	0.6
r2 (between)	0.22	0.23	0.26	0.26
r2(overall)	0.45	0.45	0.35	0.35

Note: coefficients obtained from country fixed-effects regressions, run over 687 country-years. The polarisation indicators have been derived in the way described in the previous section and they represent the difference between the actual rate of a given couple type and its counterfactual rate. 3 stars indicate significance at the 1% level, 2 stars indicate significance at the 5% level, a single star indicates significance at the 10% level. The data are weighted EU-LFS, used to construct the variables needed for the analysis, for couples in which partners are aged 25-55. The GDP-growth variable comes from the World Bank.

Figure 8: Polarisation on average in Europe, 1983-2019



Note: these graphs illustrate the regression results obtained in table 2, for models 1 and 3. The top graph is about the dual-earning polarisation indicator, the bottom graph about the dual-worklessness polarisation indicator. The data points represent country-year polarisation indicators and the trend is the regression fitted line. Positive polarisation indicates that employment/non-employment cluster in couples. Negative polarisation indicates that they are evenly distributed across couples.
Source: Author's own calculations using the EU-LFS.

If polarisation rises, it means that the rise in dual-earning cannot be solely explained by the increasing employment rates, but that instead, the couple became a medium to capture a scarce resource, employment. I plot in Figure 7 the evolution of the polarisation indicators over time as modelled by the fixed-effect regressions available in Table 2. For illustrative purposes, I also plot the evolutions over time of the actual and counterfactual rates of dual-earning and dual-worklessness in Europe (Appendix A.4). With regards to dual-earning, the graph in Appendix A.4 shows that actual-dual-earning rates, although they start at a lower level than counterfactual-dual-earning, rose more sharply than the counterfactual, and overtook it: dual-earning rates increased more than what the mere rise in employment rates would have led to predict if it had been randomly distributed. The polarisation indicator for dual-earning, starting in the negatives, increases as a result, and becomes positive, which remains the case today: employment clusters in couples.

But the process has not been linear, as the regression models confirm. The coefficient on the linear time term is positive and highly statistically significant, but the quadratic term is negative and also highly significant, confirming the tendency of the dual-earning polarisation indicator to increase at a decreasing rate.

Adding a cubic term does not change the results, while in both specifications, the impact of GDP growth is far from statistical significance. Looking at dual-worklessness tells a similar story. Europe witnessed a shift from negative values on the dual-worklessness polarisation indicator, to values that are very near zero on average, and positive in a number of countries. While non-employment was falling, it increasingly tended to cluster in couples. As a result of falling non-employment, dual-worklessness did decrease, but not as much as the fall in non-employment at individual level suggests.

But again, non-linearities emerge. The regression results clearly show that the polarisation indicator for dual-worklessness also increases at a decreasing rate (and again, the cubic term and GDP variable are not significant).

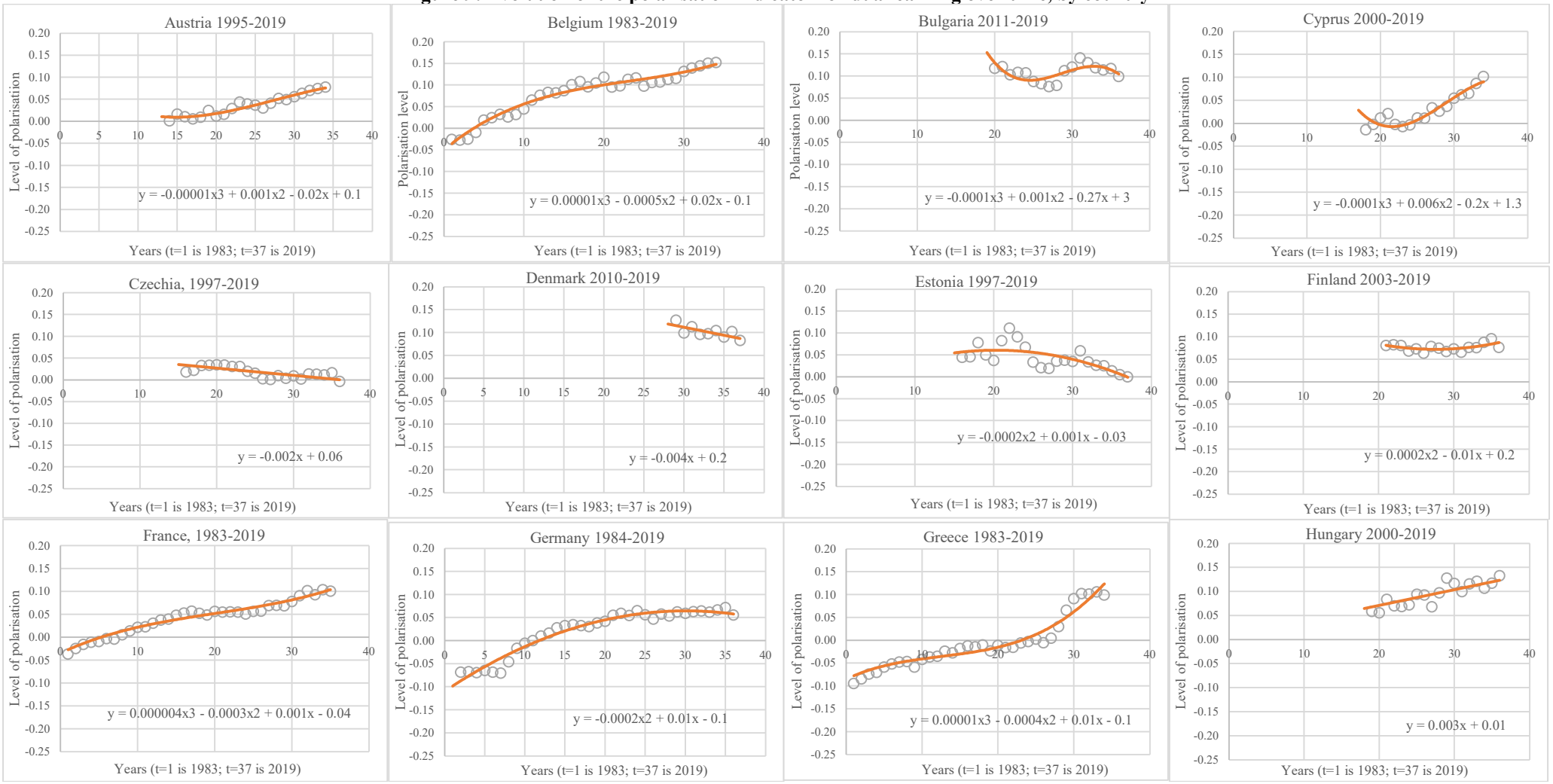
These patterns suggest non-random employment gains and losses. As female employment increased and male employment stagnated over that period, the results imply that rising female employment initially disproportionately took place with a male partner already in employment, while any men losing their jobs would have been more likely to do so as the single-earner in the couple. But these phenomena were particularly strong in the 1980s and 1990s, and show a clear slow-down since.

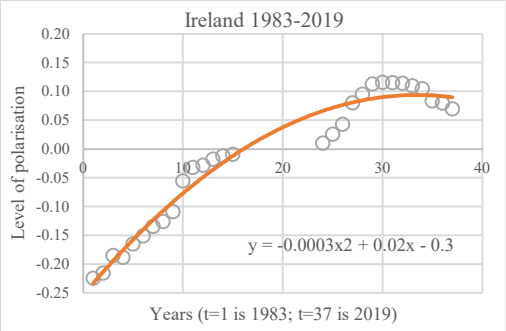
I then estimate the regression models for both indicators for each country individually, with results shown in Figures 8 and 9. Let us start with countries for which data are available since the 1980s (the "early countries"). On both indicators, they all exhibit a clearly rising polarisation trend.

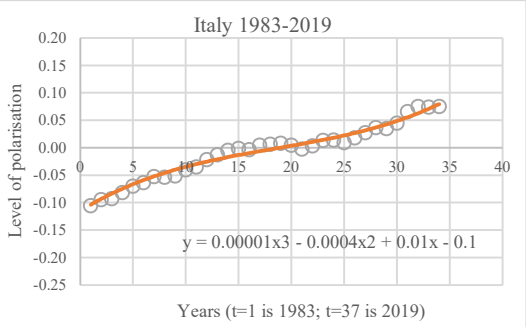
On the dual-earning indicator, they all exhibit a positive value as of 2019: employment clusters in couples. The polarisation indicator for dual-worklessness is, on the other hand, not always positive despite the rising tendency everywhere, especially for countries that started the 1980s with a strong male breadwinner model.

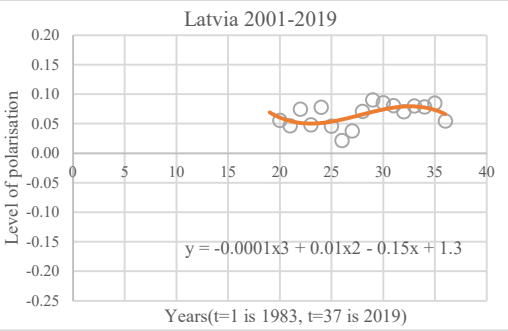
The differences between these early countries does not lie, therefore, in the direction of the trend, but in its intensity. While most early countries exhibit a rising trend that is clearly decreasing in intensity, the rise in polarisation is more linear in Portugal, Spain, Greece, or Luxembourg when it comes to both polarisation indicators, especially the one related to dual-earning.

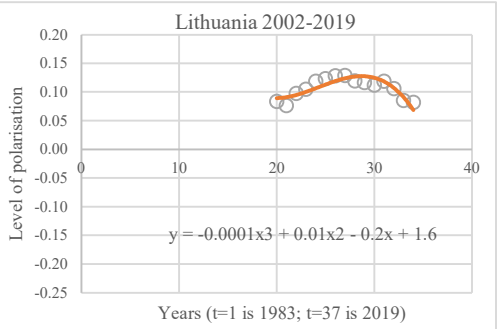
Figure 9: Evolution of the polarisation indicator for dual-earning over time, by country

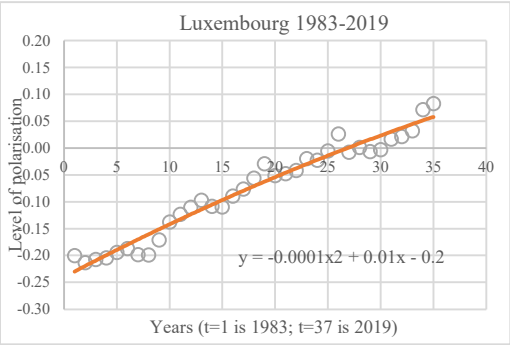


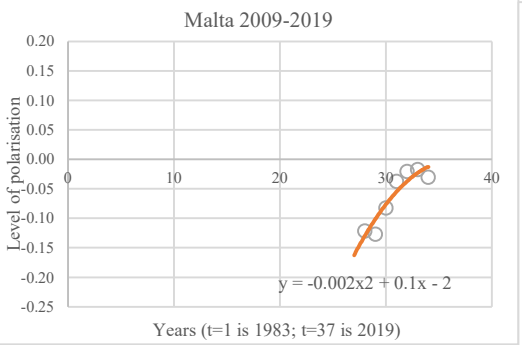

Ireland 1983-2019
Level of polarisation
y = -0.0003x2 + 0.02x - 0.3
Years (t=1 is 1983; t=37 is 2019)

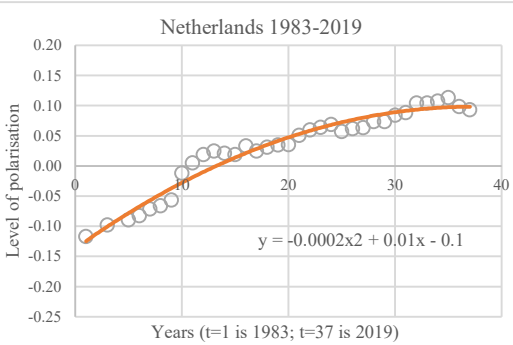

Italy 1983-2019
Level of polarisation
y = 0.00001x3 - 0.0004x2 + 0.01x - 0.1
Years (t=1 is 1983; t=37 is 2019)

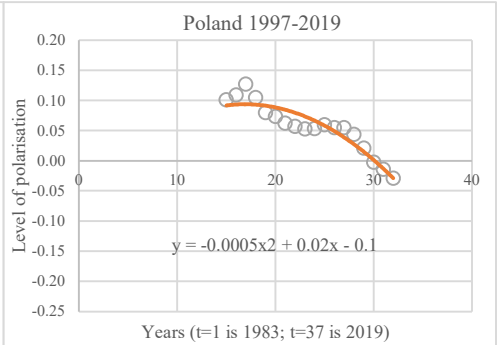

Latvia 2001-2019
Level of polarisation
y = -0.0001x3 + 0.01x2 - 0.15x + 1.3
Years(t=1 is 1983, t=37 is 2019)

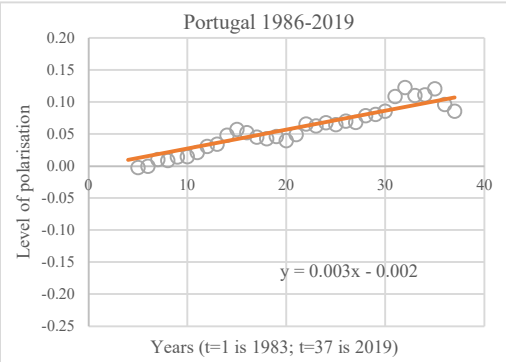

Lithuania 2002-2019
Level of polarisation
y = -0.0001x3 + 0.01x2 - 0.2x + 1.6
Years (t=1 is 1983; t=37 is 2019)

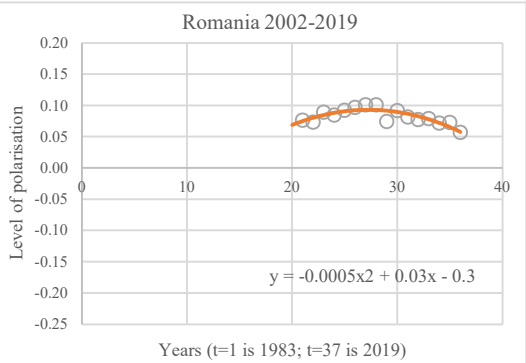

Luxembourg 1983-2019
Level of polarisation
y = -0.0001x2 + 0.01x - 0.2
Years (t=1 is 1983; t=37 is 2019)

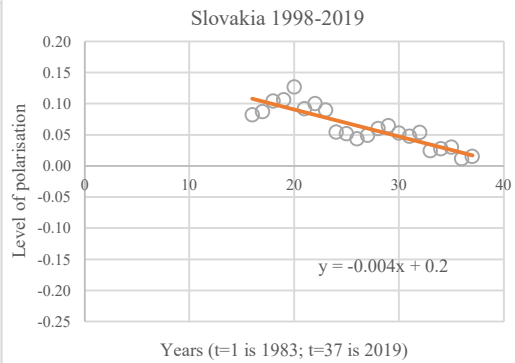

Malta 2009-2019
Level of polarisation
y = -0.002x2 + 0.1x - 2
Years (t=1 is 1983; t=37 is 2019)

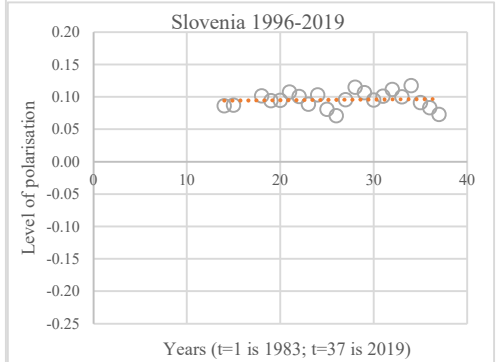

Netherlands 1983-2019
Level of polarisation
y = -0.0002x2 + 0.01x - 0.1
Years (t=1 is 1983; t=37 is 2019)

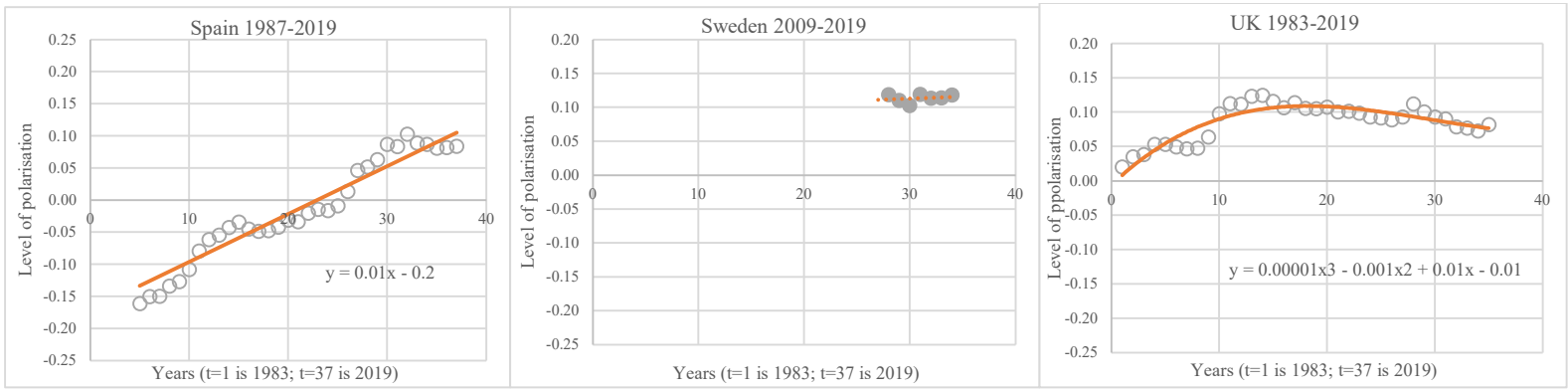

Poland 1997-2019
Level of polarisation
y = -0.0005x2 + 0.02x - 0.1
Years (t=1 is 1983; t=37 is 2019)


Portugal 1986-2019
Level of polarisation
y = 0.003x - 0.002
Years (t=1 is 1983; t=37 is 2019)


Romania 2002-2019
Level of polarisation
y = -0.0005x2 + 0.03x - 0.3
Years (t=1 is 1983; t=37 is 2019)

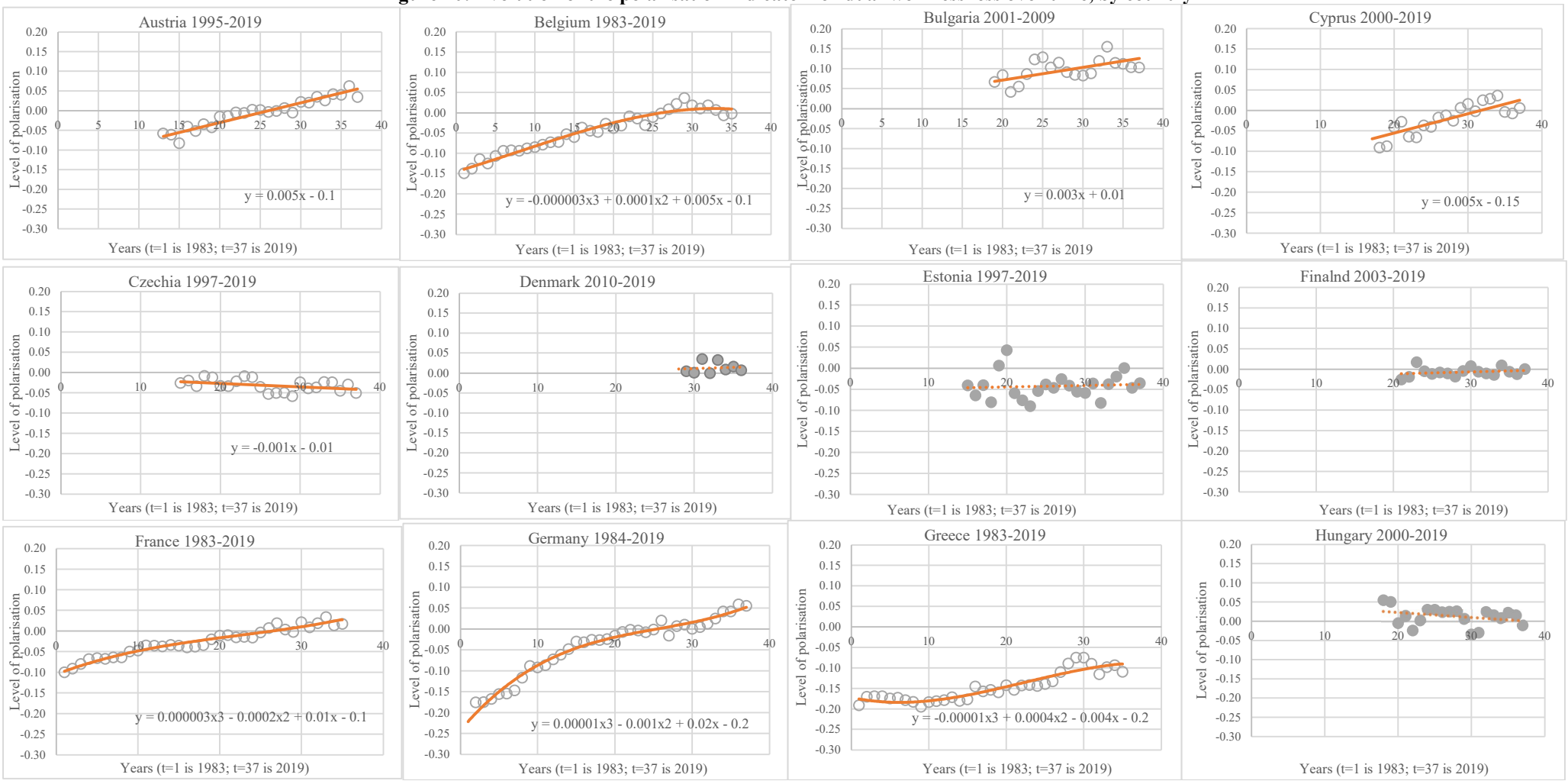

Slovakia 1998-2019
Level of polarisation
y = -0.004x + 0.2
Years (t=1 is 1983; t=37 is 2019)

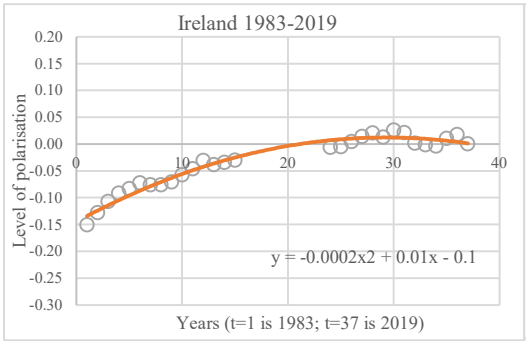

Slovenia 1996-2019
Level of polarisation
Years (t=1 is 1983; t=37 is 2019)

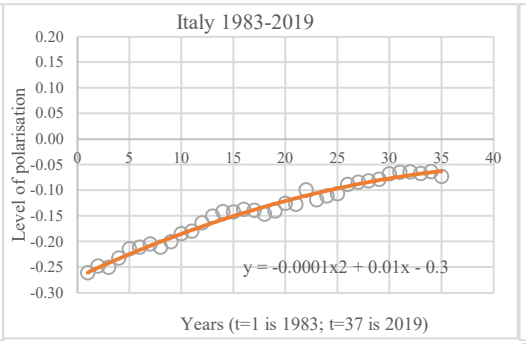


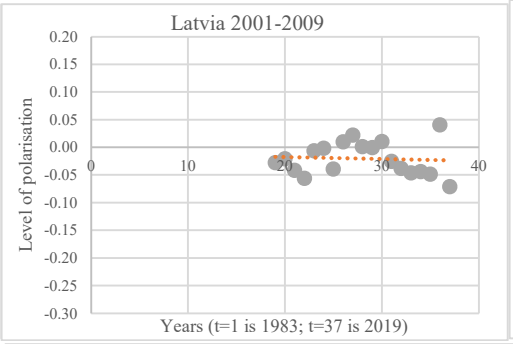
Note: the graphs represent the results of the regression models, carried separately for each country, modelling the evolution over time of the dual-earning polarisation indicator. The grey dots represent yearly data points, and the orange line represents the trend as modelled by the regression equation. When the orange line is solid, the dots are hollowed-out, and a regression equation is present on the graph, this indicates statistically significant results with regards to the time trend components. When the orange line is dotted, the dots are full, and there is no regression equation present on the graph, this indicates that no statistically significant trend over time emerges from the regressions. All the regression equations shown have controlled for the role of GDP growth in the evolution of polarisation. Results in table format are available on request from the author.
Source: author's own calculations using the EU-LFS.

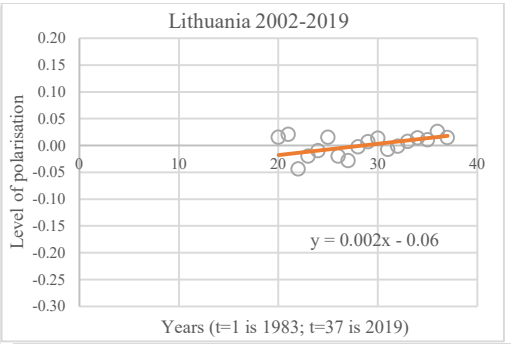
Figure 10: Evolution of the polarisation indicator for dual-worklessness over time, by country

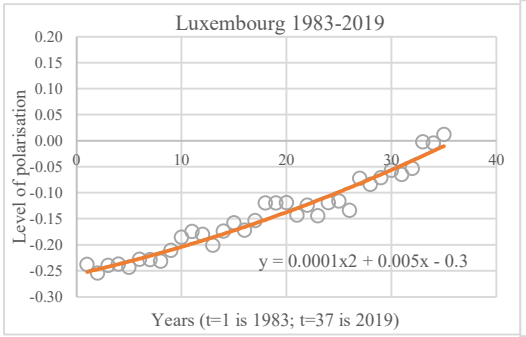


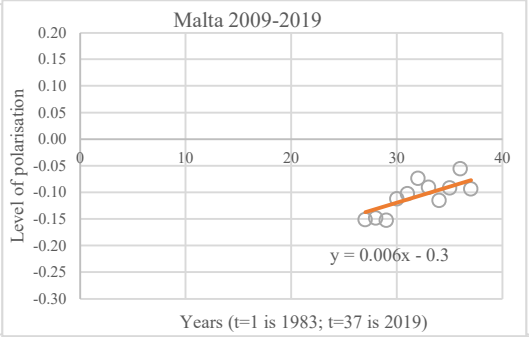

Ireland 1983-2019
Level of polarisation
y = -0.0002x2 + 0.01x - 0.1
Years (t=1 is 1983; t=37 is 2019)

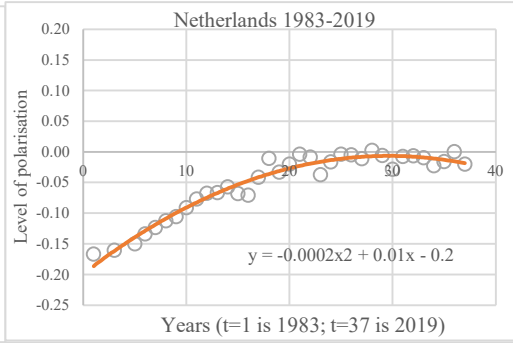

Italy 1983-2019
Level of polarisation
y = -0.0001x2 + 0.01x - 0.3
Years (t=1 is 1983; t=37 is 2019)

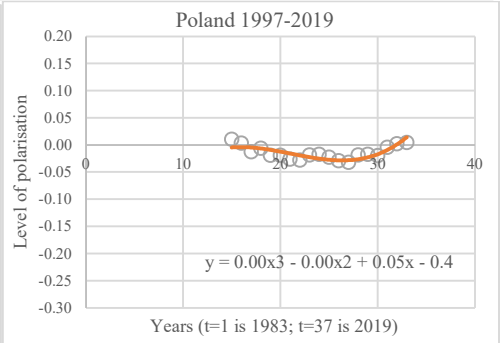

Latvia 2001-2009
Level of polarisation
Years (t=1 is 1983; t=37 is 2019)

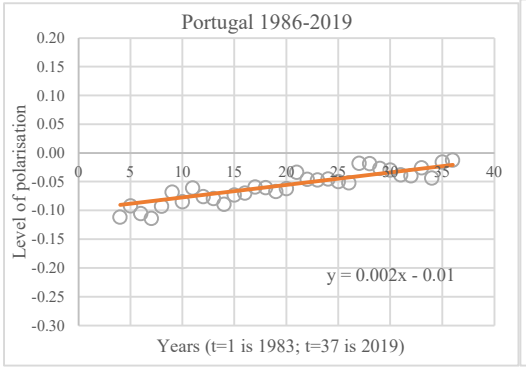

Lithuania 2002-2019
Level of polarisation
y = 0.002x - 0.06
Years (t=1 is 1983; t=37 is 2019)

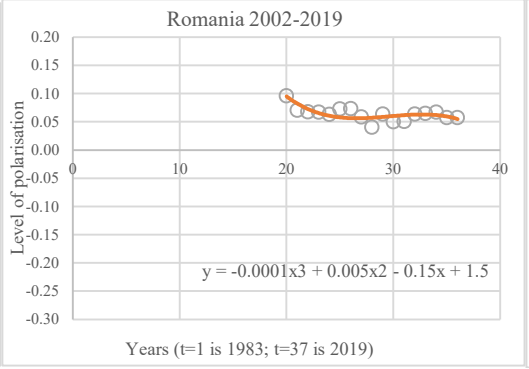

Luxembourg 1983-2019
Level of polarisation
y = 0.0001x2 + 0.005x - 0.3
Years (t=1 is 1983; t=37 is 2019)

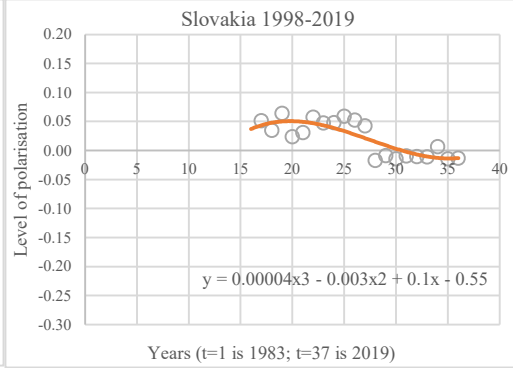

Malta 2009-2019
Level of polarisation
y = 0.006x - 0.3
Years (t=1 is 1983; t=37 is 2019)

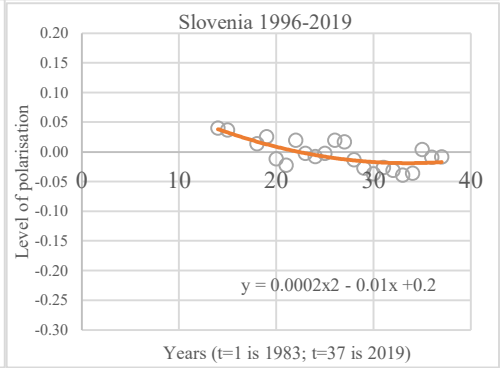

Netherlands 1983-2019
Level of polarisation
y = -0.0002x2 + 0.01x - 0.2
Years (t=1 is 1983; t=37 is 2019)

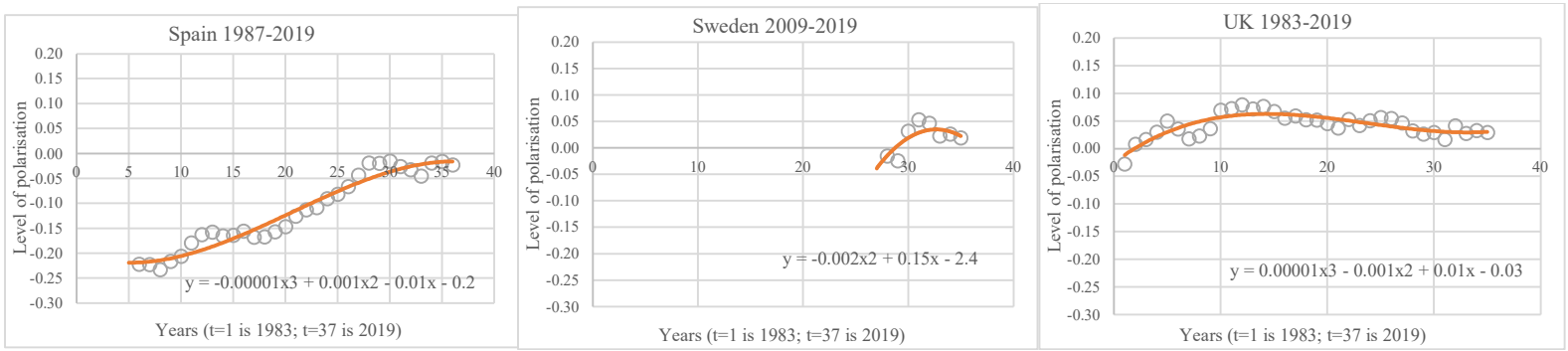

Poland 1997-2019
Level of polarisation
y = 0.00x3 - 0.00x2 + 0.05x - 0.4
Years (t=1 is 1983; t=37 is 2019)


Portugal 1986-2019
Level of polarisation
y = 0.002x - 0.01
Years (t=1 is 1983; t=37 is 2019)


Romania 2002-2019
Level of polarisation
y = -0.0001x3 + 0.005x2 - 0.15x + 1.5
Years (t=1 is 1983; t=37 is 2019)


Slovakia 1998-2019
Level of polarisation
y = 0.00004x3 - 0.003x2 + 0.1x - 0.55
Years (t=1 is 1983; t=37 is 2019)


Slovenia 1996-2019
Level of polarisation
y = 0.0002x2 - 0.01x +0.2
Years (t=1 is 1983; t=37 is 2019)



Note: the graphs represent the results of the regression models, carried separately for each country, modelling the evolution over time of the dual-workless polarisation indicator. The grey dots represent yearly data points, and the orange line represents the trend as modelled by the regression equation. When the orange line is solid, the dots are hollowed-out, and a regression equation is present on the graph, this indicates statistically significant results with regards to the time trend components. When the orange line is dotted, the dots are full, and there is no regression equation present on the graph, this indicates that no statistically significant trend over time emerges from the regressions. All the regression equations shown have controlled for the role of GDP growth in the evolution of polarisation. Results in table format are available on request from the author.
Source: author's own calculation using the EU-LFS.

An explanation could be that a catching-up phenomenon is happening. A country like the UK, with comparatively higher dual-earning rates in the 1980s, experienced the rise in polarisation, but also its slow-down and decline, before others. Conversely, countries for which polarisation is still rising could be countries which started at levels of dual-earning that were so low, that they are still in the phase of expanding polarisation.

This applies particularly well to Spain, Greece and Luxembourg, but less so to Portugal, which had comparatively higher rates of dual-earning already in the 1980s but shows little signs of polarisation slowing-down. Similarly, countries like Ireland or the Netherlands also had a very dominant male-single-earning model in the early 1980s, but the recent trajectory of their otherwise increasing polarisation curve is a clear slow-down or even reversal.

Some countries experience a slow-down in the polarisation increase overall, but a potential rebound in recent years. This is especially evident for the dual-earning indicator in Italy and Greece, and to a lesser extent, in France and Belgium. This positive cubic term is also present for the dual-workless indicator in France, Germany, or the UK. This issue is explored in more depth in the next section, about the 2008 crisis.

For countries which join the dataset from the late-1990s onwards, the picture is broadly consistent with the slow-down of polarisation that characterises Europe on average since the early 2000s.

Czechia, Estonia, and Poland exhibit negative values on the dual-earning polarisation indicator in 2019, on the back of clearly decreasing trends, which have taken indicators from positive to negative. This decreasing trend also characterises Denmark, Slovakia, and to some extent, Romania. Other countries exhibit broad stability, clearly in the case

of Sweden and Slovenia, where the regressions fail to detect any significant over-time trends, but also in the case of Finland, Latvia, Lithuania, and to some extent, Bulgaria. The remaining countries (Malta, Cyprus, Hungary, Austria) tend to exhibit a pattern of rising polarisation, that nonetheless slows-down in the most recent years.

On the dual-workless polarisation indicator, Slovakia, Slovenia, and to some extent Romania, exhibit trends that started in positive values but are decreasing, and for Slovenia, have reached the negatives.

Many countries exhibit trends that are stable over time (Czechia, Denmark, Estonia, Finland, Hungary, Latvia, to some extent Lithuania where there is a weakly rising trend), with certain countries exhibiting positive levels throughout and others showing negative levels throughout. Bulgaria, Austria, Cyprus, Malta, Poland and Sweden exhibit rising trends, with nuances across them in the intensity of this trend, the rise being most linear in Bulgaria, Austria and Malta.

In summary, there are nuances across counties below a surface of commonalities. Across Europe, polarisation tends to rise at a decreasing rate, and stability or even decline characterises the last two decades. But, the intensity with which the otherwise rising trend slows-down for "early countries" tends to vary. For countries with more recent data, whether it is an outright decrease, a stability, or an increase at a decreasing rate, differentiates countries. Employment clusters in couples almost everywhere.

This chapter is a rare one in documenting the topic for post-communist economies. While the early countries studied in this chapter usually started in a context dominated by male-single-earning, and witnessed a strong rise of female employment, the trajectory is likely

very different for post-Communist economies, with a legacy of high female employment from the Communist era.

The data are available for these countries around a decade after the transition to market capitalism. While they show, generally, high-dual-earning rates, they also show very important variations in polarisation patterns across them, some of these high-dual-earning rates being in line with the high "stock of employment" in these countries, and other being disproportionate. This emphasises the need to not treat these countries as a unitary category, as the transition to market capitalism has clearly had heterogenous effects across them. In some cases, it fuelled a job growth that evenly benefited couples, with high dual-earning and limited dual-worklessness, but in others, polarisation is strong.

More generally, results across countries emphasise that the distinction between the five big welfare-state types as identified in this chapter have limited explanatory power when it comes to trends and levels of polarisation. There is a common movement across Europe towards dual-earning, and this rise in dual-earning being more important than what the mere rise in employment rates would suggest, while at the same time, dual-worklessness does not decrease as much as the fall in non-employment could lead to predict. While, to some extent, we see the countries with a comparatively low dual-earning starting point exhibiting sharper rises in polarisation, these countries include the Netherlands, Luxembourg, Spain, and Ireland, i.e., representatives of three different types of welfare-states.

Even welfare-state types with social models that may favour male-single-earning arrangements, like the Conservative, or Mediterranean, show a distribution of employment that moves inequality, increasingly, away from within the couple (i.e., away

from male-single-earning-induced gender inequality within the couple), to being located across couples. This could be because of the increasing segmentation that characterises these countries' labour markets. It is also worth noting that countries traditionally seen as fostering social equality, the Nordic welfare-states, exhibit important levels of positive polarisation, particularly on the dual-earning indicator. Finally, countries may exhibit high levels of dual-earning polarisation indicator, but comparatively weaker levels of dual-worklessness polarisation indicator. This could be because the dual-earning/dual-workless cleavage no longer accurately describes these places, and instead, cleavages developing around the use of non-standard employment have taken over. This possibility is introduced in this chapter, and explored fully in the next.

An essential takeaway from this chapter is that, overall, polarisation is not ever rising – in fact, in most places, it slows-down or even decreases in the past two decades. This finding is new, and to explain it, potential mechanisms behind the rise, and slow-down, of polarisation, need to be put forward. This descriptive approach of this chapter is justified by the novelty of the results and the need to establish hypotheses to be explored in future research causally.

We saw that beneath the commonality, lie degrees of nuances. The mechanisms explored in the next section are explored with the commonality dimension of the results across Europe in mind, because this commonality, given the breadth of time and space coverage in this paper, is striking. Lack of space means that a choice had to be made between parsimony in focusing on average European evolutions, and detailed trends by countries, and I chose to focus on the former, and will certainly fail to explain every degree of nuance across countries.

However, the mechanisms discussed can also be seen as potential variables that, if differing across countries, may explain divergent evolutions in the polarisation trends. Where the chapter finds noteworthy differences across countries, these are discussed in the core text and presented in full in the Appendices. Any other result is available on request from the author.

9.5. What may explain the evolutions of polarisation?

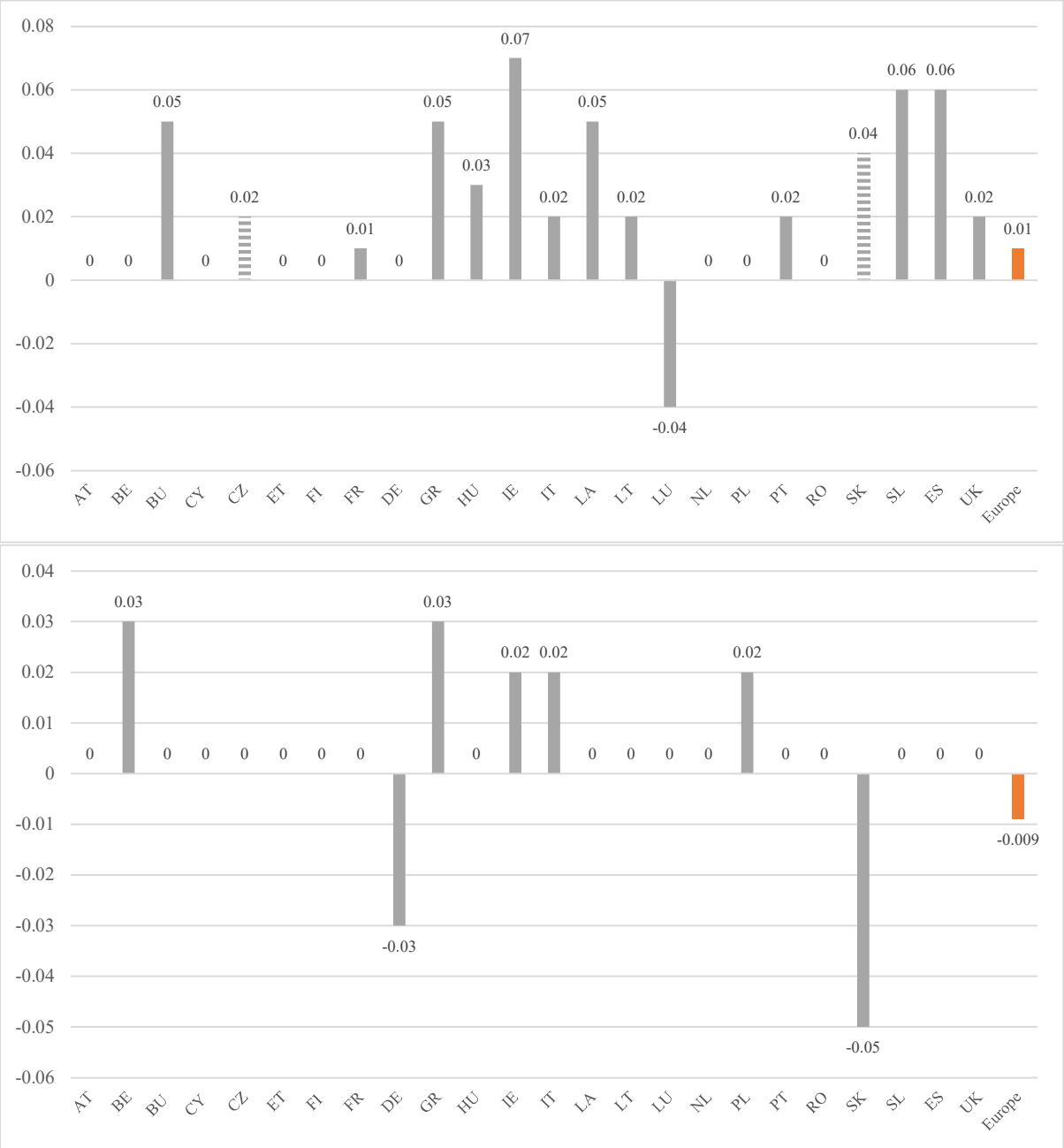
9.5.1. The 2008 crisis and sectoral shifts of European economies

The 2008 crisis

I estimated all the models again including, in addition to the variables already mentioned, a dummy variable for whether the year was after 2008 or not (2009 being the first year of proper recession across the OECD). The graphs in figure 10 show the effect of the years being from 2009 onwards on polarisation levels, holding the linear, quadratic and cubic time variables and the GDP growth variable constant. It therefore shows whether, independent of the short-term economic fluctuations and of secular trends, the years since the crisis have seen a "jump" in polarisation levels, on a deeper level than the immediate effect of job losses.

The answer is yes, but more so when it comes to employment than non-employment. On average, across Europe, the years since 2008 are associated to an increase in the value of the polarisation indicator for dual-earning.

Figure 11: Association between the year being after 2008 and the level of polarisation



Note: these graphs represent, for each polarisation indicators as dependent variable, the regression model coefficients of a dummy variable capturing whether the years are after 2008 or not, holding constant time trends and GDP growth. The top graph does so for the polarisation indicator for dual-earning. The bottom graph does for the polarisation indicator for dual-worklessness. Any coefficient not statistically significant at the 10% level at least is imputed as 0. Coefficients with broken patterns are very borderline, with p-values of 0.105 and 0.103). Source: author's own calculations using the EU-LFS.

In 15 out of 27 countries, there is a statistically significant increase in the indicator, and only in 1 do we find a statistically significant decrease. By contrast, the years since the crisis are not associated to a discernible effect in 20 countries out of the 27 studied for the dual-worklessness polarisation indicator. On average, these years are associated to a decrease in polarisation across Europe, but in a few countries the effect is actually positive.

How can square this lack of effect regarding dual-worklessness, with the positive effect found when studying dual-earning, and make sense of it when past research has found positive effects of the crisis on polarisation indicators for dual-worklessness?

These results can only be understood bearing in mind the gendered and sectoral dimensions of the crisis, which we explore shortly.

Before, let us emphasise that the difference with Biegert and Ebbinghaus (2020), who find a rise in the clustering of worklessness in households following the crisis, is that they study all households (it only takes one job loss to form a workless household in a single-person household). Their research also focuses more on the short to medium-run impact of the crisis, while this chapter focuses on a longer-run effect, netting out short-term economic fluctuations. Job losses in the short-term may have led to more polarisation immediately, but to a reorganisation of couple employment participation in the longer run.

Sectoral shifts

The sectoral shifts in the economy have affected the employment participation of couples, and are deeply related to the 2008 crisis. The story of the past three decades[4] is the rise of service employment, particularly sharply and continuously for partnered women. On the other hand, industrial employment for partnered men has declined (Appendix A.5). We observe these trends everywhere, although with variations in the decline of male industrial jobs, many post-Communist economies proving more resilient in that regard.

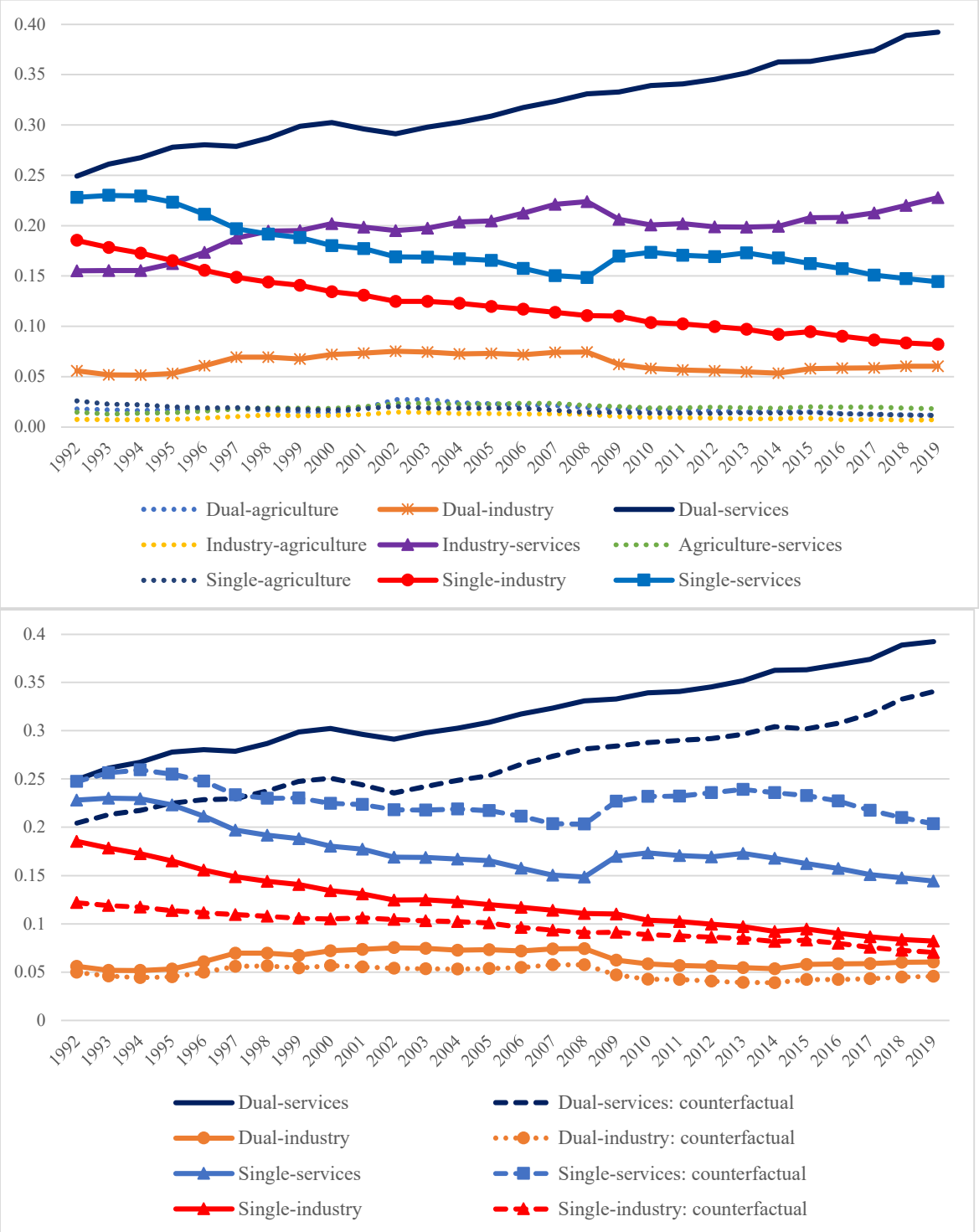
Accordingly, the last three years saw the rise of couples with both partners working in the service sector. Across almost all countries, the "dual-service-earning" couple is dominant. Even in countries with resilient male-industrial jobs, we see a rise of the "industry-services-dual-earning" couples, rather than a resilience of the old "male-single-industry-earning" couple.

Comparing the dual-service-earning rate to its counterfactual, built under the assumption that service employment is randomly distributed across couples, we see that, throughout, there have been more dual-service-earning couples in practice than in the counterfactual. It is not just employment that concentrates in couples, it is service employment in particular, which is a key contributor to polarisation. This is true in all the countries in the sample. We also see a strong decline in two forms of single-earning that were extremely prevalent at the start of the period: single-industry-earning and single-service-earning.

The decline in the former is particularly relevant because of its gendered dimension.

[4]Reliable data on sectoral employment are only available since 1992 in the EU-LFS.

Figure 12: Couple employment participation by sector of the economy



Note: the top graph shows the different combinations of couple employment participation by sector of the economy on average across Europe, using the NACE classification to reconstitute three sectors: agriculture, industry and services. The bottom graph shows the different combinations of couple employment participation by sector of the economy on average across Europe, and what these rates should be if employment in each sector was randomly allocated across couples (counterfactual). For parsimony, this bottom graph focuses only on four cases that are particularly emblematic of the transition of European economies away from industry and towards services.
Source: author's own calculations using EU-LFS data.

Industry is a sector in which we find partnered men, in vast majority. Male-single-earning fell with male-industry-single-earning. The counterfactual analysis reveals that, while there was a huge surplus of single-industry-earning couples compared to the stock of industrial jobs in European societies in the early 1990s, this surplus has nearly reduced to zero. The even distribution of employment four decades ago (across couples and at the expense of women) was the even distribution of industrial jobs. So, polarisation increased with service employment, while industrial employment, traditionally evenly distributed across couples, fell.

This also helps understand the slow-down in the rise of polarisation. The narrowing of the gap between single-industrial-earning and its counterfactual is particularly strong in the 1990s, a period of intense deindustrialisation, but has stabilised since. On the other hand, the surplus of dual-service-couples presumably dates back to the 1980s at least, because it has remained rather stable over the period

We can also better interpret the results related to the crisis. 2008 marks a concomitant decline in the rate of couples organised around one partner in industry and the other in services, and a rise in single-service-earning couples. Countries such as Spain, Greece, Ireland or the Baltic countries, exhibit this pattern very strongly, while the vast majority of countries show a resilience of dual-service-earning. Similarly, there is a fall in the rates of couples with both partners in industry, but a resilience of single-industry-earning couples.

This suggests that women were both less hit in terms of overall employment, as they worked predominantly in the comparatively sheltered service sector, and in terms of employment losses within the industrial sector. They provided a buffer to the employment

shock, especially to partnered men losing their industrial jobs. This buffer prevented a strong rise in workless couples and of polarisation for the dual-workless indicator. These results are coherent with insights from Harkness and Evans (2011), emphasising the resilience of partnered female employment in the UK in the 2008 crisis.

On the other hand, the proportion of couples with both partners in the service sector was barely affected by the crisis – and remained way above its counterfactual. This drove the reinforcement of the polarisation indicator for dual-earning associated to the 2008 crisis, as these dual-service-earning couples were disproportionately spared from job losses.

Finally, the long-term sectoral shifts may have affected the nature of dual-worklessness. Over time, in Europe, long-term dual-workless couples (couples that have been workless for more than 12 months) have been representing between roughly a third and a half of dual-workless couples (Appendix A5). The fall of dual-worklessness over time corresponds to a fall in long-term dual-worklessness, both as a share of all couples and as a proportion of dual-workless couples specifically.

Analysis of the former sector of employment of partners in workless couples suggests that at the same time as (long-term)-dual-worklessness decreases, the prevalence of former industrial workers and long-term-workless former industrial workers amongst workless couple also falls (Appendix A5).

This could suggest a changing nature of dual-worklessness. While displaced industrial workers struggled to find re-employment due, for instance, to regional specialisations, specific skillsets, or being deemed too old, the tertiarization of economies may have opened-up new routes out of dual-worklessness (albeit potentially precarious ones, as we shall see). These analyses are shown in Appendix A. 5 rather than here, in recognition of

the potential precariousness of the data, as the former sector of workless people is often subject to missing values, and in certain countries, sample sizes get rather small.

9.5.2. The changing socioeconomic profiles of couples

Rising female-single-earning

Descriptive results by countries suggested that female-single-earning has been rising over the past four decades and especially the last two, constituting a potential new middle-ground between dual-earning and dual-joblessness. I modelled the evolution of the rise in female-single-earning, and in female employment more generally, in the same way as I modelled the evolution in polarisation indicators (Appendix A.6). The results show interesting contrasts. Both rise over time. But female employment rises at a slightly decreasing rate, and is positively associated to GDP growth (and negatively to the 2008 crisis when the dummy variable is introduced).

By contrast, female-single-earning not only rises with time, but at a rate that accelerates with time. So, although female employment has been rising since the early 1980s, only recently did it start translating into substantial rates of female-single-earning in Europe.

Of course, part of the answer to why that is the case may lie in the factors just discussed. Contrarily to female employment, regressions show that, independent of the time trend variables, female-single-earning is negatively affected by GDP growth, and positively associated to the years that have followed the economic crisis, emphasising the sectoral and gendered dimension of the crisis, and the role of buffer against employment shocks that female-single-earning may constitute.

Yet, the acceleration of female-single-earning clearly pre-dates the crisis in many places, while tertiarization alone does not explain why more women are the sole breadwinner. I therefore turn to socioeconomic evolutions of European couples that may be at play.

The educational profile of European couples

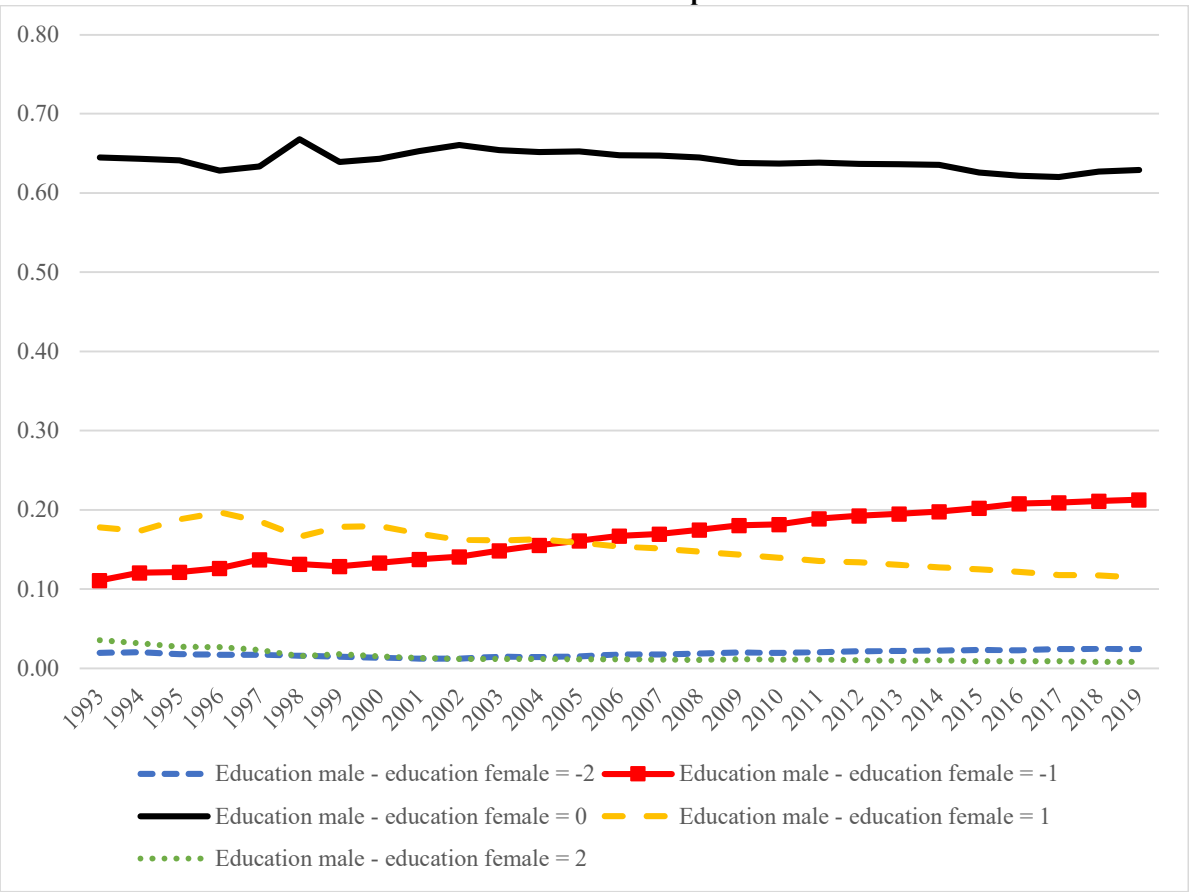
Figure 12 illustrates the distribution of the variable capturing the difference in educational level between the partners of a couple, over the past thirty years[5]. The distribution centres around zero throughout the period - for roughly 64% of couples, the difference between the male partner's level of education and his female partner equals zero, i.e., they share the same level of education. Therefore, it does not seem like evolutions in educational homogamy could explain the recent evolutions in polarisation, as it remains constant over the past thirty years.

However, while most of the non-homogamous couples at the start of the 1990s had the male partner more educated than the female partner (21% of couples in that case, 13% with a more educated female). In 2019, it is almost the exact opposite: 24% of couples have a more educated female, 12% have a more educated male. This result holds across Europe: in 2019, all European countries have a majority of homogamous couples, in all but three, women are more educated than men on average in non-homogamous couples, and everywhere the comparative educational achievement of partnered women has increased over time.

So, there is a need to explore deeper the links between female education and couple employment patterns.

[5]Educational variables in the EU-LFS do not go further back.

Figure 13: Distribution of European couples according to the difference in the level of education between the male and female partner



Note: this graph shows the proportion of couples according to a variable representing the difference between the educational level of the male and the female partner. Each partner can be highly educated (the variable takes a value of 3), medium educated (the variable takes a value of 2), or low-educated (the variable takes a value of 1). If the difference between the value of both variables is 0, both partners share the same level of education. A positive value indicates that the male partner is relatively more educated. A negative value indicates that the female partner is relatively more educated. Partners in couples are aged 25-55. The 1998 spike in the black line is due to a few countries having missing data for this year specifically.
Source: author's own calculations using EU-LFS data

Throughout the last thirty years, better educated partnered men and women have been more likely to be in employment than their less educated counterparts. Yet, for partnered women, the stratification of employment participation by educational level was much more pronounced at the start of the 1990s (Appendix A.7). Partnered women at all levels of education have started working more, but this has been more pronounced for women below tertiary education, especially medium-educated women.

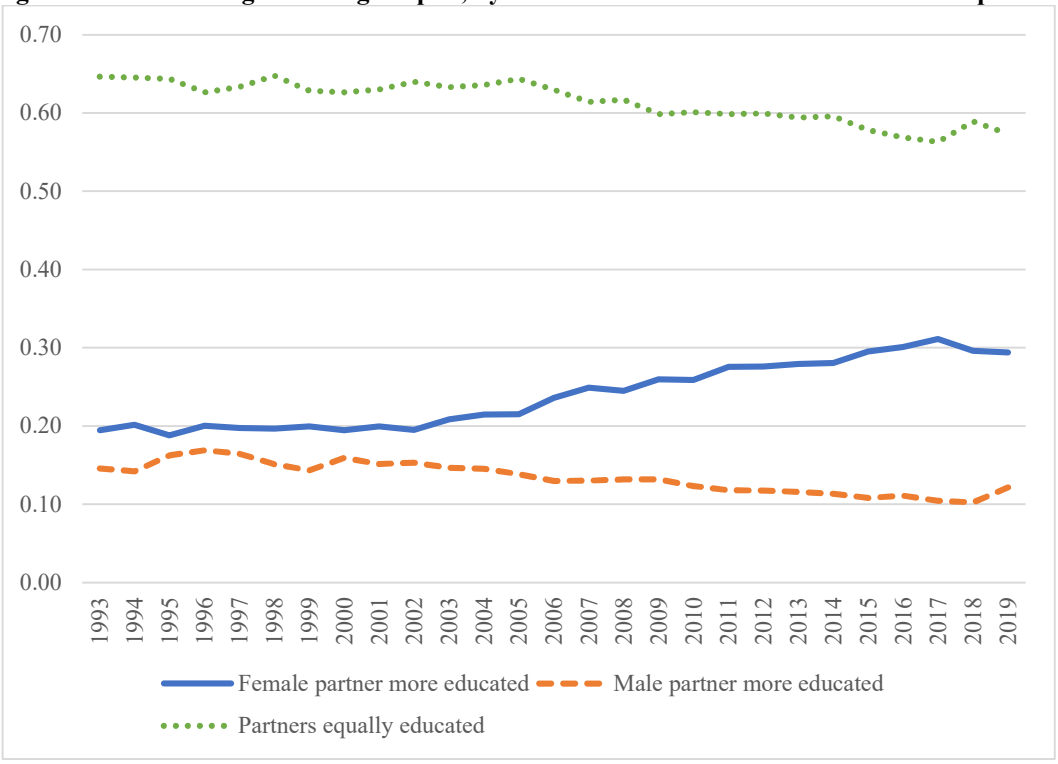
Employed partnered women were, in the 1990s, predominantly highly educated, and, due to most couples being homogamous and very few having the female more educated than the male, they were predominantly partnered to men who were also highly educated and therefore more likely to be in work themselves. The clustering of employment in couples is a logical consequence, leading to polarisation.

So, over time, we witness the conjunction of two phenomena: the rising employment rate of partnered women at all levels of education, especially pronounced for medium and low-educated women, and the fact that, on average, that level of partnered female education becomes higher than partnered men.

If medium and low-educated women start working more, as the majority of couples are educationally homogamous, it is now more likely that these working women are partnered with non-employed men, as the employment likelihood of men decreases in line with their level of education – consistent with the fact that the employment rate of women living with non-employed men increases over time (Appendix A.7).

And, in the (still significant) minority of heterogamous couples, women are now more educated than men on average. Whether it comes from rational choice, with each partner specialising in labour market work or unpaid household work according to their relative productivity, or from the weakening of the labour market positions of low-skilled men, this should translate into more female-single-earning couples. It could also explain why, over time, women's employment growth shifted from disproportionately clustering in couples with a male partner in employment, to fuelling female-single-earning couples.

Figure 14: Female-single-earning couples, by relative educational achievement of each partner



Note: this graph shows the proportion, on average and over time in Europe, of female-single-earning couples according to the relative level of educational achievement from each partner. Each partner can be highly educated (the variable takes a value of 3), medium educated (the variable takes a value of 2), or low-educated (the variable takes a value of 1), and the comparison between the values on these variables for each partner allows to determine who is relatively more educated.
Source: author's own calculations using the EU-LFS.

The rise in female-single-earning couples was, consistently, driven, as shown in figure 13, by couples in which the female is more educated than the male. These results are coherent with recent development in the economic analyses of marriage markets, that increasingly emphasise the possibility that women may be marrying down as highly educated men are increasingly in short supply.

The fact that comparatively more educated women drive the rise in female-single-earning over time is true across all the countries studied. And, variations in the stratification of partnered female employment by educational level tend to match polarisation trends. Countries that started at very low levels of employment for women below high-education, and in which the catching-up of these women in terms of employment participation is still

going on, are countries, like Ireland or Spain, in which the slow-down in polarisation is less evident. Similarly, countries like Romania or Hungary, with high polarisation levels, also have very stratified employment participation across women depending on their level of education.

Past research suggests that female-single-earning is not a desired arrangement, but rather the result of constraints, such as lack of job availability, or the male partner being incapacitated. Female-single-earning implies a strong reversal of traditional gender norms. If the arrangement is indeed not desired, it could mean that rising female-single-earning is a fragile reason behind the slow-down of polarisation.

To get a sense of such constraints, I analysed variables that captured whether the female-single-earner wished to work less than her current hours; and whether the workless-male-partner would want to work (Appendix A.8). Of course, there are limitations to these insights: constraints and desire to work are concepts that are very difficult to capture with all the required nuances in such big micro-datasets. I also analysed whether the rise in female-single-earning could be traced back to a rise in disability amongst employed males.

If there is a desire to move away from female-single-earning, it does not stem from women. While the majority of female-single-earning, couples do want some form of change, this change is mostly, on average and across all the countries studied, the male workless partner wanting to work. Such couples in which the female indicates that she wants to work less are a small minority, and one that decreased over time.

So, the desire for change amongst these couples does not seem to be a threat to female employment per se. Of course, if all the workless-male-partners of female-single-earners

were to find jobs, this may result in further polarisation (but not necessarily so: it depends on whether they find jobs (dis)proportionally to job creation in the economy). Moreover, more female-single-earning has not led to a rise in workless-male-partner desire to work: after a peak around the crisis, this desire has decreased back towards initial levels.

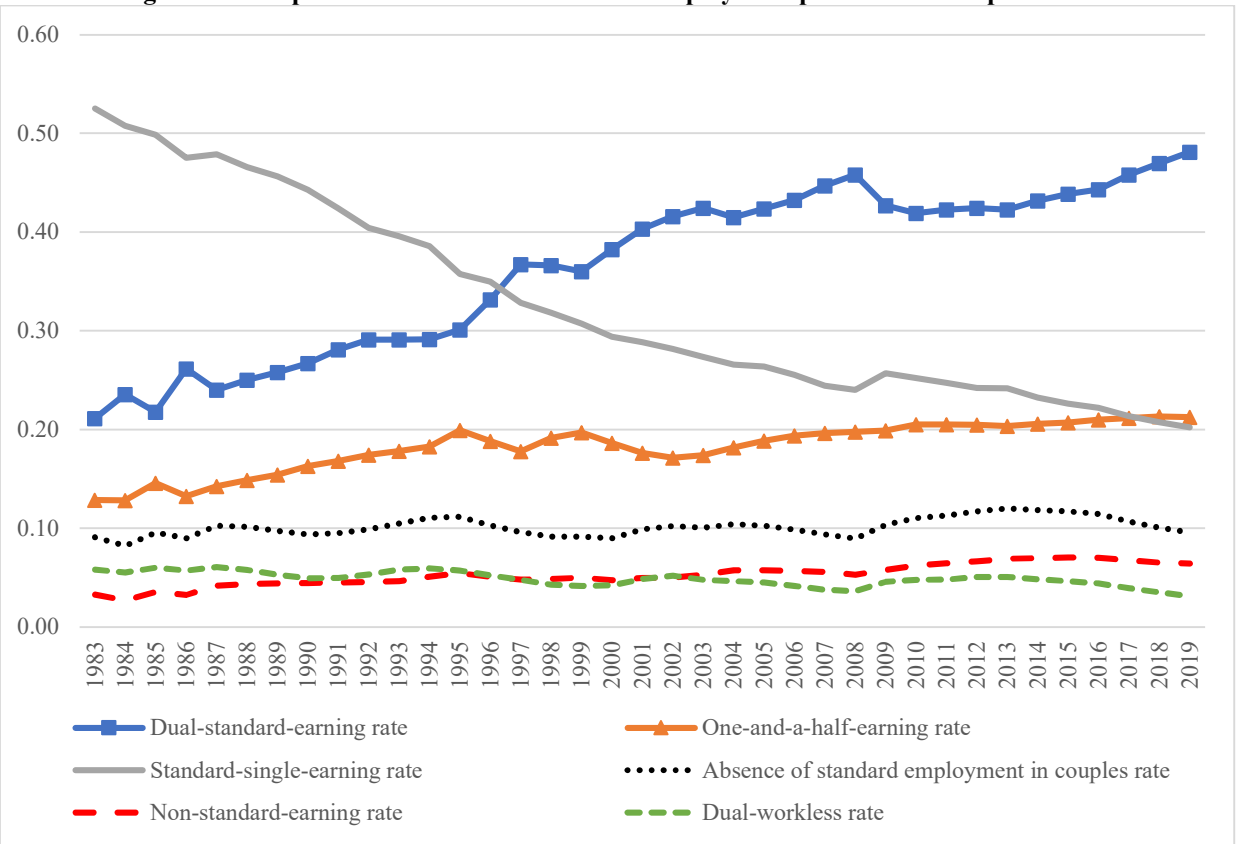
Analysing the data also shows that the rise in female-single-earning could not be attributed to disability rates in male partners. After all, it would be possible that activation policies over time led more female partners of disabled men, whether fully incapacitated or claiming disability benefits as a way to circumvent ever stricter and more conditional unemployment benefits, into the labour market. But an important caveat is the limited reliability of the variable capturing disability status, which constraints our ability to draw firm conclusions here (Appendix A.8).

Non-standard employment

Finally, studying the evolutions in couple employment over the past decades would not be complete without mentioning the rise in non-standard employment rates (Appendix A.9).

Lack of space prevents a detailed discussion of each couple type. The focus of this chapter is that, once we account for standard and non-standard employment, we can define a new category of couples: couples in which no standard employment is found ("Absence of standard employment" thereafter). This category is the sum of two types of couples: dual-workless couples, which we have already defined, and couples that are not workless, but whose only source of employment is non-standard ("non-standard-earning couples" thereafter).

Figure 15: Couple standard and non-standard employment patterns in Europe



Note: this graph represents the European average, in terms of couple employment patterns over the years, when distinguishing between standard and non-standard employment. Dual-standard-earning couples have both partners in standard employment. One-and-a-half-earning: one partner in standard and the other in non-standard employment. Standard-single-earning: a partner in standard employment, the other workless. Absence of standard-earning: no standard worker (partners are either workless or in non-standard employment. This category is therefore the sum of dual-workless couples and couples that are not workless but have no standard employment, that this chapter calls "non-standard-earning. Non-standard-employment is defined here as part-time and temporary work. Partners in couples are aged 25-55.
Source: author's own calculations using EU-LFS data.

Over time, the proportion of "Absence of standard employment" couples remains stable (Figure 14). But this hides two conflicting trends: within that category, the decline in dual-workless couples is exactly matched by a rise in non-standard-earning couples. In fact, the latter has overtaken the former as a proportion of couples in Europe, potentially constituting a new pole of couples in precarious employment situations in Europe. Although the prevalence of non-standard employment strongly varies across countries (Appendix A.9), across the vast majority of those studied, we see these inverse trajectories

of dual-worklessness and non-standard-earning, even if it tends to be less pronounced in certain post-Communist economies, where non-standard employment is lower[6].

I carry the same fixed-effect panel regressions as before, this time using the polarisation indicator for "absence of standard employment in couples" as the dependent variable (full results in Appendix A.9). This indicator can then be broken-down into polarisation sub-indicators for fully workless couples and non-standard-earning couples.

The polarisation indicator for the absence of standard employment in Europe follows a trend that, like the polarisation indicator for dual-worklessness, increases at a decreasing rate, but, unlike the polarisation indicator for dual-worklessness, shows a positive cubic term indicating a rebound in recent years.

Delving into the sub-indicators, we see that the evolution of the polarisation indicator for non-standard-earning-couples is broadly speaking the inverse mirror of the evolution of the dual-workless indicator. The former initially decreases before a reversal that sees it increase, while, as we saw, the dual-workless polarisation indicator increases at a decreasing rate.

Therefore, initially, the growth in overall non-standard employment rates in European countries did not materialise much in the form of non-standard-earning couples. Throughout the period, we see fewer of these couples than the rise and stock of non-standard employment would lead to predict. Rising non-standard employment predominantly, and disproportionately compared to if it were randomly distributed, has

[6]Sample sizes on this issue get small for certain post-communist countries, a combination of the small population and the low prevalence of non-standard employment, which means that only a handful of couples are "non-standard-earning" in the data. Results relating to small post-communist countries should therefore be interpreted cautiously.

been found in other forms of couples, namely couples where it complements standard earning.

But this is slowly changing: just as the propensity of dual-worklessness to cluster in couples slowed-down or even started reversing in recent years, the propensity of non-standard employment to cluster in couples has rebounded around the same time.

This "inverse mirror" is evident in a majority of "early countries". Interestingly, a few post-communist economies, like Bulgaria, Romania or Slovakia, despite exhibiting comparatively low levels of non-standard-employment, show comparatively high, and positive, levels on the polarisation indicator for non-standard-earning. This could reflect a situation in which non-standard employment is marginal, and clustering disproportionately amongst disadvantaged couples.

The main two fuels to the rise of non-standard-earning couples are the rise in couples in which both partners are in non-standard work, and to a lesser extent, the rise in female-non-standard-earning couples (Appendix A.9). On a structural level, non-standard-earning-couples are linked to the service sector: service employment is by far the most prevalent sector amongst these couples in Europe, and this prevalence has increased over the past thirty years (Appendix A.9).

At the micro-level, a hypothesis could be that disadvantaged couples who would have been dual-workless forty years ago, are now instead likely to be on the fringe of the labour market, as non-standard-earning couples, as labour markets have become more flexible and more service-oriented. Aside from the temporal correspondence in the respective trends, the similar human capital profile between both couple types, reinforces this hypothesis (Appendix A.9).

Couples in which both partners have a low level of education have always been over-represented amongst dual-workless and non-standard-earning couples. And, compared to couples in which both partners achieved a high level of education, couples with both partners low-educated are much more likely to be non-standard-earning or dual-workless.

This is true everywhere, except in the Netherlands, hinting at a different model of non-standard employment over there - a point I come back to in the conclusion. Consistently with the polarisation findings with regards to the non-standard-earning indicator, Bulgaria, Romania, or Slovakia, exhibit a strong overrepresentation of low-educated couples in non-standard-earning arrangements.

Interestingly though, at the start of the 1990s in Europe, there was only a minimal difference between the share of low-educated couples in non-standard-earning, and the share of highly educated couples in non-standard-earning. The gap has widened throughout the years, suggesting that this arrangement, initially not limited to disadvantaged couples, increasingly became taken-up by precarious couples.

Again, this widening gap is evident in most "early countries" – bar the Netherlands. We also see it in a number of post-communist economies, like Poland or Hungary, although in a few other post-communist cases, the small sample sizes and idiosyncratic variations that result make the results hard to interpret.

This precariousness is also reflected in the degree to which the non-standard-earning arrangement is voluntary. As of 2019, half of the couples in a non-standard earning arrangement in Europe had at least one partner in involuntary non-standard work, i.e., were in non-standard employment because they could not find a standard job (Appendix A.9). This share has been increasing over time as well, illustrating the increasingly

constrained nature of this arrangement (not to mention that this variable does not capture many other dimensions of "constraint").

The extent to which non-standard work is perceived as constrained varies across countries. It is evidently more perceived as a constraint in southern Europe and certain post-communist economies (though, far from all) than in the Netherlands, the UK or Germany. This may speak for more strongly dualized labour markets, or for non-standard-employment being a stronger feature of dualized-labour market, in the former than the latter.

However, the porosity between the disadvantages of workless couples and non-standard-earning couples does not extend to disability. Very few partners in non-standard-earning-couples indicate that the reason for their employment being non-standard is disability[7], while dual-worklessness coincides more with one of the partners reporting a disability status. So, the data do not suggest that couples that would have been dual-workless with at least a partner disabled in the 1990s, are now in a non-standard-earning, arrangement, which could have been a possibility, as workplaces adapt more to welcome people with disability, as service work may be easier to carry than industrial job for someone with a disability, and as activation policies increasingly target people with disability. But again, the limited reliability regarding the disability status variable in the EU-LFS prevents strong conclusions on the topic.

As discussed, the analyses here focus more on making a general-level argument, applicable to most European countries and to what has been going on in average in Europe. While this may lack nuance in analysing cross-country variations, it is striking

[7] Results available from the author.

to note the similarities of the processes through which European countries go through, cutting across welfare-state differences. The tertiarization of the economy and the inequality of the distribution of service sector jobs across couples, contrasting with the distribution of industrial jobs, the rising comparative educational advantage of women which translates into female-single-earning, the entrance of lower educated women onto the labour market, the substitution of non-standard-earning in couples for dual-worklessness, particularly amongst lower-educated couples, affect the vast majority of countries.

Post-Communist welfare-states stand out in the resilience of their industrial employment, which is less gendered than in 1980s Western Europe, and in having less non-standard employment, suggesting that the distribution of (full-time) employment is still key in explaining polarisation outcomes there. Mediterranean countries exhibit a concentration of (involuntary) non-standard-earning in couples, illustrating new labour market cleavages centred around segmentation and the quality of employment, but Nordic and Liberal welfare-states are not spared by these phenomena either, which also appears in some Conservative countries, although there, part-time work as a complement to a standard job retains an important dimension.

It is very important to note, here, that I only study one dimension of inequality – access to employment and standard employment across couples. It is very likely that differences subsist across countries, and welfare-state types, in terms of how these employment distribution inequalities are dealt with: for instance, extensive income redistribution in Nordic countries may attenuate the effects of the polarisation we find there; the clustering of non-standard employment in couples may be a step towards stabler labour market positions for couples in certain countries and not others; in Liberal welfare-states, these

non-standard-earning couples may result from the introduction of in-work benefits that push formerly workless couples to take-up employment by reducing the participation tax-rate, but with marginal tax rates once in employment that hinder progression away from these non-standard arrangements. These are questions that are outside the scope of this paper, but for which the findings in this paper can constitute a solid building basis.

9.6. Robustness analyses

I carried a number of robustness analyses, which are available in Appendix A.10. The results remain extremely robust throughout.

Restricting the analysis to the "early countries" does not change the insights from the core chapter. There are only a few small differences. The polarisation indicator for dual-earning does rise at a decreasing rate, but also exhibits a positive cubic term that is not present in the main specification, showing a slight rebound of polarisation for this indicator specifically in the last decade. The cubic term becomes statistically insignificant once the 2008-crisis dummy is included, however.

The growth of female-single-earning appears to be more strongly related to economic fluctuations, being negatively associated to GDP growth and positively to the 2008 crisis, while time trend variables appear less significant. To some extent, therefore, the recent acceleration of female-single-earning rates found in the main specification may be due to the introduction of other countries in the dataset, although for early countries only, the rise in female-single-earning over time remains evident, and shows acceleration over time when the economic variables are not included.

Finally, restricting the analysis to early countries reinforces the results with regards to non-standard-earning couples, with an even clearer rise in the proportion of such couples, and in the new tendency for non-standard-employment to increasingly cluster in couples.

Overall, what analysing the results for the early countries only suggests is that the evolution over time in terms of polarisation, and the underlying potential explanatory factors explored in the analysis, are not driven by the inclusion of new, and potentially different countries, such as the post-Communist and Nordic countries, in the dataset over time. The results and their interpretation would have been similar had I chosen a balanced panel, restricted to countries with data available since the 1980s. These insights are also confirmed by the analyses broken-down country by country: it is clear that rising polarisation (at a decreasing rate) is a feature of all early countries, with, as discussed in the course of the analysis, variations around the intensity of the rising trend and its recent decline. In fact, for the last twenty years, post-Communist and Nordic countries, in exhibiting polarisation levels that are positive and polarisation trends that essentially stagnate, are extremely similar to what has been happening in "early countries" over these past two decades.

Classifying self-employment as non-standard also seldom changes the conclusions. It mechanically, as expected, increases the non-standard-employment rate, and consequentially, the rates of couples organised around the "one-and-a-half" model, and non-standard-earning couples. The regression results are very similar in showing a tendency for non-standard-employment to start clustering more in couples in recent years. Another small change is that the representation of agriculture in non-standard-earning couple increases, in line with the high rates of self-employment in that sector.

Finally, the most insightful robustness analysis is separating part-time, temporary, and self-employment. Out of the three, self-employment is the form of work that tends to cluster the most in couples, but also the most trendless: the proportion of couples whose only source of income is from self-employment declines slightly over time, while the polarisation indicator for such couples stagnates.

Part-time and temporary work, on the other hand, tend to increasingly constitute the only source of labour income in couples, as measured both by aggregate couple patterns and relevant polarisation indicators. The change is particularly striking for part-time work. Although the vast majority of couples in which part-time work is found are one-and-a-half-earning couples, and although we see fewer couples whose only source of labour income is from part-time employment than its counterfactual, the share of such couple has been increasing, and the gap with the counterfactual decreasing.

On the other hand, temporary employment is seldom used in couples as a complement to a permanent job: it tends to cluster in couples, and this tendency has also been rising in recent years.

This is reflected in the voluntariness of non-standard arrangements. The prevalence of involuntariness is higher in couples relying solely on temporary work than those relying solely on part-time work, implying that the former may cluster more in disadvantaged couples who take it as they cannot find anything else. But the proportion of involuntary part-time work still concerns around 40% of part-time-earning-only couples, and has been rising for single-part-time-earning couples over time.

Using the alternative, hours-based part-time variable, raising the age limit to include partnered people until the age of 64, and using non-normalised polarisation indicators, provide very similar results, available on request.

9.7. Conclusion

Does couple employment participation still polarise between dual-earning and dual-workless couples in Europe? The answer is a caveated yes: it does so, more than forty years ago, but the increase in polarisation happened at a clearly decreasing rate. Most of it occurred in the 1980s and 1990s: since, the rise in polarisation has slowed-down or even started to reverse.

In the last two decades, the growth in female employment started to materialise into female-single-earning couples, whose rise accelerated over that same period, instead of disproportionately fuelling dual-earning couples. There are now more female-single-earning couples than dual-workless couples in Europe, while the gap with the rate of male-single-earning couples has massively narrowed over time.

The chapter shows that the polarisation of couple employment, and its slow-down in the last two decades, are European-wide phenomena, cutting across countries and welfare-state types. Below that surface of commonality, though, lie differences in terms of the intensity of the trends and the levels of polarisation across countries, particularly with regards to post-communist economies. But the commonality of the results and the phenomena experienced by the countries studied remains striking, and constitutes the overall take-away from this chapter, given the diversity of countries studied, their number, and the large historical period of observations.

In light of the novelty of these trends, this chapter explored potential explanatory mechanisms, destined to inform future causal research on the topic.

The 2008 crisis certainly played a role, accelerating the clustering of employment in couples in a majority of countries, particularly of service employment, but had a much weaker effect on the accumulation of non-employment in couples. This emphasised the role played by female work in buffering the employment shock against male-industrial job losses. While female employment rates have been found to be positively related to economic growth and negatively related to the 2008 crisis, female-single-earning rates have been found to be negatively associated to economic growth and positively associated to the crisis.

At a sectoral level, polarisation is related to a particularly uneven distribution of service-sector jobs across couples, and to the loss of industry sector jobs. The latter factor may explain why polarisation was particularly intense in the 1980s and 1990s, with heavy losses of male-single-industrial-earning jobs leading to dual-worklessness, and why it has slowed-down since, as the weight of former industrial workers in dual-worklessness has decreased.

Within couples, the educational profiles of partners have changed. Partnered women have become more educated than partnered men on average, and the rise in female-single-earning has been driven by couples in which women are more educated than men. And, lower and medium-educated women have massively joined the labour market: as these women are often partnered to lower educated, lower employability men, this increased the likelihood of female-single-earning.

The type of employment taken-up by partnered people has also changed. Although initially, the rise in non-standard-employment predominantly fuelled one-and-a-half earning couples, in more recent decades, we witness an increased use of such employment as the sole source of labour income in couples. Non-standard-earning has become a substitute, in aggregate across couples and in the polarisation trends, for dual-workless couples.

To summarise, polarisation was high in the 1980s and 1980s, as male-single-earners lost industrial jobs, leading to long-term dual-worklessness, and women working were predominantly highly educated women living with highly educated men, both in employment. Today, the situation is much more nuanced, with partnered women more educated than partnered men and having benefited from service employment to increasingly become the sole-earner in a couple. Dual-worklessness is less prevalent, as low-skilled couples find employment opportunities in non-standard work, particularly in the service sector. Dual-earning versus dual-workless polarisation is weaker than in the past, and inequality across couples may have moved onto a new terrain: employment quality.

The contribution of this chapter is important in underlining how polarisation trends actually developed over time, especially over the past two decades. The current state of the literature can lead to the misleading idea that "polarisation is high, and higher than forty years ago". This chapter actually showed a much more nuanced picture, over time and across countries. The chapter also offers an unprecedented attempt to put forward mechanisms explaining these nuances and recent developments. Methodologically, it has developed a refined polarisation indicator and counterfactuals which incorporated notions of employment quality or sector, to help explain these developments.

It is also important to note that this chapter emphasises the commonality of the social processes at play in Europe, resulting in polarisation trends that cut across welfare-state differences, but does not explore how countries then deal with these inequalities. In some places, the market income inequality resulting from polarisation, whether in terms of ILO-employment or standard employment, may not be strongly corrected. In others, it may be compensated by redistribution policies. In fact, the commonality of the polarisation experiences across Europe, contrasts with what we know are very different outcomes in terms of poverty, income inequality, and gender inequality across different welfare-states: this paradox suggests an important role of policy intervention, and this chapter can be a useful basis to study further the link between household employment participation, policy, and social inequality outcomes.

The limitations of this chapter, alongside avenues for future research, and policy recommendations, are detailed at length in the concluding chapter, chapter 12. This will allow the reader to have a holistic view of the findings, limitations and implications of this thesis, as much of the empirical work of the next chapters build on the findings of this one, and come together to form a coherent whole cutting across the three empirical chapters. For now, a key takeaway from this chapter is the importance of distinguishing between standard and non-standard-employment. This simple distinction enabled me to establish a new pole of couples, couples deprived of standard employment, and within that pole, establish similarities between dual-workless couples and non-standard-earning couples. The increasing importance of the latter suggests that the polarisation of couple employment should no longer be conceived in research and policy as merely having versus not having employment, but as having versus not having quality employment. This insight informs the endeavours of the next two chapters.

10. The inequality trade-off: inequalities across and within couples in the rise of dual-earning

10.1. Introduction

Chapter 9 documented, in line with the literature, the rise to prominence of dual-earning, now the main form of couple employment participation in Europe under the ILO-definition of employment. At face value, it seems like an improvement for social equality: through that prism, the situations of partnered men and women have become less unequal in Europe.

Yet, we have also seen in Chapters 4 and 6 that gender inequalities subsist behind the catch-all category of dual-earning. Partnered women are more likely to be found in non-standard employment than partnered men in Europe, employment on average associated to social disadvantages such as lower earnings or worse social security entitlements (Lewis et al. 2008, OECD 2015).

In addition, the dominant dual-earning model raises questions of inequality in access to employment across all couples. Past research and chapter 9 show that, as employment rates rose over the past four decades, employment and non-employment increasingly clustered in couples. The literature refers to this phenomenon as polarisation. Although I showed in chapter 9 that the increase in polarisation happened at a clearly decreasing rate, it nonetheless remains that the model of inequality in couple employment participation has tended to switched away from inequality within couples in the old male-single-earner model, towards inequality across couples.

So, the literature identifies two potential inequalities associated to the rise of dual-earning: a less equal distribution of work across all couples as couple employment is

increasingly characterised by polarisation, and a gender inequality within dual-earning couples regarding access to standard and non-standard employment. The literature separately documents these two forms of inequality extensively, but seldom links them.

The link between polarisation and non-standard employment is a missing piece in our understanding of couple employment participation. With this link, we would be able to know whether certain countries exhibit a form of "double-inequality" with employment increasingly clustering in dual-earning couples, and an important share of dual-earning employment having the female in non-standard work – polarisation would constitute a first dimension of inequality, and in the dual-earning couples, the female partner would still be at a disadvantage, constituting a second dimension of inequality.

Or, we could imagine a country in which dual-earning is high, due to high employment rates, with very few workless couples and little polarisation of employment across all couples as a result. One would be forgiven for thinking of this country as an ideal to aspire to. But what if the high non-employment rates in this country are sustained by an important share of non-standard-employment, and a dualized labour market, with non-standard-employment clustering in disadvantaged dual-earning couples, and standard employment clustering in advantaged dual-earning couples? Where low-paid or non-standard work are the only source of labour income, poverty risks may be high (Nolan and Marx 1999, Horemans et al. 2016).

Crucially, this second example highlights a third layer of potential inequality in couple employment participation, emerging once standard and non-standard employment are distinguished, and that the current literature does not identify: inequality across-dual-earning couples specifically. It would happen precisely in the case of dual-earning couples

polarising between dual-standard-earning on one side and dual-non-standard-earning on the other. More generally, these examples illustrate the limitations of studying polarisation and non-standard-employment in isolation. The ILO-defined employment status, which has informed much previous polarisation research, groups together the most marginal and substantial forms of employment.

Moreover, the finding in Chapter 9 that polarisation, albeit higher than forty years ago, has been increasing at a decreasing rate, also justifies linking issues of polarisation, standard and non-standard employment: it may be that polarisation between dual-earning and dual-workless couples slowed-down, but that it has been replaced by new forms of inequality within and across couples in the type of employment held. The mixed empirical results in past research regarding the impact of rising female employment on the inequality of the income distribution, also suggests that we need to refine studies of employment distribution to incorporate the standard/non-standard distinction.

To summarise, the three potential forms of inequality that this chapter will study, and link, to better understand the causes and consequences of the rise of dual-earning as a model of couple employment participation, are:

- Across all couples, the potential polarisation of ILO-defined employment which results in the clustering of employment in dual-earning couples. I will refer to this as “overall polarisation/layer 1 inequality”.
- Across dual-earning couples specifically, the potential inequality between couples that are dual-standard-earning and couples that are dual-non-standard-earning. I will refer to this as “inequality across dual-earning couples/layer 2 inequality”.

- Within dual-earning couples specifically, the potential inequality between men in standard-employment and women in non-standard-employment. I will refer to this as "inequality within dual-earning-couples/layer 3 inequality".

Three research questions emerge. They will be answered in the context of Western Europe since the 1980s. All research questions will first explore European average results, before breaking-down the results by country and establishing patterns of differences and commonalities to better understand the phenomena at play. With that in mind, we have:

RQ1: Can we identify an empirical regularity between the evolutions over time of the prevalence dual-earning couples with at least one partner in non-standard employment, and the level of overall polarisation?

This research question aims to "set the scene". It will provide long-term trends in terms of the respective evolutions of the two key variables that the literature has put forward so far in the context of rising dual-earning, but has hitherto studied almost exclusively separately. The first endeavour is therefore to study their evolution together to get a broad idea of what has been happening.

RQ2: How are standard and non-standard employment distributed across dual-earning couples and how has this evolved over time?

This research question constitutes the first attempt to link more formally the issues of polarisation and non-standard-employment. It will show whether, amongst dual-earning couples specifically, standard and non-standard employment are distributed such that they polarise between dual-standard and dual-non-standard-earning couples ("layer 2 inequality"), or whether they are distributed in order to foster an even access to standard and non-standard employment across couples (but generating a standard/non-standard

gendered divide within dual-earning couples, "layer 3"). This will also enable to understand which form of employment contributes more to the overall level of polarisation.

RQ3: How do the evolutions in the three identified forms of inequality account for the rise in dual-earning over the past four decades?

Have the countries that saw the biggest rise in dual-earning also been subjected to a strong rise in at least one form of inequality? Is it empirically possible to find countries which oversaw important increases in dual-earning while keeping a strong degree of equality across all couples, across dual-earning couples specifically, and within dual-earning couples? My third endeavour in this chapter is therefore to link the two key variables, non-standard-employment and polarisation, and the three potential layers of inequality they can induce, with a key outcome, the rise of dual-earning.

Section 2 briefly reminds the reader of the previous work that underpins this chapter and establishes hypotheses that guide the empirical work. Section 3 describes the analytical strategy. Section 4 presents and discusses the results. Section 5 discusses robustness tests. Section 6 concludes.

10.2. Past research

As in Chapter 9, the key theoretical frameworks, concepts and results informing this chapter have been described at length in Chapters 3-6. Th crucial point here is that, while it would be easy to oppose an old, male-single-earner, Beckerian society, to a contemporary, dual-earning polarised society, the situation can be nuanced because of non-standard employment. A dual-earning couple with the male in standard work and the

female in non-standard work is both homogamous (in terms of its raw employment status), and specialised (as both partners do not enjoy the same type of employment).

Horemans' paper (2016) is a valuable exception, in a literature that otherwise never links issues of polarisation and non-standard employment, despite both being clearly associated to the rise of dual-earning. Adapting polarisation indices derived by Gregg and Wadsworth to study the distribution of non-standard employment across dual-earning couples, he finds that non-standard employment does not tend to cluster in couples but is rather evenly distributed across them, in Europe.

This chapter goes further in linking both dimensions. First, where Horemans' paper focuses on point in time, this chapter studies a rich dataset of nearly forty years. Second, this chapter distinguishes conceptually between the three layers of equality and identify them explicitly, empirically linking them and their evolutions. Third, this chapter does not just look at the distribution of standard and non-standard employment as dependent variables: it also develops a new shift-share equation to make them independent variable, so they can account for evolutions over time of dual-earning rates. The next section details the practicalities of this endeavour. Before then, I establish research hypotheses corresponding to each research questions, to guide the understanding of empirical results.

H1: Non-standard employment and polarisation have risen together over time: their rise is positively correlated.

This is the most straightforward hypothesis: past research finds that dual-earning increased; the polarisation literature finds that this increase came with more polarisation; the division of tasks within couples literature, finds that this increase came with a rise in

the "one-and-a-half-earning" model and non-standard employment in dual-earning couples; so they must have risen together.

H2a: Standard and non-standard employment will be evenly distributed across dual-earning couples according to the "modified-male-breadwinner hypothesis"

H2b: Standard and non-standard employment will be unevenly distributed across dual-earning couples according to the "homogamy hypothesis"

Two competing perspectives exist here. On the one hand, if one-and-a-half-earning is just a modern version of male-single-earning - it is, non-coincidentally, also referred to as "modified-male-breadwinning", or "gendered dual-earning" in the literature (Daiger von Gleichen and Seeleib-Kaiser 2918, Brini et al. 2021,) - non-standard-employment will complement standard employment in dual-earning couples, just like non-employment used to complement employment in male-single-earning couples. Standard and non-standard employment will be evenly distributed across dual-earning couples, with standard employment found in each such couple, but at the expense of women, who will be found in a non-standard job complementing the standard male job.

On the other hand, one could argue that if what motivates couples is a desire for joint labour market success and status similarity, this desire could include not just mere employment, but success and similarity in terms of employment quality. Couples in which labour market resources accumulate can presumably foster homogamous outcomes in terms of higher quality employment, not just employment. Forty years ago, the strength of gender norms may have been strong enough to constrain even high resources women into non-standard-work, but whether that is still true today remains to be seen. In this

perspective, standard employment would cluster in some couples, and non-standard employment would cluster in others.

H3: For societies to transition to dual-earning as the dominant model, it is necessary that at least one of the three forms of inequality rises.

This hypothesis posits a trade-off: if dual-earning is a socially desirable goal, then to achieve it, countries must have to accept some form of inequality. This hypothesis relies on a similar premise as H1: the separate documentation of the rise of polarisation and the rise of non-standard-employment in couples, in their respective strands of literature, is so compelling, that it is difficult to imagine a country transitioning from male-single-earning to dual-earning without at least one of these phenomena affecting their couple employment patterns. To imagine the contrary would be to imagine a country in which the rise in dual-earning has been solely driven by standard employment, so there is no one-and-a-half-earning couples and no dual-non-standard-earning couples, and that this standard employment growth has been high enough to generate enough jobs for every couple, such that the rate of dual-standard-earning couple is proportionate to the overall rate of standard employment, and there is no clustering of employment and non-employment in couples.

The chapter will also study how results vary across countries. As detailed in the next section, the countries studied effectively correspond to those called "early countries" in Chapter 9. As in this chapter, one way to group them is to view them as part of welfare-state types. In this case, Germany France, Belgium, Luxembourg and the Netherlands can be seen as part of the "Conservative" type, Ireland and the UK as part of the "Liberal" type, and Greece, Italy, Portugal and Spain as part of the "Mediterranean" type.

I refer the reader to Chapter 9 for more extensive discussions of these types of welfare-states and their characteristics. For our purposes, what the literature establishes is that rising, gendered non-standard employment has been a feature across all these countries, but not to the same extent. Traditionally, Belgium, Germany, the Netherlands and the UK have relied strongly one the "one-and-a-half-earning" model, and have a long-established tradition of female non-standard employment complementing a male job in couples (Lewis et al. 2008). But in other Conservative and Mediterranean welfare-states, the combination of social security reproducing the existing social order with a need to foster higher employment rates for groups hitherto disadvantaged on the labour market (women, the young, migrants), could have led to the development of more flexible and dualized labour markets, with non-standard employment perhaps fuelling this dualization.

However, because of the heterogeneity within welfare-state clusters, - for instance, Portugal and Italy are both in the Mediterranean type, but Portugal has a very high rate of dual-full-time-earning (Tavora and Rubery 2013) and Italy has the strongest male-breadwinner model today in Europe as shown in Chapter 9 - and because of the lack of integration between the polarisation literature and the literature studying the use of non-standard employment in dual-earning couples, I adapt an explorative stance with regards to potential patterns of commonalities and differences across countries, and purposefully avoid deriving clear-cut hypotheses in that regard.

10.3. Analytical strategy

10.3.1. Data and sample

The chapter uses the EU-LFS and studies the 11 countries present in the dataset since the 1980s: Belgium, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands,

Portugal, Spain, and the UK. The EU-LFS is unique in enabling a comparative analysis across countries going so far back in time, and I exploit this feature to study the long-run evolutions of dual-earning, polarisation, and non-standard-employment. The trade-off is that this approach only includes a subset of European countries.

In chapter 9, I studied couples with partners aged 25 to 55. But here, there is a case to raise the lower bound: one may argue that non-standard-employment is often used as a first and temporary stepping-stone into the labour market by younger people, and that, as the standard/non-standard-employment divide constitutes a crucial object in this chapter (certainly a more central one compared to chapter 9), to net this out and ensure a proper comparison across countries, the study needs to focus on older couples.

Therefore, the core analyses that I will show in this chapter are based on dual-earning couples with partners aged anywhere between 35 and 55. For robustness, I will estimate the analyses again using a 25-55 cut-off. As in Chapter 9, I keep people who declare that they are out of work because of disability/illness, because of the potential for this status to constitute an alternative to unemployment in practice.

10.3.2. Variables

Chapter 8 details the reconstitution of the couple employment status based on ILO-employment. The focus of study of this chapter is on dual-earning couples, defined accordingly. These dual-earning couples, once standard and non-standard-employment are distinguished, can be classified as dual-standard-earning (both partners in standard employment), one-and-a-half-earning (one partner in standard employment and the other in non-standard employment) or dual-non-standard-earning (both partners in non-standard-employment).

I can then compute rates, for each year and country, of dual-earning couples as a share of all couples, and for each of the subtypes as a share of all couples. The prevalence of non-standard-employment in dual-earning couples is defined as the share of all couples that are dual-earning and in which at least one partner is in non-standard employment. It is the sum of the one-and-a-half-earning rate and of the dual-non-standard-earning rate.

The definition and operationalisation of non-standard-employment follows the explanation in chapter 8. For robustness, the analyses are also carried using the hours-based part-time variable, defining part-time work as working less than 30h/week (Westhoff 2022). I also run the analyses again separately for part-time and temporary work. Finally, I re-do the analyses again classifying self-employed workers as non-standard, and then separately for self-employment as its own category.

The other key concept studied in this chapter is polarisation. The polarisation indicator to capture overall polarisation, based on the ILO-definition of employment and the work of Gregg and Wadsworth (2001, 2008), is described at length in Chapters 4 and 8, and I have also used it extensively in chapter 9, so I refer the reader to them for more detail.

I will refer to the polarisation indicator which applies to dual-earning couples overall without distinguishing between standard and non-standard-employment, as the "overall polarisation indicator" throughout the remainder of this chapter. This is because, while the focus of this chapter is on dual-earning, this indicator implicitly captures inequality across all couple type.

Table 3: Descriptive statistics for the key variables of the analysis

	Average	Standard deviation	Min	Max	Number of country-year observations
Polarisation (Raw)	0.01	0.08	-0.24	0.15	388
Polarisation (normalised)	0.01	0.06	-0.15	0.12	388
Dual-earning rate	0.57	0.15	0.16	0.8	388
Dual-standard-earning rate	0.29	0.11	0.04	0.59	388
One-and-a-half-earning rate	0.24	0.14	0.04	0.58	388
Dual-non-standard-earning rate	0.02	0.02	0	0.12	388
Non-standard-employment rate (overall - partnered population)	0.16	0.09	0.03	0.43	388
Non-standard-employment rate (partnered women)	0.26	0.16	0.04	0.68	388
Non-standard-employment rate (partnered men)	0.06	0.04	0.003	0.18	388
standard-employment rate (overall - partnered population)	0.59	0.07	0.43	0.76	388
standard-employment rate (partnered women)	0.34	0.13	0.05	0.69	388
standard-employment rate (partnered men)	0.84	0.05	0.67	0.96	388

Note: descriptive statistics for the key variables used in the analysis. A similar table for the variables used to compute some of these (for instance: part-time and temporary work by gender) is available in Appendix B.2. Also in Appendix B.2, I present the sample sizes by country and year which allowed to construct these statistics.
Source: author's own calculation using the EU-LFS.

If the overall polarisation indicator is positive, it means ILO-employment clusters in couples, which implies that at the other end, non-employment may also do so, such as the rate of dual-earning is accompanied with a degree of social inequality in employment access across all couples. With that in mind, table 3 provides descriptive statistics for the key variables used in the analysis.

10.3.3. Empirical methods

This chapter uses three main empirical methods, corresponding to each research question and hypotheses.

For the first one, I will simply plot the evolution of overall polarisation, and of the prevalence of dual-earning couples in which one partner is in non-standard-employment, over time, on average and by country, and analyse their co-movement, if any.

For the second one, I develop an extension to the polarisation indicator established by Gregg and Wadsworth (2008), such that it can accommodate the distinction between standard and non-standard-employment.

I derive these indicators in full in Appendix B.3. But the intuition, which also informs Horemans' approach (2016), remains the same. Couples now are not just dual-earning, they are distinguished based on the standard and non-standard-employment statuses of their partners. For each subtype of dual-earning couple, the polarisation sub-indicator for this subtype is the difference between the actual rate of this subtype (computed amongst the overall population of couples), and the counterfactual rate of this subtype assuming a random distribution of standard and non-standard employment.

The polarisation sub-indicators for each subtype of dual-earning couples, serve to show how standard and non-standard employment are distributed across dual-earning couples, and how much they contribute to the overall polarisation indicator. In the remainder of this chapter, I will refer to them as "polarisation sub-indicators".

Again, using an example with 4 couples might be useful here. Imagine a 100% employment rate, with 4 standard jobs and 4 non-standard jobs across these 4 couples. The "modified-male-breadwinner hypothesis" would predict 4 couples organised around the one-and-a-half-earning model. The "polarisation hypothesis" would predict 2 dual-standard-earning and 2 dual-non-standard-earning couples. And, a random distribution of standard and non-standard employment yields 1 dual-standard-earning couple, 1 dual-

non-standard-earning couple, and 2 one-and-a-half-earning couples. Layer 3 inequality would correspond to an excess of one-and-a-half-earning couples compared to the counterfactual, Layer 2 inequality would correspond to an excess of dual-standard and dual-non-standard couples.

Please note that in theory, the sum of the polarisation sub-indicators for each subtype of dual-earning couples, is equal to the value of the overall polarisation indicator. In practice in this chapter, it is not the case, because of missing values. There are couples that can be classified as dual-earning, because the dataset does not have any missing values regarding the ILO-employment status, but that cannot be assigned a standard or non-standard employment status due to missing values on the variables needed to construct it.

This is a problem that decreases over time, because of sectoral evolutions in the economy. The main type of worker that cannot be assigned a standard or non-standard-employment status are “family workers”, in practice, female partners of farmers that help on the farm but do not have any contract, therefore perform a job akin to what an employee would do, but without any information on the hours worked or the permanent/temporary status.

As the share of such workers decreases with the importance of agriculture over time, the “missing gap” becomes negligible (and was only ever quite significant in Greece in the 1980s). Still, I chose to estimate all analyses using the whole sample, rather than restricting it to couples whose dual-earning status could further be refined, because:

- As there are no missing value on the ILO-status, it would be a shame to not use the whole sample to compute as precisely as possible the overall polarisation indicators.

- For robustness, I carried the analyses by assigning everyone a standard and non-standard employment status, even when values were missing (setting standard employment as the default status for anyone, and non-standard-employment as deviations from that). Doing so shows a) results that overall remain very similar and b) the expected fact, that the sum of the polarisation sub-indicators for each couple type was equal to the overall polarisation indicator, showing these sub-indicators have been properly calculated. These analyses are available on request.

Finally, for the third research question, I develop a shift-share equation inspired by the work of Gregg and Wadsworth (2001, 2008). To understand it, let us recall from chapter 4, equation (6), that the polarisation indicator was obtained as the difference between the actual rate of dual-earning, and its counterfactual obtained under an assumption of random distribution of employment:

$$\rho_{de} = de - \alpha_2$$

Equation (11)

This equation can be re-written as:

$$de = \alpha_2 + \rho_{de}$$

Equation (12)

The dual-earning rate is expressed as the sum of the contribution of the "stock" of available employment, captured by the counterfactual, and how this stock is actually shared in practice across couples, captured by the polarisation indicator.

My contribution is to extend this shift-share equation so that each component on the right-hand-side of the equation now distinguishes between standard and non-standard-employment. Once again, Appendix B.3 details in full how the right-hand-side is further decomposed. But the intuition is simple: the counterfactual can be divided into the

contribution of standard and non-standard employment to the overall employment rate. And the overall polarisation indicator is the sum of the polarisation sub-indicators obtained for each subtype of couples making-up the dual-earning category, as just described.

10.4. Empirical results

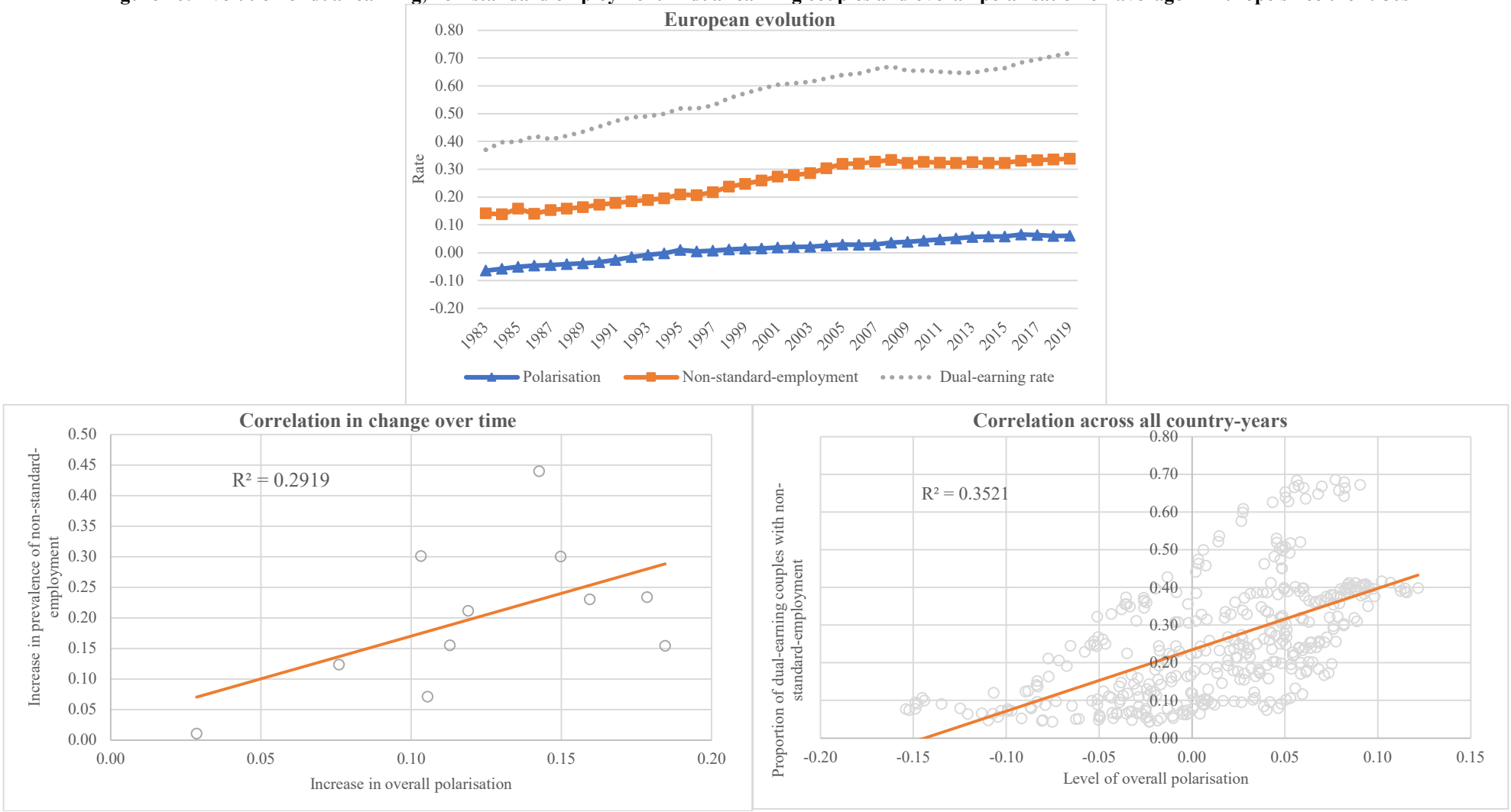
10.4.1. The overall landscape: can we identify an empirical regularity between the evolutions over time of the prevalence of dual-earning couples with non-standard-employment, and the level of overall polarisation?

The first research question seeks to set the scene in terms of how the two key variables put forward by the literature as accompanying the rise of dual-earning, evolve over time: the overall polarisation of employment (as defined by the ILO) across all couples, and the prevalence of dual-earning couples in which at least one partner is in non-standard-employment.

For reasons of space, the answer to this research question will be the most succinct. The main contribution of this chapter is precisely to go in-depth into the linkages between both variables, and this first question just serves to establish the basis to pursue such linkages.

Dual-earning rates nearly doubled across Europe over the past forty years, as Figure 15 shows. Across the 11 countries studied, on average, the rise of dual-earning over the past four decades has come with a simultaneous rise in overall polarisation (by 18 percentage points) and prevalence of dual-earning couples with non-standard-employment (by 20 percentage points).

Figure 16: Evolution of dual-earning, non-standard employment in dual-earning couples and overall polarisation on average in Europe since the 1980s



The top graph plots the evolution over time of the share of all couples that are dual-earning and in which at least one partner is in non-standard employment, of the polarisation indicator for dual-earning, and, for illustrative purposes, of the dual-earning rate. The bottom left-table shows the correlation across the 11 countries studied between the rise in the prevalence of non-standard-employment in dual-earning couples between their first and last year of observation, and the rise in polarisation indicator for dual-earning over the same period. The bottom-right graph shows the raw correlation between both variables for the 388 country-years. The three stars next to the correlation coefficient in the bottom right table indicate statistical significance at the 1% level, while the lack of star next to the correlation coefficient on the bottom left graph denotes a lack of statistical significance.
Source: author's own calculation using the EU-LFS.

These changes correspond to the erosion of two concomitant characteristics of couple employment over the past four decades: it used to be predominantly male and standard. On average, Europe started the period with a negative polarisation indicator for dual-earning, which indicates there were fewer dual-earning couples than what a random distribution of employment would have led to predict.

This negative overall polarisation indicator was characteristic of male-single-earning economies. This meant inequality very much existed within couples – employment was very evenly distributed across them, but women were excluded from employment in large proportions. Yet, overall polarisation has grown so much that it is now positive: the countries studied now exhibit an average surplus of 7 percentage point, characteristic of societies in which labour market resources and employment outcomes cluster in couples.

Regarding non-standard-employment, Appendix B.4 shows that on average, across Europe, and as a proportion of all couples, Europe did witness an important rise in dual-standard-earning (proportion multiplied by 2.09), but the rise was slightly quicker for couples with at least one partner in non-standard employment (proportion multiplied by 2.38). Amongst them, the proportion of one-and-a-half-earning couples was multiplied by 2.22, while the most spectacular rise occurred for dual-non-standard-earning couples: although they remain a very small proportion of all couples, their rate was multiplied by 6.38.

So, on average across Europe, hypothesis 1 ("non-standard employment and polarisation have risen together over time") holds. Across all the country-year observations, the correlation between both variables is positive (with a correlation coefficient of 0.59, significant at the 1% level). The correlation between the rise in both variables between

the first and last year of observation in each country is also positive (correlation coefficient of 0.54, significant at the 10% level).

Breaking-down these trends by country (Appendix B.5) reveals that in all 11 countries, both overall polarisation and the proportion of couples that are dual-earning and in which non-standard employment is found, have increased: these phenomena cut across countries.

There are, however, variations across countries in how much these variables increased, the relative importance of both variables, and their respective starting points. In France, Italy, Luxembourg, Portugal and the UK, the curves for the three variables overall look close to the average European evolution.

Germany and the Netherlands are mostly characterised by rising dual-earning couples with non-standard-employment, more than overall polarisation. Greece, Spain and Ireland are the opposite, with the most striking rise being the rise in overall polarisation. Belgium is an intermediate case, with a rise in non-standard-employment not too dissimilar to Germany and the Netherlands, but a rise in overall polarisation that is also significant.

So, the average European picture confirms hypothesis 1, and the simultaneous rise in overall polarisation and non-standard employment in couples. To link these evolutions more formally, and explore any cross-country nuances in further depth, we need to turn to research questions 2 and 3.

10.4.2. The link between polarisation and non-standard-employment: how are standard and non-standard employment distributed across dual-earning couples and how has this evolved over time?

From now on, the discussion of non-standard employment shifts from the proportion of dual-earning couples with at least one partner in non-standard employment, to the more

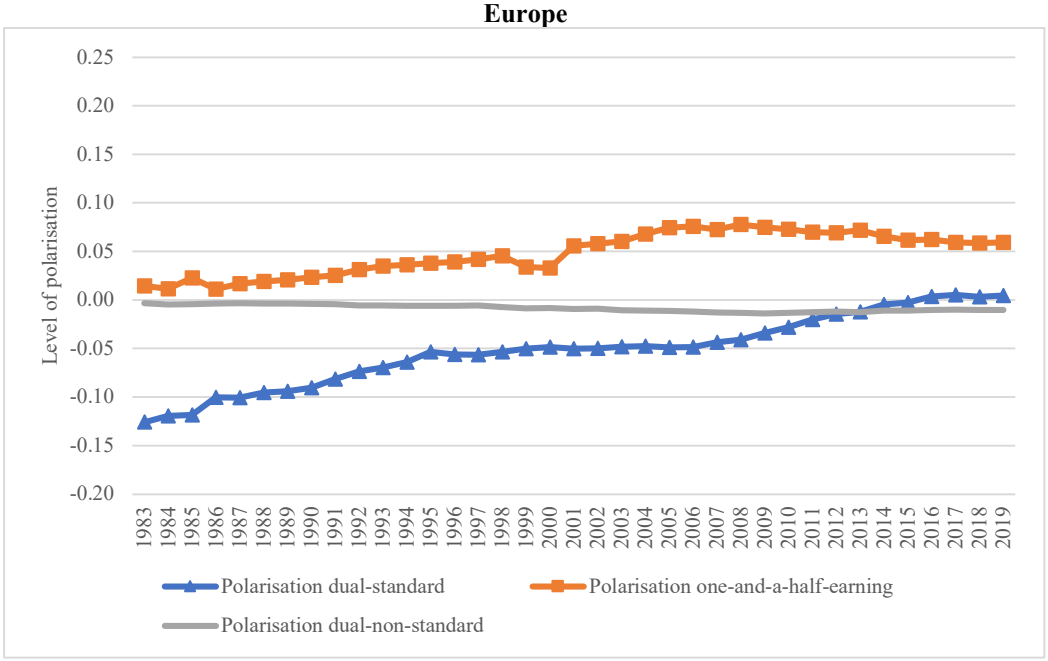
general question of how standard and non-standard employment rates in the overall population, end-up being distributed across dual-earning couples.

Let us recall that two competing hypotheses emerged for this question, and start with average European results. The first perspective argues that non-standard-employment in dual-earning couples leads to a disguised form of male-single-earning ("modified-male-breadwinning"). We would have, in each dual-earning couple, one partner in standard-employment, and the other in non-standard-employment.

The second argues that if labour market resources and outcomes increasingly polarise in couples, we should instead witness polarisation across dual-earning couples specifically, between those with both partners in standard employment, and those with both partners in non-standard-employment. The former would translate into an excess of one-and-a-half-earning couples compared to its counterfactual, the latter would correspond to an excess of dual-standard-earning and/or dual-non-standard-earning compared to their counterfactuals.

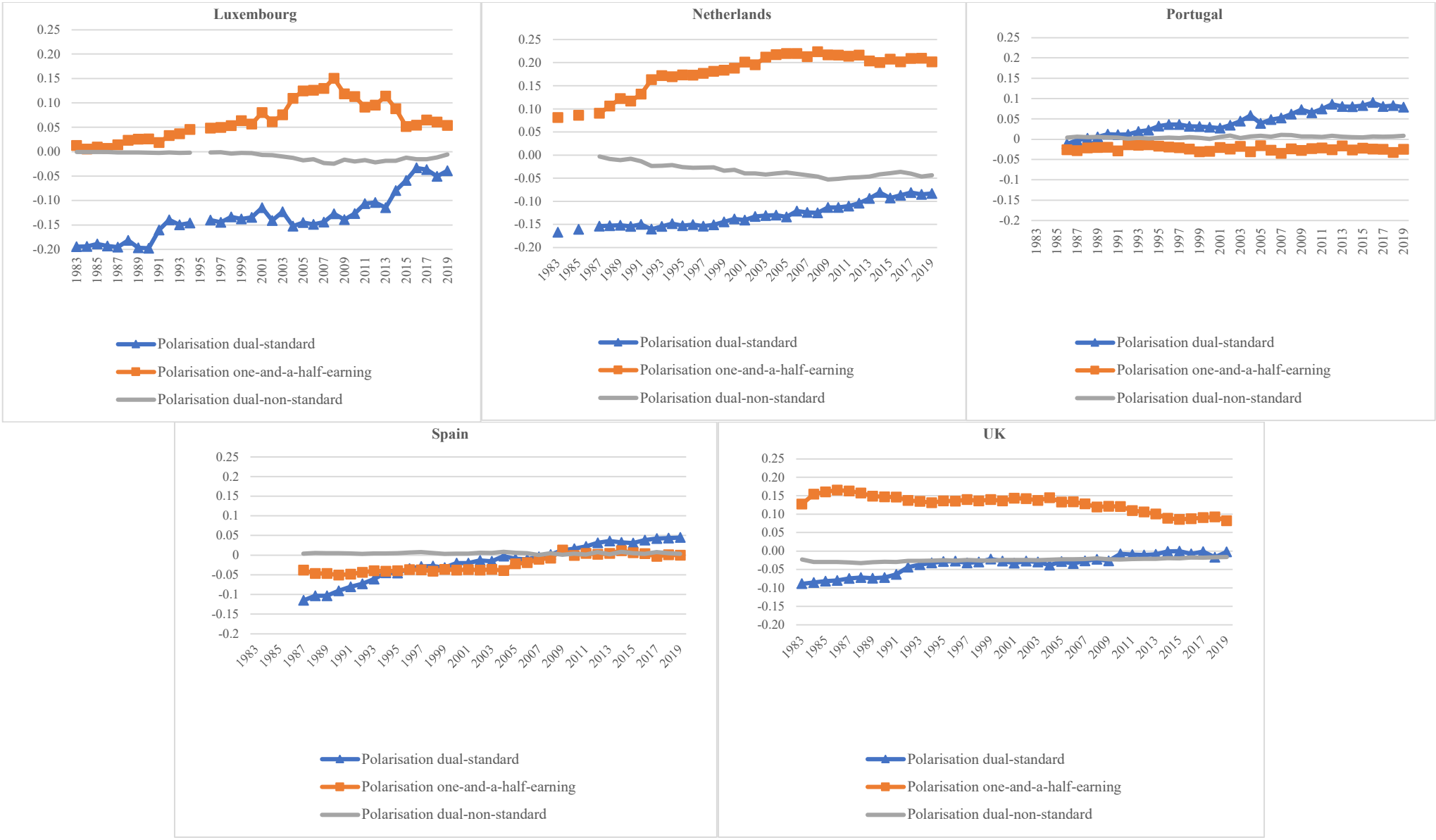
Figure 16 plots the evolution, on average, across Europe, of polarisation indicators capturing the distribution of standard and non-standard-employment across dual-earning couples. It shows that both competing perspectives are to some extent true – one "statically", and one "dynamically. At any point in time over the past forty years, the polarisation sub-indicator for one-and-a-half-earning is positive.

Figure 17: Evolution over time of the distribution of standard and non-standard employment in Europe



Note: this graph shows the evolution over time of the polarisation sub-indicators derived for each subtype of dual-earning couples as the difference between the actual rate of this subtype of couple and its counterfactual based on a random distribution of standard and non-standard-employment.
The early fluctuations at the start of the 1980s are due to different countries joining the dataset in slightly different years. The fluctuation in 1999 and 2000 is linked to a change in the way part-time employment is imputed in Belgium, leading to an artificial decrease in part-time employment rates for these two years.
Source: author's own calculations using the EU-LFS.

Figure 18: Evolution over time of the distribution of standard and non-standard employment across countries



Note: these graphs break-down the information shown on Figure 16, by country.
Source: author's own calculations using the EU-LFS.

Even when Europe had negative overall polarisation, in the 1980s, there was an excess of one-and-a-half-earning couples compared to a random distribution of standard and non-standard-employment. At any point in time after overall polarisation becomes positive, if we take the static picture, the main contributor to this polarisation is an excess of one-and-a-half-earning couples.

Dynamically, however, the biggest rise in polarisation sub-indicator is from the dual-standard-earning polarisation sub-indicator, which has risen much more strongly than the other sub-indicators. It started deep in the negatives, and is now weakly positive. It has been, by far, the most important driver of the rise in overall polarisation. Finally, the polarisation sub-indicator for dual-non-standard-earning remains broadly stable and slightly negative, despite the overall rise in dual-non-standard-earning couples.

So, back in the 1980s, the "modified-male-breadwinning" perspective was undoubtedly correct. There was a shortfall of dual-standard and dual-non-standard-earning couples. Couple employment was primarily male and standard, and that meant standard employment was very evenly distributed across couples, widely unevenly distributed within couples. If the couple at that time happened to be dual-earning, it was disproportionately likely to be (compared to the counterfactual), a one-and-a-half-earning couple, essentially a modified form of the classic male single-earning model, with non-standard-employment a complement to a standard job.

The fact that the polarisation sub-indicator for one-and-a-half-earning was already positive in the 1980s, and rose only weakly since, suggests that the one-and-a-half-earning model, as a share of all couples, rose roughly in proportion with the overall evolutions of standard and non-standard-employment rates. In particular, the rise of non-

standard-employment over the period did not significantly reinforce the tendency for non-standard-employment to be a complement job to a standard employment: this tendency already existed when dual-earning was not the dominant model of couple employment.

Instead, dynamically, the evolution of couple employment participation is much more in line with the "polarisation" hypothesis. As dual-earning rose, overall polarisation rose, and was essentially driven by a rise in the polarisation sub-indicator for dual-standard-earning, indicating a rising tendency for standard employment specifically to cluster in couples.

Because non-standard-employment is disproportionately taken-up by women, and women drove the rise in employment rates over the past four decades, there might be a tendency in employment research to associate rising employment with rising female-non-standard-employment.

This is correct, but only to some extent. As shown in Appendix B.4, female-non-standard-employment rises over the period, but less than female standard employment, which is the main driver of female employment rise, and overall employment growth over the period. At the same time, male standard-employment decreases.

The rise in the clustering of standard employment in couples can therefore be interpreted as women joining the labour market in a standard job being disproportionately likely to do so with a male partner also in a standard job. At the same time, losses of standard jobs for male single-earners, for instance standard industrial jobs, may have further contributed to the end of a model in which standard employment was very evenly distributed across couples, and very unevenly distributed within them.

At the other end, we do not witness an increase in clustering of non-standard-employment in dual-earning couples: dual-non-standard-earning couples did grow as a share of all couples, but this growth has been roughly proportionated to the overall rise of non-standard-employment in society. The rise of non-standard-employment over time, while it did not significantly reinforce its role as a complement to a standard job in dual-earning couples, did not challenge it either by disproportionately promoting the rise of a model whereby both partners would be in non-standard-employment.

This also means that the clustering of standard-employment in couples did not happen at the expense of another pole being dual-non-standard-earning couples, i.e., did not lead to a polarisation within dual-earning couples specifically, but happened instead at the expense of other couple types, the most likely outcome being an increase in the clustering of worklessness. However, as we shall see, there is a large degree of differences across countries, departing from this European average analysis, to which we now turn.

The first thing to note is that the rise in the dual-standard-earning polarisation sub-indicator cuts across all countries studied. It may vary in relative strength, in starting or arrival points, but there is everywhere a significant rise in this sub-indicator. To some extent, in all countries studied, the "homogamy" hypothesis, linked to the accumulation of labour market resources and outcomes in couples, is at play. But cross-country variations exist in terms of how important this increasing clustering of standard employment in couples is, compared to the one-and-a-half-earning model.

France, Ireland, Italy, Luxembourg and the UK are, broadly speaking, in line with the average European evolution already discussed at length. The UK, amongst them, is a special case. As a country that already had a very high level of one-and-a-half-earning

and female (non-standard) employment rates in the 1980s, it actually saw the polarisation sub-indicator for one-and-a-half-earning decline over the period (but remain positive).

Then, there is a potential Mediterranean model emerging. Portugal, Spain and Greece resemble each other in that, not only is their polarisation sub-indicator for dual-standard-earning rising much faster than their one-and-a-half-earning polarisation sub-indicator, but for all or most of the period, the dual-standard-earning polarisation sub-indicator has been above the one-and-a-half-earning one.

Portugal, Greece and Spain are unique in that the homogamy hypothesis dominates not just dynamically, but also at any point in time, in being the main contributor to overall polarisation. The role played by non-standard employment widely differs in these countries from the rest. They are the only countries in which the polarisation sub-indicator for one-and-a-half-earning is negative, denoting a shortfall of such couples compared to the counterfactual, and the polarisation sub-indicator for dual-non-standard-earning is positive (and slightly rising over time), denoting a clustering of non-standard-employment in dual-earning-couples.

Finally, Belgium, Germany and the Netherlands depart from the European average in that, although there has been a rise in the polarisation sub-indicator for dual-standard-earning over time in these countries, the key element remains the excess of one-and-a-half-earning couples compared to the counterfactual, which is higher and rises as much or faster over time than the indicator for dual-standard-earning.

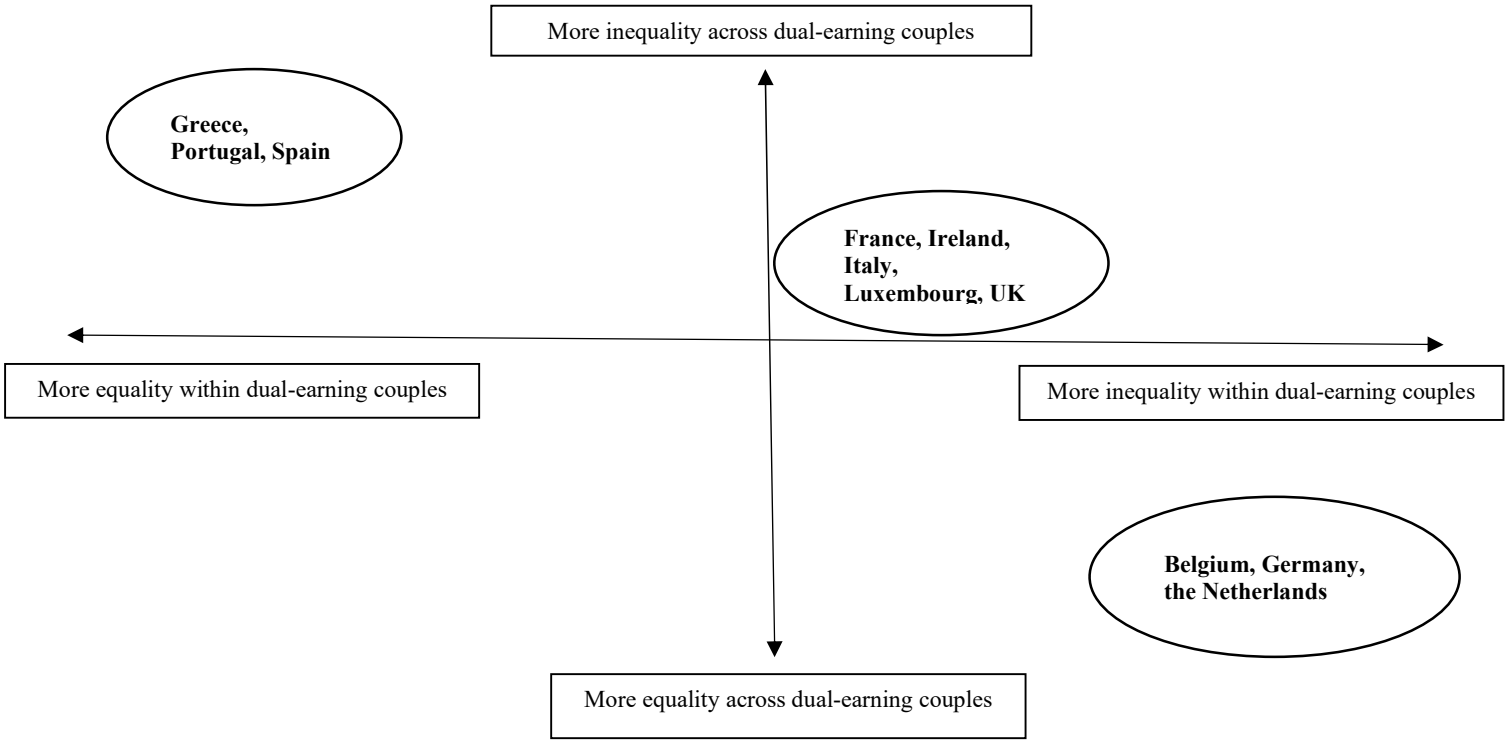
Overall, three main models emerge from these results, as illustrated by Figure 18. Bear in mind when interpreting these that they relate to how standard and non-standard-employment are distributed across dual-earning couples specifically. We have already

seen that all countries studied exhibit polarisation overall ("layer 1 inequality") – this analysis breaks-down the different types of such polarisation.

The Netherlands, Belgium, and Germany, located at the bottom-right of the figure, follow a model of "across dual-earning couple equality – within dual-earning couple inequality". The rise in polarisation of overall dual-earning there is sustained, at any point in time and dynamically, by a very even distribution of standard and non-standard-employment across dual-earning couples. Inequality in standard employment access is found within dual-earning couples rather than across them. So, here, layer 1 and layer 3 inequality come together.

Greece, Spain, and Portugal, are on the opposite of the diagonal, following a model of "across dual-earning couple inequality – within dual-earning couple equality". Standard and non-standard employment cluster in dual-earning couples. This latter feature is unique to these countries, and may illustrate labour markets that have become particularly dualized. This is all the more striking considering the relatively high lower-bound for age in this sample (35 years old): this dualization is therefore not driven by young couples stepping onto the labour market. Here, layer 1 inequality comes with layer 2 inequality.

Figure 19: Models of inequality in the distribution of standard and non-standard employment within and across dual-earning couples in Europe empirically



Note: this figure illustrates the clustering of different countries with regards to the way standard and non-standard employment are distributed across their dual-earning couples, based on the empirical analysis. Source: author's own calculations using EU-LFS data.

It is important to note that these figures refer to dual-earning couples only – and referring to Greece, Portugal and Spain as equal as I just did has to be understood as "equal in relation to how full-time employment is distributed across dual-earning couples specifically". This does not preclude these countries being unequal in other respects – for instance, via a high rate of male breadwinning, which is indeed documented in Chapter 9 for Italy and Greece especially – but this is not the object of study in this chapter, which focuses on dual-earning, and the inequality generated in relation to the rise of dual-earning specifically. Dual-earning couples in these countries tend to be unequal in terms of which couples access standard or non-standard employment at all, rather than in the gender take-up of non-standard employment.

France, Ireland, Italy, Luxembourg and the UK are countries that follow a model of "mixed inequality". The polarisation sub-indicator for one-and-a-half-earning is positive in these countries, hence their location on the right side of the graph – but the main driver, over time, of the rise in the polarisation of overall dual-earning is the polarisation sub-indicator for dual-standard-earning (which is positive in France and Ireland as of 2019, around zero for the UK and Italy, slightly negative for Luxembourg), albeit not resulting in the clustering of non-standard-employment in couples (and therefore presumably resulting in the clustering of worklessness in couples instead). All three layers of inequality characterise to some degree these countries.

One thing to note however, is that these countries do not necessarily exhibit higher overall polarisation levels, or faster increases in overall polarisation, than the others. What it means is that the "mixed inequality" cluster has more social cleavages with regards to couple employment, and that the better-defined clusters have more clearly defined cleavages, but it does not imply a clear-cut relationship with the overall level of polarisation.

10.4.3. Putting everything together: how do the evolutions in polarisation and non-standard-earning in Europe account for the rise in dual-earning over the past four decades?

I apply a shift-share to better understand how the links between polarisation and non-standard-employment have contributed to the rise in dual-earning rates over the years in Europe. Tables 4 and 5 show, respectively, the evolution on average across Europe, and the evolution by country. Full results for each country-year are available in Appendix B.6.

The equation seeks to understand one outcome: the rate of dual-earning. It is decomposed, in the next two columns to its right, into two main components: the counterfactual, which

represents the contribution of the "stock" of employment in society to the rate of dual-earning, and the polarisation indicator, which represents the contribution of how evenly or unevenly this stock is distributed, to the rate of dual-earning.

Each of these components is decomposed further in terms of standard and non-standard employment. The "stock" of employment directly results from the "stock" of standard and non-standard employment. The "distribution" component depends on how these levels of standard and non-standard employment are distributed across dual-earning couples, more particularly, how they shape the different subtypes of couples that make-up the dual-earning category. A positive polarisation indicator for dual-earning overall, which in practice characterises all European countries today, can hence be decomposed in terms of which type of dual-earning couple fuels this employment accumulation in couples.

With that in mind, let us start with the average European results. They show that the near doubling of dual-earning rates over the past four decades, has far exceeded the counterfactual rise: dual-earning has risen more than what the mere rise in employment rates ("the stock of employment") would have led to if it had been randomly distributed. This corresponds to the rise in overall polarisation already documented in this chapter and in Chapter 9. As we saw in that chapter, this rise in polarisation mostly occurred in the 1980s and 1990s, but, although it has slowed-down, it remains that European societies are polarised, with employment unevenly distributed across couples and accumulating in dual-earning couples.

Further, the rise in the "stock of employment" has been primarily driven by a rise in non-standard-employment.

Table 4: Shift-share equation components on average in Europe

Country	Year	Dual-earning rate	Counterfactual dual-earning rate	Polarisation dual-earning indicator	Standard employment rate	Non-standard-employment rate	Polarisation dual-standard-earning sub-indicator	Polarisation one-and-a-half-earning sub-indicator	Polarisation dual-non-standard-earning sub-indicator
Europe	1983	0.37	0.43	-0.06	0.55	0.08	-0.13	0.01	0.00
Europe	2019	0.72	0.66	0.06	0.60	0.20	0.00	0.06	-0.01
Europe	**Difference**	**0.35**	**0.22**	**0.12**	**0.05**	**0.12**	**0.13**	**0.04**	**-0.01**

Table 5: Evolution in the shift-share equation components between 1983 and 2019 by country in Europe

Country	Year	Dual-earning rate	Counterfactual dual-earning rate	Polarisation dual-earning indicator	Standard employment rate	Non-standard-employment rate	Polarisation dual-standard-earning sub-indicator	Polarisation one-and-a-half-earning sub-indicator	Polarisation dual-non-standard-earning sub-indicator
UK	Difference 2019-1983	0.19	0.16	0.03	0.09	0.02	0.09	-0.04	0.01
France	Difference 2019-1983	0.21	0.10	0.11	-0.02	0.11	0.15	0.03	0.00
Greece	Difference 2019-1983	0.21	0.11	0.11	0.11	0.03	0.15	0.08	0.01
Italy	Difference 2019-1983	0.22	0.10	0.12	-0.05	0.14	0.10	0.06	-0.01
Portugal	Difference 2019-1986	0.32	0.24	0.08	0.09	0.08	0.09	0.00	0.00
Germany	Difference 2019-1984	0.33	0.23	0.10	0.00	0.16	0.07	0.10	-0.03
Belgium	Difference 2019-1983	0.41	0.26	0.15	0.04	0.16	0.11	0.10	-0.02
Spain	Difference 2019-1987	0.45	0.29	0.16	0.09	0.15	0.16	0.04	0.00
Luxembourg	Difference 2019-1983	0.46	0.28	0.18	0.07	0.13	0.16	0.04	-0.01
Netherlands	Difference 2019-1983	0.49	0.35	0.14	-0.01	0.26	0.08	0.12	-0.04
Ireland	Difference 2019-1983	0.52	0.33	0.18	0.16	0.10	0.19	0.01	-0.01

Note: these tables show the values of the different component of the shift-share equation decomposing in any given year and country, the dual-earning rate between the contribution of the stock of employment, as expressed by a counterfactual obtained under the assumption that employment is randomly distributed, and the way employment is actually distributed in practice, captured by the overall polarisation indicator. Each component is then further decomposed to account for the roles of standard and non-standard-employment.
Source: author's own calculations using the EU-LFS.

In fact, non-standard-employment plays a much more prominent role in raising the "stock of employment" (as expressed by the counterfactual) than in contributing to the increase in polarisation, when distinguishing between the roles of these two components in accounting for the rise of dual-earning.

This further confirms what we saw in the previous section: the rising clustering of employment in dual-earning couples is primarily a rising clustering of standard employment. This also helps makes sense of the fact that rising non-standard-employment rose, but it did not reinforce its role as a complement to a standard job in a couple: rather, it just maintained it by contributing to a rise of one-and-a-half-earning couples in proportion to its own rise, and by ricochet, to the rise of dual-earning couples in proportion to its own rise.

These results can be interpreted in light of the "homogamy" hypothesis. As non-standard employment rises and represents an increasing share of employment rates, standard employment becomes a relatively scarcer resource. The couple becomes a medium to capture such a resource, whereby advantaged couples (in terms of human capital) are able to seize it: dual-standard-earning rose significantly more than what the (relatively weak) rise in standard employment would have led to predict if it has been randomly distributed across couples.

Decomposing the rise in standard employment by gender (Appendix B4) shows that standard employment rates for partnered men actually fell on average over the period: the rising clustering of standard work in couples comes on the back of a rise in standard employment for women, but a fall for men, which corresponds, as seen in the Chapter 9, to the fall in standard industrial, male-single-earning jobs, and to women more likely to

gain standard employment with a male partner also in standard employment. The fact that the clustering of dual-standard-earning rose while male standard employment in Europe fell also reinforces the idea that the increase in the relative scarcity of such jobs increases the role of the couple as a medium to capture it.

Overall, the rise of dual-earning in Europe has been driven by rising polarisation of employment across all couples ("layer 1 inequality").

This has come with a limited rise in inequality across dual-earning couples, whereby standard employment would cluster in some of them and non-standard-employment would cluster in others ("layer 2 inequality"). Indeed, standard employment has increasingly been clustering in couples, but not non-standard-employment, which remained predominantly a complement to a standard job.

The stability of the distribution of non-standard-employment across dual-earning couples means that the standard/non-standard gender divide within couples ("layer 3 inequality") exists but remained stable.

As we saw in the previous section, however, the European average hides different models with regards to layer 2 and layer 3 inequalities. Now that I have put everything together through the shift-share equation, I analyse how the variables that make it up and compose the evolution in dual-earning rates, vary across the countries studied.

The shift-share equation shows that all countries exhibiting an above average increase in dual-earning also saw an above average increase in overall polarisation or non-standard-employment, and in practice, in both dimensions in all instances but Ireland. Spain, Luxembourg and Ireland are countries that began the 1980s with very low dual-earning

rate and caught-up, exhibiting the three biggest rises in polarisation (driven by the clustering of standard employment in couples).

Belgium and the Netherlands started the 1980s with dual-earning rates below average, but only just, and the rise in non-standard-earning and its use as a complement to a standard-job is the main feature explaining the evolution of their dual-earning rate. Things are very similar in Germany, where the rate of dual-earning increase has been just below average, but from a higher starting point. The case of Portugal is discussed extensively in the next subsection.

While stronger dual-earning increases are associated to stronger rises in at least overall polarisation or non-standard-employment, the reverse is also true: countries with the weakest rises in dual-earning rates also oversaw comparatively weak increases in overall polarisation and non-standard-employment (although, in the case of France and the UK, this is largely explained by a comparatively high dual-earning starting point in the 1980s).

So, strictly speaking, the results show that a necessary condition for a country to have an above average increase in dual-earning rates is to either have an above average increase in overall polarisation of dual-earning, or in non-standard employment, and in practice, in most cases, in both, inducing at least one of the three layers of inequality described.

Abstracting from issues regarding the strength of the dual-earning rise, in 2019, in all countries, from the lowest to highest dual-earning rates, the polarisation indicator for dual-earning is positive; non-standard-employment rates are, at a minimum, at 10%; the polarisation sub-indicator for dual-standard-earning has been rising (although it is not positive everywhere in 2019); the polarisation sub-indicator for one-and-a-half-earning

has been weakly rising or stable (except in the UK) and is positive in all but two countries (Greece and Portugal).

There is no clear case, say, of a country overseeing an above average increase in dual-earning, this increase being entirely accounted for by the counterfactual (i.e., by rising employment rates), and the rise in the counterfactual being primarily driven by standard employment. Similarly, in 2019, there is no country with above European average dual-earning rate, this rate being accounted for entirely by the level of employment and this employment being standard entirely or almost.

From these results, it therefore appears that, if dual-earning is seen as a socially desirable goal combining policy goals such as gender equality and high employment rates, it has to be achieved with polarisation ("layer 1 inequality") or (and most often, and) non-standard-employment - which, depending on the models explored when discussing research question 2, can take the shape of "layer 2 inequality" between dual-earning couples or "layer 3 inequality" within dual-earning couples, and sometimes a combination of both.

A potential exception to this trade-off could be Portugal, which achieves the third-highest rate of dual-earning in the dataset with levels of polarisation and non-standard-employment in line with or below EU average.

Portugal undoubtedly does comparatively well. But there are a few caveats. The first is that, albeit comparatively low, the level of overall polarisation is still positive, and the level of non-standard-employment remains important (nearly 15%), and, though more moderately than average, both variables have increased over the past forty years.

The second is that, in Portugal, although the polarisation indicator for dual-earning is comparatively low, once it is decomposed, it shows a strong inequality across dual-earning couples, with standard-employment clustering in certain dual-earning couples, and non-standard employment in others. Portugal could be a prime example of the changing face of polarisation: no longer dual-earning versus dual-workless, but dual-standard versus dual-non-standard.

The third is a point that extends beyond Portugal. As the shift-share equation shows, in Europe, the main role that non-standard-employment has been playing in increasing dual-earning rates, is increasing employment rates, the "stock of employment". It is possible that it does by pushing into employment (or creating employment opportunities, for a more positive framing), groups traditionally remote from the labour market, such as housewives, long-term jobless people, low-skilled people, because of the flexibility associated to non-standard-jobs. In a nutshell, it creates the "cheap labour" needed for economies to grow (King and Rueda 2008).

Portugal does have comparatively low non-standard-employment. But it also has comparatively low wages and it is possible that the "flexibility" of the labour market there and the high levels of employment, rather than on non-standard-employment, rely on low wages. Countries may adopt different strategies in terms of how they make their labour market more flexible (Barbieri 2009).

Finally, linking back to how the countries studied can be grouped by welfare-state type, what clearly emerges is, again, phenomena that tend to cut across welfare-state typologies. Everywhere, non-standard employment is on the rise; everywhere, standard-earning increasingly tends to cluster in couples. What varies is the nature of the use of the

former in couples, and the intensity of the latter. The phenomenon that is the most clearly associated to a welfare-state type, is the polarisation of dual-earning couples between dual-standard-earning on one side, and dual-non-standard-earning on the other, which is particularly acute in the Mediterranean welfare-states. This speaks for a segmentation of the labour market in these countries, which has been documented in the literature (Westhoff 2024), and which, as we shall see in the robustness analyses, is particularly linked to the prevalence of temporary employment as a form of non-standard employment, and its clustering in couples.

10.5. Robustness analyses

The results of the robustness analyses estimated with a 25-55 age cut-off are very similar in all respects to the main specification, and are available on request from the author. I concentrate here on discussing the others which yield more interesting substantive insights. Full results of these analyses are available in appendix B.7.

Part-time work as working less than 30 weekly hours

Operationalising part-time work as working less than 30 hours per week, and full-time work as 30 or more, rather than basing it on the respondent's self-reported status, also generally lead to very similar conclusions. In general, what the change means that the non-standard-employment rate, and all the derived variables, are slightly lower than in the main specification.

There are a few countries for which this gap is quite significant, especially Belgium, the Netherlands and Germany, presumably countries in which work of at least 30 hours per week but in which respondents consider themselves working part-time (for instance, work on the 30-34 segment, very substantial part-time), is important. In the case of Belgium,

which, amongst the Netherlands-Germany-Belgium "across dual-earning couple equality – within dual-earning couple inequality" cluster was already the case closest to being an intermediate case with the "mixed-inequality" cluster, this is enough to now move Belgium in the "mixed-inequality" group.

And it makes intuitive sense – if most women in Belgium who work part-time are in fact almost in full-time work (say, working 33 hours per week), then it has to reduce the extent to which we consider Belgium a country in which dual-earning comes with within dual-earning couple gender inequality. Beyond the Belgian case, this new definition of full-time and part-time work means more employment is considered standard, and tends to slightly reinforce the results with regard to the role of the increasing unevenness of standard employment distribution over tome across all couples.

Generally, though, the conclusions – with regards to the concomitant rise in polarisation and non-standard-employment, the change in the way standard and non-standard-employment are distributed over time, the cross-country differences and similarities, the main components of the shift-share equation – remain very similar. The nuances between the two operationalisations relate to a more general limitation of this chapter – treating non-standard-employment as the same across different countries, an active decision made to enable comparisons across time and places while maintaining parsimony in the results – that I come back to in the concluding chapter.

Self-employment as non-standard employment

Classifying self-employment as a non-standard form of work, unsurprisingly, mechanically increases the non-standard-employment rate and the associated variables, for instance the rate of one-and-a-half-earning couples. The evolution over time of the

polarisation sub-indicator for dual-standard-employment is very similar to the main specification.

What changes, in many countries, are the other two polarisation sub-indicators. The one regarding on-and-a-half-earning now starts in the negative in many places, and rises over time, but often remains either negative, or a less important contributor to overall polarisation than the dual-standard-earning polarisation sub-indicator. The one regarding dual-non-standard-earning is now positive and stable across most places.

This specification reinforces the distinctiveness of the Belgium, Germany and Netherlands cluster (especially the latter two, while, as in the other specifications, Belgium is slightly closer to being a mixed case). On the other hand, it tends to erase the distinction between the "mixed" cluster, and the cluster of Portugal, Greece and Spain, in the sense that all countries now move towards the "across dual-earning couple inequality – within dual-earning couple equality" that the three Mediterranean countries represent, with standard employment clustering in some couples and non-standard-employment clustering in others.

This suggests that employee jobs cluster in couples in these countries, and self-employment jobs cluster in other. This warrants a final analysis, looking separately at part-time, temporary and self-employment.

Part-time, temporary, and self-employment, analysed separately

The first thing that analysing these three forms of work separately reveals, is that, when we talk about non-standard-employment in dual-earning couples, part-time work is the most important category. All forms of non-standard-employment in dual-earning couples rise over time, but, both in rise over time and overall share of dual-earning couples it

represents, the “one partner full-time, one partner part-time” model is the main one. Therefore, the rise in overall polarisation over time is most strongly correlated with the rise in part-time employment.

The full-time/part-time divide, the way they are distributed across couples and how these evolutions evolve over time, are really what shape the evolutions over time in the way standard and non-standard-employment are distributed across couples, and the cross-national differences in this respect. Everywhere, the graphs in Figure 17 are almost identical to the same graphs studying the evolution of the distribution of part-time and full-time work across dual-earning couples, by country.

On the other hand, the permanent/temporary and employee/self-employed divides are much more similar in the couple inequality outcomes they yield across countries.

For the former, there is a generally strong excess of dual-permanent couples compared to the counterfactual, about as many dual-temporary couples as the counterfactual would suggest, and a strong shortfall of couples with one partner in permanent and the other in temporary work compared to the counterfactual.

This suggests that homogamy in permanent employment is not necessarily at the detriment of other dual-earning couples, but of other couple types, that are not dual-earning (for instance, workless couples). This also suggests that temporary employment is not seen as a complement to a standard job, and is perhaps more of an involuntary form of work. The only countries that stand-out slightly are Portugal, Spain and Greece, with a stronger tendency for temporary work to cluster in couples – which relate to the more general finding that these countries exhibit a stronger inequality across dual-earning couples specifically, between dual-standard and dual-non-standard couples.

For the latter, there is an excess both of dual-employee couples and of dual-self-employed couples compared to their respective counterfactuals, which according to countries may have risen over time, or been more stable. On the other hand, there is a shortfall, though less pronounced than in the case of the permanent/temporary divide, of couples organised around one partner in employee work, and the other in self-employment. Here, this suggests a polarisation within dual-earning couples specifically, with employee and self-employed work coming in dual-earning couples.

10.6. Conclusion

Three hypotheses guiding the empirical work of this chapter. The first was that non-standard employment in dual-earning couples, and overall polarisation, have risen together over time and that their rise is positively correlated.

The empirical results supported this hypothesis. Over time, in Europe, there has been a simultaneous rise in the prevalence of couples in which at least one partner is in non-standard employment, and in the polarisation of the distribution of employment across couples. Although to varying degrees of magnitude, these evolutions were common to the 11 countries studied, which all saw the degree of "layer 1 inequality" increase over time.

The second hypothesis proposed two potentially contrasting hypotheses regarding the distribution of standard and non-standard-employment across dual-earning couples: the "modified-male-breadwinner" hypothesis according to which standard and non-standard employment would be evenly distributed across them, and the "homogamy hypothesis" predicting the clustering of standard employment in some dual-earning couples and of non-standard-employment in others.

The empirical results supported both perspectives in different ways. Statically, at any given point in time in Europe and on average, the clustering of employment in dual-earning couple was supported by a very even distribution of standard and non-standard-employment across dual-earning couples, along the lines of the "one-and-a-half" model.

But this was already true in the 1980s, when overall polarisation of couple employment was very low and dual-earning was not the dominant model. Dynamically, what drove the rise in the clustering of employment in couples across Europe was an increase in the clustering of standard employment, at the same time as dual-earning rose.

On average, this did not lead, however, to the clustering of non-standard-employment in couples on the other hand: rising non-standard-employment continued to predominantly fuel jobs that were used as a complement to a standard job in a couple, in proportion with the overall rise of non-standard-employment. Rising non-standard-employment contributed a lot more to raising the "stock" of employment, than the unevenness of its distribution across all couples and across dual-earning couples specifically.

This means that the rising clustering of standard-employment in couples, in general, was not done at the expense of other dual-earning couples in which only non-standard-employment would be found, but at the expense of dual-workless couples.

Moreover, while this was true on average, different country models emerged. Mediterranean countries (bar Italy) in fact did constitute clear departures from the average European results, with rising polarisation across dual-earning couples between dual-standard and dual-non-standard-earning, constituting the purest outcome predicted by the homogamy perspective. Belgium, Germany and the Netherlands, on the other hand, constituted clear cases predicted by the "modified male-breadwinner perspective" of

strong equality across dual-earning couples and inequality within them. The other countries showed a mix of both tendencies.

The third hypothesis posited that for societies to transition to dual-earning as the dominant model, it is necessary that at least one of the three layers of inequality rose. The results supported this hypothesis: generally, the strongest increases in dual-earning rates, and the highest dual-earning rates as of 2019, have been sustained at least by either polarisation or non-standard-employment, and often both, inducing at least one of the three associated layers of inequality. So, there is a trade-off: more dual-earning comes with more of one of these three forms of inequality. It is not so much that countries differ in the sense of some being more equal than others, as that they differ in the locus of inequality.

Robustness analyses, especially separating full-time/part-time, permanent/temporary, and employee/self-employment, emphasised the different roles that they play. Most of the European evolutions across the past four decades, and of the differences across countries, in the way standard and non-standard employment are distributed across all couples, across dual-earning couples and within dual-earning couples, are due to the way full-time and part-time employment are distributed.

Permanent/temporary work and employee/self-employed work, tend to generate homogamous employment outcomes, in a way that is rather uniform across countries and times. There are important policy and future research implications to this specific finding, and to this chapter in general, which, for the same reasons as in chapter 9 are left for the concluding chapter, chapter 12.

Chapters 9 and 10 have contributed to refine our understanding of the role of non-standard-employment in affecting inequality within and across couples, in terms of

employment access. While Chapter 10 focused on the now predominant form of couple employment pattern, dual-earning, much policy and academic attention has been devoted to the opposite end of the scale: dual-workless couples. The link between dual-worklessness and the evolutions in the role of non-standard-employment in couples, is what the final empirical chapter of this thesis turns to.

11. Exits from dual-worklessness before and after a labour market reform: evidence from Germany.

11.1. Introduction

Dual-workless couples, which have attracted much academic and policy attention, have been declining as a proportion of all working-age couples since the mid-2000s in Europe, as shown in Chapter 9. However, Chapter 9 also shows that, on aggregate, they have been replaced by a new form of couple arrangement, much less identified and studied: couples that are not jobless but in which no partner is in standard (full-time, open-ended) employment, thereafter referred to as "non-standard-earning" couples.

This is a significant development given the social disadvantages associated to, and the potential precariousness induced by, non-standard employment, as detailed in Chapter 4. Non-standard employment does not have the same social implications when it complements a standard job and when it is the only source of labour earnings (Nolan and Marx 1999, Horemans et al. 2016). The situation of non-standard-employed couples may go under the radar of welfare-states, despite disproportionate poverty risks for households in which the only source of labour income is derived from non-standard jobs (OECD 2015).

But in a couple perspective, non-standard employment is rarely conceived as the sole source of labour income. Most often, it is studied at the individual level in terms of its implications for earnings, socioeconomic outcomes, or future labour market prospects (Bardasi and Francesconi 2000, Aaronson and French 2004, Filomena and Picchio 2021, Manning and Mazeine 2022). When studied at the couple level, it is most often understood as a complement to a standard income, in the "one-and-a-half" earning model

(Lewis, Campbell and Huerta 2008, Hook 2015), described at length throughout this thesis.

We are therefore faced with two concomitant phenomena, that are under-documented, or poorly understood: the decline in dual-worklessness, and the rise in non-standard-earning couples. The aim of this chapter is to study both issues and explore whether they are linked. The main hypothesis is that the decline in dual-worklessness, and concomitant rise in non-standard-earning couples, reflects the change of priority in social and labour market policy in Europe.

Systems centred around compensating workers upon the occurrence of a social risk, like unemployment or disability, typically with generous and long-term out-of-work benefits, have evolved towards putting people back into employment upon the realisation of the risk as the overarching aim, via active labour market policy, conditionality and sanctions, combined with less generous unemployment benefits (Eichhorst et al. 2008, Eichhorst and Marx 2012, Boeri and van Ours 2013).

Typically, labour market reforms of the past decades have targeted people with traditionally low employment rates or difficulties integrating on the labour market (European Council 2000, Barbieri 2009, Emmenegger et al. 2012). Dual-workless couples, because of their tendency (perceived or real) to rely on the benefit system, are amongst those (Daly 2011).

Non-standard employment may therefore provide an opportunity for people in couples with low labour market attachment to find a job that they would have otherwise struggled to find. But in doing so, the couple may have lost its role of buffer against non-standard-employment being the only source of labour income in the household. Disadvantaged

couples that may have been dual-workless four decades ago, could potentially now find themselves on the fringe of the labour market, in a non-standard-earning arrangement.

This chapter studies Germany because it is a country in which the decline of dual-joblessness and rise in non-standard-earning is particularly marked, as found in chapter 9, and in which deep labour market reforms aiming at increasing employment, particularly amongst people furthest away from work, occurred in the mid-2000s (the Hartz reforms).

In this context, the chapter studies how dual-worklessness exits evolve after a labour market reform aiming at increasing employment and re-employment. Please note that the language here is deliberately not causal – "after a labour market reform" rather than "caused by a labour market reform". This is because, as the analytical strategy section will detail, the roll-out of the Hartz IV reform makes causal identification very difficult, and while the research design used is close in spirit to quasi-experimental designs, the limitations linked to these practicalities must be kept in mind throughout. The research questions guiding this chapter are:

RQ1: Does the rate of exit from dual-worklessness change after the Hartz IV package, a reform aimed at increasing re-employment rates?

RQ2: Does the type of exit out of dual-worklessness made by dual-workless couples change after the Hartz IV package?

11.2. Institutional background

Germany provides a good ground for this chapter, because of the Hartz reforms. Made of four broad packages passed between 2003 and 2005, they overhauled the German labour market, reforming job centres to make them more efficient, liberalising the use of

temporary, part-time and mini-jobs (marginal part-time jobs capped at 400 euros monthly), changing the obligations of jobseekers and the counselling they receive, and cutting the generosity of unemployment benefits for long-term unemployed, amongst its cornerstone elements. Table 6 summarises the main elements of each reform package, as compiled by the General Direction of the Treasury (Direction Générale du Trésor, the French Ministry of Economics 2013).

Table 6: Main characteristics of the four packages of Hartz reforms

• ***Hartz I (January 2003)*** *facilitated jobseeker training and back-to-work measures for the unemployed, including the introduction of personal service agencies (Personal Service Agenturen) i.e., temporary agencies set up under the public employment service agencies. The law also overhauled the system of jobseekers' rights and obligations, including a reversal in the burden of proof for rejected job offers, with the jobseeker now required to prove that an offer was not reasonable. Finally, Hartz I extended the potential for temporary employment by eliminating the maximum duration of an assignment (which had been 24 months) and by opening the possibility of exceptions from the obligation of equal treatment and pay between temporary (agency) staff and permanent employees.* • ***Hartz II (April 2003)*** *created a new grant to facilitate the transition from unemployment to entrepreneurship (the IchAG, or one-person company, which was combined in 2006 with the transition benefit, the Überbrückungsgeld, to form a new start-up subsidy, the Gründungszuschuss); and extended the range of so-called marginal jobs (creating mini-jobs and midi-jobs, i.e. very marginal forms of part-time work capped at a small amount of earnings per month).* • ***Hartz III (January 2004)*** *reformed the public employment service agency), whose name was changed to Bundesagentur für Arbeit (or BA, Federal Employment Agency); it restructured management at the federal level, provided greater local autonomy, and restructured the offices to increase the ratio of counsellors to jobseekers. Hartz III also merged job creation measures (Arbeitsbeschaffungsmaßnahmen, or ABM) with structural adjustment measures (Strukturanpassungsmaßnahmen, or SAM), and reduced their maximum duration. Further, the conditions for unemployment insurance benefits were made stricter, with the minimum prior-contribution period changed from 12 months in the previous three years, to 12 months in the previous two years.* • ***Hartz IV (January 2005)*** *amalgamated two forms of assistance into a single benefit. The previous long-term unemployment benefit (Arbeitslosenhilfe) was intended for those whose unemployment insurance benefits had expired, and was proportional to the reference salary. The other was a social welfare benefit intended to provide a minimum income. When they were combined into the single Hartz IV benefit, called Arbeitslosengeld II, eligibility was contingent on signing an integration contract with the Federal Employment Agency or municipal employment office. For those whose unemployment insurance benefits had expired, the financial situation worsened considerably under the new system.c Hartz IV also created a new programme for insertion in the non-private sector, known as ein-euro-jobs, which pay at least one euro an hour for work in the public interest, while the recipient continues to receive Arbeitslosengeld II benefit.*

Note: this table presents the four main packages of Hartz reforms in Germany.
Source: research note from the French Ministry of Economics (2013)

Hartz IV is generally considered the centrepiece of the Hartz reforms (Price 2019), as it most directly aimed to tackle long-term unemployment, which had been identified as a

key problem in Germany**.** On the eve of the reform, the German unemployment rate was above 10% (OECD 2023), and long-term unemployed claimants made-up a significant proportion of them (Direction Générale du Trésor 2013, Trinh 2022), with 2.2 million long-term unemployment benefit claimants, representing more than 5% of the labour force (Price 2019).

Before Hartz IV, unemployed people who would meet the contribution condition would be eligible to earnings-related unemployment insurance (UI - with a replacement rate of 60% for childless people, and 67% for people with children) for a duration rising with the previous employment length, contribution record and age, up to a ceiling of 32 months for unemployed people above the age of 57 with enough contributions (OECD 2004). UI can be considered, for the sake of simplicity, the "short-term" unemployment payment.

Upon expiration of such payment, an unemployed claimant would be moved onto unemployment assistance (UA), essentially a less generous version of unemployment insurance, which still provided earnings-related payments (53% of previous earnings, up to 57% with a dependent child) for an unlimited duration, subject to a light means-test: although the benefit was tested against assets and other sources of income in the household, an earning disregard applying to 53% of the partner's earnings above a minimum threshold existed (OECD 2004). UA can be considered the "long-term" unemployment payment.

Unemployed people who would fail to meet the eligibility conditions for earnings-related UI and UA in the first place, would directly receive a third type of payment called social assistance (SA), a strictly means-tested payment aiming to provide the minimum

subsistence level. The pre-Hartz system overall relied on these three pillars (Trinh 2022): UI for the short-term, UA for the long-term, SA for those not eligible to UI/UA.

Hartz IV essentially merged the old UA and SA pillars, to make long-term unemployment payments less attractive financially to claimants. UI ("short-term benefits") remained unchanged, but upon their expiry, claimants would be switched onto a new style UA ("long-term benefits") that is essentially the same as the pre-reform SA: a strictly means-tested payment, not related to earnings, designed for subsistence rather than for income replacement, with much lower levels of income replacement for most unemployed claimants (Chagny 2005, Price 2019).

Table 7 summarises and illustrates the German unemployment benefit system before and after the Hartz reforms. Table 8 illustrates the duration of receipt of UI benefits for claimants who have contributed enough to be eligible for them, before they are switched onto assistance payments. It is important to note that Hartz IV does not affect UI payments, neither the replacement rate, nor the duration it can be received for, which are the same before and after Hartz IV. What it affects is the fate of the long-term unemployed, once they exhaust their right to UI. A 2006 follow-up to the Hartz reform did end-up affecting UI duration entitlement, but it is not of interest here (although it is a point I come back to in the empirical analyses).

Table 7: The German unemployment benefit system before and after the Hartz IV package

Before Hartz IV: a three-pillar system	*After Hartz IV: a two-pillar system*
Pillar 1: Unemployment Insurance (UI) payments, for those with a big enough contribution record, received for a duration that increases with age and contribution record (see below). Earnings-related (67% of former wage for claimants with children, 60% otherwise).	Pillar 1: Unemployment Insurance (UI) payments, for those with a big enough contribution record, received for a duration that increases with age and contribution record (see below). Earnings-related (67% of former wage for claimants with children, 60% otherwise).
Pillar 2: Unemployment Assistance (UA) payments, for people who formerly were receiving UI but have reached the end of their entitlement period for UI receipt. Still earnings-related (57% of former wage for claimants with children, 50% otherwise). Means-tested but means-test applies a strong disregard to partner's earnings. Unlimited duration for receipt subject to the means-test.	Pillar 2: Unemployment/Social assistance, which applies both to people who formerly were receiving UI but have reached the end of their entitlement period for UI receipt AND to people who do not have a big enough work record to qualify for UI receipt. This payment is similar to SA in the pre-Hartz IV times, i.e. strictly means-tested and not earnings-related.
Pillar 3: Social Assistance (SA) payments, for people who do not have a big enough work record to qualify for UI receipt. This payment is much less generous than UI, strictly means-tested and not earnings-related.	

Table 8: Maximum duration of UI payment entitlement, by age group in Germany at the time of Hartz IV

Age	Maximum duration of UI receipt in months	What happens after UI
<45	12	Means-tested UA for unlimited duration (subject to means-test)
45-46	18	
47-51	22	
52-56	26	
>57	32	

Note: these tables present key features of the German unemployment benefit system around the time of Hartz IV, regarding replacement rates, means-testing, and UI benefit receipt.
Source: Amable and Françon (2014), MISSOC database (2023)

Importantly for our purposes, the new system reinforces the interrelation between partners' labour market situation in determining the benefit amount: no strong earning disregard for partner income exists anymore, meaning that the partner's income is strictly considered in determining the amount a claimant is eligible to, and decreases it sharply[8],

[8] There is a basic allowance of 100 €. For gross incomes above the first 100 € the rate of withdrawal of UA is a 80 % up to a gross income of 800 € and 90 % in a range between 800 € and 1200 € for single workers (up to 1500 € for working recipients with children).

while the benefit amount is adjusted to take account of the number of dependent adults in the household (OECD 2006).

There was no "grandfathering" clause: the changes applied immediately to any current benefit claimant (Price 2019). Unemployed people who fail the eligibility for UI in the first place, post-reform, directly receive this new-style UA payment, very similar to the old SA. The German system essentially switches from three pillars to two: UI for the short-term, UA for the long-term and for people not eligible to UI. In addition, conditionality, job search criteria and sanction rules were tightened, in particular with regards to the "suitability" of job criteria according to which claimants could refuse a job offer.

The Hartz reforms, and Hartz IV as its centrepiece, therefore represent a clear transformation of a welfare system designed around generous and long-term compensation upon the occurrence of unemployment, to a system centred around making re-employment a priority. It is representative of longer-term trends towards labour market flexibilization that have happened in Europe, but how sudden it is, how stark the change is from the previous system to the new, and how clearly identifiable the change date is, make it a good policy experiment to answer the questions this chapter seeks to tackle.

In popular culture and policy circles, the Hartz reforms are associated to the "German miracle", transforming Germany from the "sick man of Europe", to a country with envied employment performances (Direction Générale du Trésor 2013). Academic research, whether on the overall reforms, or on Hartz IV specifically, tends to confirm the association between these reforms and better employment performances, showing that they are associated with a decrease in equilibrium unemployment at the macro-level

(Hochmuth et al. 2019), and with an increase in the job finding rate at the micro-level (Amable and Françon 2014, Price 2019).

Although the Hartz reforms are indeed associated with more employment, the literature points out that a lot, if not most, of the positive effects happened through non-standard-employment, particularly part-time and mini-jobs (Amable and Françon 2014, Rothe and Wälde 2017). The consequences in terms of job matching, wage level, stability in the new job, but also wider social outcomes such as wellbeing and health, are therefore debated and often found to have worsened, or at least not improved, post-reforms (ibid, Deter 2021).

11.3. Theoretical expectations

So, the Hartz IV reforms have made unemployment benefits less generous, a dimension that has often been highlighted by research on these reforms, and more strictly means-tested, a dimension less often discussed.

With regards to generosity, the expectations from the theoretical frameworks and empirical results discussed in Chapters 5 and 6, are clear: we should witness a higher likelihood of exits from dual-worklessness, due to the income effect.

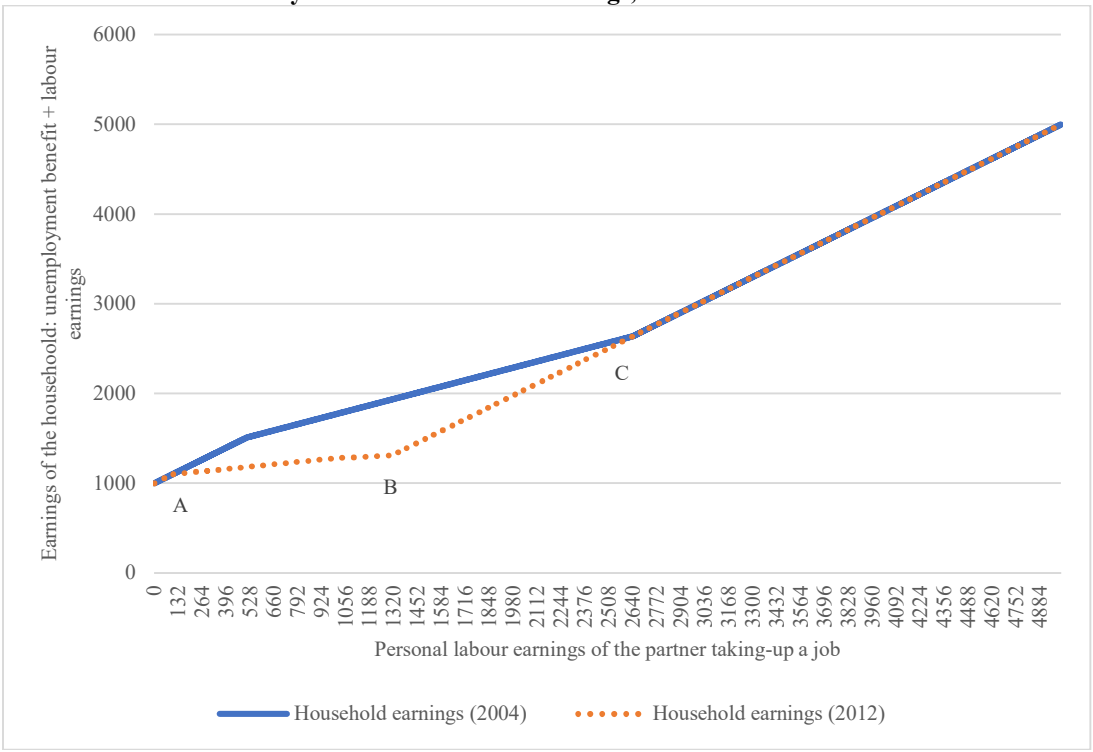
There is, however, one caveat: most of the empirical literature testing the predictions of job-search models, is concerned with short-term unemployment benefits, most often of the "Unemployment Insurance" type. The "spike" at benefit exhaustion is most often assessed empirically at the point of termination of UI entitlement – in all EU countries, however, this termination does not imply the end of all benefits, it means switching to a usually less generous and more conditional, unemployment assistance system (MISSOC database 2023).

It matters because in job search models, the disincentive effect of higher replacement rates is thought to be stronger at the start of the spell, as the prospect of benefit exhaustion is far away and the higher rates mean a low disutility of unemployment (Lalive, van Ours and Zweimüller 2006). But in the Hartz IV context, the benefit cut only intervenes after the exhaustion of UI, as it concerns UA instead, long into the unemployment spell.

Despite this nuance, it still constitutes an income shock for the long-term unemployed and a prospective income shock for the short-term unemployed, and although cuts to long-term benefits are much less empirically studied, Price (2019) does find, in the case of Hartz IV, that it leads to increased re-employment probabilities amongst German claimants. We can therefore expect the chances of employment exits to be particularly affected, as a result of the reform, in the longer duration of unemployment spells, particularly after 12 months, which for most German claimants is the minimum entitlement period to UI reforms. However, it is also conceivable to see an effect at earlier spell durations, if the reform pushes better-off couples to not claim at all, hence reducing the take-up of benefits of couples more likely to exit dual-worklessness quicker, or if the prospect of the severe benefit cut upon expiration of the benefits pushes better-off couples to intensify their search effort from the start, as, contrarily to before Hartz IV, there is now a clear difference of treatment and replacement income received for longer durations of joblessness.

So, overall, the "generosity" hypothesis posits that we should witness an increased rate of dual-worklessness exits after the Hartz IV package. But the prediction is different, from a couple perspective, if we take the means-testing aspect: let us recall that much theoretical and empirical literature suggests negative effects of more means-tested benefits on the probability that a dual-workless couples would exit dual-worklessness.

Figure 20: Simplified illustration of how much the partner of a workless person taking-up a job would actually increase household earnings, before and after the reform



Note: this graph is a simplified representation of how, in the case of a workless couple with one partner claiming 1000 euros in unemployment assistance, and one inactive partner, the inactive partner taking-up a job would contribute to overall household earnings, before and after Hartz IV. It assumes no other source of earnings, disregards other benefit sources, income taxation and social security contributions: it is purely concerned with how partner's earnings would affect the amount of unemployment assistance, and the sum of earnings and unemployment assistance. It compares 2004, the last year before Hartz IV, to 2012, the last year in the sample.

Before Hartz IV, net partner earnings below a certain threshold (591 euros per month in 2004) would be disregarded in the means-test. Then, the benefit would be reduced by 47% of the difference between net partner earnings and the threshold, up to a point where the benefit is completely withdrawn and partner net labour earnings increase household earnings 1 to 1.

After Hartz IV, the earning disregard threshold is brought down to 100 euros of gross labour earnings. In a region between 100 and 1000 euros, the benefit is reduced by 80% of the partner's gross labour earnings. In a region between 1000 and 1500 euros, the reduction rate rises to 90%, and above that, to 100%. When the reduction in benefit is equal to the benefit amount, the only source of earnings in the household becomes the partner's labour earnings.

Source: Author's interpretation of the OECD tax-benefit model policy descriptions.

Figure 19 illustrates (in a very simplified way) the extra means-testing post Hartz IV. The graph shows that for a region of low-earnings post-reform (from point A to B on the graph), the partner of the benefit recipient taking-up a job would only weakly increase couple earnings, because of the corresponding strong decrease in unemployment benefit amount, a phenomenon that was much tamer before the reform. It is only from point C onwards that the household is equally well-off before and after the reform, despite the benefit level assumed to be the same before and after the reform.

Note that in practice, post-reform, a given couple would in fact suffer from a benefit cut. Also note that pre-reform means-testing was based on partner's net earnings, as opposed to post-reform, now based on gross earning. The graph therefore actually underestimates the extent to which partner earnings fail to contribute to overall couple earnings after the reform. To the author's knowledge, the German tax system did not change around the time of Hartz IV, this dimension therefore staying constant. Although it is impossible to capture every couple situation, and the whole complexity of the German tax-benefit system, this simplified representation illustrates the more general move towards tighter household-means-testing post-reform. The "means-testing" hypothesis suggests that we could actually witness lower exits from dual-worklessness after the Hartz IV package.

The premise of this chapter is how non-standard-earning couples have been substituting, on aggregate, for dual-workless couples, in Europe and Germany specifically. To the author's knowledge, the empirical evidence, in Europe regarding the probability that dual-workless couples would transition to a standard earning or a non-standard-earning arrangement, is scarce. Therefore, to hypothesise on, not just the effect on dual-

worklessness exits, but on the type of exits, we need to extrapolate from other relevant literatures.

Given the liberalisation of non-standard-employment enabled by previous packages of the Hartz reforms, one expectation could be that a significant contribution to dual-worklessness exits, post Hartz IV, will be through non-standard-employed couple arrangements, as non-standard-employment was preponderant in the German job creation since 2005 (Direction Générale du Trésor 2013).

There is indeed empirical evidence, at the individual level, that the decrease in benefits linked to Hartz IV, have led jobless people into non-standard-employment (Amable and Françon 2014, Rothe and Wälde 2017). But Price (2019), one of the most detailed and sophisticated study on the Hartz reforms, contradicts these findings. Beyond the German case, the evidence regarding the link between generosity of unemployment benefits and the quality of jobs found is resolutely mixed.

On top of this very mixed evidence regarding the generosity of UI, in the context of couples, the means-tested dimension could lead to further hypotheses. If more means-testing means a higher threshold for partners in a dual-workless couples to find a job that is financially worth it for the couple as a whole, non-standard jobs, typically associated with lower earnings, may not provide that.

To take a simple example, imagine the unemployment benefit is worth 1000 euros/month and is reduced pound for pound if the partner finds a job. It is easy to see why a job offer to said partner paying 10.000 euros per month would likely mean that the associated loss of benefits does not matter too much should the partner accept the offer, but that part-time job paying 900 euros/month may not be deemed worth it. Couples may be caught in

the crossfire of conflicting incentives with regards to non-standard jobs: more escape routes (non-standard jobs) are created, but they are made less attractive by more means-testing.

With regards to standard jobs, expectations are unclear too under the "means-testing hypothesis": although they are on average associated with better earnings than non-standard jobs, low-hourly-earning full-time work may typically provide an income that just cancels-out an equivalent entitlement to unemployment assistance and may not be deemed attractive. Moreover, much of the job growth strategy post Hartz has centred around non-standard jobs, and dual-workless couples receiving unemployment benefit may find it difficult to find standard employment.

Table 6 summarises the conflicting hypotheses that emerge: how the rate of exits from dual-worklessness evolve after the Hartz IV package is an empirical matter.

Table 9: Generosity vs Means-testing hypotheses

Hypotheses	*Reform decreases the replacement rate of unemployment assistance: implications according to the generosity hypothesis*	*Reform makes the means-test associated to unemployment assistance receipt stricter: implications according to the means-testing hypothesis*
Predicted change in terms of exits from dual-worklessness	Increased exit rate from dual-worklessness after Harz IV.	Decreased exit rate from dual-worklessness after Hartz IV.
Predicted change in terms of the type of exit out of dual-worklessness	Increased exit rate from dual-worklessness to both non-standard and standard-earning after Hartz IV, unclear which type of exit would be more increased.	Decreased exit rate from dual-worklessness to non-standard-earning after Hartz IV, evolution unclear a priori regarding exits towards standard employment.

11.4. Empirical strategy

11.4.1. Data and sample

The data used are from the German Socio-Economic Panel (SOEP), presented in Chapter 8. The chapter studies the period 1997 (the last year of significant reform to the German benefit system before the Hartz reforms) to 2012 (in order to build a symmetrical pre-reform and post-reform period of study). I study dual-workless couples, at the monthly level, after having reconstituted couples and their employment status month by month.

Dual-workless couples are defined as couples in which both partners are workless, and worklessness is defined as not having a job (regardless of the reason, i.e., it encompasses unemployment and inactivity). Although the Hartz reforms are targeted towards unemployed people specifically, rather than inactivity in general, the chapter studies dual-workless couples broadly defined, precisely in order to contrast the fate of dual-workless couples receiving benefits, and those who do not. People who hold a job (a mini-job in practice) but are also registered unemployed are considered workless, in light of the fact that only very marginal employment can be held alongside being registered as unemployed. For robustness, all analyses are estimated again classifying these people as employed.

Let us recall that, in the SOEP, the only dimension of non-standard employment that I can capture at the monthly level are temporary work/minijob. Even with this restrictive definition of non-standard-employment, my data still clearly show that non-standard-employed couples have overtaken dual-workless couples over time in Germany (Appendix C.1). Similarly, the share of transitions out of dual-worklessness taking place towards non-standard-employment instead of an arrangement with at least a partner in standard work has increased over the years (Appendix C.1).

To recall from Chapter 8, the main specification of this chapter studies working-age dual-workless couples in which both partners are above 25, and excludes those in which both partners are above the age of 57. For robustness, I also estimate the analyses without excluding couples in which both partners are above the age of 57 (which does substantially increase the sample size). They are also estimated on samples that includes young couples (from the age of 18 onwards, excluding couples with both partners in full-time education). Finally, for robustness and comparison purposes, all the analyses are also estimated at the individual level – this enables to see how results may differ, if at all, between workless individuals and workless couples, as well as check the robustness of the results: past research strongly suggest that individual level re-employment increases after the reform.

11.4.2. Event history models

As is common in research on worklessness duration (Butler and Worrall 1985, Giannelli and Miclewright 1995, Meyer, Viscusin and Durbin 1995) this chapter uses event-history models to model the time spent in a state (dual-worklessness) to an event (exit from dual-worklessness). Because of the nature of the data, available on a monthly level, the most appropriate models are discrete-time models (Box-Steffensmeier et al. 2004, Steele 2005, 2011).

The dependent variable is, therefore, the monthly hazard of dual-worklessness exit. In a first step, the type of exit is not studied – any forms of couple arrangement that is not dual-worklessness is considered as an "event" and the dependent variable therefore is a binary taking the value of 0 if no event occurs in a given month, and 1 if an event, namely transitioning out of dual-worklessness, occurs. Discrete-time models of that sort can be estimated using the logit model (ibid).

In a second step, this chapter estimates competing-risk models distinguishing between exits from dual-worklessness to a non-standard-earning arrangement, and exits to an arrangement in which at least one of the partners is in standard work. Competing-risk transitions are estimated using repeated multivariate binary response models**,** whereby the models are run separately for each type of dual-worklessness exit, treating the other type of exit as censored.

The baseline hazard function in each model follows the most flexible approach and is fitted as a step function, with a dummy corresponding to every month of the spell of dual-worklessness, with durations above four years grouped together in a single dummy[9].

Some couples will have multiple spells of dual-worklessness. To account for this, the models include a frailty term (Steele 2005, 2011), aiming at capturing the fact that observations across different spells may not be independent, and are estimated using clustered standard error, with the couple as the clustering unit. A frailty term more generally helps to account for unobserved heterogeneity, i.e., time invariant characteristics that may affect the occurrence of an event: in discrete-time specification, this means that the model essentially is a multilevel, random intercept logistic regression effect model with spells nested within individuals (ibid).

Couple-level duration models induce additional challenges regarding the assumption that right-censoring (i.e., a couple is still in dual-worklessness when it last observed) is non-informative, because a couple may not be observed in a given wave because of partnership break-down. For robustness in order to account for any potential link between partnership

[9]For step-functions, the grouping of the time dummy variables above a certain threshold may vary from specification to specification depending on the population studied and the type of transition, as it is, established after inspecting the rate of transition for per month of the spell t. Each estimated model specifies exactly what this threshold is.

instability and re-employment probability (Anderson, Bukodi and Monden 2021), the models are estimated again with variables capturing first the number of divorces observed throughout each partner's lives using biographical information available in the SOEP, and second with the number of partnership break-down (not limited to marriage/divorce) observed for a respondent while in the SOEP, to capture relationship instability, as well as with variables measuring the life satisfaction of each partners, to account for spill over effects between partnership satisfaction and employment.

Finally, left-truncation could be an important bias: therefore, the analysis only keeps couples for whom the entry into dual-worklessness is observed.

11.4.3. Capturing the reform in the models

There is no temporal or geographical variation to exploit in the implementation of Hartz IV: it applies to all of Germany from January 2005 onwards, which makes it difficult to find groups affected by the reforms and groups that are not, that are directly comparable. The approach in this chapter is to compare dual-workless-couple-months receiving unemployment support (defined as couples in which at least one of the partners receives any type of unemployment benefits) and dual-workless-couple-months that do not receive any unemployment support (defined as couples in which no partner receives any of the unemployment benefits), and to analyse how the difference in their hazard of exiting dual-worklessness differs before and after the Hartz IV package.

In spirit, this is close to a Difference-in-Differences (DID) design. But where DID aims to pin-down causality, the approach chosen here, while yielding very fruitful insights, cannot claim to do so. This is, despite the richness of the control variables used in the models to capture the differences between the treatment and control groups (detailed

shortly) and despite the placebo and robustness tests carried, because of the endogeneity of the treatment (people can chose whether to claim benefits or not), in addition to the fact that the Hartz IV package, by making benefits more strongly means-tested, may mean that some people previously eligible to benefits are no longer so.

Nonetheless, by studying workless couples who receive unemployment benefits, this chapter gets at the heart of what the Hartz IV package seeks to achieve, and therefore, evolutions in their exits from dual-worklessness around the reform, even if not strictly speaking possible to be ascribed causally to the reform, are worth studying.

In practice, this means that I estimate the following models

$$logit[h(t)] = \alpha(t) + \beta_1 UnemploymentSupport_c + \beta_2 Post2004_m + \beta_3 UnemploymentSupport_c * Post2004_m + \beta_4 Z_{cm} + \varepsilon_{cm}$$

Equation (13)

With *h(t)* the hazard rate of exiting dual-worklessness for couple-month c in month m , *α(t)* the baseline hazard (specified as a step function), *Post2004* capturing whether the observed month takes place from January 2005 onwards.

UnemploymentSupport is a dummy variable capturing whether the couple-month observation has received any unemployment benefits in that calendar year. Unfortunately, the SOEP only gathered information on benefit receipt at monthly level for a few of the early waves, so the yearly level approximation is the best possible one for our window of observation. That said, while it is impossible to say whether a couple has received benefits exactly in a given month, whether the couple has received benefits in the recent past is still a vary salient way of capturing whether it has been affected by the reform.

Still, for robustness, the chapter also estimates models in which the treatment group is made of dual-workless-couple-months that have received unemployment support at any point in their dual-worklessness spell (as this is possible to ascertain exactly), the control group is made of dual-workless-couple-months that have not received unemployment support at any point in their spell, and the reform year is a dummy capturing whether the dual-worklessness spell encompasses years post-2004 or not.

Z_{cm} is a vector of covariates controlling for possible confounders, to try and eliminate the observable differences between both groups – these covariates are detailed in the next subsection.

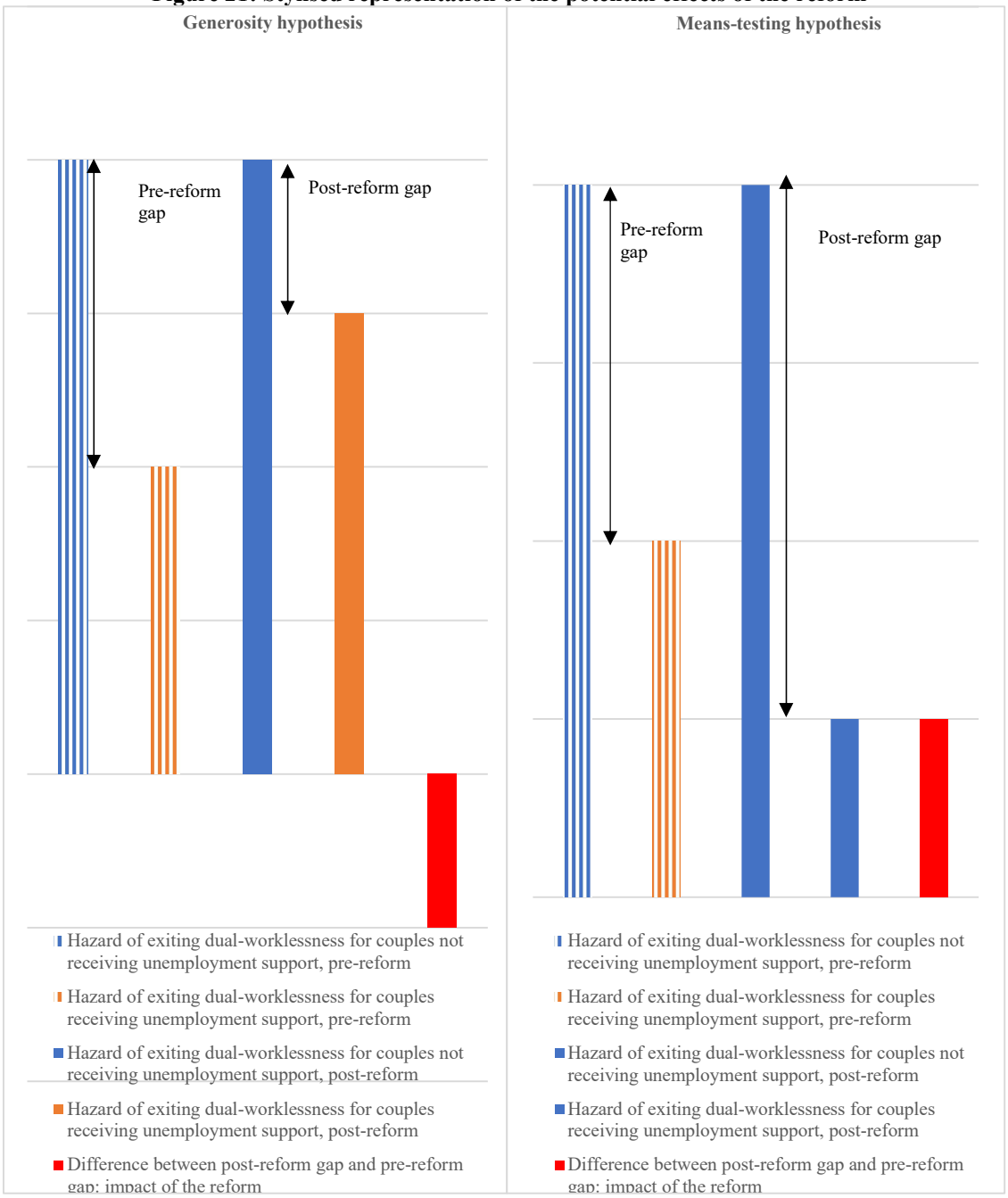
The competing-risks models are the same, except that the dependent variables are now the hazard of exiting dual-worklessness towards a non-standard-earning arrangement and the hazard of exiting dual-worklessness towards a standard arrangement.

The interaction of receiving unemployment support and the date being from January 2005 onwards tells us how any pre-reform difference in hazard rates between the two groups, evolves after the reform.

Job search models tell us that there must be a gap before the reform, whereby couples not receiving unemployment benefits, everything else held equal, should exit dual-worklessness quicker because they do not have the financial support of the unemployment benefits.

Whether this expected gap then widens (the interaction effect is negative, implying that dual-workless couples receiving benefits are even less likely after the reform to exit dual-worklessness compared to those who do not receive benefits) or shrinks (positive interaction effect) depends on the hypothesis followed.

Figure 21: Stylised representation of the potential effects of the reform



Note: this figure illustrates the expected gap between the two compared groups, before and after the reform, according to two competing hypotheses.
Source: author.

The “generosity” hypothesis posits that, by making unemployment benefits less generous, the expected gap between couples that receive support, and those that do not, should reduce. The “means-testing” hypothesis suggests that the gap may not necessarily decrease, and may even possibly increase, as extra-means-testing disincentivises partners of a workless couple taking-up a job. Figure 20 illustrates the different predictions linked to the two hypotheses, with regards to the hazard rate of exiting dual-worklessness.

In terms of exit type, the generosity hypothesis posits that exits to non-standard and standard jobs are encouraged, without providing clear-cut expectations in terms of which type of exits should be more favoured. The stance in this chapter is more explorative when it comes to the “means-testing” hypothesis.

Let us now turn to the covariates. Table 10 shows the descriptive statistics for the control and treatment groups, based on the main covariates. They include the age of each partners; an educational attainment variable corresponding to the average of the number of years of education completed by each partner; an educational homogamy variable corresponding to the difference in the number of years of education between the two partners; a dummy variable controlling for whether any of the partners is disabled; another to control for whether any of them is retired; and one to capture whether there is a migration background in the couple; the number of children in the household is included, and so is a dummy controlling for whether there are children below school age. The total number of people in the household is also in the model, to try and account for multi-generation households.

In addition to these classic socio-demographic variables, the models control for the fact that dual-worklessness may be affected by the economic conditions of the region, the

local labour market demand, and the sectoral composition of the local economy, by including a dummy variable corresponding to the lander of residence. They control for the couple's past labour market success by including a variable capturing the last annual gross labour income of the couple before the dual-worklessness spell[10]. A variable for the labour market status of the couple before dual-worklessness is added, taking the value of 0 if the couple had at least one partner in standard employment, and 1 if it was a non-standard-earning couple.

A dummy variable capturing whether the couple owns their dwelling or rent is included: ownership is sometimes seen as reducing exits from (dual) worklessness because it induces a higher geographical mobility constraint, and can also be seen as a proxy for wealth. Still in the spirit of attempting to capture wealth, a variable capturing the annual asset income (from interest, dividends, and rent) made by the household is included. Finally, to control for exogenous shocks and economic fluctuations, the model includes a dummy variable capturing whether the year is 2009 (year of the economic recession induced by the 2008 crisis); a variable corresponding to the aggregate unemployment rate in a given year, and an economic growth rate variable. For robustness the models are estimated again using year-fixed effects.

[10] This variable may suffer from two shortcomings. First, this earning variable is annual – therefore, in the case of a couple that starts the year employed, becomes workless, and finds a new job before the end of the year, the variable will not only pick-up the pre-dual-worklessness situation, but also the situation post-dual-worklessness. Second, dual-workless couples may have some (very limited) labour earnings, as it is possible to hold very marginal forms of employment while being registered unemployed. For robustness, the models are estimated again using the Erikson Goldthorpe Portocarero social class scheme, still in the spirit of capturing the labour market standing of the couple pre-worklessness. This variable is not favoured in the main specification because it has more missing values.

Table 10: Descriptive statistics

Average for the variable:	Whole sample *N=24519* *Pre-reform: 12120* *Post-reform: 12399*	Control group *N=6683* *Pre-reform: 3412* *Post-reform: 3271*	Treatment group *N=17836* *Pre-reform: 8708* *Post-reform: 9128*
Months observed as dual-workless	36.7	37.9	36.3
Age of female partner	44.8	48.3	43.5
Age of male partner	48.23	52.7	46.6
Number of children in the household	0.94	0.47	1.12
Number of children below 5 in the household	0.19	0.14	0.21
Total number of people in the household	3.36	2.87	3.54
Years of education of female partner	10.91	11.24	10.79
Years of education of male partner	11.12	11.63	10.92
Educational homogamy (difference in years of education between partners)	1.28	1.45	1.22
Couple has migration background (proportion)	0.33	0.26	0.36
One partner is disabled (proportion)	0.33	0.47	0.28
	0.35	0.73	0.2

One partner is early retired (proportion			
Last gross annual labour income before dual-worklessness spell	17977.2	23426.15	15935.49
Couple had no partner in standard employment before dual-worklessness spell	1.27	1.27	1.27
Couple owns their dwelling	0.33	0.53	0.26
Annual asset income of the household	763.22	1588.78	453.89
Unemployment rate	0.09	0.09	0.09
Economic growth rate	1.3	1.3	1.3

Note: descriptive statistics regarding the variables included in the main regression models.
Source: German SOEP

Table 11: Cross-tabulation of couple benefit status and start date of spell (number of couples)

	Couple does not claim unemployment during their spell	Couple claims unemployment support during their spell
Dual-worklessness spell begins before 2005	248	924
Dual-worklessness spell begins in 2005 or later	363	686

Note: sample sizes in terms of number of couples, and not of couple-months, for the, control and treatment groups, before and after the reform
Source: author's own calculations using the German SOEP

There are 17745 couple-months observations receiving unemployment support (8629 before the reform, 9116 after) and 6605 couple-months observations that do not (3375 before the reform, 3230 after), as shown in Table 10. Couples not receiving support tend to be better-off couples: older, wealthier, more likely to own their dwelling, more educated, more likely to have one partner early retired, and with a higher pre-dual-worklessness gross labour income. This is true before and after the reform, but this difference between the two groups is at the heart of why the approach cannot claim causality – it is possible that, despite all the controls, couples who claim benefits before and after the reform are fundamentally different, maybe due to the extra means-test and requirements to receive benefits, maybe because the stigma around benefit receipt is greater, for instance. Indeed, we can see from tables 10 and 11 that fewer couples claim unemployment benefits at all during their dual-worklessness spell after the reform, but that the duration of dual-worklessness spell of those who do is longer.

11.4.4. Validity tests

Although this chapter does not claim causality, it applies tests commonly used in DID setting to test the "parallel trend" assumption, to reinforce the credibility of the results (Autor 2003, Angrist and Pischke 2008). This chapter uses, for the main specification looking at general exits from dual-worklessness[11], placebo tests: studying pre-reform years (1997-2004), it picks fake reform dates (2000, as it splits the period in 2 symmetrically, and 2003 as it corresponds to the first Hartz package) and estimates the difference-in-difference models, with no significant interaction effects between being in the treatment group and the fake reform dates emerging as shown in Appendix C.2.

[11] The number of transitions in the competing-risk specification gets very low and not particularly meaningful if we only look at the pre-reform years only.

In addition, using all year of data, the analysis is estimated interacting a dummy variable for each year of data and the dummy variable for the couple-month receiving unemployment support, with none of the pre-reform years exhibiting a significant interaction effect with receiving unemployment support (Appendix C.2).

For robustness, I also run the main specification again with a categorical variable corresponding to the year and month the dual-worklessness spell begins, with the aim of capturing any unobserved heterogeneity in the couples beginning dual-worklessness spells in different years, as well as with a categorical variable corresponding to the calendar month, to control for any seasonal employment patterns.

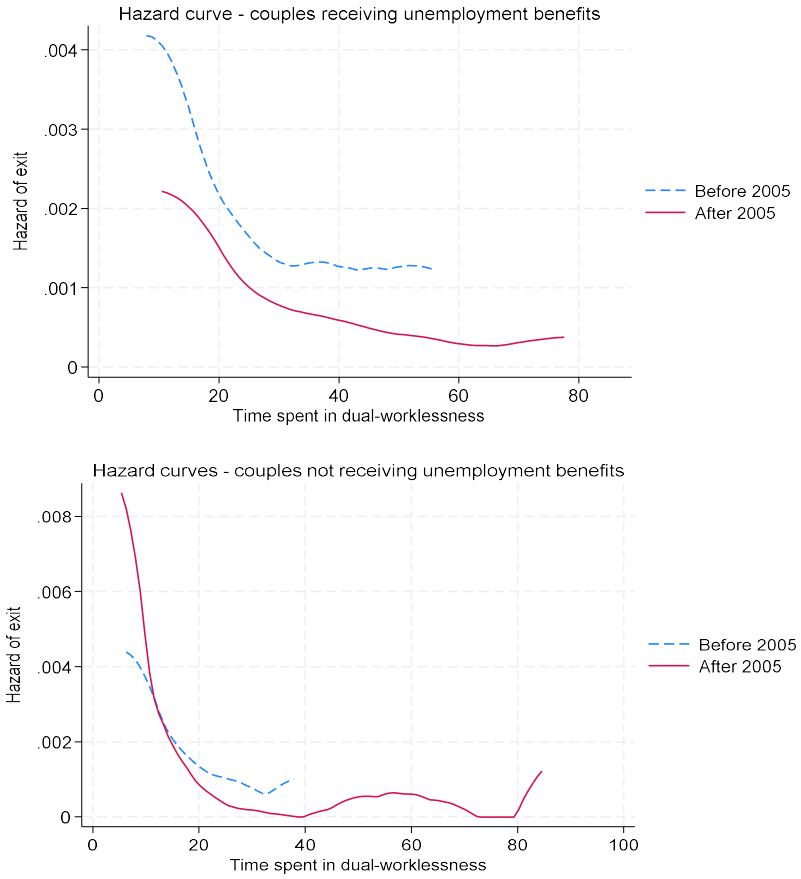
Further, a February 2006 sequel of the Hartz reforms reduced the duration of UI for workers above the age of 45, effectively shifting any new spell beginning after that date quicker onto the new-style, more means-tested and less generous, UA. To account for that and try to isolate the effect of the 2005 package specifically, I run the model again with the variable capturing the year the spell begins, controlling for whether the couple is made of partners both above the age of 45 and interacting the older than 45 variable with a dummy variable capturing whether a spell starts from February 2006 onwards. I also run the models keeping only spells beginning before February 2006 and only couples below the age of 45.

11.5. Empirical results

11.5.1. Main specification

Figure 21 presents the raw evolution of the hazard rates of exiting dual-worklessness (any type of exit) for dual-workless-couple-months observations receiving unemployment benefits, and those who do not, before and after the reform.

Figure 22: Hazard curves for dual-worklessness exits



Note: this figure illustrates how the raw hazard of dual-worklessness exits evolves with time spent in dual-worklessness, for dual-workless couples receiving unemployment benefits in a given month (top panel) and those not receiving benefits in a given month (bottom panel).
Source: author's own calculations using the German SOEP.

The hazard of exiting dual-worklessness, for both groups, decreases sharply with time, which is an expected result - both because couples more able to find jobs do so quicker, leaving the more disadvantaged ones in the pool of long-term dual-workless couples, and because employability tends to decrease with time spent in dual-worklessness. For couples receiving unemployment benefits, the whole hazard curve, strikingly, shifts down after the reform, implying that, at all durations of dual-worklessness, the hazard of finding a job for any of the partner decreases – though this gap is particularly strong very early in the spell, and for very long-term dual-workless couples.

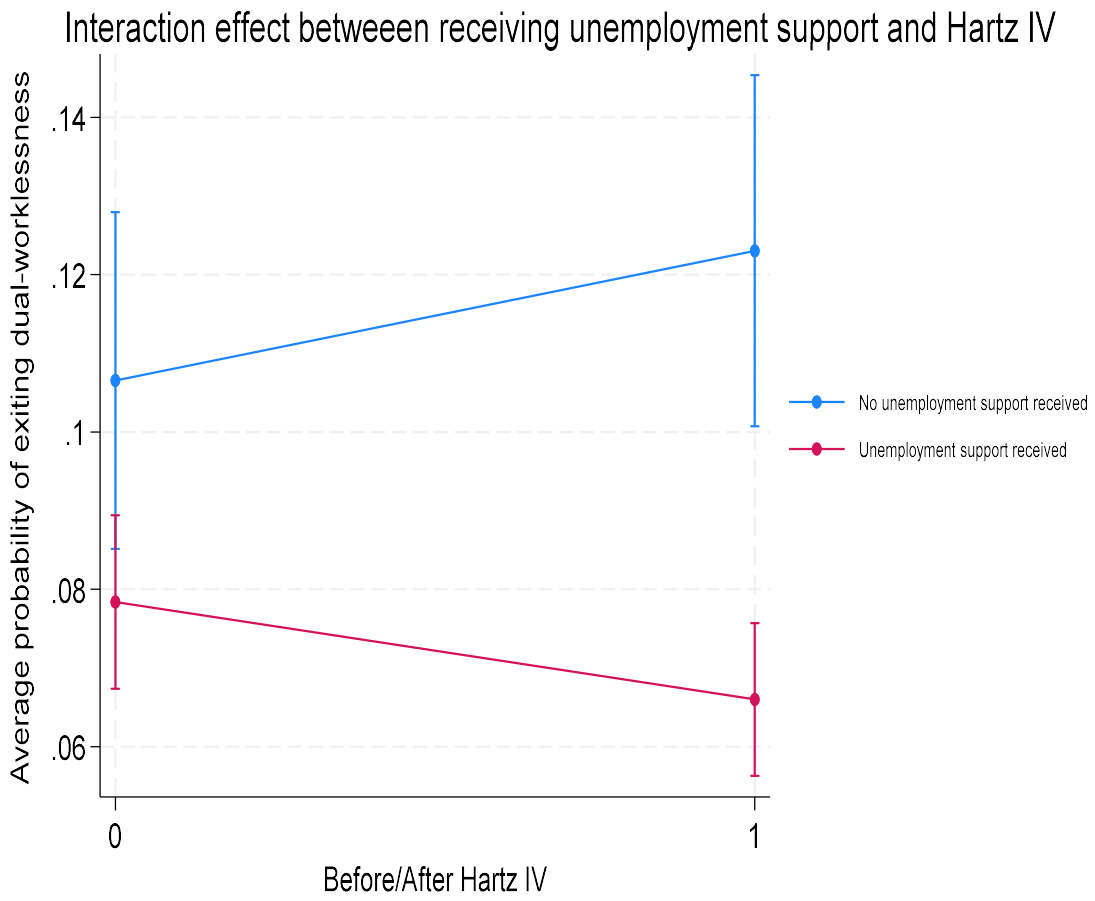
Table 12: Results of the discrete-time event-history models estimating the hazard of exiting dual-worklessness

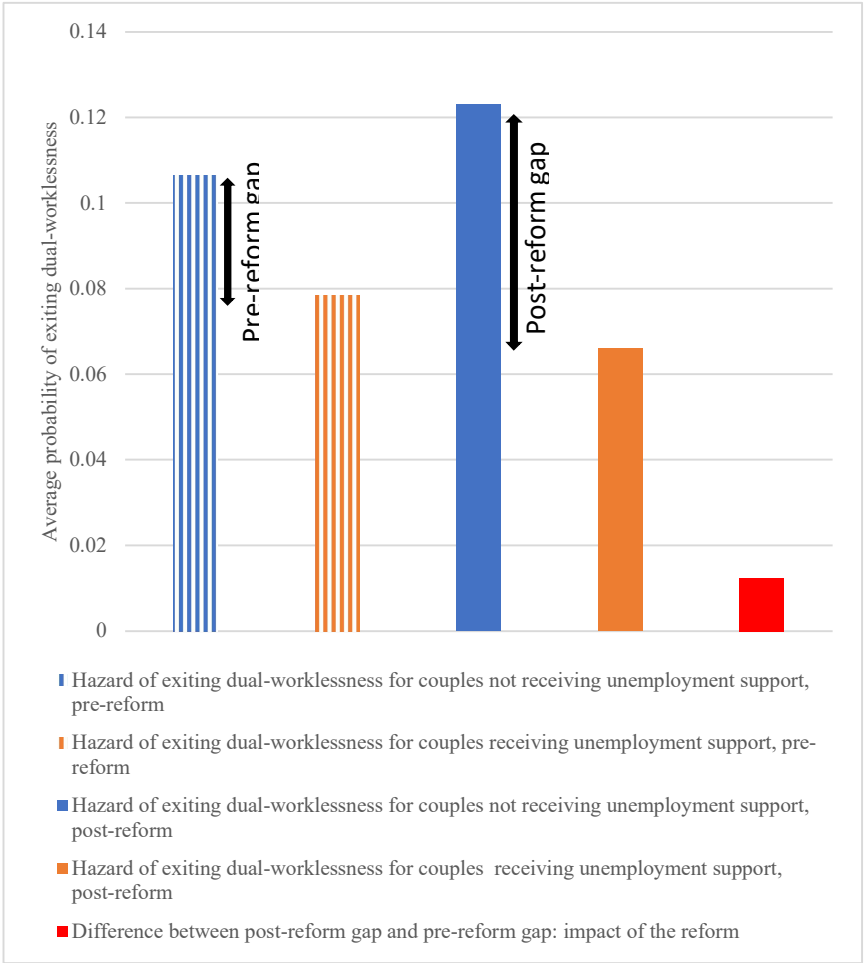
Independent variables	Model 1: Treatment and period dummy	Model 2: Difference-in-difference (without the covariates)	Model 3: Difference-in-difference (all covariates included)
Post-2004 years	0.14* *(0.07)*	0.75*** *(0.15)*	0.2 *(0.14))*
Couple receives unemployment support	-0.48*** *(0.1)*	-0.04 *(0.13)*	-0.4*** *(0.12)*
Post-2004 years*Couple receives unemployment support		-0.83*** *(0.16)*	-0.41*** *(0.16)*
Age of female partner			-0.02* *(0.009)*
Age of male partner			-0.03*** *(0.008)*
Number of children in household			0.04 *(0.07)*
Presence of children below 5 in household			0.21** *(0.1)*
Total number of persons in household			-0.05 *(0.06)*
Education of female partner			0.11*** *(0.02)*
Education of male partner			0.00010 *(0.02)*
Educational homogamy			-0.05** *(0.02)*
Couple has migration background			-0.3*** *(0.11)*
One partner is disabled			-0.11 *(0.11)*
One partner is retired			-1.09*** *(0.15)*
Last gross annual labour income before dual-worklessness spell			0.000007** *(0.000003)*
			-0.09 *(0.09)*

Couple had no partner in standard employment before dual-worklessness spell			0.34*** *(0.09)*
Couple owns their dwelling			-0.0000411*** *(0.00002)*
Annual asset income of the household			
Economic crisis dummy			0.23 *(0.14)*
Unemployment rate			-3.74* (2.12)
Economic growth rate			0.04** *(0.02)*
Lander fixed-effects	NO	NO	YES
Time dependency	Step function (a dummy per month of spell, t>48 grouped together)	Step function (a dummy per month of spell, t>48 grouped together)	Step function (a dummy per month of spell, t>48 grouped together)
Constant	-1.97*** *(0.11)*	-2.31*** *(0.13)*	-1.38*** *(0.53)*
N (couple-months)	25072	25072	24519
Number of couples	1478	1478	1444
Number of spells of dual-worklessness	2213	2213	2165
Number of transitions out of dual-worklessness	1606	1606	1570

Note: the table shows the effect of selected covariates on the hazard rate of dual-worklessness exits, as estimated using discrete-time event-history modelling. Negative signs indicate a decrease in the hazard of exiting dual-worklessness, positive signs the reverse. The interaction effect between benefit receipt and the year being from 2005 onwards shows how the initial difference in dual-worklessness exit hazard evolves between couples who receive benefits and those who do not after the reform. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients.
Source: author's own calculations using the German SOEP.

Figure 23: Evolution in the gap in the dual-worklessness exit hazard between the two groups, before and after





Note: These graphs illustrate the results of the regression models estimated above with all the covariates, by plotting the interaction effect between receiving unemployment support and the pre/post reform period on the probability of exiting dual-worklessness. The left-hand side graph presents the statistical output of running the "margins" command in Stata, with 95% confidence intervals. The graph on the right illustrates these results and the overall impact of the reform in terms of the difference it made on the probability of exiting dual-worklessness. The pre-reform/control group estimate corresponds to the probability of exiting dual-worklessness if everyone in the sample was not receiving unemployment support, before 2005. The pre-reform/treatment group estimate does the same if everyone in the sample was receiving unemployment support, before 2005. The post-reform/control group estimate corresponds to the probability of exiting dual-worklessness if everyone in the sample was not receiving unemployment support, after 2005, and the post-reform/treatment group estimate does the same, this time assuming everyone receives unemployment support, after 2005. These hold all the values of covariates in the model as constant. For margins estimated at the mean value of all the covariates, see Appendix C.7.
Source: author's own calculations using the German SOEP.

For those who do not receive benefits, the post-reform period is associated to a much-increased chance of exiting dual-worklessness in the first year of the spell, though it then decreases over time in a way that is comparable to the pre-reform period.

Table 7 presents the results from the regression models. We can see in model 1 that, as expected, the raw association between receiving unemployment support and exiting dual-worklessness across all the sample and years of data, is negative, while post-2004 years are associated to a raw increase in the hazard rate of exiting dual-worklessness, generally in line with the German "employment miracle" that has been found to characterize these years.

Despite this favourable context, model 2 suggests a potentially negative association between the time Hartz IV is introduced and exits from dual-worklessness for couples receiving unemployment support, which corresponds to what the Hazard curves tell us, and which is explored in more details in model 3 with all the covariates.

Again, in line with expectations, the main effect associated to unemployment support receipt shows that, before 2005, couples receiving unemployment support have a lower exit rate from dual-worklessness than couples not receiving support

Exponentiating the coefficient gives an idea of the magnitude: the odds of the hazard of exiting dual-worklessness are 32% lower for dual-workless couples receiving unemployment support in a given month than for couples not receiving it, before the reform ($e^{-0.39} = 0.68$). The main effect of post-2005 years (the effect on the control group) is positive, which is in line with the general favourable employment and economic context in Germany since the Hartz reforms: including a variable capturing economic

growth means that this main effect remains positive but loses statistical significance, while the economic growth variable has the expected positive and significant effect.

The negative and statistically significant at the 1% level coefficient on the interaction effect between receiving unemployment support and the years being post-reform, suggests that after the Hartz IV package, the pre-reform gap between the two groups has gone bigger. Couples receiving unemployment support are even less likely, compared to pre-reform, to exit dual-worklessness in a given month, relative to couples not receiving support. Exponentiating the interaction effect ($e^{-0.43} = 0.65$) means that there is a 35% further decrease in the odds of exiting dual-worklessness relative to the pre-reform gap between the two groups. Figure 22 illustrates how this pre-reform gap increases following the reform.

Let us recall that the limitations linked to this research design mean that I cannot claim that the Hartz reforms directly caused this gap to increase. It could be that couples who receive benefits before and after the reforms change with unobservable characteristics that all the controls included in the model cannot capture. It could be that the extra means-test means that richer couple, who may be in a better position to secure re-employment, are now more likely to not receive unemployment benefits. This could partly explain the strong before and after gap in exit hazard rates early in the dual-worklessness spell, if couples with stronger employment propensity now do not claim benefits, hence depriving the pool of dual-workless claimant couples of those who would exit this state quicker.

But what these results tell, is that, whatever the reason, after the Hartz IV package is introduced, those dual-workless couples that do receive unemployment benefits are even less likely than before to exit dual-worklessness. While the reform may not have caused

that, it was never its intended purpose anyway (rather the reverse), and it seems unsuccessful at helping these couples that do remain on unemployment benefits after the reform, exit dual-worklessness. In particular, the fact that the before and after gap in hazard rates is also sizable for longer durations of dual-worklessness suggests that there could be something more substantive going on related to benefits, as these long-durations are precisely those we would expect to be affected by Hartz IV.

On a more substantive note, these results, perhaps surprising through the lens of the individual-level job search models, are in line with the "means-testing" hypothesis. As discussed in more details in the final subsection, the fact that models estimated on workless individuals show a positive and statistically significant interaction coefficient which, in line with past research, suggests that individuals receiving unemployment benefits are more likely to exit worklessness after the reform, reinforces this hypothesis.

Still reinforcing the plausibility of the results is the fact that the covariates exhibit expected signs. The time dependency (available in Appendix C.3) shows that the hazard of exiting dual-worklessness decreases the longer the dual-worklessness spell lasts, albeit with a statistically significant rebound at 12 months, a spike consistent with the fact that, for many unemployed Germans, 12 month signals the end of UI and the switch to UA.

Older couples exit dual-worklessness less easily, while the negative coefficient of disability disappears once we include a dummy for one of the partners being early retired, suggesting, amongst the couples studied, a great deal of overlap between both states. More educated couples, couples without a migrant background, couples with higher gross labour earnings pre-worklessness, couples that own their dwelling, exit dual-worklessness quicker, while asset income delays dual-worklessness exit.

Let us now turn to the results of the competing-risk models, analyzing the type of transitions made by dual-workless couples.

For parsimony, the results of the step function and main covariates are shown in Appendix C.3 and C.4. An important caveat to these results is the fact that when distinguishing between the different types of transitions, the number of transitions mechanically decreases: 1166 for transitions towards standard-earning, 455 for transitions towards non-standard-earning. This limited sample is an obvious limitation and these results should be taken as a first exploratory analysis of an understudied issue that deserves further exploration with bigger datasets.

The "raw" models 1 and 4 confirm the importance of non-standard employment in the German job performance since 2005, including at couple levels, as post-2004 years are associated with a raw increase in exits towards non-standard-earning arrangements, but barely any change in exits towards standard-earning. Across all years and all couples, receiving unemployment support is associated to a raw decreased probability of transitioning to non-standard-earning and to a standard arrangement.

For transitions towards non-standard-earning (model 3), the main effect suggests a potential pre-reform gap, with couples receiving unemployment support less likely than those not receiving it to transition. The interaction effect, although negative, is far from statistical significance ($P>|z=0.57$).

Table 13: Results of the discrete-time competing-risks event-history models estimating the hazard of exiting dual-worklessness towards non-standard-earning and standard-earning

	Transitions from dual-worklessness to a non-standard-employment arrangement			*Transitions from dual-worklessness to a standard-employed arrangement*		
Independent variables	Model 1: Treatment and period dummy	Model 2: Difference-in-difference (without the covariates)	Model 3: Difference-in-difference (all covariates included)	Model 4: Treatment and period dummy	Model 5: Difference-in-difference (without the covariates)	Model 6: Difference-in-difference (all covariates included)
Post-2004 years	0.3*** *(0.11)*	0.47** *(0.21)*	0.06 *(0.21)*	0.09 *(0.09)*	0.78*** *(0.17)*	0.19 *(0.17)*
Couple receives unemployment support	-0.27** *(0.12)*	-0.14 *(0.18)*	-0.34* *(0.19)*	-0.5*** *(0.11)*	-0.005 *(0.15)*	-0.4*** *(0.14))*
Post-2004 years*Couple receives unemployment support		-0.23 *(0.24°)*	-0.13 *(0.23)*		-0.95*** *(0.2)*	-0.42** *(0.18)*
Time dependency	Step function (a dummy per month of spell, t>35 grouped together)	Step function (a dummy per month of spell, t>35 grouped together)	Step function (a dummy per month of spell, t>35 grouped together)	Step function (a dummy per month of spell, t>32 grouped together)	Step function (a dummy per month of spell, t>32 grouped together)	Step function (a dummy per month of spell, t>32 grouped together)
Covariates	NO	NO	YES	NO	NO	YES
Lander fixed-effects	NO	NO	YES	NO	NO	YES
Constant	-3.69*** *(0.25)*	-3.8*** *(0.27)*	-3.03*** *(0.64)*	-2.41*** *(0.26)*	-2.8*** *(0.16)*	-1.91*** *(0.62)*
Variance of logged random effect	-0.26	-0.21	-2.39	0.66	0.57	-0.23
N (couple-months)	25072	25072	24519	25072	25072	24519
Number of couples	1478	1478	1444	1478	1478	1444
Number of spells	2213	2213	2165	2213	2213	2165
Number of transitions out of dual-worklessness (any type)	1606	1606	1570	1606	1606	1570
Number of transitions out of dual-worklessness towards standard-earning	1158	1158	1132	1158	1158	1132
Number of transitions out of dual-worklessness towards non-standard-earning	448	448	438	448	448	438

Note: Logit discrete-time competing risk event-history models estimating the hazard of exiting dual-worklessness for dual-workless couples, distinguishing between exits towards a standard-earning arrangement and a non-standard-earning arrangement. The models are estimated using repeated models for binary responses, i.e., outcomes other than the transition to the specific state studied are treated as right-censored. Negative signs indicate a decrease in the hazard of exiting dual-worklessness, positive signs the reverse. The interaction effect between benefit receipt and the year being from 2005 onwards shows how the initial difference in dual-worklessness exit hazard evolves between couples who receive benefits and those who do not after the reform. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients.
Source: author's own calculations using the German SOEP.

This suggests that the reform did not affect this gap: before and after the reform, dual-workless couples receiving unemployment benefits remain less likely to exit towards non-standard-earning than those not receiving benefits. For transitions towards standard-earning (model 6), the main effect suggests a pre-reform gap. Although the raw and negative interaction effect between benefit receipt and the reform being introduced in model 5 decreases in magnitude and statistical significance when the covariates are added, it remains negative and significant at the 5% level. This implies that the gap increased after the reform, with couples receiving unemployment support even less likely to exit dual-worklessness towards a standard-earning arrangement.

The absence of post-reform change with regards to non-standard-earning contrasts with the context of liberalization of non-standard employment in Germany since 2005. The limited sample size could be at play, of course. The conservative operationalization of non-standard-employment in this chapter should also be kept in mind. But substantively, it could be that dual-workless couples are taken in a "crossfire" of policy incentives. On the one hand, the job growth strategy centred around the creation of non-standard jobs makes these jobs the main route out of (dual)-worklessness, all the more so for couples that may be remote from the labour market and to whom the flexibility of these jobs may correspond better. On the other hand, the increased household-means-testing post-reform means that many of these jobs may not provide the financial worth needed to take them up.

After the reforms, transitions to a standard-earning arrangement are clearly affected negatively. This could be because dual-workless couples, a population with, on average, low labour market attachment, may not have the ability to find standard jobs that pay

sufficiently to be financially worth it as compared to the means-tested unemployment payment.

The covariates tend to have the expected signs and do not differ massively, in that regard, from the general models. The main difference is that the presence of a standard job in the couple before the dual-worklessness spell, irrelevant in the general transition models, now becomes key. Being in an arrangement with no standard worker prior to dual-worklessness is strongly negatively associated with transitioning out of dual-worklessness towards an arrangement with at least one partner in standard work, and strongly positively associated with the probability of returning to a non-standard-earning couple arrangement. This hints at a potential dualization of the labour market for couples, in line with findings at the individual level (Emmenegger et al. 2012), whereby couples stay entrenched in a segment of the labour market, and suggests that non-standard-earning arrangements in couples is not a status that couples get rid off easily.

11.5.2. Further analyses

Individual level models

First, I estimated the same models on the individual 25-65-year-old workless population[12] (with the partnership status and the gender of the individual as additional covariates). Like in the couple-level models, these are workless individuals (regardless of unemployment versus inactivity status), whose entry into worklessness could be witnessed in the data, and for which the before and after Hartz IV hazard of exiting worklessness is estimated by comparing benefit recipients to those who do not receive benefits.

[12] To match the population at the couple level. Remember that the couples that are excluded are those in which *both* partners are above the age of 57. That still leaves a range of people between the age of 57 and 65 partnered with younger people.

Table 14: regression models on the individual workless population

Independent variables	Model 1: Treatment and period dummy	Model 2: Difference-in-difference (without the covariates)	Model 3: Difference-in-difference (all covariates included)
Post-2004 years	0.02 *(0.2)*	-0.004 *(0.03)*	-0.07** *(0.04)*
Individual receives unemployment support	0.13*** *(0.03)*	0.1*** *(0.04)*	-0.31*** *(0.04)*
Post-2004 years*Individual receives unemployment support		0.06 *(0.05)*	0.12*** *(0.047)*
Age			-0.03* *(0.002)*
Sex: female			-0.6*** *(0.03)*
Number of children in household			0.05** *(0.02)*
Presence of children below 5 in household			-0.23*** *(0.03)*
Total number of persons in household			0.03 *(0.02)*
Education			0.05*** *(0.006)*
Direct migration background			-0.21*** *(0.04)*
Indirect migration background			-0.18*** *(0.07)*
Disabled			-0.33*** *(0.06)*
Early retired			-1.67*** *(0.07)*
Last gross annual labour income before worklessness spell			0.0000065** *(0.0000015)*
Couple had no partner in standard employment before worklessness spell			-0.04 *(0.03)*
Owns dwelling			011***

			(0.03)
Annual asset income of the household			-0.0000052*** *(0.0000023)*
Economic crisis dummy			0.21*** *(0.05)*
Unemployment rate			-2.05*** *(0.7)*
Economic growth rate			0.03*** *(0.006)*
Lander fixed-effects	NO	NO	YES
Time dependency	Step function (a dummy per month of spell, t>95(grouped together)	Step function (a dummy per month of spell, t>95(grouped together)	Step function (a dummy per month of spell, t>95 grouped together)
Constant	-2.81*** *(0.04)*	-2.79*** *(0.04)*	-1.48*** *(0.15)*
N (individual-months)	319174	319174	315415
Number of individuals	10992	10992	10874
Number of worklessness spells	18319	18319	18099
Number of transitions out of worklessness	12550	12550	12372

The table shows the effect of selected covariates on the hazard rate of worklessness exits, as estimated using discrete-time event-history modelling. Negative signs indicate a decrease in the hazard of exiting worklessness, positive signs the reverse. The difference-in-difference estimator is given by the interaction of the individual-month observation receiving unemployment support and the time period being from January 2005 onwards. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients.
Source: author's own calculations using the German SOEP

The results, shown in table X, are very similar to the couple-level models when it comes to the covariates, and have the expected signs. Gender, a covariate added compared to the couple-level specification, has the expected effect with women less likely to exit joblessness. The key difference that emerges is that the interaction effect between receiving unemployment benefits in a given month, and the date being after the reform is implemented, is now positive and statistically significant at the 1% level: this time, the post-reform period sees an increase in the rate at which individual workless people who receive benefits exit worklessness, in line with theoretical expectations predicting that lower unemployment benefits generosity lead people to remain jobless for less time.

This result is also in line with much of the previous empirical literature on the Hartz reforms, and reinforces the credibility of the results obtained at couple level. In fact, adding a partnership variable in the individual-level regressions shows that being in a partnership as opposed to single is associated to a lower probability of exiting worklessness. What further reinforces the credibility of the results are the competing-risks models for individuals (Appendix C5). While they show that the hazard rate of exiting individual worklessness increases both for exits towards standard employment and non-standard employment, the regression coefficient for the latter is of a greater magnitude and statistically significant at a higher level. This confirms, in light with previous literature, the importance of non-standard work in the good employment performances of Germany post-Hartz IV.

This suggests that the Hartz IV package may have had different consequences for workless couples, compared to workless individuals: the dynamics, incentives and decisions that affect employment transitions out of worklessness may be different. This reinforces the suggestion that more means-testing could be to blame for the negative

effects on dual-workless couples, as that dimension is much more relevant to workless couples.

The benefit that a single individual workless person receives is much lower than the household-assessed benefit for a couple, and therefore the threshold for this job to be financially worth it is also lower: a "minijob" pays more than the benefit received for a single-workless-individual, not for a workless-couple. As for individual unemployment benefit recipients living with an employed partner, the expiry of UI payments comes with an even harsher cut in benefits than the mere switch to UA suggests, as UA will be decreased by the employed partner's earnings, sometimes completely. This is a strong incentive to find re-employment, but the income shock is not as strong for workless couples with no labour earnings and entitled to full-rate UA after UI expires. Let us also recall that the couple level models show that the workless couples that remain jobless longer are those with lower pre-dual-worklessness labour earnings, which further implies that the switch from earnings-related UI to UA may not be as big an income shock anyway.

The competing-risks models strongly emphasise, at the individual level, how non-standard employment becomes a key route out of worklessness for individuals after Hartz IV, in line with an employment creation strategy centred around such non-standard jobs. This is a key difference with the couple-level models, suggesting that how appealing these non-standard jobs are as a route out of worklessness, depends on the household context.

Transitions that did happen

Second, I narrowed down the analysis to the actual transitions out of dual-worklessness – while the competing-risks models find that after the reform, the chances of transitioning

from dual-worklessness to non-standard-earning relative to standard employment or staying workless do not increase, it could still be that, amongst the transitions that did happen, the chance that this transition was towards non-standard-earning increased after the reform, in particular in the context of increased availability of non-standard jobs in the German economy. Appendix C.5 shows results of logistic regression analysis with the dependent variable taking the value of 0 for transitions towards a standard arrangement, and of 1 for transitions towards non-standard-earning. The design is the same in the first instance, and then is tweaked such that the treatment group becomes couples who, before transitioning, had received unemployment support at any point in their spell, and the control group are couples who, before transitioning, had never received any support.

The "raw" models without interaction suggest that years since the reforms could be associated to more of these transitions taking the form of transitions towards non-standard-earning. The raw interaction between benefit receipt and reform introduced tends to be positive, implying an increased probability that the transition takes the form of non-standard-earning as the reform is introduced, but the coefficients, significant at the 10% level or bordering it depending on the specification, lose all proximity to statistical significance once the covariates are included – although the positive sign is retained.

Again, small sample sizes may be at play. While these results cannot show that, amongst the transitions that do occur, the reforms have induced a change towards more of these transitions fuelling non-standard-earning, the hints from the raw models suggest that it is a hypothesis that should not be discarded on the spot, and deserves further research.

Unemployed people with a marginal job classified as working

I re-estimated all the models again classifying people who held a job alongside being registered unemployed as being in employment (Appendix C.5). As only very marginal employment could be held alongside a formal registration at the unemployment office (typically, mini or midi-jobs), this helps analyse whether such forms of work would have been used as couples as ways out of "pure" dual-worklessness.

The results of the general exit models remain largely unchanged in substance, although the coefficient decreases in magnitude and statistical significance (P>|z=0.056). A similar change occurs for transitions towards standard-earning. As for transitions towards non-standard-earning: the raw increase in transitions towards non-standard-earning after 2005 for dual-workless couples is reinforced, while the interaction coefficient, albeit still negative, becomes very small and even less statistically significant.

Overall, these changes suggest that indeed, for dual-workless couples, combining some marginal activity with unemployment support could be a strategy out of "pure" dual-worklessness with no labour income at all.

Crucially, it could also help refine the potential interpretation of the main results of the chapter. The negative association between dual-worklessness exits with the introduction of the Hartz IV package that I find, could imply that the disincentive that means-testing constitutes would be stronger than the effect of tightened conditionality and sanctions that also come with the package. The change in the results when analyzing exits towards marginal jobs held alongside unemployment registration suggests that one strategy to combine benefit receipt and counselling and avoid sanctions, in dual-workless couples, may have been very marginal employment, as the tapper rates of benefit reduction only start applying above 100 euros.

Older workless couples

Analyses in this chapter excluded couples with both partners aged above 57. This was to circumvent the fact that, for much of the late 1990s and early 2000s, many such couples would be receiving unemployment benefits as a bridge towards retirement, therefore constituting in practice early retired couples.

But an objection to this exclusion could be that the Hartz reforms particularly targeted these older workers, who de facto constituted an important share of the long-term dual-workless that the reform sought to put into work – the sample size in my dataset certainly increases substantially once couples with both partners aged 57 are included.

Doing the same analyses with these older couples included does not fundamentally change the conclusions – couples that receive benefits before the reform are less likely to exit dual-worklessness before the reform than those who do not, and this gap increases after the reform. But the negative coefficient on the interaction effect, indicating this gap increase, is divided by almost two in magnitude, and is only significant at the 10% level. This does suggest that the post-reform period may have been associated with more exits from dual-worklessness for a specific set of dual-workless couples – older dual workless couples. This could make intuitive sense: if they were using unemployment benefits as a cushion towards retirement, the reduced generosity of these benefits could particularly sting, and even trump considerations related to the extra means-testing. This calls for future research studying older workless couples, particularly in light of the 2006 follow-up reform that targets them specifically.

11.5.3. Robustness tests

Before concluding, let us mention briefly the results of the different robustness tests. Lack of space prevents a detailed discussion, but they are available and discussed in appendix C.6. The general take-away is that they do not change the overall conclusion and interpretation of the results.

Finally, to try and separate the results shown here from what the 2006 follow-up may have induced, reform, all the models have been estimated again with a dummy variable capturing whether both partners are older than 45, on its own, and interacted with a variable capturing whether the spell starts after February 2006, with the results staying very constant. Models estimated without the spells beginning after February 2006 altogether or without couples above the age of 45 retain the negative sign associated to the DID estimator, but lose statistical significance. In the first case, it is hard to disentangle it from the fact that the time restriction automatically means way fewer spells after 2005 in the sample and therefore much more limited variation to estimate a before/after 2005 model. In the second case, the sample size becomes very small (the average couple in our initial sample has partners aged 46.5 years old), and therefore potentially not meaningful.

While further work is needed to distinguish with absolute certainty the 2005 and 2006 reforms, three elements are noteworthy. First, this chapter, by excluding couples with both partners aged above 57, excluded those most strongly affected by the reform, as the 2006 reform affected most strongly people from 57 onwards.

Second, the 2005 and 2006 reforms, albeit both broadly related to the generosity of unemployment benefits, affect two different parameters: the first is about generosity (and

means-testing), the second is about potential benefit duration. Comparing the raw hazard curves of the treatment group before and after the reform suggests that the whole curve shifts down, meaning that at all spell durations, the hazard of exiting dual-worklessness is lower. If the 2006 reform was at play, we would expect the change to intervene at longer durations of spells. As discussed at the start of this section, the gap between the two curves is indeed very pronounced at long spell durations, but also very early on – and more generally, the whole curve shifts down. This suggests that something other than the mere duration of benefits is at play.

Third, in any case, the results presented in the main models show that the years post-reform are associated to a lower chance of exiting dual-worklessness: this is certainly not the aim of the 2006 reform and would run against expectations that bringing the exhaustion of UI closer incentivises exits from dual-worklessness for couples older than 45.

11.6. Conclusion

This chapter has sought to understand how exits from dual-worklessness evolved after the Hartz IV package for dual-workless couples affected by the reform, in the broader context, in Germany and Europe, of the decline of dual-worklessness as a share of all couple types, and its replacement, on aggregate, by couples that, albeit not workless, do not have anyone in standard employment. It used a design akin to difference-in-differences applied to discrete-time event-history models, analysing first the likelihood of exiting dual-worklessness in general, and then more specifically the destination states of couples exiting dual-worklessness.

It has found that the period post-Hartz IV introduction is associated to a decrease in the likelihood that couples who receive unemployment benefits would exit dual-worklessness. While the design does not allow to say that this is a direct causal impact of the reform, it is certainly not what the reform would have intended to do anyway. Substantively, these results contradict expectations that may have been derived from individual-level standard job-search models, but are in line with predictions according to which unemployment benefits that are more strictly means-tested at the household level deter dual-workless couples from finding employment due to the higher threshold for a job to be financially worth it when benefits tie partners' resources together.

The competing-risks models find that the period after Hartz IV introduction is associated to a decrease in the probability that dual-workless couples exit dual-worklessness towards a standard arrangement, and no association with the probability that they exit towards non-standard-earning. For the latter, it could be that dual-workless couples face a crossfire of incentives, as, on the one hand, most of the routes out of joblessness that previous Hartz packages had developed go through non-standard-earning, but on the other hand, more strictly means-tested benefits may make non-standard jobs potentially less attractive, and dual-workless couples therefore face more routes out of worklessness, that are less valuable. But low sample sizes when distinguishing between the two forms of exits are an important caveat to keep in mind.

While the likelihood of exiting dual-worklessness towards non-standard earning does not increase after the reform, restricting the analysis to focus only on couples that have exited suggests that, for them, more of these transitions took the form of non-standard-earning post-reform, though no independent effect of the reform itself could be shown. This could partly be related to sample size and warrants further research.

Three more findings of this chapter are noteworthy. First, running the models at the individual level show a discrepancy between the couple and individual level: while dual-workless couples receiving unemployment benefits are less likely to transition out of dual-worklessness after the reform, workless individuals, in line with previous research, are more likely to do so. This reinforces the hypothesis that more household means-tested benefits may be the mechanism behind the negative effect for couples, and, more generally, suggests that the household context needs to be taken seriously when assessing the effect of a policy. For a part of the population in which the labour market is particularly remote, dual-workless couples, reforms that may have otherwise been successful at increasing re-employment look like they could have failed, and even had the opposite of the intended effect.

Second, re-estimating the models by classifying people in marginal jobs alongside being registered as unemployed suggests that this could be a route out of "pure" dual-worklessness (with no labour activity at all), and a way for dual-workless couples to combine benefit receipt with a marginal activity and with the stricter conditionality after the reforms have been passed.

Finally, when it comes to the destination state out of dual-worklessness, the state prior to dual-worklessness is the strongest determinant. Couples that used to be non-standard-earning are more likely to become non-standard-earning again, couples that were in a standard arrangement are more likely to transition towards a new standard-earning arrangement. This suggests a phenomenon of labour market segmentation, and while it has been extensively studied at the individual level in the literature, it implies that again, the household could be a mediating factor warranting more study. Future research should

conceive polarisation in employment at household level not just in terms of mere access to employment, but in terms of access to, and permanency in, good quality employment.

Does the lack of reform effect in terms of exits towards non-standard-earning invalidate the hypothesis that policy changes in Europe have turned dual-workless couples into non-standard-earning? It certainly does not prove it, but more research is needed on the topic. The Hartz reform may have idiosyncrasies that affect the results – for instance, it may have had effects regarding job finding rates particularly pronounced for older workers, less so for the rest. More fundamentally, labour market policies work in interaction with each other: perhaps it is the general, and more long-run, switch in unemployment benefits, employment protection, active labour market policies, sanctions and conditionality, minimum wage or nature of employment that is at play, rather than one abrupt change in a single area in isolation. In addition, studying where dual-workless couples go is only the most obvious, emerged tip of the iceberg when studying the broader counterfactual question of couples that would have been dual-workless forty years ago, but are in non-standard-earning today. This chapter is aimed as a first step to spur on further research on the topic going beyond its present limitations.

12. Conclusion

I have aimed to understand better the evolutions in heterosexual couple employment participation across Europe, over the past forty years. I have tried to understand these evolutions in light of two phenomena, which had both been found to be rising by previous literature, but had seldom been linked until now: the polarisation of the access to employment across couples, and the rise of non-standard employment. Three overarching research questions have guided this thesis:

RQ1: Is the evolution of couple employment participation still characterised by increasing polarisation across Europe, and why may this have changed?

RQ2: How do polarisation and non-standard-employment relate to each other empirically, and how do they jointly account for changing couple employment patterns?

RQ3: To what extent has the use of non-standard-employment in couples switched from being a complement to a standard job, to being the sole source of labour income?

These questions guide the empirical work of the thesis and to a large extent, are transversal across the empirical chapters. Each of them delves into these issues in more details, and explore their own specific research questions derived from these three main ones. The rest of this chapter is devoted to reminding the reader of the main findings from each empirical chapter, and then putting together what they mean with regards to the three overarching research questions. I then discuss the implications of this thesis for research, its limitations and avenues for future work. I finish by providing policy recommendations.

12.1. The end of polarisation? Evolution of the distribution of employment across couples in Europe over the past forty years

In chapter 9, I revisited the question of whether couple employment participation increasingly polarises between dual-earning and dual-workless couples over 27 European countries in the last four decades. The answer is a caveated yes: polarisation increased over the past forty years in Europe, but at a clearly decreasing rate. Most of the rise in polarisation happened in the 1980s and 1990s, decades in which the rising tide of female employment disproportionately fuelled dual-earning couples.

The stabilisation, slow-down and potential signs of reversal of this trend suggest a new context in Europe, whereby rising female employment no longer disproportionately fuels dual-earning couples, but also materialises into female-single-earning couples. The rise of this form of couple has been found to accelerate with time, and also benefit from economic downturns, like the 2008 crisis, which reinforced the role of female employment as a buffer against dual-worklessness.

More generally, the finding that polarisation slows-down and may have started going down is an original contribution. Although the literature contained some hints that it may be the case, no research had established it so clearly, an important reason being that past research often stops in the mid-2000s, before the slow-down in polarisation really materialises in the data.

The richness of the dataset, across the years and countries, is therefore a key contribution of this chapter. Across countries, it shows that the polarisation trends, and the explanatory factors put forward, tend to exhibit a surface of commonality cutting across Europe, with nuances emerging at a finer level of analysis, regarding the intensity of the trends and the

starting and arrival points. Unsurprisingly, the countries that stood-out the most were post-Communist economies, with a different legacy in terms of female employment. But they are certainly not a unitary category, at least with regards to the results put forward in this chapter.

In light of how new these long-term trends are, the chapter proposed a few mechanisms that may explain the slow-down in polarisation. At the macro-level, the 2008 crisis and the long-run sectoral reshaping of European economies played a role, and reinforced each other. The crisis led, in general, to a temporary spike in the clustering of employment in couples, due to the resilience of the "dual-service-earning" couple, but did not lead to a clear spike in non-employment clustering in couples, due to the resilience of female-service employment. The clustering of service employment in couples had been a long-run factor behind the rise in polarisation, combined with the decline of male-single-industrial employment.

In terms of couple characteristics, the rising education of women matters: on average, partnered women are now more educated than partnered men in Europe, and couples in which the female partner is more educated than the male have been fuelling the rise in female-single-earning couples.

But it is not the whole story: women at all levels of education have started working more over the past forty years. In fact, this may be the other side of the coin: the "democratisation" of female employment means that in the 1980s and 1990s, female employment was predominantly the employment of highly educated women living with highly educated and employable men, while today, it increasingly also is the employment of lower educated women living with less employable men.

Finally, in exploring the potential causes of the slow-down in polarisation, this chapter has established a key result, that underpins much of the subsequent work in the thesis. It is the fact that, although the concentration of non-employment in couples has slowed-down in the last two decades, the concentration of the absence of standard employment has increased, driven by an increasing tendency for rising non-standard employment to fuel couples in which it is the only source of labour income.

The two trends appear to be substitute to each other. The potential switch of rising non-standard employment from predominantly fuelling couples in which it is a complement to a standard job, towards couples for which it is the only source of labour income, is another key finding of this thesis.

To summarise, polarisation was high in the 1980s and 1980s, as male-single-earners lost industrial jobs, leading to long-term dual-worklessness, and women working were predominantly highly educated women living with highly educated men, both in employment. Today, the situation is much more nuanced, with partnered women more educated than partnered men and having benefited from service employment to increasingly become the sole-earner in a couple. Dual-worklessness is less prevalent, as low-skilled couples find employment opportunities in non-standard work, particularly in the service sector. Dual-earning versus dual-workless polarisation is weaker than in the past, and inequality across couples may have moved onto a new terrain: employment quality.

12.2. The inequality trade-off: inequalities across and within couples in the rise of dual-earning

Chapter 10 took the unprecedented step of linking the rise of dual-earning to the rise of polarisation and of non-standard-employment, being the first contribution in the literature to study how these latter two dimensions relate to each other dynamically in Europe. It did so by studying 11 countries since the early 1980s. Linking polarisation and issues of standard and non-standard employment led this chapter to identify three types of potential inequality in couple employment participation, linked to the rise of dual-earning:

- Inequality in employment access, broadly defined in the ILO-sense, across all couples. This is "overall polarisation/layer 1 inequality".
- Inequality in the quality of employment access across dual-earning couples, once standard and non-standard-employment are distinguished, with standard employment clustering in some dual-earning couples, and non-standard-employment clustering in others. This is "inequality across dual-earning couples/layer 2 inequality".
- Inequality in the quality of employment access within dual-earning couples, once standard and non-standard-employment are distinguished, with men accessing standard employment and women accessing non-standard-employment. This is "inequality within dual-earning couples/layer 3 inequality".

To set the scene, this chapter established that overall polarisation and the prevalence of couples in which non-standard-employment have risen together over time across Europe, showing that they indeed, rose together.

It then studied how standard and non-standard-employment are actually distributed across dual-earning couples, and how they contributed to overall polarisation. It showed that, since the 1980s, there has been a stable excess of one-and-a-half-earning couples

compared to the counterfactual, suggesting that at any point in time, standard and non-standard-employment tend to be distributed in a way reinforcing layer 3 inequality, with an even access to standard employment across dual-earning couples, but inequality within dual-earning couples in access to standard employment.

However, the fact that this excess has remained stable is striking in light of the rise of non-standard-employment over the period, and the increase in overall polarisation. While at any point in time, the main contributor to overall polarisation is the excess of one-and-a-half-earning couples, over time, what drives its rise is the increasing clustering of standard employment in couples.

Putting everything together in the shift-share equation helps make sense of this result. Rising non-standard-employment has contributed to increasing the level of employment, and fuelled different types of dual-earning couples in line with its overall rise. On the other hand, the rise of standard employment has been particularly unevenly distributed, and is the main contributor to the rise in the overall tendency for employment, broadly defined to cluster in couples, and for dual-earning rates to have risen more than what the increase in overall employment rates would have led to predict.

Analysing the results by country also proves fruitful. It shows different models of inequality, regarding the three types identified.

Greece, Portugal, and Spain, are countries in which overall polarisation tends to come with inequality across dual-earning couples, as standard employment clusters in certain dual-earning couples, and non-standard-employment clusters in others (layer 2 inequality).

Belgium, Germany and the Netherlands, on the other hand, see overall polarisation come with inequality within dual-earning couples, as standard and non-standard-employment are very evenly distributed across them, resulting in a strong excess of one-and-a-half-earning couples and of gender inequality within dual-earning couples in terms of the type of employment accessed (layer 3 inequality).

France, Ireland, Italy, Luxembourg and the UK show mixed inequalities, with both layer 2 and 3 inequalities present, but a switch over time from layer 3 to layer 2.

Finally, analysing the results by countries also led to the identification of a trade-off regarding the rise of dual-earning. If dual-earning is seen as a socially desirable goal, because it combines higher employment rate and more gender inequality, it has come in practice with a rise in either overall polarisation, or more non-standard-employment, and often both, implying a rise in at least one of the three forms of inequality described. The countries in which dual-earning rose the most, or is the highest currently, all have had important increases in either polarisation or non-standard-employment. Past research, which focused only on one of the three layers of inequality, did not identify this trade-off. But countries differ not so much in the fact that they have some inequality linked to couple employment participation, as in the locus of this inequality.

12.3. The impact of labour market reform on exits from dual-worklessness: the case of Germany.

In chapter 11, I have sought to understand how much the rate of exit from dual-worklessness had changed after the Harte IV package, in the broader context, in Germany and Europe, of the decline of dual-worklessness as a share of all couple types, and its replacement, on aggregate, by couples that, albeit not workless, do not have anyone in standard employment.

I hypothesised that labour market reforms making labour markets more flexible, which have been important in Europe over the last four decades, had increasingly led dual-workless couples to become non-standard-earning couples. As I case study, I picked Germany, because the Hartz reforms constitute an emblematic, sudden, and well-defined, change from a welfare-state geared towards compensating generously people suffering from the occurrence of a social risk, towards aiming to put them back into work.

The roll-out of the Hartz IV package does not enable to pinpoint its causal effect, but it enables to see how the phenomenon of interest evolves before the reform for an affected group, dual-workless couples, and whether this evolution is in line with what we would expect of this reform.

The descriptive results show, over time, an increasing tendency for dual-workless couples to exit towards such a non-standard-earning arrangement, relative to an arrangement with at least a partner in standard employment.

Yet, the years after the Hartz IV package are associated to a decrease in the likelihood that couples would exit dual-worklessness. Although this contradicts expectations from individual-level job-search models, it is in line with predictions according to which unemployment benefits that are more strictly means-tested at the household level deter dual-workless couples from finding employment due to the higher threshold for a job to be financially worth it when benefits tie partners' resources together.

This negative association with the post-reform years is particularly strong in terms of transitions towards at least one partner finding a standard job. It is weaker when it comes to transitions towards a non-standard-earning couple arrangement, with an insignificant negative coefficient. So, this thesis does not find evidence to support the hypothesis that

after a labour market reform making labour market more flexibles, here by decreasing the generosity of unemployment benefits, dual-workless couples increasingly transition towards a non-standard-earning arrangement.

It could be that dual-workless couples face a crossfire of incentives, as, on the one hand, most of the routes out of joblessness that previous Hartz packages had developed go through non-standard-earning, but on the other hand, more strictly means-tested benefits may make non-standard jobs potentially less attractive, and dual-workless couples therefore face more routes out of worklessness, that are less valuable.

The negative association between the years post-Hartz IV and the chance that dual-workless couples exit dual-worklessness, also contrast with the positive association found when studying the individual workless population. This suggests that the household context needs to be taken seriously when assessing the effect of a policy. For a part of the population in which the labour market is particularly remote, dual-workless couples, reforms that have generally found to increase re-employment in the literature, could have failed.

Furthermore, when it comes to the destination state out of dual-worklessness, the state prior to dual-worklessness is the strongest determinant: couples that used to be non-standard-employed are more likely to become non-standard-employed again, couples that were in a standard arrangement are more likely to transition towards a new standard-employed arrangement. This suggests a phenomenon of labour market segmentation, and while it has been extensively studied at the individual level in the literature, it implies that again, the household could be a mediating factor.

12.4. Wrapping things together: couple employment, polarisation, and non-standard-employment

RQ1: Is the evolution of couple employment participation still characterised by increasing polarisation across Europe over the past twenty years, and why may this have changed?

This thesis has established that the answer a caveated yes. Polarisation, is higher than forty years ago, but its rise has been much weaker over the last two decades. This thesis managed to establish this fact by studying an unprecedented period of time and range of countries. The 2008 crisis and sectoral evolutions of European economies, at the macro-level, and at the couple level, the changing socioeconomic characteristics of partnered men and women regarding their respective levels of education, as well as the rise in non-standard-earning couples, are potential explanatory factors behind this slow-down. A key dimension found throughout this thesis is, indeed, the fact that polarisation may not happen so much anymore in terms of dual-earning versus dual-workless, but in terms of the unevenness of the distribution of standard and non-standard employment.

RQ2: How do polarisation and non-standard-employment relate to each other empirically, and how do they account for changing couple employment patterns?

This thesis has shown that overall polarisation and the prevalence of dual-earning couples with non-standard-employment had risen together over time in Europe. But their interrelationship is much more complicated than that. The main contributor to the rise in overall polarisation over time has actually been the increase in the clustering of standard employment in couples. The rise in non-standard-employment has been more important in terms of increasing the employment levels needed to reach higher dual-earning rates.

Different models of inequality related to the rise of dual-earning, across all couples, across dual-earning couples, and within dual-earning couples, exist in Europe. In any case, higher dual-earning rates have come, empirically, with a trade-off, as they have been accompanied by at least more overall polarisation, or more non-standard-employment in dual-earning couples, leading to at least one of the three forms of inequality identified in the chapter. Studying cross-country differences in terms of the inequalities associated to couple employment participation, needs to be done not just in terms of the level of inequality, but the locus of such inequality, as studying one dimension in isolation only gives a partial understanding of the issue.

RQ3: To what extent has the use of non-standard-employment in couples switched from being a complement to a standard job, to being the sole source of labour income?

This thesis has shown an increase in the use of non-standard employment as the sole source of labour income in European couples. All forms of such couples have increased as a proportion of all couples: couples in which both partners are in non-standard employment, couples with workless man and a non-standard-employed woman, couples with a workless woman and a non-standard employed man. Such non-standard-earning couples, added to workless couples, represent a block of 10% of couples of working-age in Europe that, in 2019, do not have access to standard employment. In this block, non-standard-earning couples are now much more prevalent than dual-workless couples, a clear change from forty years ago. Polarisation indicators confirm that, while the tendency of worklessness to cluster in couples has increased overall, but slowed-down in recent years, this has been the reverse for non-standard-employment.

Findings in Chapter 10 show that certain countries in particular, mostly the Mediterranean welfare-states, tend to exhibit models of inequality with dual-standard-earning couples on one side, and dual-non-standard-earning couples on the other, speaking of increasingly segmented labour markets at the household level. The increasing tendency of part-time work to cluster in couples is at play, but in these countries, the concentration of temporary employment in couples is also a noticeable distinctive factor. Generally, decomposing the analyses by forms of non-standard work shows that self-employment tends to come in couples, and that temporary employment is rarely a complement to a permanent job: permanent status comes in couples, while temporary employment seems to be more involuntarily taken-up in couples. This has implications for future policy and research discussed shortly.

Finally, focusing on Germany as a prime example of the substitution of non-standard-earning couples for workless couples, this thesis finds evidence that the transition probability away from dual-worklessness towards non-standard-earning, as opposed to an arrangement with at least a partner in standard employment, has increased over time. But the hypothesised mechanism – labour market policy making labour markets more flexible – has not been proven, although much further research on the issue is needed given the potential idiosyncrasies of the case studied. Moreover, the fact that the strongest predictor of the type of exit made by dual-workless couples was their previous status – with couples that were non-standard-earning prior to dual-worklessness much more likely to exit towards a non-standard-earning arrangement – is striking and suggests a porosity between both states dynamically that needs to be further explored.

12.5. Implications of this thesis for future research

Implications for future research emerges both from the results shown in this thesis, but also from the limitations of this work, which this section discusses in turn.

12.5.1. Implications flowing from the results of this thesis

The findings challenge a number of empirical results, theoretical expectations, and way of conceptualising different dimensions relating to couple employment participation.

Starting with the two key concepts that this thesis studies, polarisation and non-standard employment, the thesis clearly establishes that polarisation cannot be defined solely in terms of mere access to employment as defined by the ILO. The question of employment distribution matters, yes, but in a world in which new forms of employment emerge, with some that are very precarious, the question of how different forms of employment are distributed is even more salient.

Polarisation in future research should not be conceived just as certain couples in which both partners work and certain couples in which none work. As labour markets become more flexible, as employment becomes non-standard, as workers switch between worklessness and different forms of employment, polarisation should be studied as access to, and permanency in, good quality jobs on the one hand, and lack of such access on the other.

More generally, this thesis forces us to reconsider what we know about the role of non-standard employment in couples. Much of the literature conceives it, and studies it, as a complement to a standard job in couples, emphasising the gendered nature of such an arrangement, as women disproportionately take-up the non-standard job. This thesis does not contradict that: it indeed finds that such "one-and-a-half" earning has been on the rise in Europe over the past four decades.

What this thesis highlights is that, *in addition* to this form of use of non-standard employment in couples, the last two decades have witnessed the rise of a new way in which non-standard employment is used in couples: as the sole source of labour income. The rise of non-standard earning couples, and how they have overtaken dual-worklessness as a form of couple employment participation, suggests that much of the academic and policy attention devoted to dual-worklessness also has to adjust its focus.

More broadly, this key, new finding deserves a lot of further research. Who are couples relying on non-standard employment? Are they former dual-workless couples, single earner couples made more precarious, dual-earner couples looking for a better work-life balance? Are they poor? Are they poorer than workless couples? Are they on their way to standard employment? Are they poor in certain European countries and better-off in others, and if so, why? Are they stuck in a segment of the labour market in certain European countries and better-off in others, and if so, why? Can they be, in the case of both partners working part-time, an example of a move towards greater gender equality in the division of market work and household tasks? Can the concentration of non-standard work in couples explain certain political economy outcomes – job insecurity, voting behaviour, resentment of mainstream parties, preferences over redistributive policies?

The robustness analyses to chapter 10, separate for full-time/part-time, permanent/temporary work and employee/self-employed work, are also crucial to inform former research. Permanent/temporary work and employee/self-employed work, tend to generate homogamous employment outcomes, in a way that is rather uniform across countries and times.

This is particularly pronounced in Mediterranean countries, which have relied a lot on temporary work as a way to stimulate job creation in the last two decades, fostering a labour market segmentation whereby these temporary jobs are taken-up by disadvantaged workers. But, beyond them, temporary employment has been on the rise in Europe over time. We know from previous research that, as far as non-standard forms of work go, temporary employment may be less desirable than part-time work: it implies more volatile earnings and less straightforward entitlements to social security. It is potentially more imposed than chosen, a finding that this thesis confirms in Chapter 9, showing that non-standard-earning couples relying solely on temporary work tend to report more that this temporary work is involuntary, than those couples relying solely on part-time work.

Precariousness in couples' employment participation may not just be the rise of non-standard-earning couples: within this category, it may also be the rise of such couples relying on less favourable forms of employment. This, contrasting with the finding that permanent employment is strongly homogamous, suggests that this uneven distribution of temporary versus permanent work could be a driver of inequality and precariousness in couples. A similar argument could be made with regards to self-employment, as self-employment comes in couples, and so does employee work, but the data at hand in this thesis makes it hard to distinguish between the different realities behind the "self-employed" category.

Researchers therefore need to keep monitoring the evolution in the prevalence of these forms of employment. But, equally importantly, they need to monitor the rise in forms of work that are potentially at the intersection of different forms of non-standard work: a key example would be the rise in "gig economy" workers. If these forms of employment increase and cluster in couples, and in households more generally, which the self-

employed status of such workers suggests, they may induce rises in social and income inequality, and poverty risks.

But the "self-employment" status of these workers is disputed, and, in addition, they present characteristics that are both similar to well-known forms of non-standard employment (like part-time work), and on the other hand, present a relationship to their employer that suggests an imbalance of risks (working for a well-defined brand but being in charge of their own earnings and access to social protection). If non-standard work increasingly moves towards the gig economy, it is important for researchers to monitor these forms of work, but crucially, to monitor it in a household context, which is the one that determines further social risks such as poverty.

Thinking of non-standard work as the only source of employment some households can access forces us to reconsider its implications and opens-up a vast range of questions. Its porosity with dual-worklessness, established in the German case study, whereby the main predictor of the type of exit from dual-worklessness is the status prior to dual-worklessness and whether the couple had any standard employment or not, is particularly interesting.

This speaks of a form of segmentation of labour markets at the couple level. Being stuck in a segment of the labour market without access to standard employment may not be great for an individual – but if the household cannot be a buffer against that risk, the social implications may be worse than initially thought of.

Other findings of this thesis have implications for future research. In terms of couple employment patterns, it clearly documents the rising importance of female-single-earning, in line with a recent literature. Although the focus of this thesis has primarily

been on dual-workless or dual-earning couples, still many questions remain to be answered on the relatively new phenomenon of female-single-earning, the extent to which it is a permanent arrangement, a voluntary agreement between the partners, what drives it, what its consequences are. This thesis did not just emphasise the increasing importance of female-single-earning, but also its role as a buffer to employment shocks, which further underlines the importance of better understanding the phenomena.

The fact that female-single-earning seems to be driven by women who are more educated than their male partner suggests that, for all its flaws, there could be something in Becker's argument that couples specialise according to who is most productive on the labour market. But the fact that a majority of couples are homogamous both in educational achievement and employment participation, shows that this desire for specialisation cannot be seen as a driver behind partnership formation in the first place for many couples, contrarily to the Beckerian theory. This points to a potential need to decouple the analysis of gains to marriage from that of employment participation and specialisation once the couple is formed.

Finally, the extension of the shift-share analysis proposed in this thesis to incorporate the distinction between standard and non-standard employment can have implications in terms of future research endeavours It shows that the methodology is robust to the distinction between sub-categories, which could be used to refine the analysis, for instance by distinguishing between different forms of part-time work, by considering newer forms of non-standard employment. More broadly, it can be used to analyse the concentration, and distribution, of various forms of social risks within couples and households. An example of more prospective analysis could be to explore the extent to which automation risks concentrate in couples and households, which would have huge

implications for the design of future social policies. Another could be to further contribute to the literature on low-paid poverty by analysing the extent to which low-paid work clusters in households, and how this has been evolving over time.

12.5.2. Implications flowing from the limitations of this thesis

Substantive implications

This thesis focuses on two dimensions, non-standard employment and polarisation, that can constitute forms of inequality and social risks. A natural extension, which the scope of this thesis did not allow, would be to link these results to developments regarding income inequality and in-work poverty amongst couples.

Polarisation slowing-down could be attenuating income inequality, and the decline in dual-worklessness could be good news on the poverty front. On the other hand, if part of this slow-down stems from substituting dual-worklessness with non-standard-earning, given the lower-earnings associated with non-standard-jobs, this could have strong implications for the poverty levels in these couples that are non-standard-earner. It could be that a new category of disadvantaged couples, on the fringe of the labour market but not on the radar of policy-makers, policy alleviation policies and welfare-states. It could also explain any discrepancy between income inequality/poverty, if they keep rising, as seems to be the case and the slow-down in overall polarisation.

More generally, it could be that the polarisation of ILO employment was a good explanation to rising income and social inequality in the 1980s and 1990s, times in which such polarisation was strong and female employment was heavily stratified by educational level, but is much less relevant today. The rise of non-standard employment is key in this context, and within it, the rise of forms of non-standard work that are

particularly precarious and tend to cluster in couples, such as temporary work and certain forms of pat-time work, which this thesis could touch on, but warrants further, more detailed exploration in future research. These implications relate to the wider points made by the in-work poverty literature: that the nature of poverty has been changing to be increasingly characterising the world of work, rather than being limited to worklessness, and that linking individual employment characteristics to household outcomes is crucial.

Further research should also seek to link the different models of inequality identified in chapter 10, across all couples, across dual-earning couples, and within dual-earning couples, to wider issues of poverty and income and social inequality. A country whose ILO-defined employment distribution across couples is very even, with a lot of dual-earning couples and few dual-workless ones, may have high levels of income inequality that would be surprising at face value, but that could be explained by a high degree of inequality across dual-earning couples between dual-standard and dual-non-standard ones. A country relying heavily on the one-and-a-half-earning model may mean that women, upon separation of the couple, become financially vulnerable single-person households.

The fact that this thesis links questions of household polarisation to questions of employment quality also opens the door to linking the "two polarisations": how does household employment relate, if at all, to job/wage polarisation? It would be interesting to explore whether those countries that polarise the most over time between low and high occupations, also see these occupations become more unevenly distributed across households.

Linking these models of distribution of standard and non-standard employment across and within couples to questions of income inequality would also be relevant in the aim of understanding better the role of female employment in affecting household income inequality. The role of female employment may be more equalising in countries like Germany and the Netherlands, with female non-standard work typically complementing male standard employment, than in Spain or Portugal, with female standard employment clustering with male standard employment.

Moreover, the fact that, historically, as shown in chapter 2, the distribution of standard and non-standard employment has followed the "modified-male-breadwinner" model may explain why female employment is often found to equalise income across households; but the fact that rising clustering of standard employment has since taken-place, may suggest that Esping-Andersen's (2007) prediction that more female employment would increase household income inequality simply has not yet materialised but is on its way. Exploring these questions in further research has the potential to inform very relevant social policies.

Another limitation is that, throughout this thesis, non-standard employment and its sub-components have been treated as equal everywhere. While this is worthwhile in facilitating analyses over time and across countries, this misses out on differences in what non-standard employment actually means in each country context, nuances that deserve to be captured in further research. The implications of having a household solely relying on non-standard employment as a source of labour income are not the same if this non-standard employment is substantial or marginal (in the case of part-time work); if it is temporary work lasting years or weeks; if it is well-paid or not; if it yields decent social security entitlements or not.

The case of the Netherlands, which has a much higher proportion of dual-non-standard-earning couples than most other European countries, but in which non-standard employment tends to be institutionalised and good quality work, could be an interesting example to explore further. While Chapter 9 shows that, over time, non-standard-earning couples increasingly, and disproportionately, are low-educated couples, it shows that the Netherlands is an exception, with a high selection of high-educated couples into this form of work which, combined with a lower propensity to report that non-standard-work is involuntary in Dutch non-standard-earning couples, could illustrate new forms of chosen couple arrangements around new forms of work. The new polarisation may not just between dual-standard-earning couples and non-standard-earning couples: within that latter category, a potential divide may emerge between those who choose such an arrangement, and those for which it is constrained, a divide that may differ across countries depending on how segmented the labour market is.

All of this could form part of a future research agenda on non-standard employment in couples, an agenda that would delve further into distinguishing between different forms of non-standard employment, and, within a given form of non-standard employment, distinguishing between more or less precarious and more or less involuntary forms of work, while keeping an eye on new forms of non-standard work such as the gig economy.

Couples are also only one form of household, albeit the most important in terms of the proportion they represent. How polarisation and non-standard employment play-out for other household types, for instance single-headed households, and affect social risks such as poverty and inequality, is an obvious possible extension of the work, in particular as single-headed households are often more vulnerable to social risks such as worklessness or precarious employment.

This chapter also hypothesised that the rise in the couples that solely rely on non-standard employment as a source of income, and how they have replaced dual-workless couples as a share of couples, may be due to a landscape of flexibilization of labour market and welfare-states changing their focus away from compensating social risks upon their occurrence, towards (re)-employment. It attempted to test this hypothesis in the context of the Hartz IV reforms in Germany, studying whether the reform made dual-workless couples more likely to exit dual-worklessness, and more likely to exit it towards a non-standard earning arrangement.

So, does the lack of effect post-reform found in terms of exits towards non-standard-earning invalidate the hypothesis that policy changes in Europe have turned dual-workless couples into non-standard-earning? It certainly does not prove it, but more work is needed on the topic.

Fundamentally, labour market policies work in interaction with each other: perhaps it is the general, and more long-run, switch in unemployment benefits, employment protection, active labour market policies, sanctions and conditionality, minimum wage or nature of employment that is at play, that has been taking place over decades, rather than one abrupt change in a single area in isolation. The general landscape may matter more than a single policy reform.

Future research on this more general and progressive change of landscape may be as useful as research studying the effect of abrupt reforms. In addition, future research exploiting such abrupt reforms should widen the geographical field, as the German case may have had specificities that impacted the results, and the field of labour market

policies, as policies such as employment protection laws, active labour market policies, or minimum wage, may also matter.

In addition, studying where dual-workless couples go is only the most obvious, emerged tip of the iceberg when studying the broader counterfactual question of couples that would have been dual-workless forty years ago, but are in non-standard-earning today. The substitution of one form of couple for the other is not just dual-workless couples transitioning to non-standard earning. To take a simplifying example, a male-single-earner working in the mining industry in the 1980s may have lost its job as mines closed down, and been in a region with little work for him or his female partner to compensate, leading the couple to dual-worklessness. But let us have the thought experiment of this same couple becoming dual-workless today: possibilities (however unappealing) such as working part-time in a discount supermarket on a zero-hour contract, becoming an Uber driver or Deliveroo rider, or potentially combining more than one of these jobs, have become more prevalent, as work has become more flexible, and labour market policy too.

Therefore, it is not just that the relevant horizon for policy change may be the long-run one: this may also be the case for couples too. Dual-workless couples being replaced by non-standard-earning ones can literally mean that a dual-workless couple exits dual-worklessness towards non-standard earning. Or it can mean that sociologically, they are similar, but the context of the 1980s means they would be dual-workless, and the context of the 21st century mean they are employed on the fringe of the labour market. In any case, the question of the role of labour market policy in the transformation of couple employment patterns and the rise in non-standard earning couple is still very much open.

Methodological implications

Limitations of this thesis are also linked to certain methodological limits. For instance, an obvious extension for future research is to explore more causally the hypotheses and descriptive analyses that Chapter 9 put forward in order to explain why the rise of polarisation has slowed-down or even started to reverse. In fact, in exploring the coherence and relevance of these potential explanations in chapter 9, the aim was exactly to spur on further research on causal mechanisms. Of course, quantitative designs may be very useful in that respect. But qualitative research exploring in more depth the choices of employment made by couples, particularly the newer forms of couples led by women, or relying solely on non-standard work, would also be very useful in establishing potential mechanisms that microdata may not allow to go into.

In Chapter 10, I made the choice to focus on a more limited number of countries and study them over time. Therefore, its conclusion that there might be a trade-off between the rise of dual-earning, and elements of inequality in couple employment participation that it implies, has to be caveated because of the absence of many European countries (or indeed, other OECD advanced economies). Key forms of welfare-states, such as the social-democratic ones, or the post-Communist economies (if they even form a single group of welfare-state, which is doubtful at best), are missing. Some may be able to achieve more female employment, more dual-earning, with better quality jobs that do not polarise across couples.

Chapter 11 attempts to pin-down the effect of Hartz IV, but had to rely, in the absence of geographical or time disparities in the rollout of the reform, on a comparison between a rather different treatment and control group. Although the rich set of control variables enable to make this comparison, quasi-experimental designs that exploit a sharper, more clear-cut allocation to treatment and control would be welcome.

Finally, at the intersection of substantive and methodological concerns, is the choice of studying the pre-pandemic period. This choice is partly driven by very practical considerations: work on the thesis started before the pandemic, and the data obtained at the time only went to 2019. The latest year of data that would have been possible to use realistically may have been 2020, at the very best 2021, years that were still fully shaken by the pandemic or the beginning of the recovery. Whatever results would have emerged from these years, would have been hard to interpret in line with a chapter that adopts a very long-term perspective.

However, potential evolutions from the pandemic definitely warrant studying evolutions in the object of interests of this thesis since 2020. The pandemic may have redefined our relation to work and our family. It may have made some men realise the extent of unpaid household work that their female partners still definitely take-up (one can dream). It may have pushed on the agenda the issues of a better work life balance, shorter hours, shorter weeks. It may have put the welfare-state, and the power of public spending, back into the game. The shortages of labour in the recovery context may have given workers more bargaining power to get better quality jobs, but also perhaps more flexible ones.

All of this make the evolution of couple employment patterns, non-standard employment and polarisation in the 2020s a fascinating issue – I just thought that I lacked the necessary distance to do it, and that it deserved more than two heavily affected years without post-pandemic context, to explore it.

There will, no doubt, be other limitations in this thesis. These are non-exhaustive examples that hint at potential future work which, combine with the insights coming from the results, make for a very rich potential research agenda in the area.

12.6. Policy recommendations

A thesis in social policy aims to make policy recommendations, and this is the task this section undertakes to finish the book.

12.6.1. The quality of non-standard-employment

A key, overarching recommendation, relates to the finding that non-standard earning couples are on the rise, and to the methodological limitation of this thesis that, as described earlier, treats all non-standard employment across Europe as equal, under the assumption that it is a deviation from standard work that is generally a social disadvantage.

But, after all, my data do not tell everything. A couple with both partners in non-standard employment could be a couple with both partners working 27 hours per week, an arrangement they decided to reach in order to allow both of them to have more time off-work, to share household duties equally, while contributing to household income in a relatively even way. These 54 hours of weekly work would probably be more than a single-earner could achieve on its own even if in standard employment. This couple could live in a country in which hourly earnings are high and part-time employment leads to no penalty when it comes to social security entitlements.

They may very well be such couples in my data. A country like the Netherlands, where part-time employment is less gendered than elsewhere, can be found in good quality job, and does not weaken social protection, would be a possible example. But the overwhelming amount of evidence from past research is that non-standard jobs, in practice, are less desirable jobs on average, and the data from this thesis shows that, on

average, non-standard earning couples tend to be couples that have socioeconomic disadvantages, apart maybe from the Dutch case.

It is up to further research to determine exactly who the non-standard earning couples are, and sort the truly disadvantaged ones from the ones that enjoy their status. The point that I would like to make here, rather, is that the form of ideal non-standard earning couple that I describe could be an ideal to aspire to, from a policy perspective.

Non-standard employment is only treated as a potential form of social risk in this thesis, because it tends to be in practice, as has been described, but it does not need to be. And, if chapter 10 is correct in pointing-out that a dose of non-standard employment is needed for European economies to create enough jobs for everyone and increase employment and dual-earning rates, it may need to be embraced if dual-earning is seen as a desirable social objective.

But policymakers need to create the conditions under which these non-standard jobs are no longer, for many, bad jobs. In a way, they need to make non-standard employment a real, desirable alternative to standard employment.

This means better social security entitlements and longer hours (within the part-time realm). German type minijobs may look good on paper to decrease the unemployment rate, less so in terms of the social outcomes they generate.

This also means regulating the more precarious sectors with the most vulnerable workers, especially those that cumulate different forms of non-standard jobs, like gig economy workers with a self-employed status who work less than full-time, with little social security protection if things go wrong. This is even more important in light of the finding that self-employment tends to cluster in couples. If, in couples, and in households more

generally, gig economy workers are the only source of labour income, the social risks associated to such forms of work may be worse than currently thought, and this is an important task for researchers and policymakers to tackle.

This means privileging part-time work over temporary work as a form of non-standard employment creation: the latter is associated with more instability for workers, more times spent workless in between jobs, less time to accumulate social security rights or invest in human capital. But if part-time work creation is privileged, this needs to come with the efforts mentioned above to make it substantial and more equally taken-up by men and women.

12.6.2. Supporting female-single-earning couples

The finding that female-single-earning couples have been rising as a proportion of all couples also generates policy issues. Again, there may be couples in which female-single-earning is an arrangement that both partners have agreed upon explicitly, and the male partner takes up the household duties proportionately, while the female provides a stable source of income.

But again, this may be more an ideal to aspire to rather than the reality for many female-single-earning couples, despite the rise in female-single-earning couples with the female more educated than the male. The rise in non-standard female-single-earning couples could be the symptoms of a loss of traditional "male jobs" in certain sectors like manufacturing or construction (due to economic crises, deindustrialisation, work-related injuries) and of women compensating by taking-up work in the sector that creates jobs, services, but that also happens to create an important number of non-standard jobs.

Further, evidence suggests that non-employed males, in workless couples or female-single-earning couples, just do not do the share of household work that women would do in the same situation, sometimes because of incapacity, often because of powerful gender norms. This could create a double-burden on working women in single-earning couples. A country like Portugal, where female employment rate is comparatively high, and where women work long hours, despite little public childcare comparatively and traditional gender norms, is a clear example of this potential double-burden.

The evidence from this thesis is that female-single-earning is here to stay. It has risen both in the long-run, and in an accelerated fashion recently. The educational advantage of partnered women over partnered men is now significant, and the trend is still rising. Female-single-earning may be undesired on paper – but this is not true of the actual female in these couples, but of the males. After a peak around the crisis, the desire for change in these couples has declined. More importantly, the desire for change amongst these couples has stayed stable despite the recent acceleration in female-single-earning.

In this context, aside from improving the conditions associated to non-standard employment as discussed in the previous subsection, policies closing the gender pay gap are key to ensure that female-single-earning couples are not put at a disadvantage. This is a question of gender equality, but also, increasingly, a question of poverty and inequality, structurally, but also as emphasised by the crucial buffer role played by female employment in the case of the 2008 crisis.

Further, policies to relieve the double-burden and engage men into doing more household work would be needed. More childcare availability, available even for women in single-earning couples who work part-time, and not just affordable or available for those with a

full-time job, is key, because the evidence from previous research is clearly that workless men may not engage in household and care work as much as their time allows. More even parental leave, and incentives for men to take more paternity leaves would also be an option, to try and rebalance this care work. Education about gender stereotypes and sensibilisation of the unevenness of household work as it currently is distributed between men and women would be welcome, because the availability of paternal leave may not be enough if gender roles are strong.

12.6.3. Labour market policy and the couple context

Although the German case study did not establish a link between labour market reform and the decline of dual-worklessness (and its propensity to be replaced by non-standard earning), it still enabled a certain number of conclusions.

The most obvious is the importance of the household context in mediating policy effects. I found a positive association between the years that followed the reform on individuals' re-employment chances, but a negative one for dual-workless couples. A plausible mechanism is that the extra means-testing brought about by the reforms would have generated workless-couple-specific disincentives. The policy recommendation here would be to individualise as much as possible the access to unemployment benefits.

This is extra important in the context of couples: evidence suggests that having a partner in employment helps a workless person find work too, via the networks, information, and general labour market connections that the employed partner has. Partners in a dual-workless couples do not have this option. Breaking the cycle is important, and making sure policies do not have unintended incentives therefore matters.

The German case study also highlighted the porosity between dual-worklessness and non-standard-earnings, as dual-workless couples that use to be non-standard employed were more likely to exit dual-worklessness towards a new non-standard-earning arrangement, than those who previously had someone in standard work. This highlights a potential issue of segmentation, and couples being stuck in the non-standard/workless segment of the labour market, sometimes known as the outsider part of the labour market. Whether non-standard jobs lead to standard employment is an unsettled debate in labour economics, one whose answer, as often, seems to be "it depends".

Policymakers should therefore create the conditions for this "it depends" to work – for dual-workless couples who exit towards non-standard-earning to not come back to dual-worklessness, and ideally evolved towards good quality jobs. Solutions could include active labour market policy – for instance, in the current context of labour shortages, helping dual-workless couples train in areas that are expanding, as well as encouraging the training of people on the job once they exit worklessness.

This, as alluded to, is even more crucial – and potentially even more beneficial – in the context of workless households who cannot rely on the labour market knowledge of an employed partner. It reduces the risk of training someone who would have found a job anyway, which is sometimes associated with active labour market policy. As partners making-up dual-workless couples cannot rely on an employed partner to find work, they can end-up in long-term joblessness: rebuilding the skills needed for work and general employability of these people is crucial, which can also take the form of hiring subsidies, or direct job creation – people who work on job guarantee schemes for instance, emphasise how public jobs are less costly for public finances than (long-term)

joblessness, and this may be even more important for dual-workless couples in which the worklessness of one partner can reinforce the worklessness of the other.

Finally, in the context of potential "macho-effects", whereby dual-workless couples remain workless because of gender norms that hinder the female partner from taking a job, all measures already discussed – more education to alleviate gender stereotypes, more measures to make female employment more attractive via better working conditions and the provision of childcare – apply.

The rise of dual-earning and of female employment has been conducive to more equality between men and women, in addition to all the positive externalities linked to higher employment rates, and any intrinsic benefits that employment can sometimes bring. By many metrics, they are desirable social aims, but unregulated, they can come with hidden downsides in terms of the quality of employment, and the precariousness of couples that lose-out from these evolutions, whether fully workless or relying on precarious work. Policymakers have a role to play to ensure the rises of female employment and dual-earning truly fulfil their potentials in terms of gender and social inequality.

PART IV: SUPPLEMENTARY MATERIAL AND BIBLIOGRAPHY

Appendices

A. Appendix to chapter 9

A.1. Details on the derivation of the polarisation indicators and their extension to study the type of employment

To formally study how much society polarises between dual-earner and dual-jobless couples, I use the approach developed in the seminal works of Gregg and Wadsworth (2001, 2009, 2010). They develop a model to formalise and capture the idea of employment polarisation. They do it to measure employment polarisation across all households. But, as will become clear below, their model is also directly applicable to specific types of households and I indeed adapt it to concentrate on couples only, and later to integrate considerations of employment quality.

The intuition behind their indicator is to compare a counterfactual in which employment is completely randomly and equally distributed across households and the real, empirical distribution of work across households.

Let us consider a world with $i=1;2;3;.....I$ individuals. They live in $h=1;2;3;....H$ households. Each household has $k=1;2;3....K$ people living in that household. In the counterfactual model, each individual has the same probability of being non-employed. This probability is the aggregate non-employment rate. In a society with a 25% non-employment rate, this counterfactual scenario assumes that any single individual in that society has a 0.25 probability of being jobless.

Formally, if μ denotes the aggregate non-employment rate, then the counterfactual workless household rate γ_k, for every household h with k adults is given by:

$$\gamma_k = \mu^k \qquad (1)$$

Therefore, a single-person household's counterfactual probability of being jobless is just μ, the aggregate non-employment rate. For a couple, it is the square of the non-employment rate. The aggregate counterfactual household joblessness rate simply is a weighted average of the counterfactual workless rates obtained for each household of size *k*, weighted by the proportion s_k of households of size *k* in the population:

$$\bar{\gamma} = \sum_{k=1}^{K} s_k \gamma_k = \sum_{k=1}^{K} s_k \mu^k$$

(2)

As the population of interest here is couples, I discard other forms of households and only focus on households with two adults living in partnership. Therefore, while keeping the same overall approach as Gregg and Wadsworth, there is no need for a weighted average to account for the relative proportions of households of different sizes, and the aggregate counterfactual couple dual joblessness rate is given by:

$$\gamma_2 = \mu^2$$

(3)

And by construction, using the exact same logic to derive it, the counterfactual couple dual earner rate α is given by

$$\alpha_2 = (1 - \mu)^2$$

(4)

As $(1 - \mu)$ is equal to the aggregate employment rate θ, this is equivalent to saying that the counterfactual dual earner employment rate, under the assumption of random allocation of employment across couples, is the square of the employment rate.

The polarisation indicator aims to compare how unequally or equally distributed employment actually is in the population of couples, when compared to this "predicted rate" based upon the idea of a random distribution of employment. If we define *dw* the workless couple rate in the population of couples, and *de* the dual earner rate in the population of couples, then the polarisation indicator ρ is given by

$$\rho_{dw} = dw - \gamma_2 \qquad (5)$$

and by

$$\rho_{de} = de - \alpha_2 \qquad (6)$$

For dual workless and dual earner couples respectively.

A positive value for equation (5) means that there are more dual workless couples in society than would have been expected given a random allocation of non-employment. Equally, a positive value for (6) means that there is an "excess" of dual earner couples. A negative value means that employment is more equally spread across couples than the counterfactual would have predicted.

Note that as detailed in Gregg and Wadsworth (2009), these two polarisation indicators move in the same direction but need not move in the same proportions over time and therefore need not be exact mirror-images of each other. The picture is only ever fully complete in that regard if there is a polarisation indicator constructed for single breadwinner couples: the single breadwinner polarisation is the exact inverse of a "homogamy" measure that would sum-up the dual workless and dual earner polarisation measures.

This-single-earner counterfactual is given by:

$$\lambda = [(1 - \mu^2) - (1 - \mu)^2]$$

(7)

Which means that the predicted single-earner rate is the counterfactual probability that the couple is not dual-workless (i.e. that at least someone is employed) minus the counterfactual probability that the couple is dual-earner (i.e. that both partners are employed).

Finally, I follow Gregg and Wadsworth' recommendation to normalise the polarisation measures over the business cycle, to enable better comparisons across countries and time, by dividing the polarisation of dual-joblessness measure by the non-employment rate, and the polarisation of dual-earning measure by the employment rate. The final measures of polarisation are:

$$\rho_{dw_n} = \frac{dw - \gamma_2}{\mu}$$

(8)

and:

$$\rho_{de_n} = \frac{de - \alpha_2}{\theta}$$

(9)

Let us now turn to the type of employment. I propose a new version of the Gregg and Wadsworth polarisation indicator, that takes into account the "nature" of the job. In this chapter, I apply the extension to incorporate the distinction between standard and non-standard employment in the polarisation indicators, and to distinguish between employment in the service, industrial, and agricultural sectors. Below, I describe how I construct these indicators for standard and non-standard-employment – but once the process is understood, it is exactly the same for sectoral considerations.

The general approach remains the same: building a counterfactual model in which standard and non-standard-employment are completely randomly distributed across couples, and compare it to the real distribution across. For instance, if the standard employment rate at aggregate level is 60%, in the counterfactual it means that any individual drawn at random would have a 60% chance of being in standard employment, and by construction, a 40% chance of not being in standard employment. Not being in standard employment can mean being jobless, or being employed in a non-standard job.

Formally, and following the same logic as for raw employment, if θ_s denotes the aggregate standard employment rate, then the counterfactual dual-standard-employed couple rate α_{S2} is given by

$$\alpha_{S2} = {\theta_s}^2 \tag{10}$$

And by construction, using the exact same logic to derive it, the counterfactual couple absence of dual standard worker rate γ_{S2} is given by

$$\gamma_{S2} = (1 - \theta_s)^2 \tag{11}$$

With $1 - \theta_s$ corresponding to people not in standard work, that is, being the sum of the non-employment rate μ and of the non-standard-employment rate θ_{ns}

Again, we aim to compare these counterfactuals to the actual distribution of standard employment we observe across couples. If we define d_s the dual-standard-earner rate of couples in the population of couples, and d_{ns} the rate of couples with no standard workers in the population of couples, then the polarisation indicator ρ are given by

$$\rho_{ds} = d_s - \alpha_{S2}$$

(12)

and by

$$\rho_{dns} = d_{ns} - \gamma_{S2}$$

(13)

For dual-standard and absence of standard-employment couples respectively.

As in the case of standard employment, I normalise the measures to enable better comparisons across countries and time, by considering the "stock" levels of people in standard employment and not in standard employment. This yields, for dual-standard employment and its absence, respectively:

$$\rho_{dst_n} = \frac{dst - \alpha_{S2}}{\theta_s}$$

(14)

and:

$$\rho_{dnst_n} = \frac{dnst - \gamma_{S2}}{(\theta_{ns} + \mu)}$$

(15)

Finally, the polarisation of the absence of standard employment can be decomposed into two components: the polarisation of dual-worklessness (as already derived), and the polarisation of couples that are not jobless but are not in standard employment either ρ_{ow}.

This latter component is derived in the following way – with δ_{NS} denoting the non-standard employment rate amongst the population of employed individuals, M_{nst} denoting the rate of male-single-earner couples in non-standard employment, F_{nst} the rate of female-single-earner

couples in non-standard employment, and T_{nst} the rates of couples with two partners in non-standard employment.

$$\rho_{ow} = [M_{nst} + F_{nst} + T_{nst}] - \left[\left[(1-\mu^2) - (\theta^2)\right] * \delta_{NS}\right] + \left[\theta^2 * (\delta_{NS})^2\right]$$

(16)

This is the difference between the actual rates of couples that are not jobless but do not have standard employment and their counterfactual.

The counterfactual itself is the sum of two components: the counterfactual rate of couples with a single breadwinner in non-standard employment and the counterfactual rate of couples with both partners in non-standard employment.

Keeping in mind the assumption that everything is randomly distributed – employment, non-employment, standard employment, non-standard employment – the former is obtained as the product of the counterfactual for single-earner couple, and, given that the couple is single-earner, the probability that this single-earner is in non-standard employment, given by the rate of non-standard employment amongst employed individuals.

The latter is obtained as the product of the probability that both partners are employed (the counterfactual rate of dual-earning), and, given that both partners are employed, the probability that both of them are in non-standard employment, which is obtained as the square of the non-standard employment rate amongst employed individuals.

Finally, note that the same principles can be applied to whatever we define as "the nature" of employment. For instance, it is possible to build a counterfactual of for couples in which both partners are in service employment which is the square of the service employment rate in the population, and a polarisation indicator which is the difference between dual-service-earner couples and this counterfactual. Similarly, it is possible to build a counterfactual for single-

industry-earning couples, which is the product of the counterfactual rate of single-earning, and the rate of industrial jobs amongst people who are employed: the polarisation indicator is then similarly derived as the difference between the actual and the counterfactual.

A.2. Sample size and methodology, proportion of partnered people, and descriptive statistics on variables used for the analysis

Table A1: Average descriptive statistics on sample sizes		
Individuals	Couples	Statistic
46815	14995	Average country-year sample size
1823	562	Smallest country-year sample size
289343	87484	Biggest country-year sample-size
34500	11534	Median country-year sample size

Note: this table offers the sample sizes on which the different variables used for the analyses are computed for Europe as a whole. Sample sizes in the EU-LFS vary across countries, often, but not always, in a way proportional to the country's population. They can also vary rather sharply over time for a given country, reflecting changes in data collection processes, as the next table, which breaks this table down by years and countries, shows.

The samples with all individuals are used for the computation of the counterfactual couple rates – remember that for instance, the counterfactual dual-earning rate is the squared employment rate, and therefore one needs to compute the employment rate using the general population to reach this counterfactual. The couple-files are used after reconstituting the couples, and are used to compute all actual couple-related variables.

Please also note that these are the "maximum" sample sizes, i.e., the ones used to compute the polarisation indicators for dual-earning and dual-worklessness, and the descriptive couple employment rates using ILO-employment. In the dataset I use, there is no missing value for this ILO-status and therefore, for every year and every country, everyone in the sample and every couple can be assigned a relevant ILO-defined employment state. But this is not the case for all variables – some variables in the analysis will have missing values, for instance there are missing values for the educational variable, or the sectoral variable.

I made the choice to carry all the analyses using the "maximum" sample, rather than restricting it to the population that would have no missing value on any of the variables used in the analysis.

This has multiple justifications. First and foremost, the core of this chapter, and its most important contribution, is documenting the evolution across an unprecedented number of times and countries of polarisation indicators. To be computed as precisely as possible, and as representatively as possible, these polarisation indicators require the biggest sample size possible, and excluding people and couples with missing values on other variables, not relevant to the computation of polarisation indicator, would have undermined this.

Another possibility would have been to adjust the sample each time by, for the analysis of each variable, excluding people with a missing value on that variable. But that would produce analyses on a different sample for different variables, which would undermine the explanatory potential of the analyses. Because much of the analysis rests on computing proportions, and analysing how relative proportions change over time, it is important that the background sample to these proportions remains stable across the different parts of the analysis.

In recognition of the fact that certain variables have missing values, all variables are defined "positively". For instance, once standard employment is defined, non-standard employment is not defined as "all those that are employed but not in standard employment", but as "those who are in part-time or/and temporary work". This

means that people are either workless, in standard employment, in non-standard-employment, or unassigned a status, if they have missing values on the variables required to define standard or non-standard employment. This means that the rate of standard and non-standard employment is calculated as the rate of people that we are sure are in standard or non-standard employment amongst the sample used to compute the dual-earning and dual-workless polarisation indicators.

In practice, the number of observations with missing values is extremely small, and therefore does not bear on the results. However, after exploring the data, if a country-year shows no response on variable, or a level on the variable that is a complete outlier compared to other years of the same country due to high non-response rate, the country-year is excluded from the analysis on that variable when it comes to computing European averages. For instance, for no explained reason, Luxembourg in 1995 does not collect any data on the variable capturing whether people work in a permanent or temporary contract. This artificially sharply decreases the standard employment rate of Luxembourg for that year only, and therefore causes an artificial data break in the average level of standard employment in Europe for the year 1995. Therefore, the country-year Luxembourg 1995 is excluded from any average European analyses that look at standard and non-standard employment.

For each result regarding each variable, the graphs or tables mention which country-years (if any – usually very few are excluded if at all) are taken out. Further, even if the EU-LFS in general benefits from substantial sample sizes, there are a few cases in which they can be quite low – in the case of a combination of a small country with a small prevalence of a certain variable, for instance, non-standard-employment in the Baltic countries. Again, whenever such small sample sizes are likely to disrupt the analysis, the core text explicitly mentions it.

Table A2: Sample sizes by year and countries, for individuals and couples

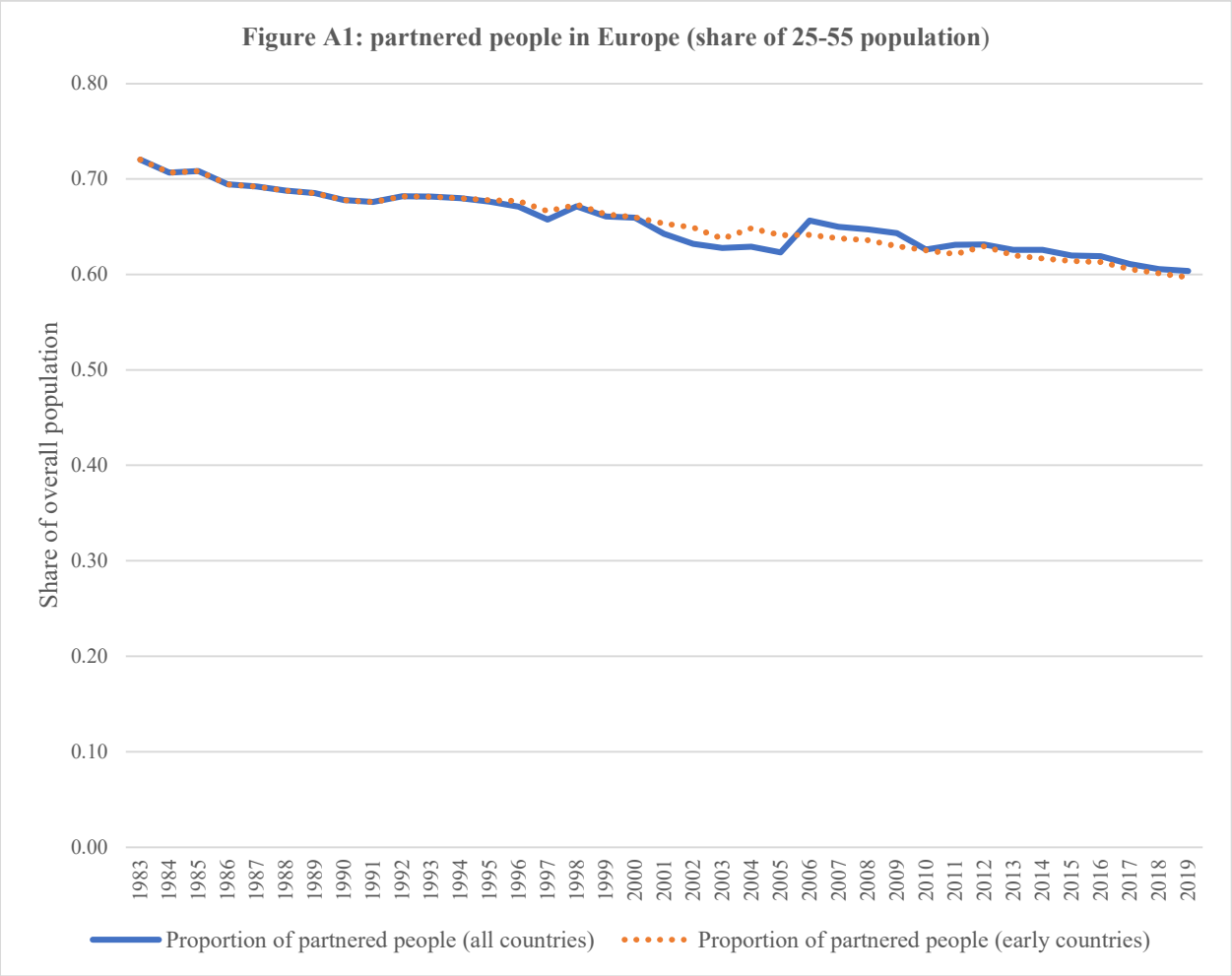
		1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Mean
AT	I													25700	25666	25482	26312	26041	24901	25217	24770	23539	19338	87973	86215	87324	83681	79796	78148	76857	76775	76602	73709	71975	73495	74278	71722	71120	56665
	C													8416	8293	8305	86119	85886	81414	80443	79331	7589	63944	28643	28568	28819	27105	25600	24937	24376	23978	23478	22592	22217	22286	22465	21601	21328	17931
BE	I	42902	17389	35469	31313	28550	30141	27772	27945	30136	30888	33222	33318	33144	34285	33917	33737	11471	11388	10333	11770	11549	12289	48187	49735	48969	45838	44975	44092	40971	40979	40064	42276	39856	39967	18977	17336	18804	31188
	C	16355	6650	13458	11551	10280	10823	10022	9597	10159	10213	10835	10748	10677	11655	10723	11295	3644	3428	3011	3390	3288	3591	13595	13827	13335	12290	11973	11417	10418	12720	12187	12750	11854	11945	5756	5227	5571	9737
BU	I																			25098	24186	15940	14903	56629	53362	51133	13312	13515	12930	12237	11019	12438	13041	11301	13111	11642	12365	12139	20542
	C																			7368	7019	4718	4354	16311	17621	16689	4300	4221	40778	3769	31911	37312	4052	3349	3956	33911	3537	3434	6268
CY	I																		4331	4415	4453	4518	4436	16796	15995	16333	17298	17943	19383	19051	18653	18422	17126	16706	17039	17017	16693	16051	14133
	C																		1587	15955	15775	1582	1499	57006	54003	55333	58002	59551	62614	59557	58388	57115	51341	49685	51085	5024	48377	46794	44854
CZ	I															29880	29318	28610	27363	26968	26254	25678	26265	1035548	1041005	1018660	9636 1	9238 6	9178 4	17731	17056	16267	15980	15912	15609	15359	14868	14237	41452
	C															10774	10383	10012	9536	9218	8894	8567	8630	33766	34584	33323	31354	29863	29543	5706	5534	5250	5095	5054	4997	4891	4658	4453	13656
DK	I																												30601	14854	15764	15911	14910	14156	15883	12168	12102	12344	15869
	C																												4374	4972	5283	5395	4959	4542	5260	3841	3862	4015	4650
ET	I															2621	6719	6591	1881	2097	1979	1942	1823	7379	8411	9680	9339	8252	8223	8916	10182	10052	10201	10154	10017	11379	11507	11664	7435
	C															674	2132	2059	605	646	625	623	562	23 68	2857	3275	3216	2822	2814	3001	3361	3360	3432	3375	3379	3770	3621	3588	2442
FI	I																					26933	26082	25273	24592	23653	23847	22933	22218	20990	20643	19481	19724	18952	18405	17990	17025	16490	21484
	C																					8566	8368	7972	9139	8716	8906	8505	8222	7784	7650	7213	7192	6976	6785	6576	6222	5964	7692
FR	I	66827	67071	66707	66674	67095	68023	68142	67412	68230	70172	73866	76359	76383	76655	75573	75812	76037	76180	74362	72526	35560	35402	13 61 02	13 39 52	13 76 69	13 45 77	15 95 34	18 92 07	19 61 94	19 36 98	17 62 12	19 22 71	18 89 90	19 08 80	18 44 51	18 03 86	17 41 75	10 99 83

| | | |

	C																												32 50	31 69	29 15	29 83	30 99	30 10	28 97	27 36	23 56	22 03	20 53	27 88
N L	I	68 60 0		66 66 3		22 24 8	33 29 2	35 03 9	34 10 1	34 16 3	35 55 9	34 38 7	38 81 2	41 58 0	37 55 6	43 62 5	26 86 9	25 16 9	33 32 0	44 64 2	47 77 3	46 82 6	54 69 5	22 54 45	49 81 6	48 23 8	49 52 8	42 08 0	36 68 1	38 85 7	36 07 5	36 28 9	32 62 9	30 79 9	29 93 3	28 91 9	32 43 4	28 76 1	44 32 6
	C	25 75 3		24 63 1		82 55	12 14 9	12 35 3	11 88 6	11 77 2	13 64 8	13 15 6	14 77 4	15 91 5	14 46 2	16 71 6	10 17 6	95 03	12 84 4	17 33 8	18 76 8	18 16 2	20 80 6	84 67 2	18 13 2	17 40 0	17 75 2	15 00 2	13 16 4	14 03 6	12 91 2	12 69 2	11 31 7	10 59 8	10 16 9	96 35	10 80 2	95 50	16 31 1
P O	I															28 14 1				24 19 5	24 42 1	24 46 4	24 07 5	93 86 9	89 59 7	84 69 1	83 95 7	85 87 3	16 67 19	16 84 92	16 59 16	15 35 33	14 11 83	13 10 08	12 28 74	11 48 57	10 62 08	96 41 3	96 52 4
	C															95 66				79 67	78 60	77 59	75 66	29 61 1	30 43 4	28 39 2	28 16 7	28 99 2	56 09 5	55 74 2	54 60 6	50 36 1	46 32 8	43 00 7	40 41 7	38 05 1	35 33 2	31 98 3	31 91 2
P T	I				34 33 0	33 33 4	32 79 0	31 65 2	31 41 6	32 40 5	19 03 1	19 07 8	18 39 4	17 21 7	17 14 7	17 21 7	19 20 7	17 99 5	17 38 1	17 52 8	17 50 7	18 26 5	20 77 2	76 72 3	70 83 3	67 26 8	65 60 4	63 81 8	62 44 1	61 44 2	60 81 8	60 37 2	65 55 0	64 85 1	61 56 1	59 02 0	55 43 0	51 37 7	40 58 2
	C				11 98 0	11 41 2	11 00 0	10 71 3	10 67 5	11 10 8	66 52	65 79	62 89	57 56	55 78	54 67	63 23	56 93	54 81	55 14	53 96	56 05	66 68	24 29 6	23 35 4	21 97 1	21 16 4	20 21 4	19 70 1	18 94 8	18 31 4	18 20 0	20 62 4	20 38 1	18 92 7	18 17 2	16 75 8	15 27 8	12 94 7
R O	I																				16 96 5	17 11 6	29 32 7	11 45 14	10 83 82	10 41 98	99 46 0	97 88 6	96 63 5	95 51 0	91 42 8	89 62 4	88 79 1	99 48 5	94 55 1	94 27 3	93 11 9	90 34 2	84 53 4
	C																				51 10	51 62	88 04	34 32 5	37 41 3	35 68 7	33 79 9	33 15 1	32 03 9	31 20 7	29 24 9	28 34 0	27 81 3	32 34 4	30 55 3	30 44 4	30 20 2	29 62 6	27 51 5
S K	I																12 72 8	12 36 0	12 89 3	12 86 7	12 19 0	12 27 4	12 05 8	48 45 9	47 25 1	45 41 2	45 17 6	42 12 7	42 00 0	42 21 6	40 61 5	39 89 1	38 43 3	36 62 0	35 69 8	33 80 3	32 66 4	31 55 1	31 33 1
	C																42 20	39 11	40 17	39 64	35 81	37 38	36 77	14 51 1	15 54 1	14 61 9	14 49 1	13 29 1	13 02 0	12 79 9	12 28 5	12 06 3	11 53 4	10 89 3	10 39 2	10 01 3	95 82	92 45	96 09
S L	I														10 69 9	80 36			85 08	89 76	90 74	92 55	86 58	32 61 7	31 61 5	30 29 2	28 74 4	28 71 7	28 06 7	26 32 4	24 49 3	25 50 1	26 14 4	25 13 6	25 27 6	25 39 2	25 29 2	23 60 4	21 38 3
	C														33 82	25 06			25 66	27 11	27 69	27 75	25 39	91 47	97 65	91 94	86 24	86 74	85 39	79 51	74 08	74 91	77 35	74 81	74 83	75 97	76 96	71 65	64 18
E S	I					65 83 9	70 95 9	72 22 5	73 88 2	73 57 2	73 06 7	71 48 3	73 01 7	75 09 2	75 76 7	76 32 1	77 54 4	80 50 4	74 83 2	72 17 5	72 30 7	73 77 1	74 18 6	26 09 97	45 12 4	45 68 2	46 47 4	47 67 0	48 02 1	46 46 6	47 36 3	45 63 1	45 23 8	44 71 1	41 31 6	40 40 0	39 62 7	40 06 3	67 01 0
	C					22 11 3	23 78 6	24 03 9	24 62 9	24 22 3	24 02 9	23 40 6	23 70 4	24 36 5	24 67 7	24 53 0	24 75 5	25 51 2	23 52 0	22 31 7	22 12 0	22 24 3	22 51 2	80 38 0	14 33 6	14 51 8	14 81 4	15 11 9	15 12 8	14 75 3	14 94 9	13 99 3	13 89 6	13 65 1	12 39 1	12 19 3	11 86 0	12 00 8	21 22 6
S E	I																											20 92 0	18 57 9	17 41 5	16 55 4	15 12 2	13 81 4	12 62 1	82 10	80 95	49 73	43 88	12 79 0
	C																											74 95	63 68	59 85	56 80	52 07	49 63	40 78	28 04	28 41	16 28	14 59	44 10
U K	I	82 91 3	62 58 7	63 75 9	64 24 8	63 57 4	65 09 3	66 06 9	65 07 3	64 59 6	65 81 2	67 40 2	65 93 7	63 88 1	63 81 4	62 48 5	61 09 0	60 37 0	58 26 5	56 29 4	56 16 8	53 07 4	50 49 0	49 58 9	48 31 8	47 71 2	76 35 3	37 24 5	35 96 4	34 28 4	33 06 1	32 24 0	33 05 8	31 42 1	30 66 5	30 62 0	30 99 8	31 56 1	53 13 7

	C	30641	22913	23074	22878	22568	22744	23520	23154	22842	22947	23372	22618	21623	21570	20939	20418	19990	19304	18497	18153	17004	16042	15699	15393	15090	24041	11766	11218	10497	10220	9972	10306	9922	9672	9704	9770	9969	17839

Note: this table shows sample sizes by year and country. The letter I denotes individual sample sizes. The letter C denotes couple sample sizes.



Note: this graph shows the proportion of people who are partnered (married or not) in the 25-55 population over time in my sample on average across Europe. Data are weighted EU-LFS data.

The graph on the next page breaks down this proportion of partnered people by country and by year.

Table A3: partnered people in Europe (share of 25-55 population), by year and country																										
Year	**AT**	**BE**	**BU**	**CY**	**CZ**	**DK**	**ET**	**FI**	**FR**	**DE**	**GR**	**HU**	**IE**	**IT**	**LA**	**LT**	**LU**	**MT**	**NL**	**PO**	**PT**	**RO**	**SK**	**SL**	**ES**	**SE**	**UK**
1983		0.76							0.73		0.70		0.68	0.70			0.70		0.75								0.74
1984		0.76							0.73	0.68	0.69		0.69	0.69			0.68										0.73
1985		0.76							0.73	0.67	0.69		0.70	0.70			0.68		0.74								0.72
1986		0.74							0.72	0.66	0.68		0.69	0.70			0.66				0.70						0.71
1987		0.72							0.72	0.65	0.68		0.69	0.69			0.65		0.74		0.69				0.67		0.71
1988		0.72							0.72	0.64	0.67		0.70	0.68			0.66		0.73		0.67				0.67		0.70
1989		0.72							0.73	0.64	0.67		0.70	0.68			0.63		0.71		0.68				0.67		0.71
1990		0.69							0.73	0.63	0.66		0.69	0.68			0.62		0.70		0.68				0.67		0.71
1991		0.67							0.72	0.64	0.65		0.69	0.68			0.64		0.69		0.69				0.66		0.71
1992		0.66							0.72	0.66	0.65		0.70	0.66			0.63		0.77		0.70				0.66		0.70
1993		0.65							0.71	0.65	0.66		0.69	0.66			0.67		0.77		0.69				0.65		0.69
1994		0.65							0.72	0.65	0.66		0.68	0.65			0.70		0.76		0.69				0.65		0.69
1995	0.66	0.64							0.72	0.65	0.65		0.68	0.64			0.72		0.77		0.67				0.65		0.68
1996	0.65	0.68							0.71	0.65	0.65		0.67	0.63			0.71		0.77		0.65				0.65		0.68
1997	0.65	0.63			0.72		0.52		0.71	0.65	0.64		0.66	0.62			0.70		0.77		0.64				0.64		0.67

1998	0.66	0.67			0.71		0.64		0.71	0.65	0.64			0.62			0.73		0.76		0.66		0.66	0.63	0.64		0.67
1999	0.66	0.64			0.70		0.63		0.70	0.65	0.63			0.61			0.73		0.76		0.63		0.63	0.62	0.63		0.66
2000	0.65	0.60		0.73	0.70		0.64		0.70	0.65	0.61	0.66		0.60			0.74		0.77	0.68	0.63		0.62	0.60	0.63		0.66
2001	0.64	0.58	0.59	0.72	0.68		0.62		0.70	0.64	0.60	0.65		0.59	0.54		0.73		0.78	0.66	0.63		0.62	0.60	0.62		0.66
2002	0.64	0.58	0.58	0.71	0.68		0.63		0.70	0.64	0.60	0.63		0.58	0.54	0.55	0.74		0.79	0.64	0.62	0.60	0.59	0.61	0.61		0.65
2003	0.65	0.57	0.59	0.70	0.67		0.64	0.64	0.68	0.63	0.58	0.62		0.57	0.57	0.55	0.71		0.78	0.63	0.61	0.60	0.61	0.60	0.60		0.64
2004	0.66	0.58	0.58	0.68	0.66		0.62	0.64	0.67	0.63	0.62	0.60		0.61	0.54	0.58	0.73		0.76	0.63	0.64	0.60	0.61	0.59	0.61		0.64
2005	0.65	0.56	0.58	0.68	0.65		0.64	0.63	0.67	0.62	0.60	0.58		0.61	0.53	0.59	0.72		0.75	0.63	0.63	0.60	0.60	0.56	0.62		0.63
2006	0.66	0.56	0.66	0.68	0.66		0.68	0.74	0.66	0.61	0.60	0.66	0.62	0.62	0.63	0.68	0.73		0.73	0.68	0.66	0.69	0.66	0.62	0.64		0.64
2007	0.66	0.54	0.65	0.68	0.65		0.68	0.74	0.65	0.61	0.60	0.65	0.63	0.62	0.58	0.68	0.72		0.72	0.67	0.65	0.69	0.64	0.61	0.64		0.63
2008	0.65	0.54	0.65	0.67	0.65		0.69	0.75	0.65	0.60	0.59	0.64	0.64	0.61	0.59	0.66	0.73		0.72	0.67	0.65	0.68	0.64	0.60	0.64		0.63
2009	0.64	0.53	0.62	0.67	0.65		0.69	0.74	0.65	0.60	0.58	0.62	0.65	0.61	0.58	0.65	0.69	0.63	0.71	0.68	0.63	0.68	0.63	0.60	0.63	0.72	0.63
2010	0.64	0.52	0.63	0.64	0.64	0.39	0.69	0.74	0.65	0.60	0.58	0.56	0.65	0.61	0.58	0.64	0.67	0.63	0.72	0.67	0.63	0.66	0.62	0.61	0.63	0.69	0.63
2011	0.63	0.51	0.62	0.63	0.64	0.67	0.67	0.74	0.65	0.59	0.58	0.54	0.65	0.60	0.57	0.64	0.67	0.62	0.72	0.66	0.62	0.65	0.61	0.60	0.64	0.69	0.61
2012	0.62	0.62	0.58	0.63	0.65	0.67	0.66	0.74	0.65	0.57	0.57	0.54	0.65	0.59	0.57	0.64	0.69	0.62	0.72	0.66	0.60	0.64	0.60	0.60	0.63	0.69	0.62
2013	0.61	0.61	0.60	0.63	0.65	0.68	0.67	0.74	0.65	0.56	0.56	0.53	0.65	0.59	0.56	0.62	0.67	0.62	0.70	0.66	0.60	0.63	0.60	0.59	0.61	0.69	0.62
2014	0.61	0.60	0.62	0.61	0.64	0.67	0.67	0.73	0.63	0.56	0.55	0.60	0.64	0.58	0.55	0.62	0.65	0.60	0.69	0.66	0.63	0.63	0.60	0.59	0.61	0.72	0.63
2015	0.62	0.59	0.59	0.60	0.64	0.64	0.67	0.74	0.62	0.57	0.56	0.59	0.64	0.58	0.55	0.61	0.64	0.59	0.69	0.66	0.63	0.65	0.59	0.60	0.61	0.65	0.63

2016	0.61	0.60	0.60	0.60	0.64	0.66	0.68	0.74	0.62	0.57	0.57	0.57	0.63	0.57	0.54	0.59	0.67	0.57	0.68	0.66	0.62	0.65	0.58	0.59	0.60	0.68	0.63
2017	0.61	0.61	0.58	0.59	0.64	0.63	0.66	0.73	0.61	0.57	0.56	0.57	0.63	0.57	0.52	0.57	0.58	0.52	0.67	0.66	0.62	0.65	0.59	0.60	0.60	0.70	0.64
2018	0.60	0.60	0.57	0.58	0.63	0.64	0.63	0.73	0.61	0.58	0.56	0.57	0.62	0.57	0.53	0.57	0.57	0.53	0.67	0.67	0.61	0.65	0.59	0.61	0.60	0.65	0.63
2019	0.60	0.59	0.57	0.59	0.63	0.65	0.62	0.72	0.60	0.58	0.57	0.55	0.62	0.56	0.54	0.56	0.55	0.54	0.66	0.66	0.60	0.66	0.59	0.61	0.60	0.67	0.63

Table A4: Descriptive statistics for the key variables that underpin the creation of other variables used in the analysis on average in Europe.							
Variable	**Unit of observation**	**Mean**	**Standard deviation**	**Minimum value**	**Maximum value**	**Number of country-years**	**Country-years excluded due to data unreliability**
Non-employment rate	Individual	0.23	0.06	0.11	0.45	687	None
	Female partner	0.32	0.13	0.12	0.78	687	None
	Male partner	0.1	0.04	0.02	0.26	687	None
Employment rate	Individual	0.77	0.06	0.55	0.89	687	None
	Female partner	0.68	0.13	0.22	0.88	687	None
	Male partner	0.9	0.04	0.74	0.98	687	None
Part-time employment rate	Individual	0.09	0.07	0.01	0.37	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Female partner	0.17	0.14	0.01	0.64	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Male partner	0.03	0.02	0.001	0.15	682	Luxembourg (1995) and Denmark (from 2016 onwards)
Full-time employment rate	Individual	0.67	0.08	0.46	0.83	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Female partner	0.5	0.17	0.09	0.83	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Male partner	0.87	0.05	0.67	0.97	682	Luxembourg (1995) and Denmark (from 2016 onwards)
Temporary employment rate	Individual	0.06	0.04	0.004	0.19	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Female partner	0.05	0.03	0.003	0.16	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Male partner	0.04	0.03	0.002	0.17	682	Luxembourg (1995) and Denmark (from 2016 onwards)
Permanent employment rate	Individual	0.59	0.1	0.29	0.75	682	Luxembourg (1995) and Denmark (from 2016 onwards)

	Female partner	0.53	0.14	0.14	0.78	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Male partner	0.68	0.09	0.41	0.87	682	Luxembourg (1995) and Denmark (from 2016 onwards)
Self-employment rate	Individual	0.11	0.04	0.05	0.23	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Female partner	0.07	0.03	0.02	0.17	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Male partner	0.18	0.18	0.06	0.43	682	Luxembourg (1995) and Denmark (from 2016 onwards)
Employee rate	Individual	0.66	0.08	0.41	0.8	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Female partner	0.61	0.13	0.2	0.84	682	Luxembourg (1995) and Denmark (from 2016 onwards)
	Male partner	0.73	0.08	0.49	0.89	682	Luxembourg (1995) and Denmark (from 2016 onwards)
Rate of employment in the agricultural sector	Individual	0.04	0.03	0.005	0.2	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
	Female partner	0.03	0.03	0.002	0.18	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
	Male partner	0.05	0.03	0.006	0.18	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
Rate of employment in the industrial sector	Individual	0.21	0.05	0.08	0.36	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
	Female partner	0.11	0.05	0.02	0.3	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
	Male partner	0.34	0.06	0.16	0.49	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
Rate of employment in the service sector	Individual	0.52	0.08	0.29	0.72	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
	Female partner	0.55	0.11	0.26	0.8	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)

	Male partner	0.5	0.08	0.3	0.73	574	All country-years before 1992 (data unavailable); Luxembourg (2015); Denmark (since 2015); Poland (1997); Finland (all years)
Educational achievement: high (tertiary education)	Female partner	0.3	0.13	0.06	0.6	570	All country-years before 1993 (data unavailable); Germany, Luxembourg and the UK (1998); Netherlands (before 1996); Czechia (before 1998); Denmark (all years)
	Male partner	0.26	0.09	0.07	0.47	570	All country-years before 1993 (data unavailable); Germany, Luxembourg and the UK (1998); Netherlands (before 1996); Czechia (before 1998); Denmark (all years)
Educational achievement: medium (upper secondary education)	Female partner	0.46	0.15	0.1	0.79	570	All country-years before 1993 (data unavailable); Germany, Luxembourg and the UK (1998); Netherlands (before 1996); Czechia (before 1998); Denmark (all years)
	Male partner	0.5	0.18	0.09	0.81	570	All country-years before 1993 (data unavailable); Germany, Luxembourg and the UK (1998); Netherlands (before 1996); Czechia (before 1998); Denmark (all years)
Educational achievement: low (lower-secondary education)	Female partner	0.24	0.18	0.03	0.81	570	All country-years before 1993 (data unavailable); Germany, Luxembourg and the UK (1998); Netherlands (before 1996); Czechia (before 1998); Denmark (all years)
	Male partner	0.24	0.18	0.03	0.83	570	All country-years before 1993 (data unavailable); Germany, Luxembourg and the UK (1998); Netherlands (before 1996); Czechia (before 1998); Denmark (all years)
Rate of "constrained" non-standard employment	Female partner	0.06	0.04	0.003	0.17	463	All country-years before 2000 (data unavailable); Slovenia (all years); Hungary since 2016; France before 2003; Spain in 2005; the UK in 2008;
	Male partner	0.04	0.03	0.002	0.15	463	All country-years before 2000 (data unavailable); Slovenia (all years); Hungary since 2016; France before 2003; Spain in 2005; the UK in 2008;
Rate of long-term joblessness	Female partner	0.25	0.1	0.08	0.59	598	All country-years before 1992 (data unavailable)
	Male partner	0.07	0.03	0.01	0.21	598	All country-years before 1992 (data unavailable)
Rate of employed people that wishes to work less than current hours	Female partner	0.06	0.04	0.0002	0.26	395	All country-years before 2000 (data unavailable); Austria (2004); Belgium (All years but 2000, 2003 and 2006); Czechia (before 2002); France (before 2003); Germany (all years before 2008 apart from 2005); Hungary (all years but 2000, 2001 and 2019); Ireland (before 2007); Italy (before 2002); Latvia (before 2002); Luxembourg (2004; 2008); Malta (all years but 2010); Poland (before 2001); Portugal (before 2001); Slovenia (before 2015); Spain (2004); UK (all years)

Rate of workless people that wishes to start working	Male partner	0.07	0.04	0.01	0.21	395	All country-years before 2000 (data unavailable); Austria (2004); Belgium (All years but 2000, 2003 and 2006); Czechia (before 2002); France (before 2003); Germany (all years before 2008 apart from 2005); Hungary (all years but 2000, 2001 and 2019); Ireland (before 2007); Italy (before 2002); Latvia (before 2002); Luxembourg (2004; 2008); Malta (all years but 2010); Poland (before 2001); Portugal (before 2001); Slovenia (before 2015); Spain (2004); UK (all years)
GDP growth	Country	2.6	3.2	-14.8	24.3	687	None

Note: this graph shows, for each of the variable, descriptive statistics, sample size, and the country-years that were or were not used. These variables are variables that are used in the analysis to underpin the creation of the core variables shown in the chapter – for instance, the employment rate is used to create the dual-earning counterfactual; the part-time, temporary and self-employed variables underpin the analysis of non-standard-employment. All data are EU-LFS weighted data.

| Table A5: Normalised (N) and raw (R) polarisation indicators for dual-earning, by country and year | | |

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| Table A6: Normalised (N) and raw (R) polarisation indicators for worklessness, by country and year | | |

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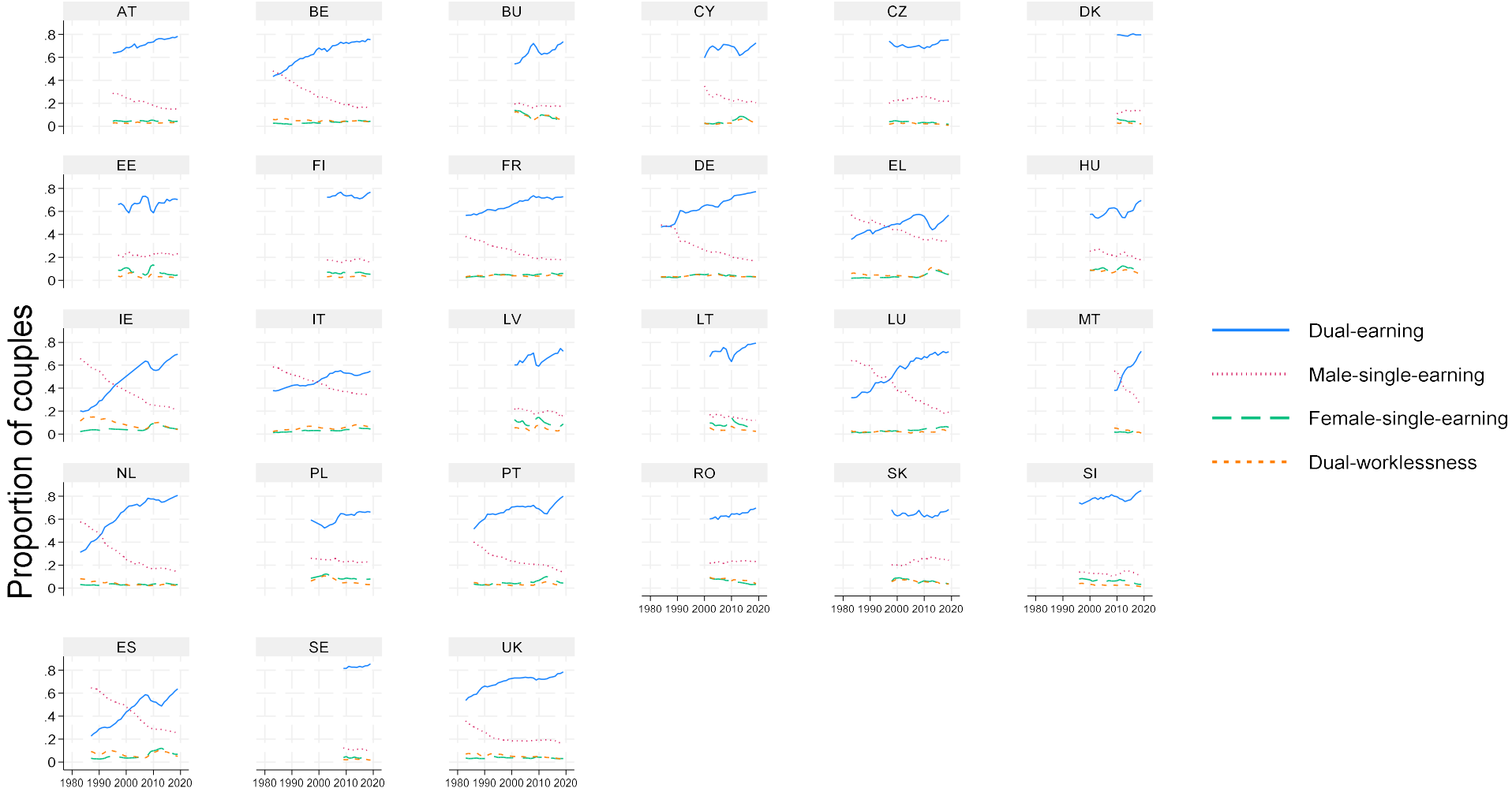
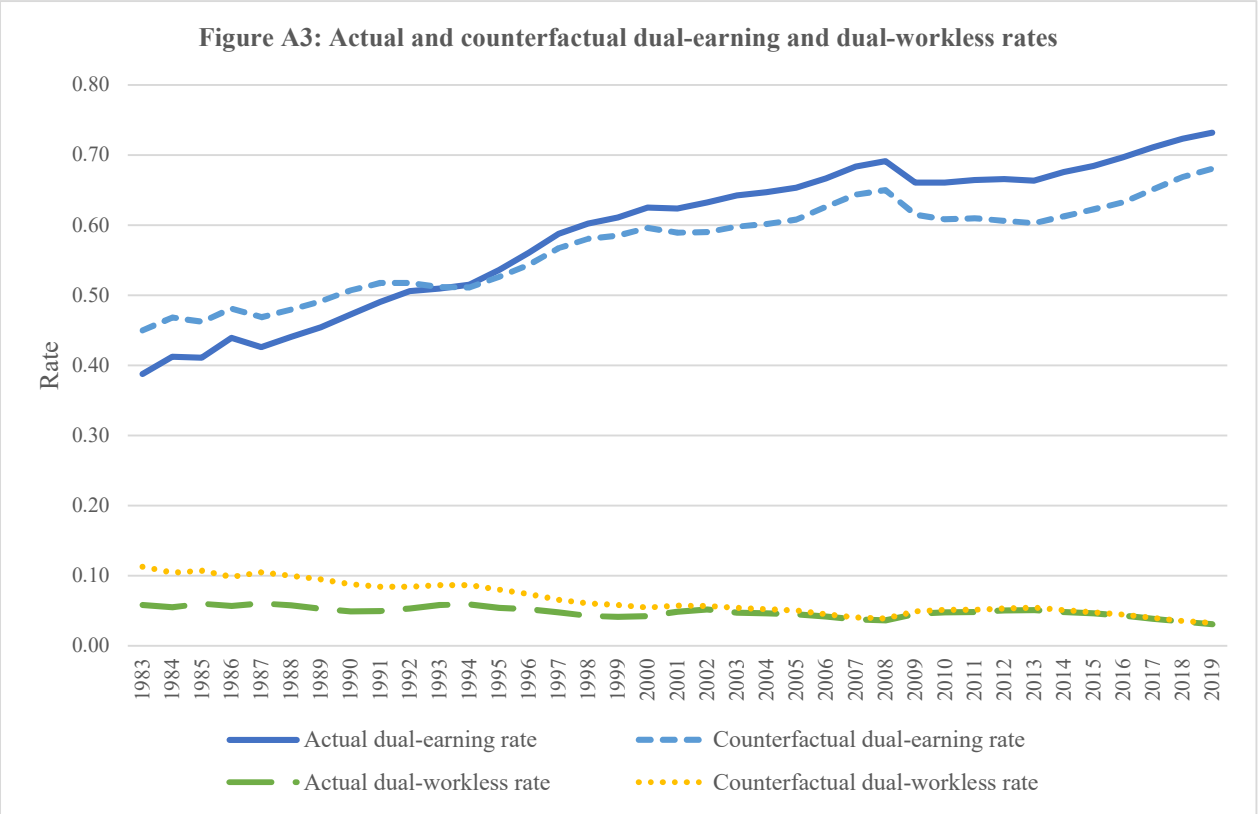
A.3. Couple employment participation (ILO-definition), by country and over time

Figure A2: Couple employment participation (ILO-defined)



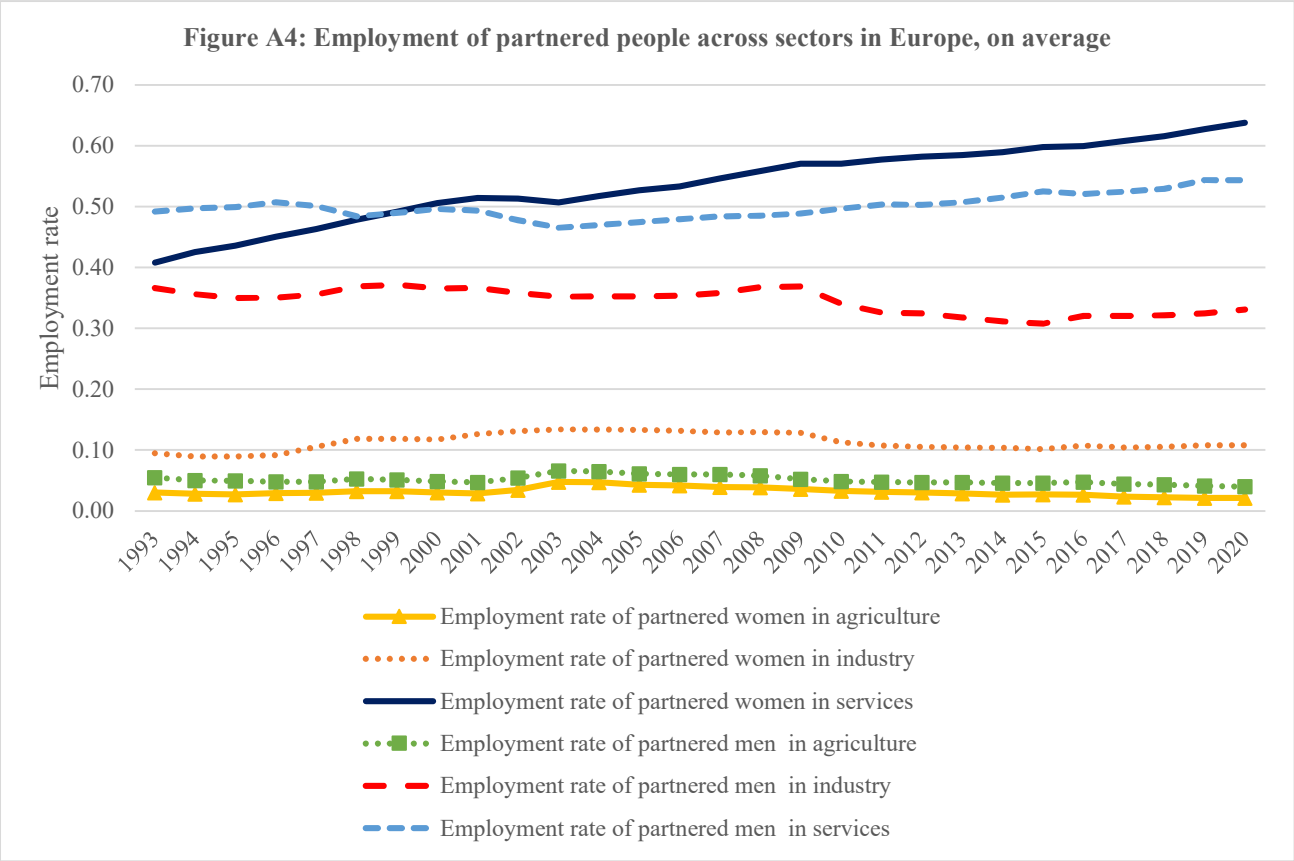
Data used are weighted data from the EU-LFS, as early as 1983 for 11 countries, for couples in which partners are aged 25-55. The blue lines represent the share of couples in which both partners work, according to the ILO definition. The red lines represent the share of couples in which only the male partner works. The green lines represent the share of couples in which only the female partner works. The yellow lines represent the share of couples in which no partner works.

A.4. Evolution over time of the actual and counterfactual rates of dual-earning and dual-worklessness



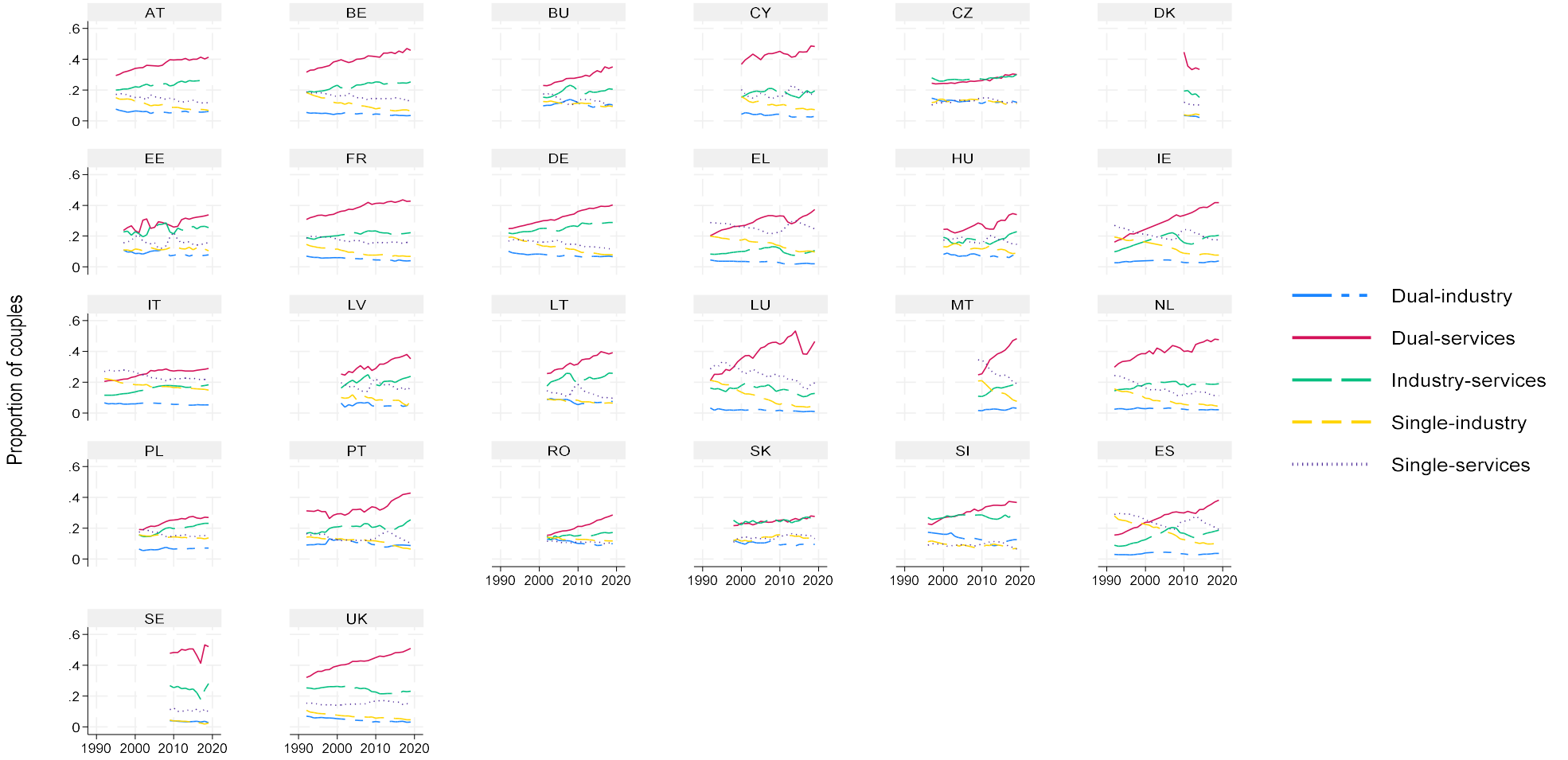
Note: this table plots the evolution over time and on average across Europe, of the actual rates of dual-earning and dual-worklessness, and of their respective counterfactuals – derived under the assumption that employment is randomly distributed across couples. The difference, for a given year, between the actual and counterfactual rate for a given couple type, gives the value of the polarisation indicator for that year. Data are weighted EU-LFS data, for couples in which partners are aged 25 to 55.

A.5. The changing sectors of couple employment and the changing nature of dual-worklessness, by country



Note: this graph shows, on average across Europe, the employment rate of partnered men and women, across sectors of the economy. The sectoral variable is based on the NACE classification; data are weighted EU-LFS data for couples with partners aged 25 to 55. The same trends broken-down by country are available on requests from the author.

Figure A5: Couple employment by sector and country



Note: these graphs break-down the results shown in chapter 9, by country. For parsimony, only the main types of couples are shown here (excluding those with a partner in agriculture). The graphs show, in each country, the proportion of all couples in which both partners are in industry; both in services; one in industry and the other in services; one workless and one working in industry; one workless and one working in services. Sectoral classification is based on the NACE classification. Data are weighted EU-LFS data for couples with partners aged 25 to 55.

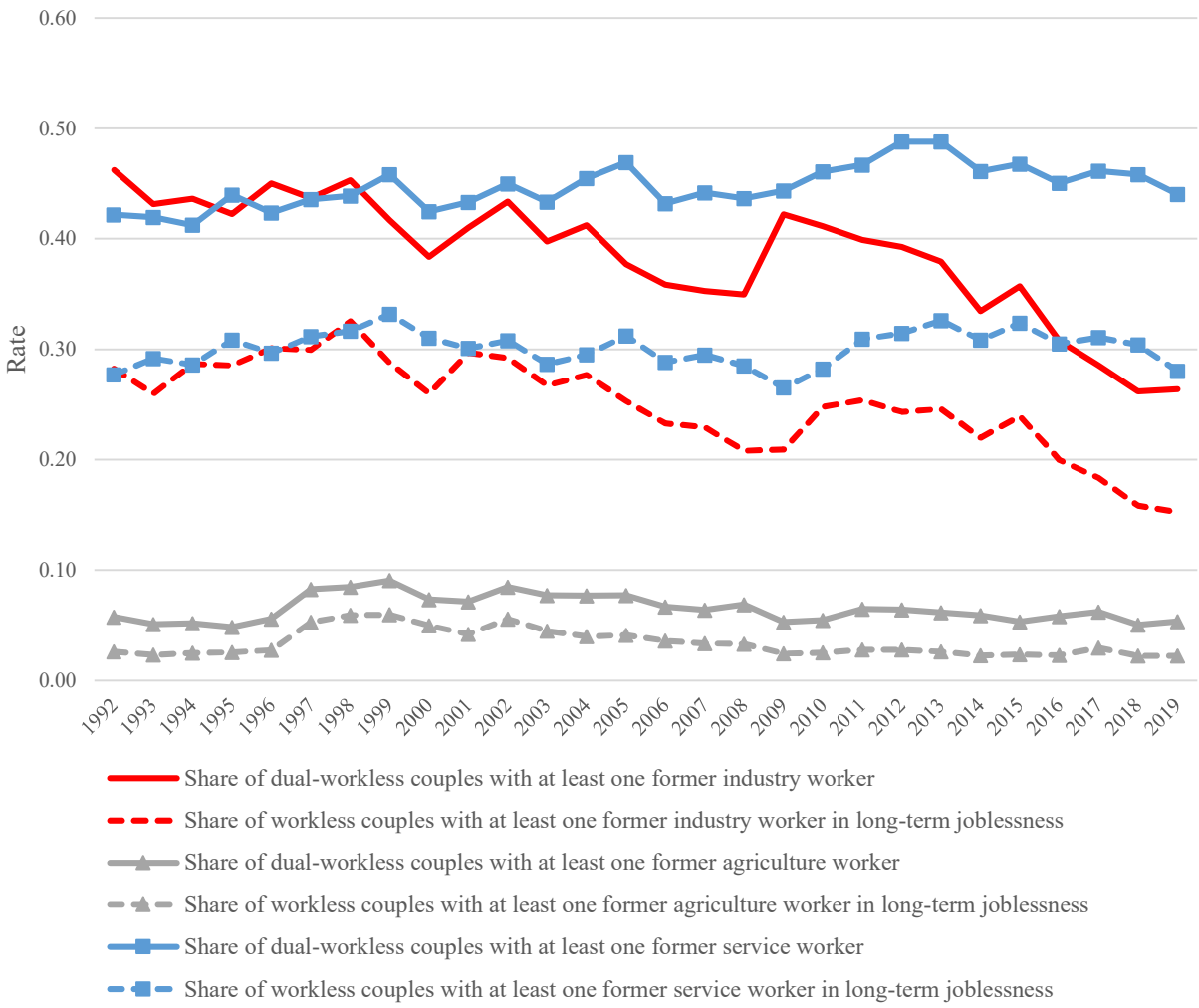
Figure A6: Actual and couterfactual rates of couple employment

Note: these graphs break-down the results shown in chapter 9, by country. The graphs show, in each country, the proportion of all couples in which both partners are in services; what this proportion would be under a counterfactual assuming a random distribution of service employment; and the same real and counterfactual rates for couples in which one partner is workless and the other is employed in industry. The graphs concentrate on these two couple types for parsimony, as these are the two that are especially discussed in the core of the chapter. Sectoral classification is based on the NACE classification. Data are weighted data from the EU-LFS, for couples with partners aged 25 to 55.

Figure A7: Dual-workless and long-term dual-workless rates in Europe

Note: these graphs break-down the dual-workless and long-term dual-workless rates (as a share of all couples) by country. Dual-workless couples are couples in which none of the partners are employed according to the ILO-definition. Long-term dual-workless couples are couples in which both partners have been workless for more than 12 months. Data are weighted data from the EU-LFS, for couples with partners aged 25 to 55.

Figure A8: Representation of different sectors of the economy in dual-workless couples



Note: this graph shows, on average across Europe and over time, the proportion of dual-workless couples according to the prevalence of each possible former sector of employment within these couples. Sectors are based on the NACE classification. Data are weighted data from the EU-LFS.

A.6. Regressions modelling the evolution of female employment rates and female-single-earning rates over time in Europe

Table A7: Regression results for the modelling of the evolution over time of female employment rates

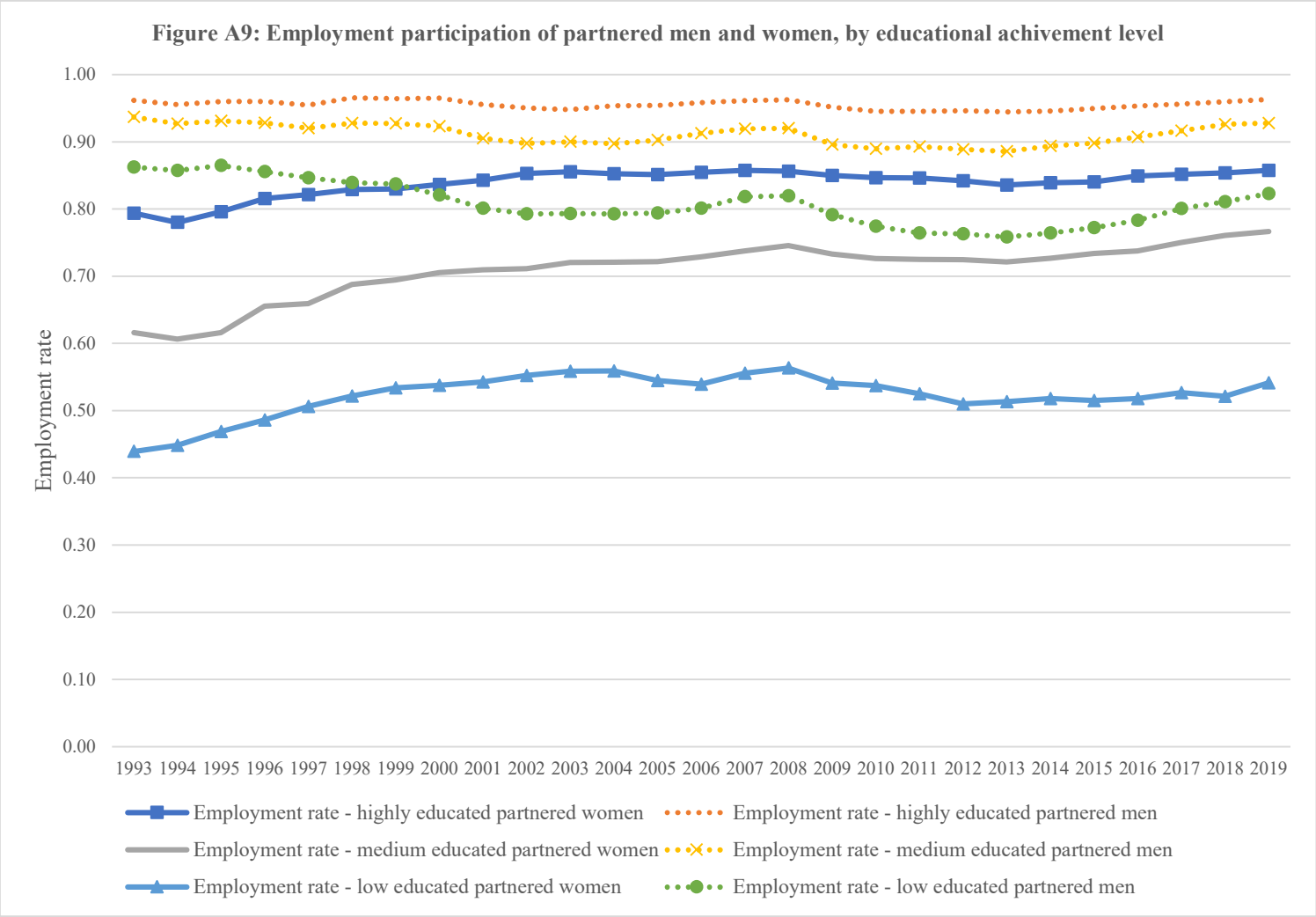
Variable	*Model 1. Dependent variable: female-employment rate*	*Model 2. Dependent variable: female-employment rate*	*Model 3. Dependent variable: female-employment rate*
Time t	0.02***	0.015***	0.01***
	(0.0006)	*(0.001)*	*(0.002)*
Square of time variable	-0.0002***	-0.0002**	-0.00004
	(0.00001)	*(0.00009)*	*(0.0001)*
Cube of time variable		0.0000001	-0.000002
		(0.000002)	*(0.000002)*
GDP growth	0.001***	0.001***	0.0003
	(0.0004)	*(0.0004)*	*(0.0005)*
Post-2008 dummy			-0.003***
			(0.0005)
Constant	0.44***	0.45***	0.46***
	(0.006)	*(0.008)*	*(0.009)*
Country fixed-effects	YES	YES	YES
N	687	687	687
r2 (within)	0.78	0.78	0.79
r2 (between)	0.4	0.4	0.42
r2 (overall)	0.52	0.52	0.53

Table A8: Regression results for the modelling of the evolution over time of female-single-earning rates

Variable	*Model 1. Dependent variable: female-single-earning rate*	*Model 2. Dependent variable: female-single-earning rate*	*Model 3. Dependent variable: female-single-earning rate*
Time t	0.02***	0.0004	0.02**
	(0.0003)	*(0.0007)*	*(0.0007)*
Square of time variable	-0.00005***	0.00008*	0.00001
	(0.00001)	*(0.00004)*	*(0.00004)*
Cube of time variable		-0.000002	-0.000001
		(0.0000006)	*(0.0000006)*
GDP growth	-0.001***	-0.001***	-0.0007***
	(0.0002)	*(0.0002)*	*(0.0002)*
Post-2008 dummy			0.01***
			(0.003)
Constant	0.03***	0.03***	0.03***
	(0.003)	*(0.003)*	*(0.004)*
Country fixed-effects	YES	YES	YES
N	687	687	687
r2 (within)	0.23	0.24	0.27
r2 (between)	0.16	0.2	0.16
r2 (overall)	0.16	0.18	0.19

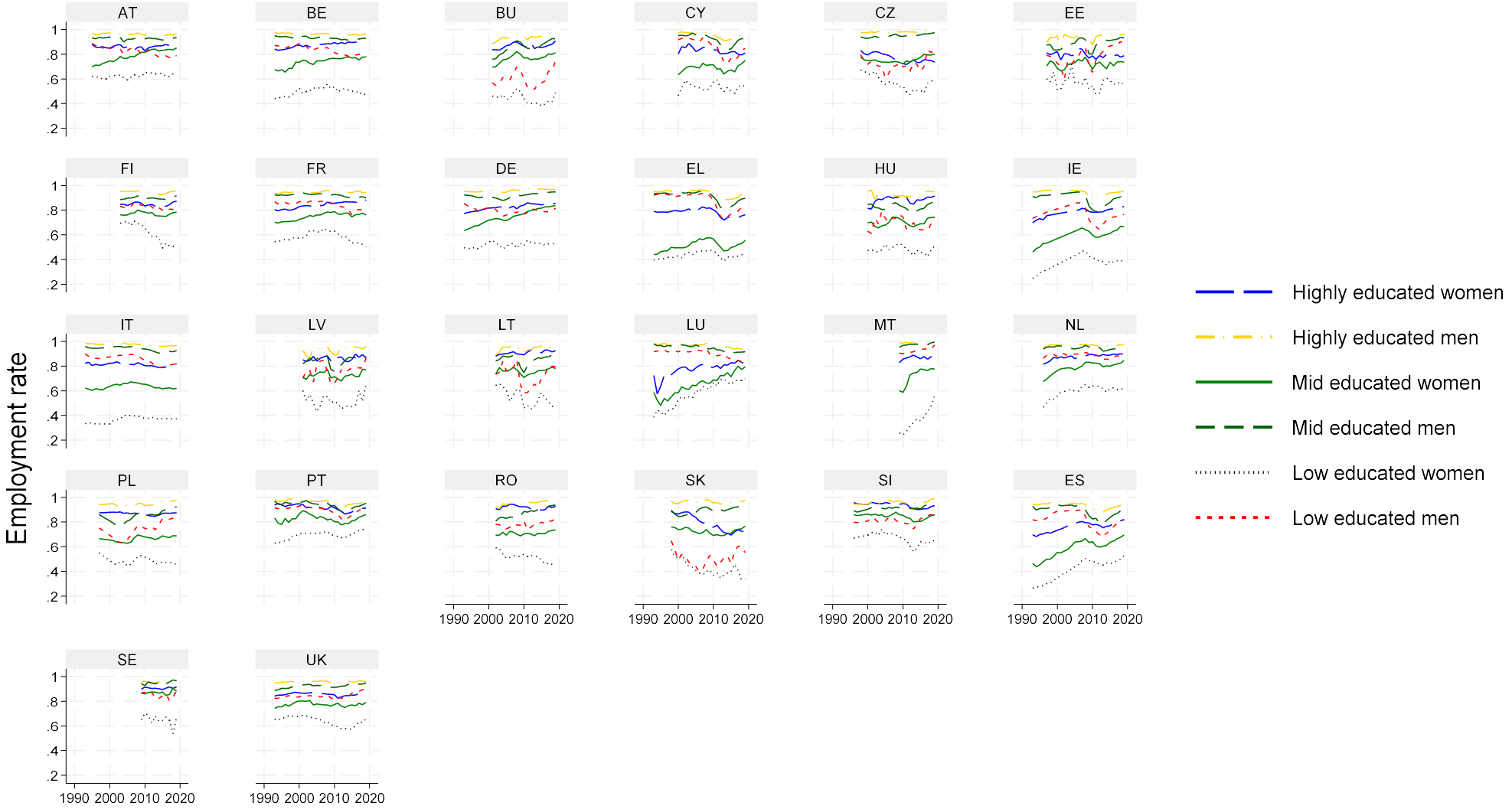
Note: coefficients obtained from country fixed-effects regressions, run over 687 country-years. 3 stars indicate significance at the 1% level, 2 stars indicate significance at the 5% level, a single star indicates significance at the 10% level. The data are weighted EU-LFS data. Results available by country, or for the "early countries" only, are available on request from the author.

A.7. The changing educational profile of European couples and the translation into new employment patterns



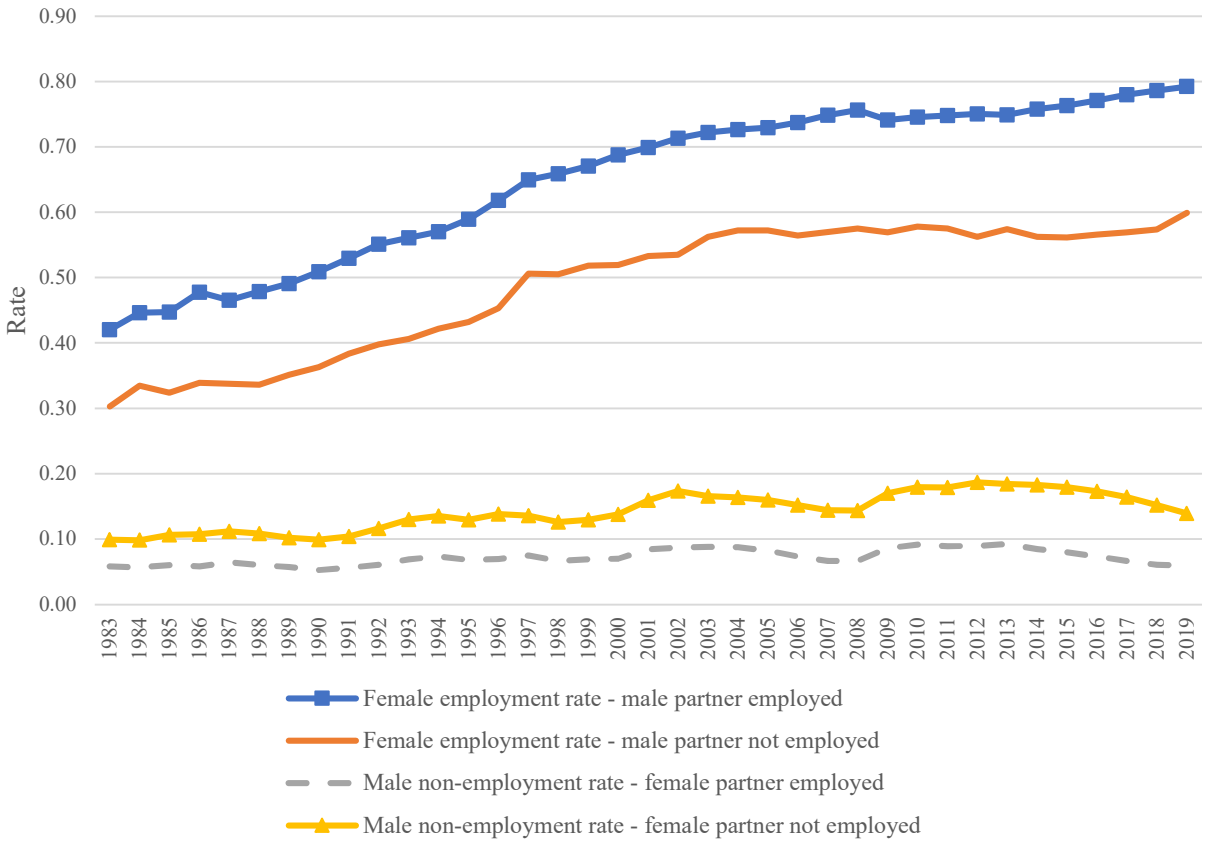
Note: this graph represents the employment rate for partnered men and women according to their level of education. Each partner can be highly educated (the variable takes a value of 3), medium educated (the variable takes a value of 2), or low-educated (the variable takes a value of 1. Data are weighted EU-LFS data for couples with partners aged 25 to 55.

Figure A10: Employment participation by educational level



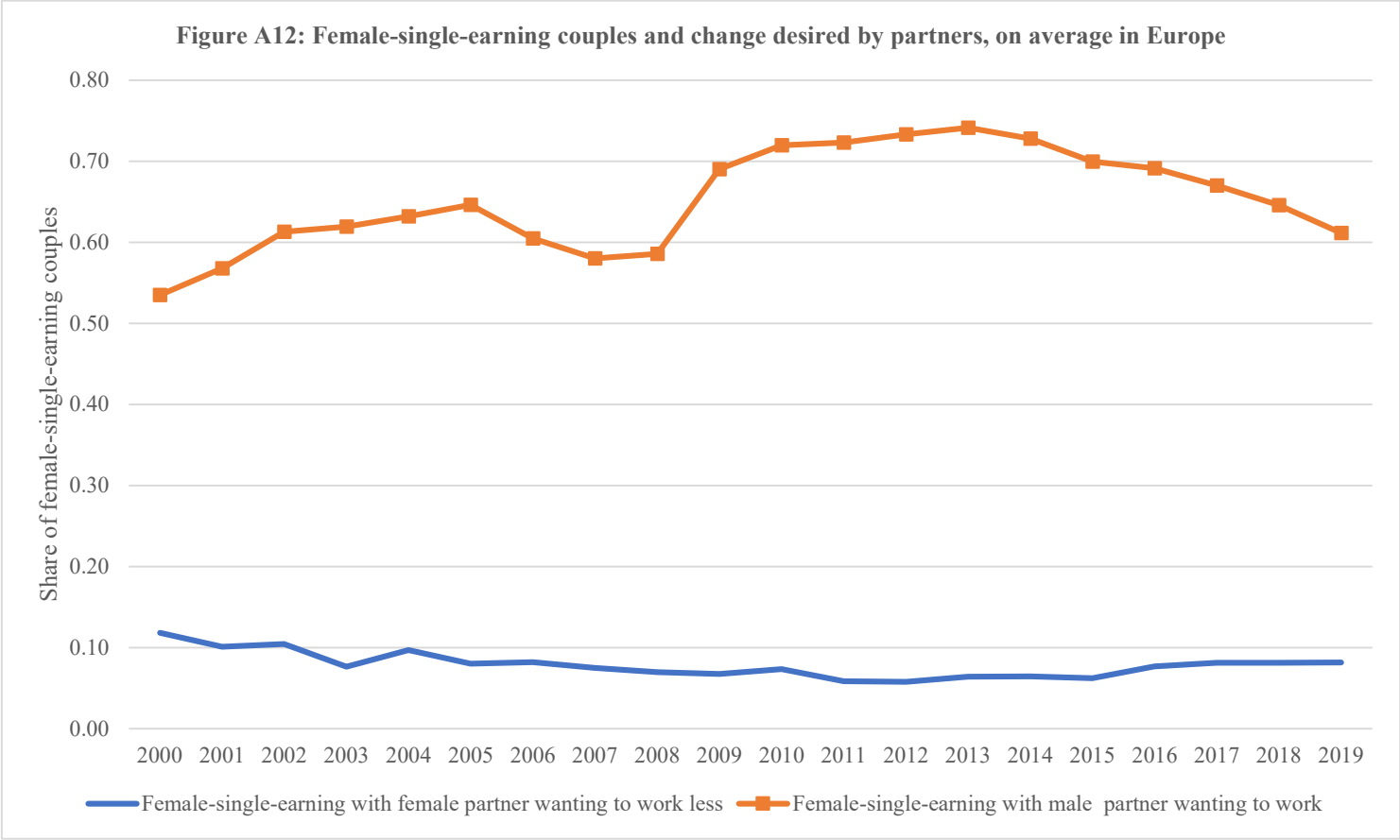
Note: these graphs represent the employment rate of partnered women and men in Europe, broken-down by educational level. Highly educated partners are those that completed tertiary education. Mid-educated partners completed upper secondary education. Lower- educated partners completed lower secondary education. Data come from the EU-LFS, are weighted, and encompass couples with partners aged 25-55.

Figure A11: Cross-tabulations of partners employment statuses



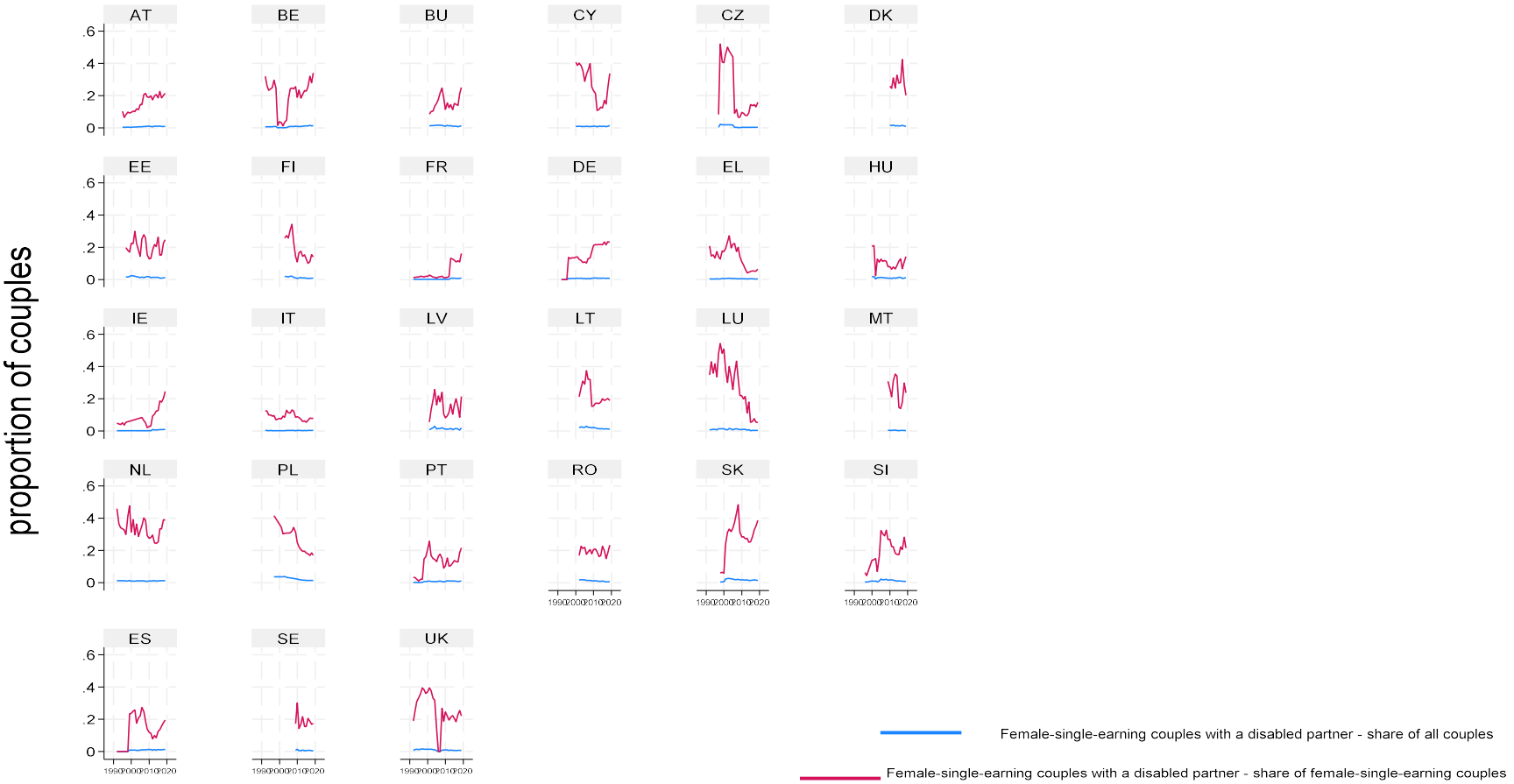
Note: this figure represents the evolution of female employment rate based on male partner employment status, and of male non-employment rate based on female employment status. Data are weighted data from the EU-LFS, for couples with partners aged 25 to 55.

A.8. Characteristics of female-single-earning couples



Note: this graph shows, on average and across Europe, the proportion of female-single-earning couples in which the female partner wants to work less (as captured by her usual weekly working hours being higher than her indicated ideal weekly working hours), and the proportion of such couples in which the male partner wants to work (as indicated by an active job search behaviour, or by a stated desired to work even if not searching). Data are weighted EU-LFS data, for couples with partners aged 25-55.

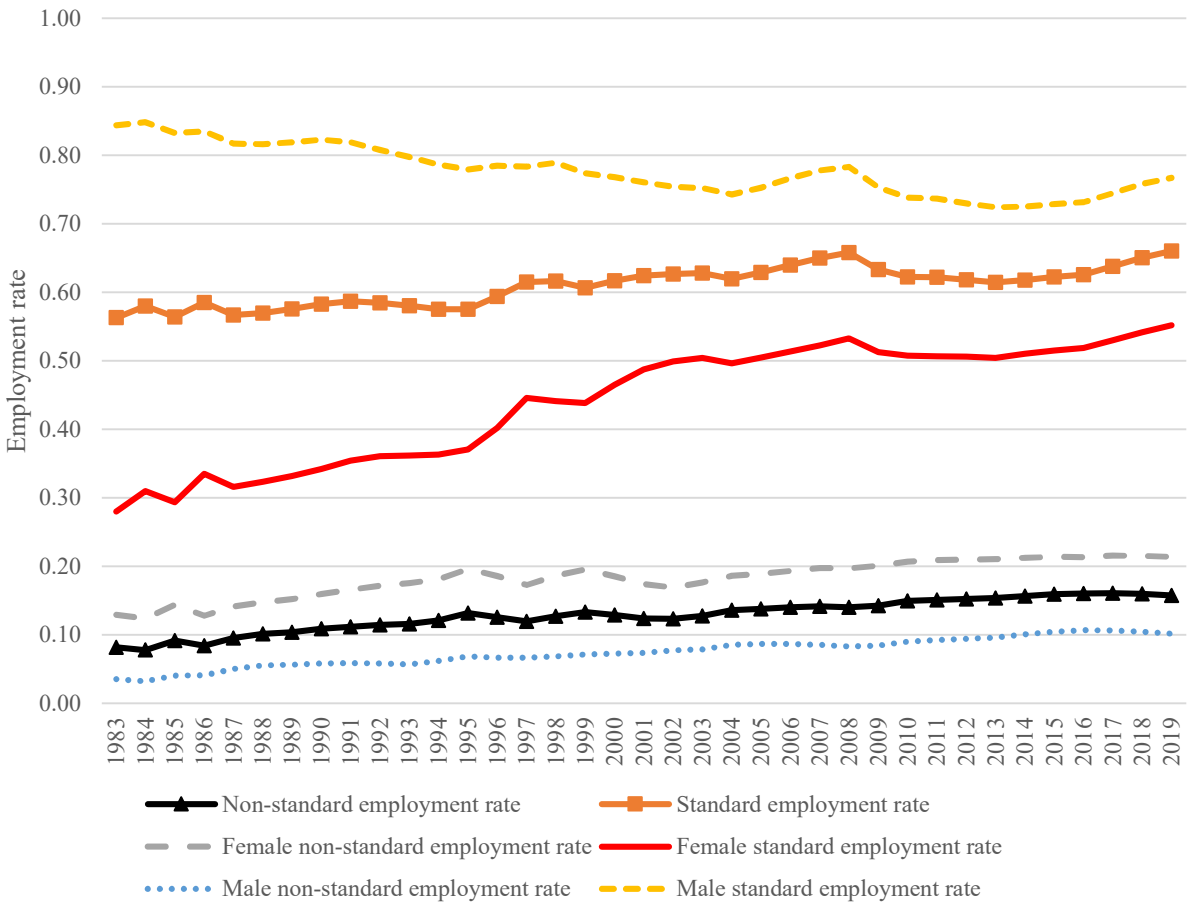
Figure A13: Disability of male partner in female-single-earning couples



Note: these graphs show, for each country, the share of female-single-earning couples with a male partner whose disability prevents him from working – as a share of all couples (in blue) and as a share of female-single-earning couples (in red). The following caveat should be kept in mind here: the variable capturing whether a workless individual is workless because of sickness/disability is rather unreliable in a number of cases, leading to the sharp variations from a year to another that we can observe. For instance, in the UK in 2006 and 2007, not a single respondent is classified as unable to work because of sickness/disability, hence the sharp drop. In France, this proportion is multiplied by 15 between 2012 and 2013, hence the sharp increase. Whether linked to the survey being administered differently from year to year, or from national definitions for disability/sickness being changed over time, this caveat affects the way we should analyse these results, which is also why no European-averaged result is shown. Nonetheless, the overall take-away remains that across all countries, female-single-earning couples with a disabled male partner remains a tiny, and stable, proportion of overall couple. Data are weighted data from the EU-LFS, for couples with partners aged 25 to 55.

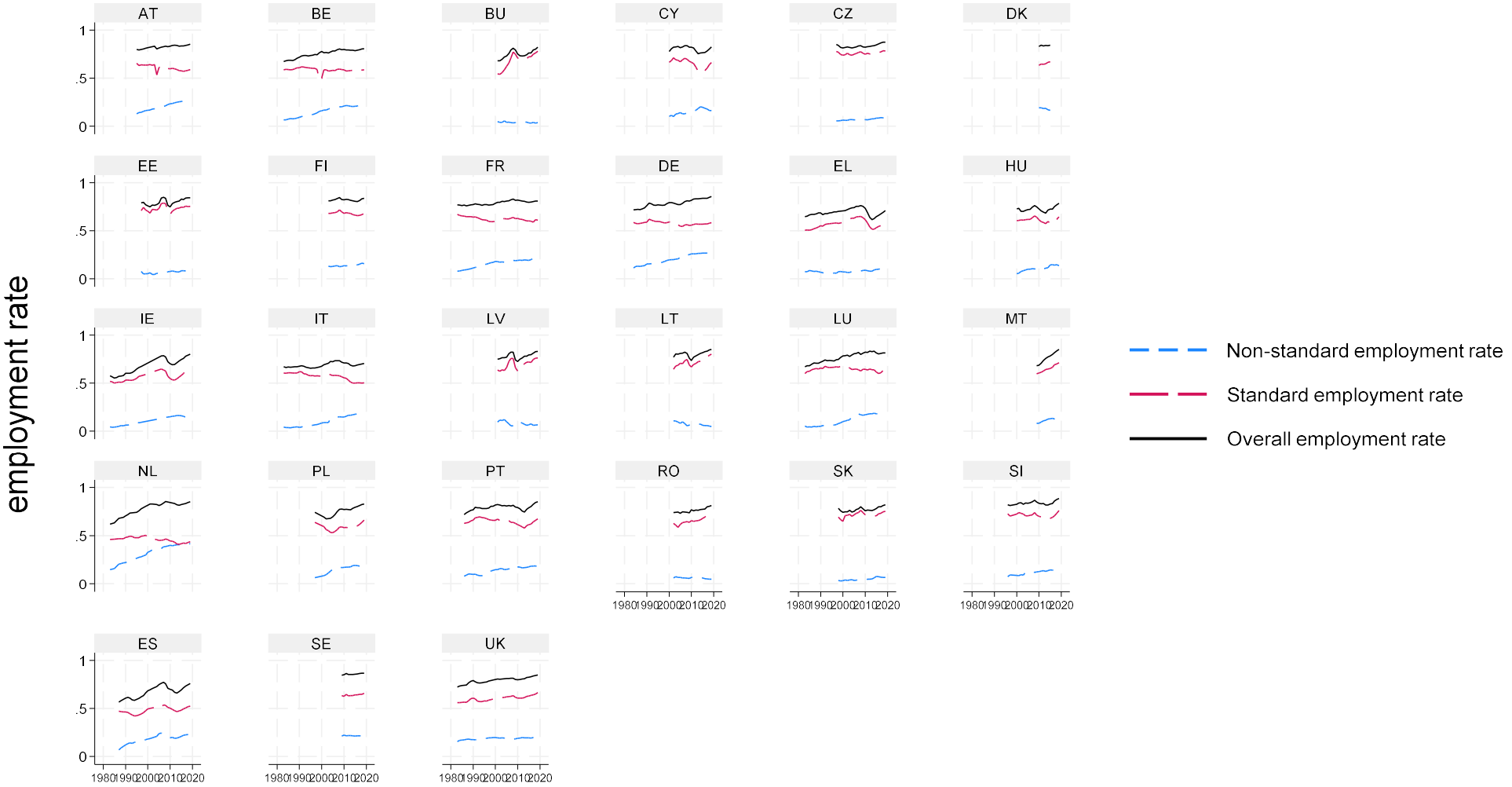
A.9. Standard and non-standard employment in Europe, and the implications for couple employment patterns

Figure A14: Evolution of standard and non-standard employment rates on average in Europe



Note: this graph shows the evolution in standard and non-standard employment rates across Europe over time, broken-down by gender. The definitions of standard and non-standard employment here correspond to the one used in the core chapter: standard employment encompasses full-time and permanent work (including self-employed people), non-standard employment is temporary and/or part-time employment. Data are weighted EU-LFS data for couples with partners aged 25 to 55.

Figure A15: Standard and non-standard employment in Europe



Note: this graph shows standard and non-standard employment rates by country in Europe, over time, using EU-LFS data for the 25-55 population..

Figure A16: Absence of standard employment in couples

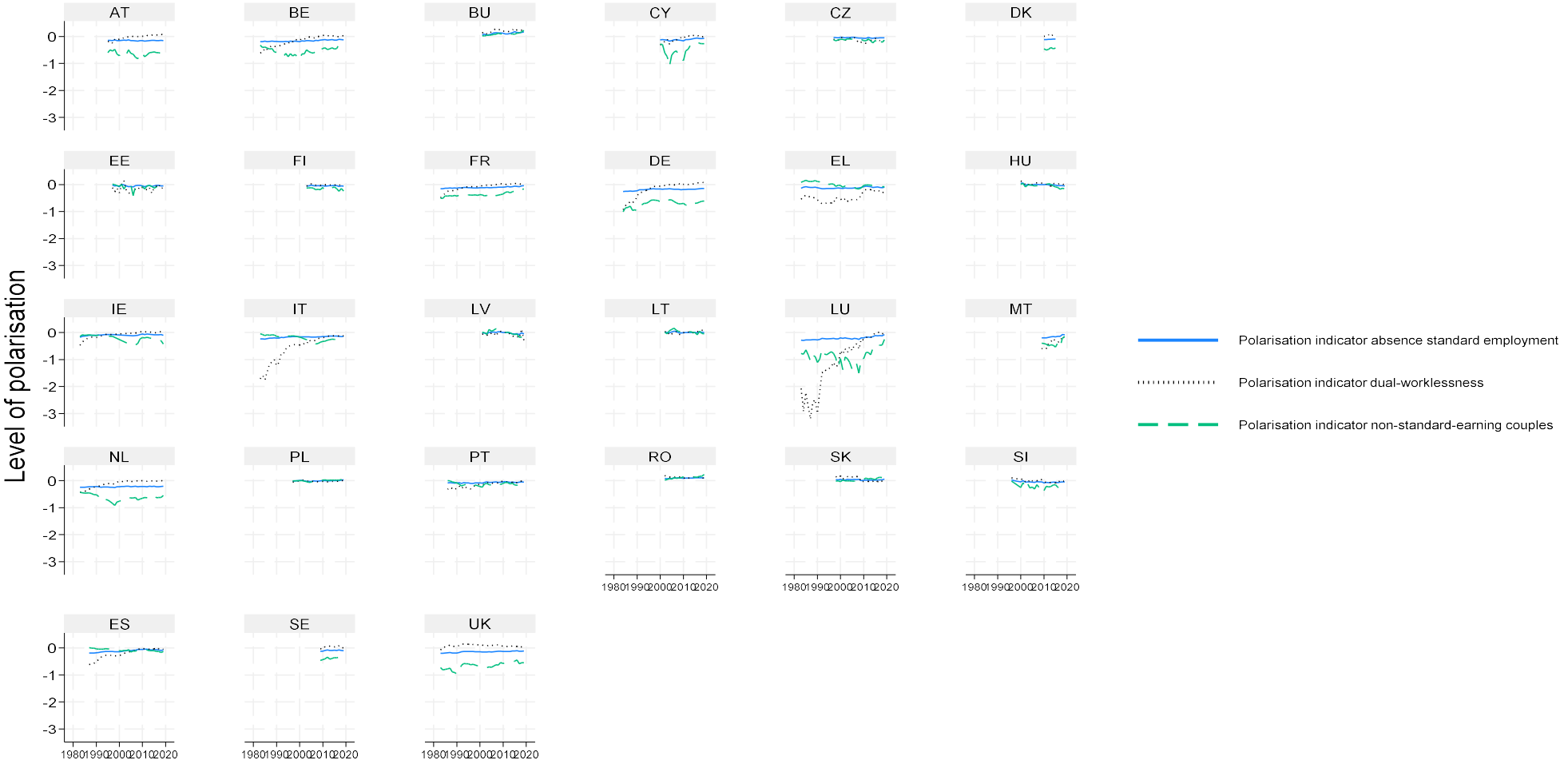
Note: these graphs break-down the results shown in chapter 9, by country. For parsimony, given the lack of clarity that a graph plotting the evolution in all the possible couple types for each country would generate, these graphs concentrate on the object of focus of the chapter: couples that do not have standard employment, which can be divided between fully workless couples, and couples in which the only source of labour is from non-standard employment. Data are weighted data from the EU-LFS for couples aged 25-55.

Table A9: Regression results for the modelling of the evolution over time of the polarisation indicators for the absence of standard employment (all countries)

Variable	*Model 1. Dependent variable: polarization indicator for the absence of standard employment*	*Model 2. Dependent variable: polarization indicator for the absence of standard employment*	*Model 3. Dependent variable: polarization indicator for non-standard-earning couples*	*Model 4. Dependent variable: polarization indicator for non-standard-earning couples*
Time t	0.003***	0.007***	-0.01***	-0.004
	(0.0004)	*(0.001)*	*(0.002)*	*(0.005)*
Square of time variable	-0.00004***	-0.0002***	0.003***	-0.0002
	(0.00001)	*(0.00008)*	*(0.00005)*	*(0.0003)*
Cube of time variable		0.000003***		0.000008
		(0.000001)		*(0.000005)*
GDP growth	-0.0003	-0.0005*	-0.002	-0.002
	(0.0003)	*(0.0003)*	*(0.001)*	*(0.001)*
Constant	-0.15***	-0.16***	-0.21***	-0.23**
	(0.004)	*(0.005)*	*(0.02)*	*(0.007)*
Country fixed-effects	YES	YES	YES	YES
N	682	682	682	682
r2 (within)	0.34	0.35	0.06	0.06
r2 (between)	0.33	0.32	0.17	0.22
r2 (overall)	0.2	0.18	0.0003	0

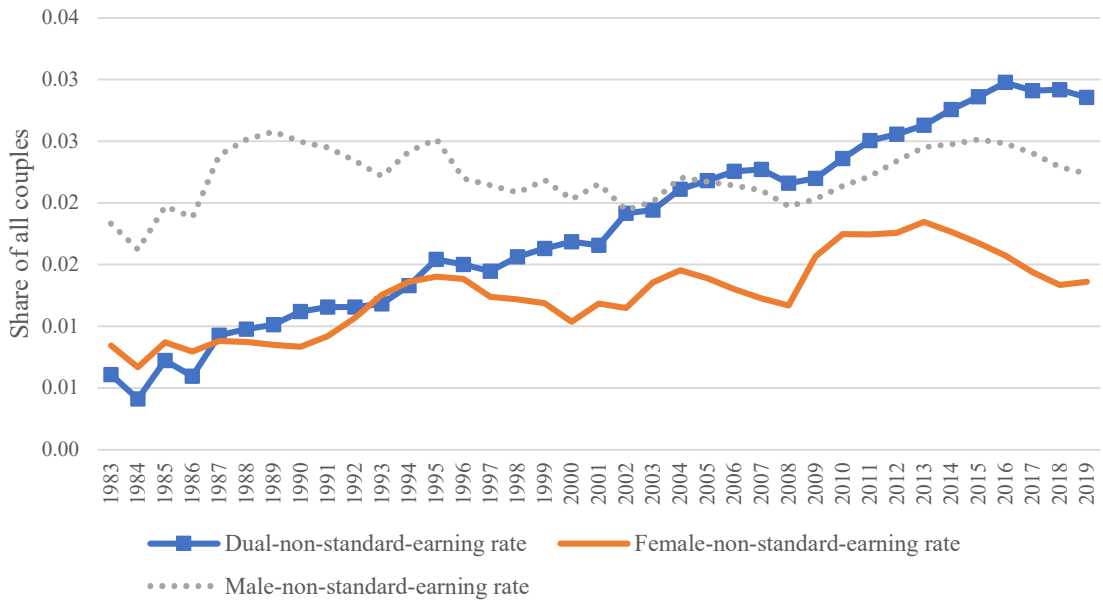
Note: coefficients obtained from country fixed-effects regressions, run over 682 country-years. The polarisation indicators have been derived in the way described in appendix 1, and they represent the difference between the actual rate of a given couple type and its counterfactual rate. 3 stars indicate significance at the 1% level, 2 stars indicate significance at the 5% level, a single star indicates significance at the 10% level. The data are weighted EU-LFS, used to construct the variables needed for the analysis. Luxembourg in 1995 and Denmark since 2015 are excluded due to the unreliability of the data for these country-years. The polarisation indicator for the absence of standard employment is for couples that are either fully workless, or whose only source of employment is from non-standard-employment. The polarisation indicator for non-standard-earning couples refers precisely to this latter type of couple. The evolution for the indicator for dual-worklessness is already shown in the core chapter, and hence, not reproduced here.

Figure A17: evolution of polarisation indicators for the absence of standard-employment in couples



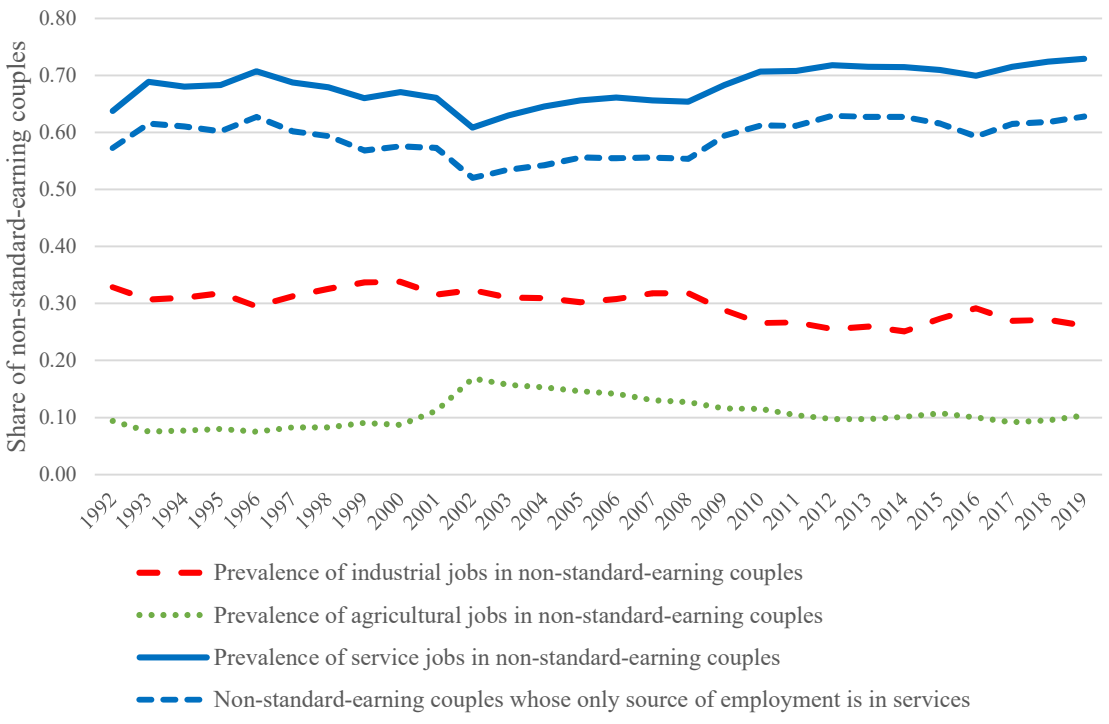
Note: the graphs represent the evolution over time and by country, of polarisation indicator for the absence of standard-employment in couples. This indicator is computed as the difference between the actual rate of such couples, and a counterfactual rate based on a random allocation of the absence of standard-employment across couples. It is the sum of two polarisation indicators, computed following the same logic: one for couples that are fully workless, and one for couples that are not workless but whose only source of employment is non-standard. Data used are from the EU-LFS for couples aged 25-55.

Figure A18: Non-standard-earning couples, by couple type, on average in Europe



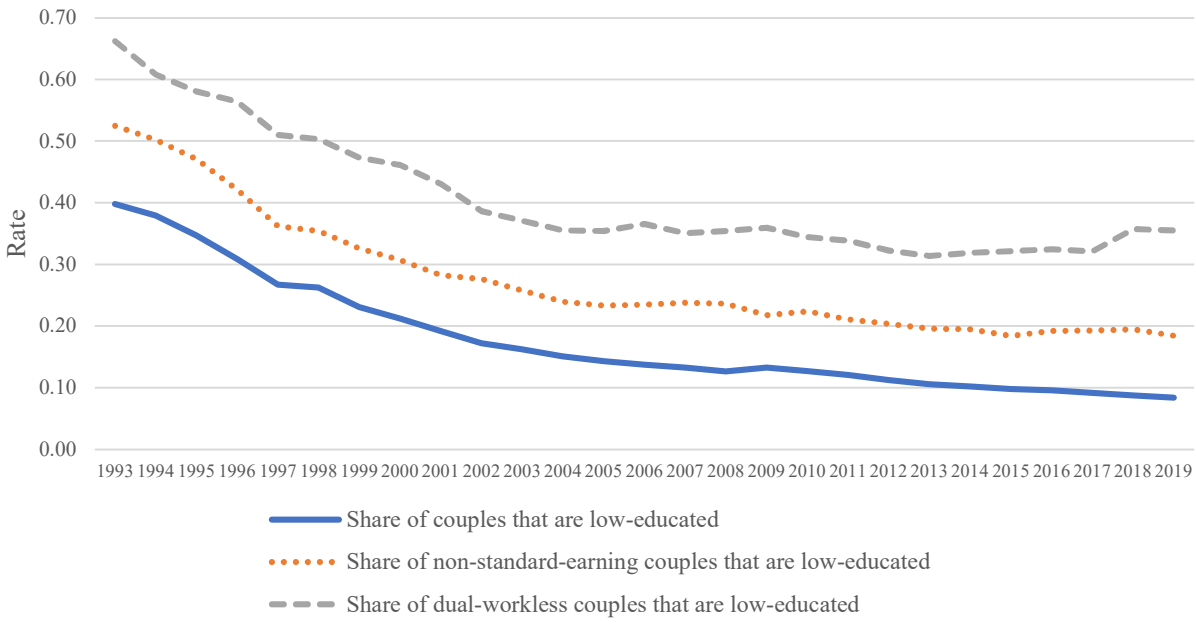
Note: this graph breaks-down the category "non-standard-earning" couples into the three sub-components that make it: couples in which both partners are in non-standard-employment, couples in which the male is workless and the female is in non-standard-employment, couples in which the female is workless and the male is in non-standard-employment. Non-standard-employment here follows the operationalisation of the core chapter and is defined as temporary and/or part-time work. Data are weighted EU-LFS data for couples aged 25-55.

Figure A19: Non-standard-earning couples and sectoral employment



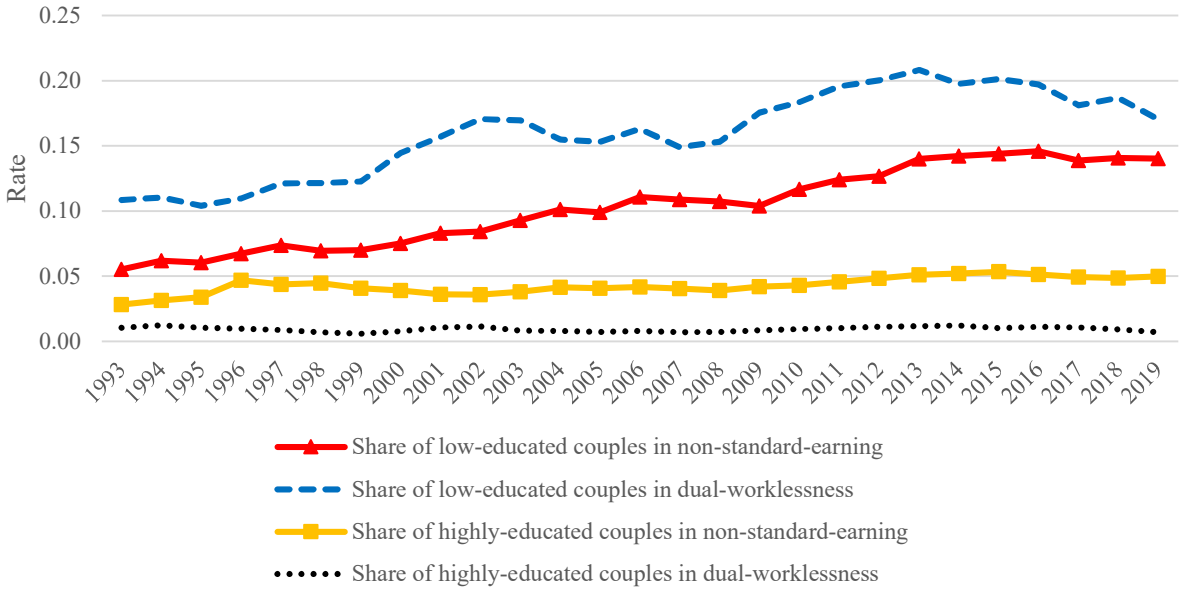
Note: this graph breaks-down the category "non-standard-earning" couples according to the prevalence of different sector of the economies in the employment of these couples. Non-standard-employment here follows the operationalisation of the core chapter and is defined as temporary and/or part-time work. Data are weighted EU-LFS data for couples aged 25-55.

Figure A20: Comparison of the proportion of low-educated couples in the population, in non-standard-earning and in dual-worklessness



Note: this graph shows the proportion of low-educated couples in the general population of couples, in the population of non-standard-earning couples, and in the population of dual-workless couples, on average in Europe. Low-educated couples are defined as couples in which both partners are low-educated, i.e., achieved lower-secondary education. Non-standard-earning couples are defined as couples whose only source of labour income is from non-standard employment. Dual-workless couples are those in which both partners are workless in the ILO sense. Data are weighted EU-LFS data for couples aged 25-55.

Figure A21: High and low-educated couples in dual-worklessness and non-standard-earning

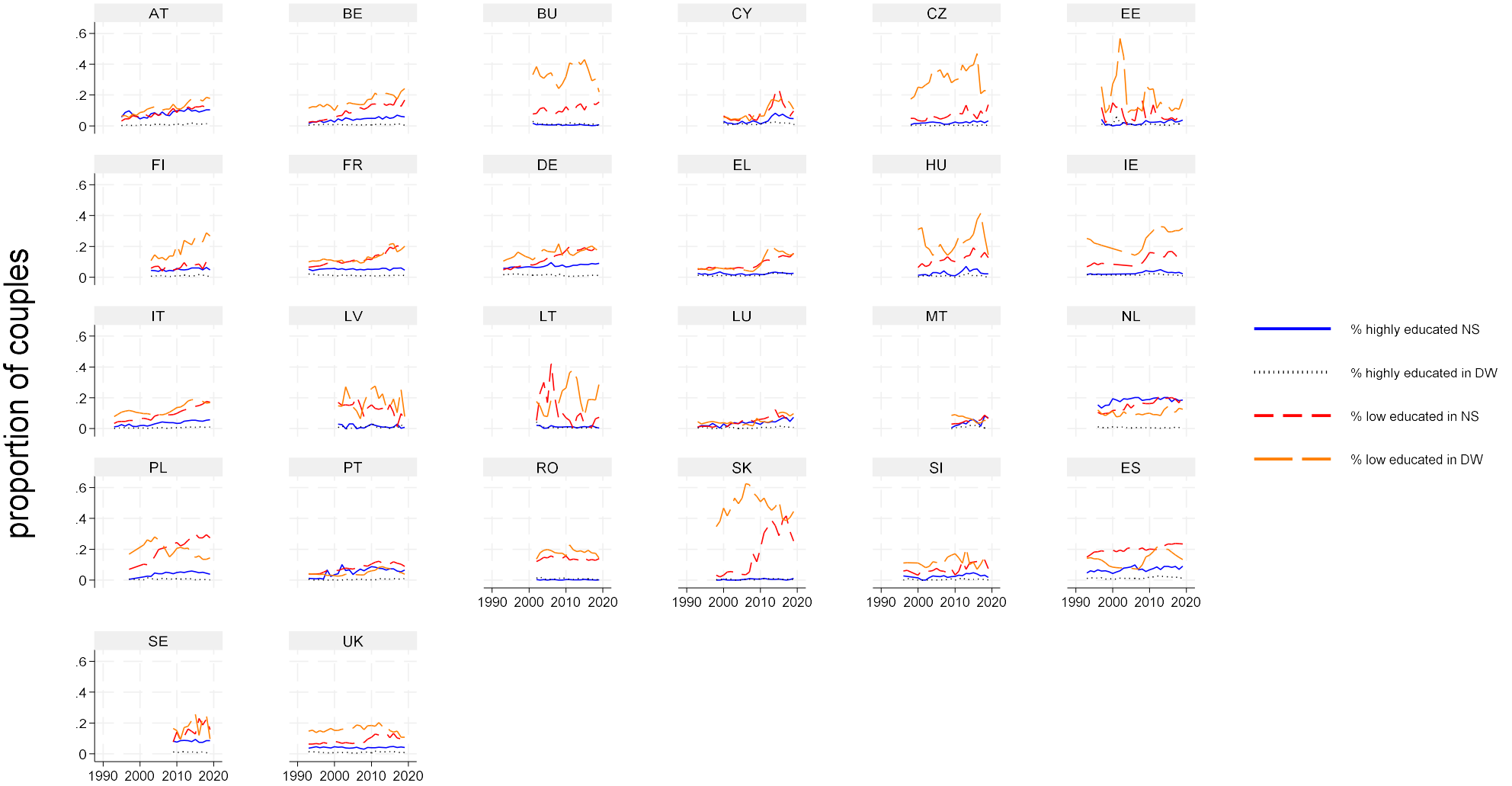


Note: this graph shows the proportion of low-educated couples that find themselves in non-standard-earning and in dual-worklessness, versus the share of high-educated couples that find themselves in non-standard-earning and dual-worklessness, on average in Europe. All these concepts have been defined in the note to the previous figures, aside from "high-educated couples", which are couples in which both partners have achieved a high level of education, i.e., tertiary education.

Figure A22: Low-educated couples across couple types in Europe

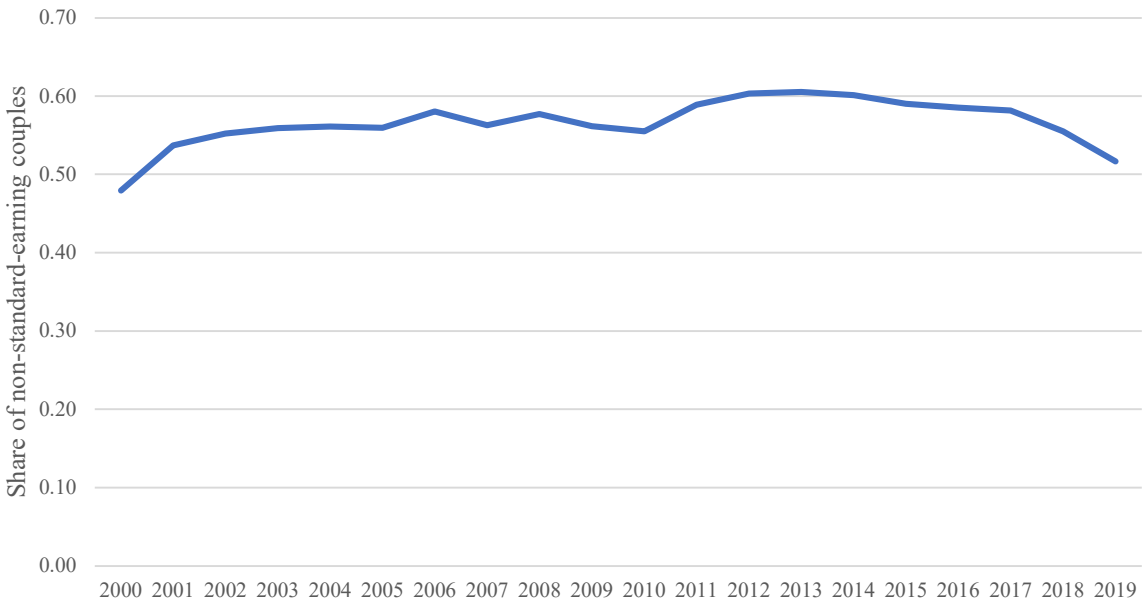
Note: these graphs show the distribution of low-educated couples across different forms of couple employment participation in Europe, over time and by country, using EU-LFS data for partnered people aged 25-55.

Figure A23: Low and high education in dual-workless and non-standard-earning couples



Note: these graphs show the educational profiles of dual-workless and non-standard-earning couples, in Europe, over time and by country, using EU-LFS data for partnered people aged 25-55.

Figure A24: Share of non-standard earning couples with at least one partner in involuntary non-standard work (share of non-standard earning couples)



Note: this graph shows the proportion of non-standard-earning couples, who have at least one partner in involuntary non-standard-employment. This situation describes someone reporting being in part-time work because full-time work is not available; or someone being in temporary work because permanent work is not available. Data are weighted EU-LFS data for couples aged 25-55.

Figure A25: Proportion of non-standard-earning couples with at least one parter in involuntary non-standard-employment

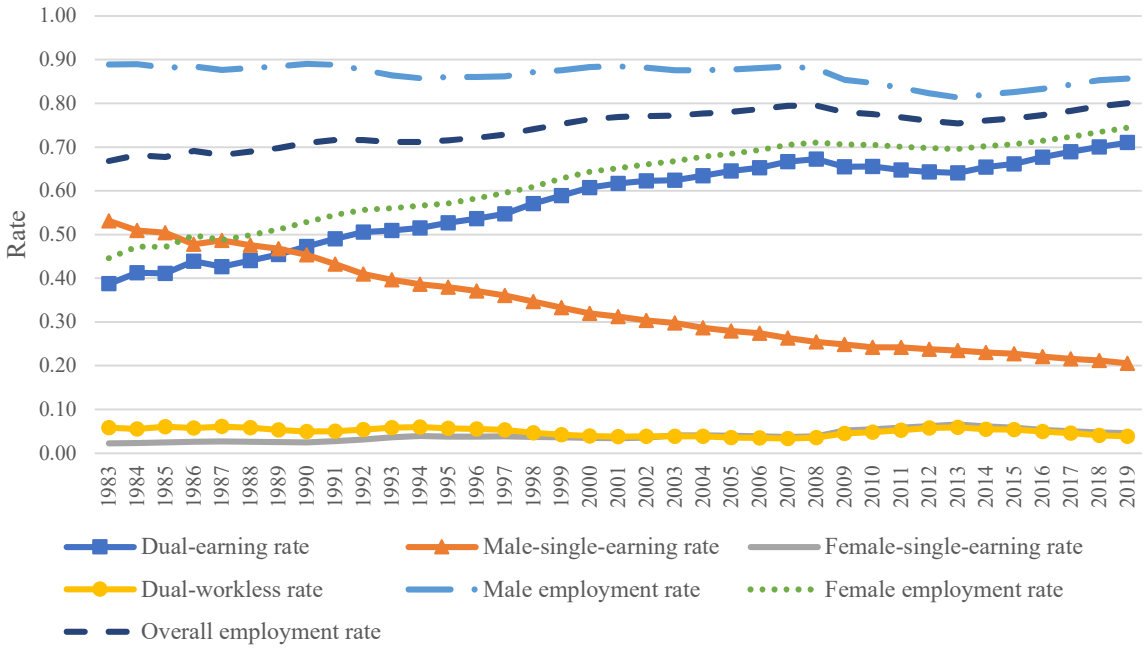
Note: these graphs show the proportion of non-standard-earning couples with at least one partner in involuntary non-standard employment in Europe, over time and by country, using EU-LFS data for partnered people aged 25-55..

A.10. Robustness analyses

A.10.1. Robustness analyses regarding the "early countries"

The analysis of the dataset restricted to the "early countries" show that the results shown in the core chapter remain robust when studying only those countries present in the dataset since the 1980s. For parsimony, I selected a few of the key results to illustrate this similarity here. The core text discusses any relevant differences between the two specifications. Any other result present in the core analysis, for which no significant difference is mentioned in the core text, and which is not reproduced here can be assumed to be extremely similar – and is available on request from the author.

Figure A26: Evolution of employment rates and couple employment patterns across early countries



Note: this graph reproduces results shown in Chapter 9 for early countries, and breaks-down couples by employment pattern according to the ILO definition of employment.

Figure A27: Polarisation indicator for dual-earning: 1983-2019 evolution on average across early countries

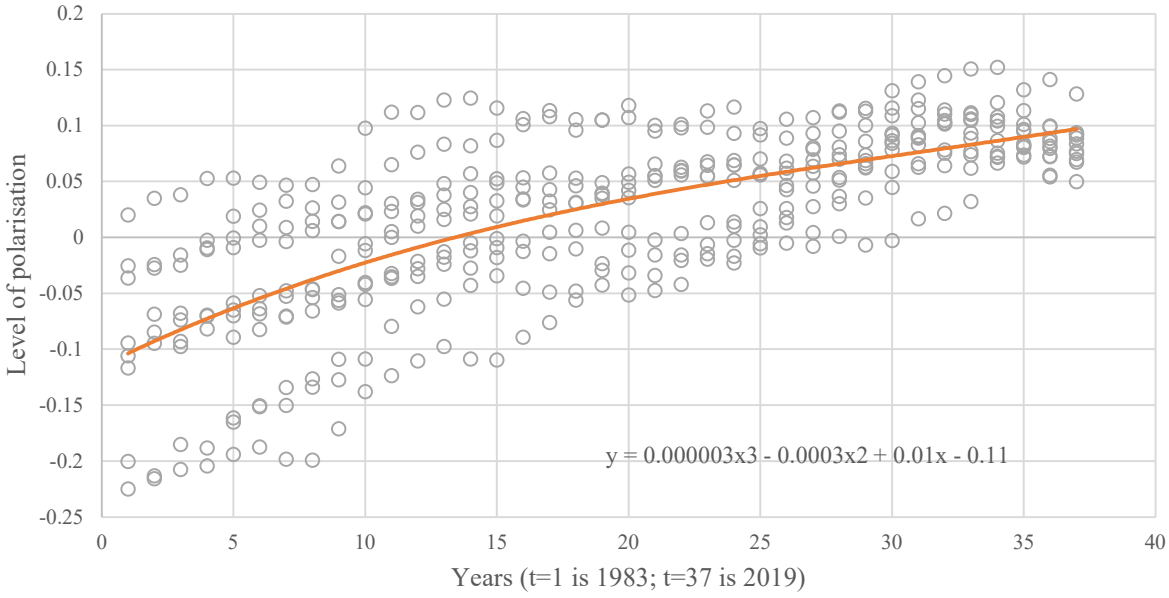
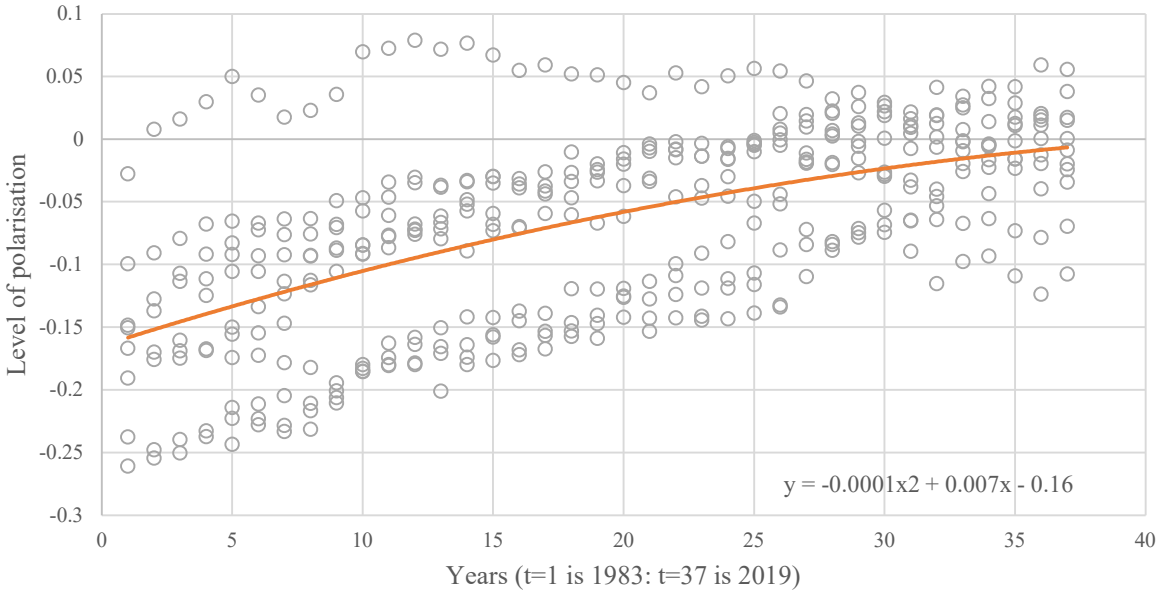
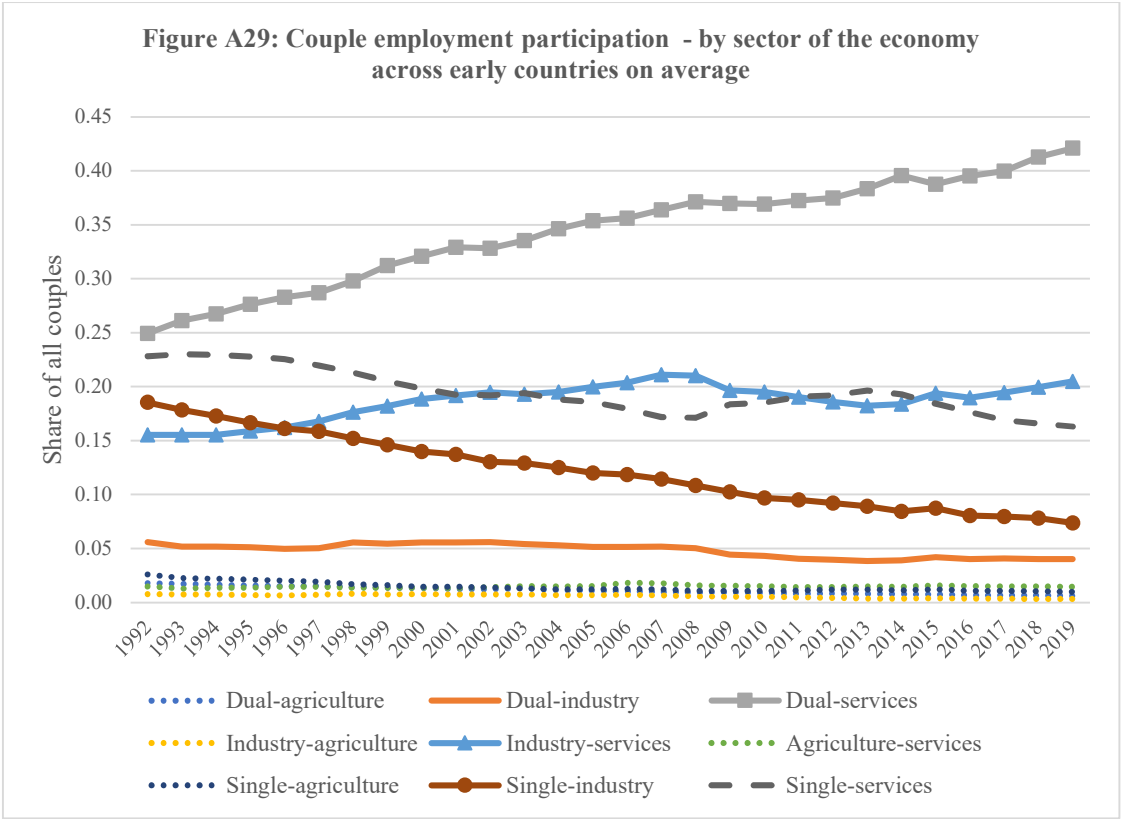


Figure A28: Polarisation indicator for dual-worklessness: 1983-2019 evolution on average across early countries



Note: these graphs reproduce results shown in Chapter 9 for early countries, regarding the evolution of polarisation indicators for dual-earning and dual-worklessness. The results also exist in table format and are available on request from the author.



Note: this graph reproduces results shown in Chapter 9 for early countries and breaks-down couples according to the sector of employment of each partner.

Table A10: Regression results for the modelling of the evolution over time of female employment rates across early countries

Variable	*Model 1. Dependent variable: female-single-earner rate*	*Model 2. Dependent variable: female-single-earner rate*	*Model 3. Dependent variable: female-single-earner rate*
Time t	0.001***	0.00004	0.001
	(0.0002)	*(0.0006)*	*(0.0006)*
Square of time variable	-0.000001	0.00005	0.000008
	(0.000006)	*(0.00003)*	*(0.00003)*
Cube of time variable		-0.000001	-0.0000007
		(0.000001)	*(0.0000006)*
GDP growth	0.001***	-0.001***	-0.001***
	(0.0002)	*(0.0002)*	*(0.0002)*
Post-2008 dummy			0.02***
			(0.003)
Constant	0.03***	0.03***	0.02**
	(0.002)	*(0.002)*	*(0.003)*
Country fixed-effects	YES	YES	YES
N	389	389	389
r2	0.36	0.52	0.53

Note: this table models, using the same models as for the evolution of polarisation indicators in the core chapter, and for early-countries only, the evolution of female-single-earning rates over time.

Figure A30: European couples by relative educational achievement of the partners, on average across early-countries

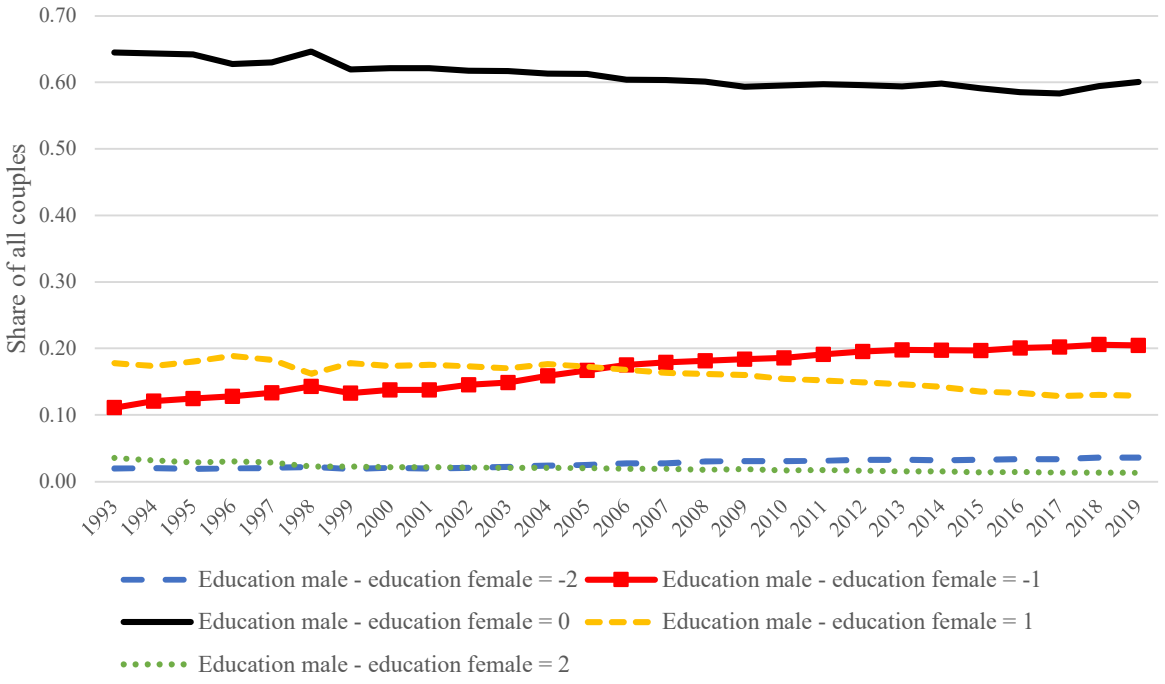


Figure A31: Employment participation of partnered men and women, by level of educational achievement since 1993 - early countries average

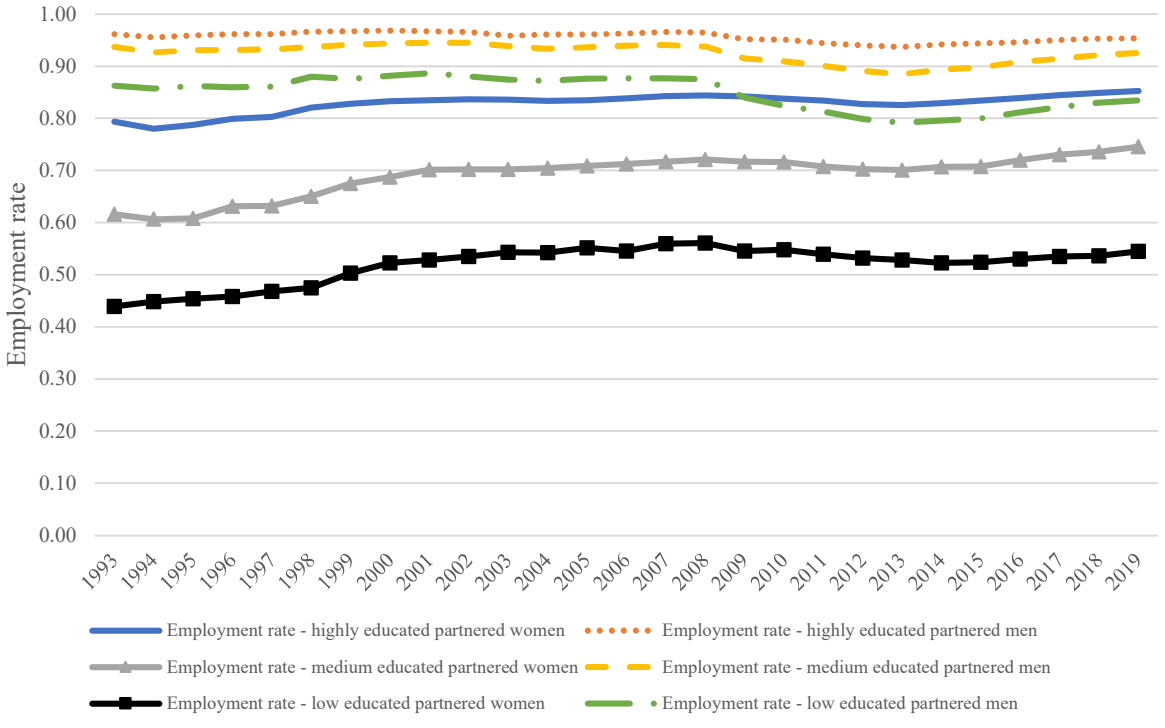
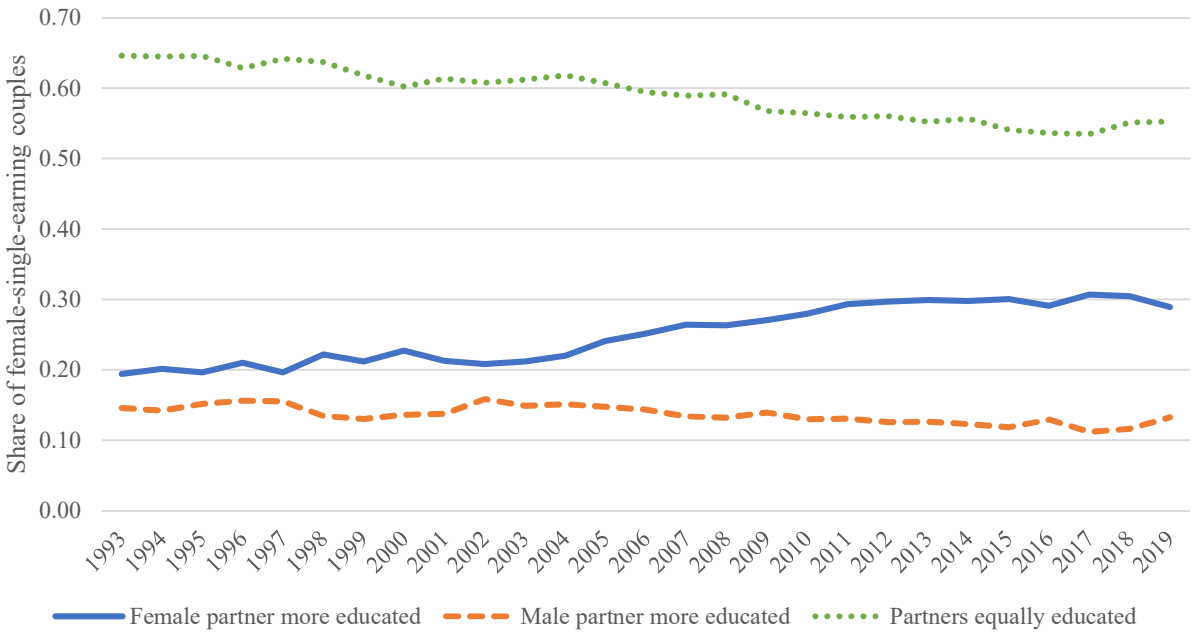
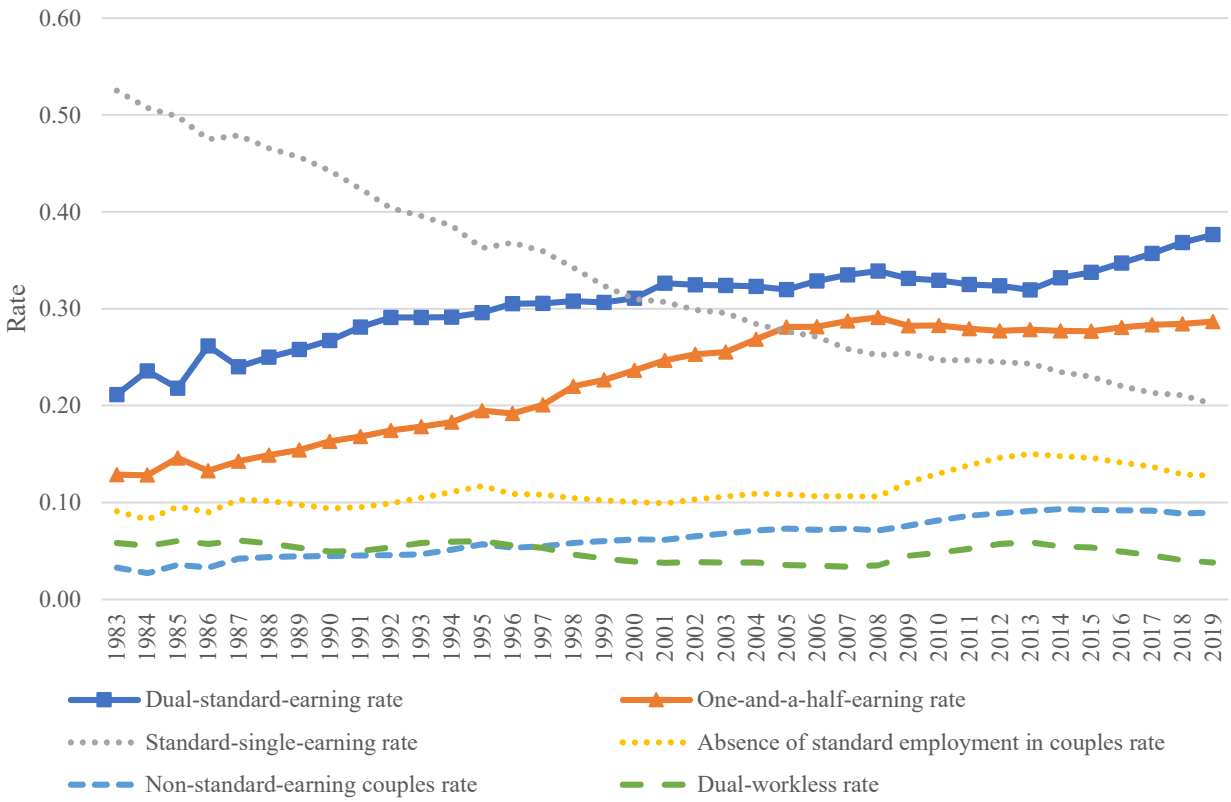


Figure A32: Proportion of female-single-earning couples according to the relative educational achievements of male and female partners across early countries



Note: Figures A30 shows homogamy and heterogamy in educational achievements amongst couples. A31 shows employment participation of partnered men and women at different levels of education. A32 decomposes female-single-earning couples by relative level of education of each partner. All these analyses are estimated for early countries only using EU-LFS data for partnered people aged 25-55.

Figure A33: standard and non-standard-earning rates over time, on average across early countries



Note: this graph reproduces results shown in Chapter 9 for early countries, and shows the couple employment participation according to the standard and non-standard-employment rates of each partner.

Table A11: Regression results for the modelling of the evolution over time of the polarisation indicators for the absence of standard employment (early countries only)

Variable	*Model 1. Dependent variable: polarization indicator for the absence of standard employment*	*Model 2. Dependent variable: polarization indicator for the absence of standard employment*	*Model 3. Dependent variable: polarization indicator for non-standard-earning couples*	*Model 4. Dependent variable: polarization indicator for non-standard-earning couples*
Time t	0.002***	0.005***	-0.02***	-0.003
	(0.0004)	*(0.001)*	*(0.003)*	*(0.007)*
Square of time variable	-0.000007	-0.0002***	0.0004***	-0.0004
	(0.00001)	*(0.00007)*	*(0.00006)*	*(0.0004)*
Cube of time variable		0.000003***		0.00001*
		(0.000001)		*(0.000007)*
GDP growth	-0.002***	-0.002*	-0.004	-0.005*
	(0.0004)	*(0.0004)*	*(0.002)*	*(0.003)*
Constant	-0.18***	-0.19***	-0.3***	-0.34**
	(0.004)	*(0.005)*	*(0.02)*	*(0.03)*
Country fixed-effects	YES	YES	YES	YES
N	388	388	388	388
r2	0.18	0.19	0.02	0.03

Note: coefficients obtained from country fixed-effects regressions, run over 388 country-years. The polarisation indicators have been derived in the way described in appendix 1, and they represent the difference between the actual rate of a given couple type and its counterfactual rate. 3 stars indicate significance at the 1% level, 2 stars indicate significance at the 5% level, a single star indicates significance at the 10% level. The data are weighted EU-LFS, used to construct the variables needed for the analysis. Luxembourg in 1995 and is excluded due to the unreliability of the data for this country-year. The evolution for the indicator for dual-worklessness is already shown in this appendix focusing on early country, and is hence not reproduced here.

Figure A34: The overrepresentation of low education in non-standard-earning an ddual-worklessness across early countries on average

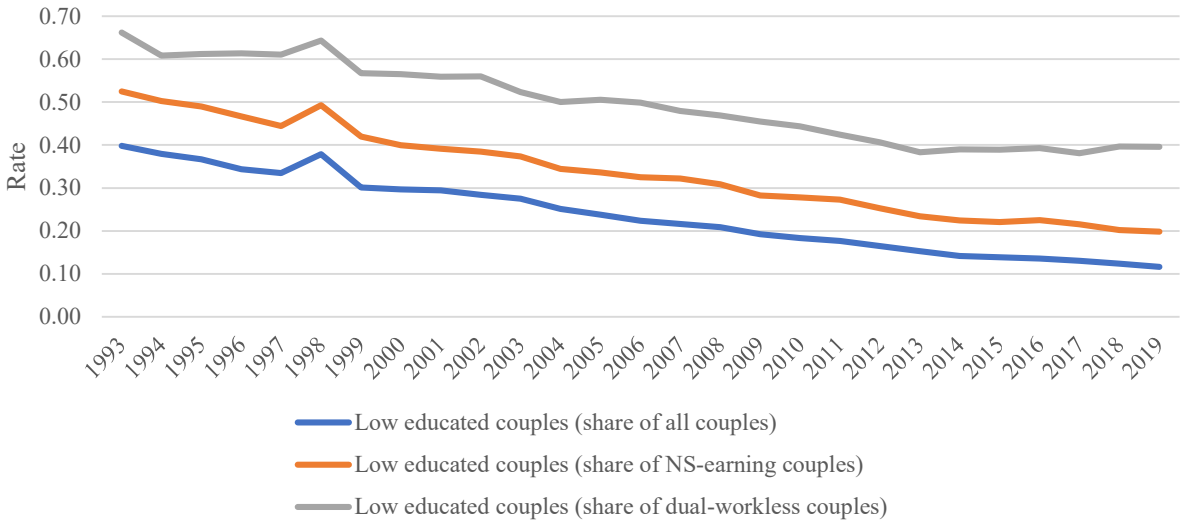
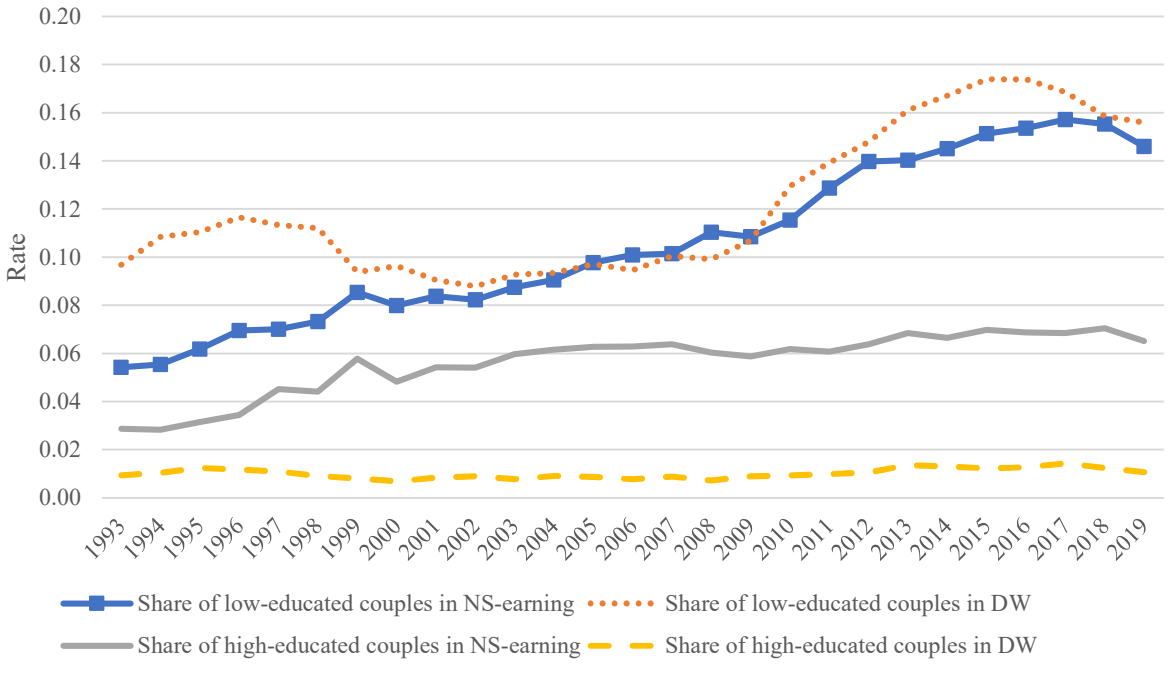


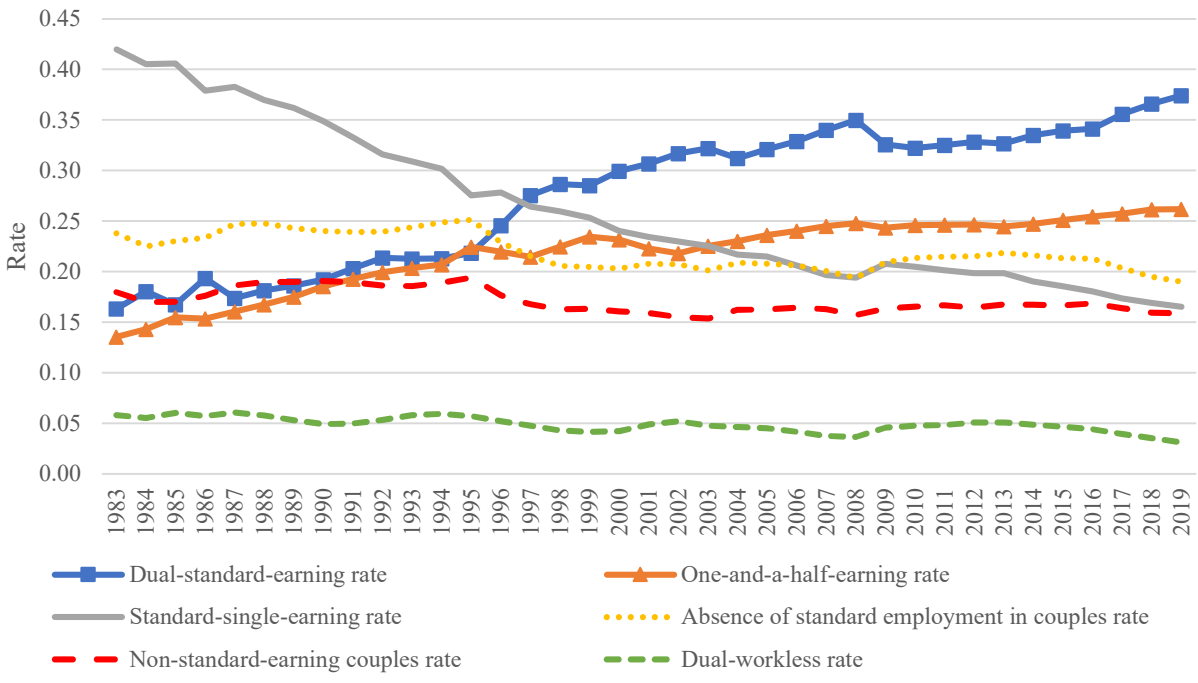
Figure A35: and low educated couples in dual-worklessness and non-standard-earning across early countries on average



Note: these two graphs analyse the educational level of dual-workless (DW) and non-standard-earning (NS-earning) couples, with low-educated couples being couples in which both partners are low-educated (educated at lower-secondary level, and high educated couples being couples in which both partners are high-educated (tertiary education). The 1998 spike in figure A34 is due to missing data for a number of countries that year.

A.10.2. Results obtained classifying self-employment as non-standard

Figure A36: Couple standard and non-standard employment patterns in Europe (self-employment as non-standard)



Note: this graph reproduces results shown in Chapter 9 with self-employment classified as non-standard,, and shows the couple employment participation according to the standard and non-standard-employment rates of each partner.

Table A12: Evolution of polarisation indicators for the absence of standard employment in couples (self-employment as non-standard)

Variable	*Model 1. Dependent variable: polarization indicator for the absence of standard employment*	*Model 2. Dependent variable: polarization indicator for the absence of standard employment*	*Model 3. Dependent variable: polarization indicator for non-standard-earning couples*	*Model 4. Dependent variable: polarization indicator for non-standard-earning couples*
Time t	0.0025***	0.006***	-0.04***	-0.001
	(0.0004)	*(0.001)*	*(0.0004)*	*(0.001)*
Square of time variable	-0.00004***	-0.0002***	0.00005***	-0.00008
	(0.00001)	*(0.00006)*	*(0.00001)*	*(0.00006)*
Cube of time variable		0.000003***		0.000002**
		(0.000001)		*(0.000001)*
GDP growth	0.0002	-0.00003	-0.0003	0.0002
	(0.0003)	*(0.0003)*	*(0.0003)*	*(0.0003)*
Constant	-0.06***	-0.07***	0.05***	0.04**
	(0.004)	*(0.006)*	*(0.004)*	*(0.005)*
Country fixed-effects	YES	YES	YES	YES
N	682	682	682	682
r2	0.12	0.1	0.01	0.01

Note: coefficients obtained from country fixed-effects regressions, run over 682 country-years. The polarisation indicators have been derived in the way described in appendix 1, and they represent the difference between the actual rate of a given couple type and its counterfactual rate. 3 stars indicate significance at the 1% level, 2 stars indicate significance at the 5% level, a single star indicates significance at the 10% level. The data are weighted EU-LFS, used to construct the variables needed for the analysis.

Figure A37: educational profile of non-standard-earning couples and dual-workless couples compared (self-employment as non-standard)

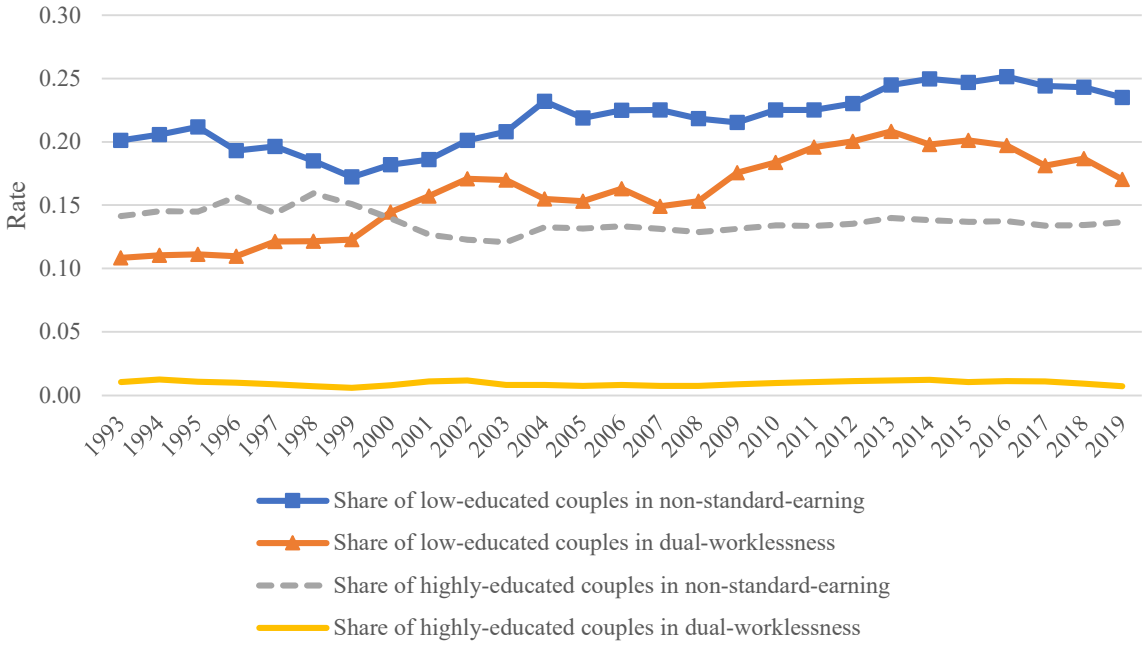


Figure A38: Low educated couples in dual-worklessness and non-standard-earning (self-employment as non-standard)

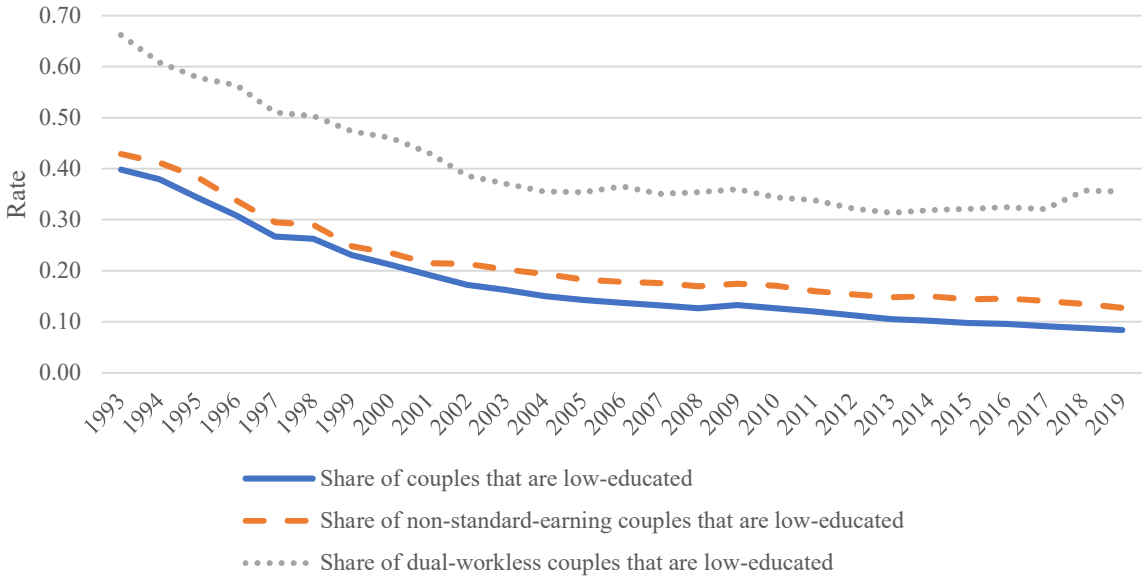
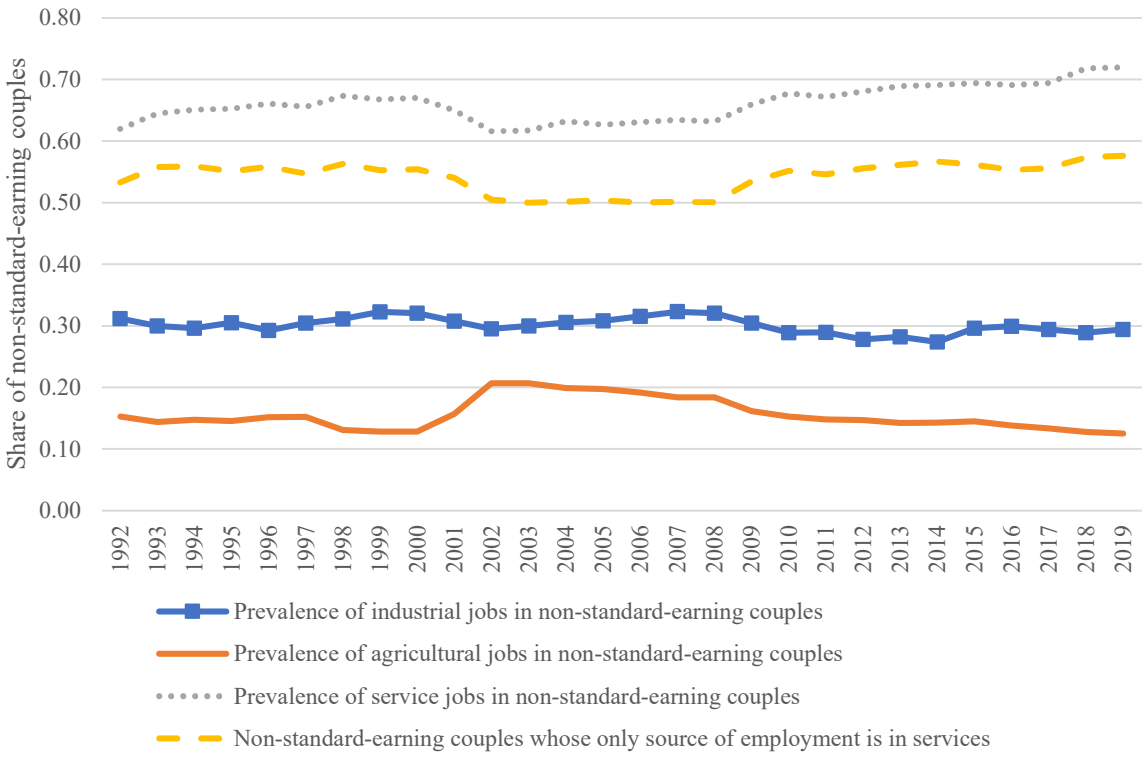


Figure A39: Non-standard-earning couples, sectoral employment (self-employment as non-standard)



Note: These figures reproduce results shown in Chapter 9 with self-employment classified as non-standard A37 shows the share of high and low-educated couples in dual-worklessness and non-standard-earning, A38 shows the share of low-educated couples across all couples, across dual-workless couples, and across non-standard-earning couples, A39 shows the prevalence of different sectors of the economy amongst non-standard-earning couples. All results are European averages, obtained using weighted EU-LFS data for couples aged 25-55.

A10.3. Results obtained separately for part-time, temporary, and self-employment

Figure A40: Couples part-time and full-time employment

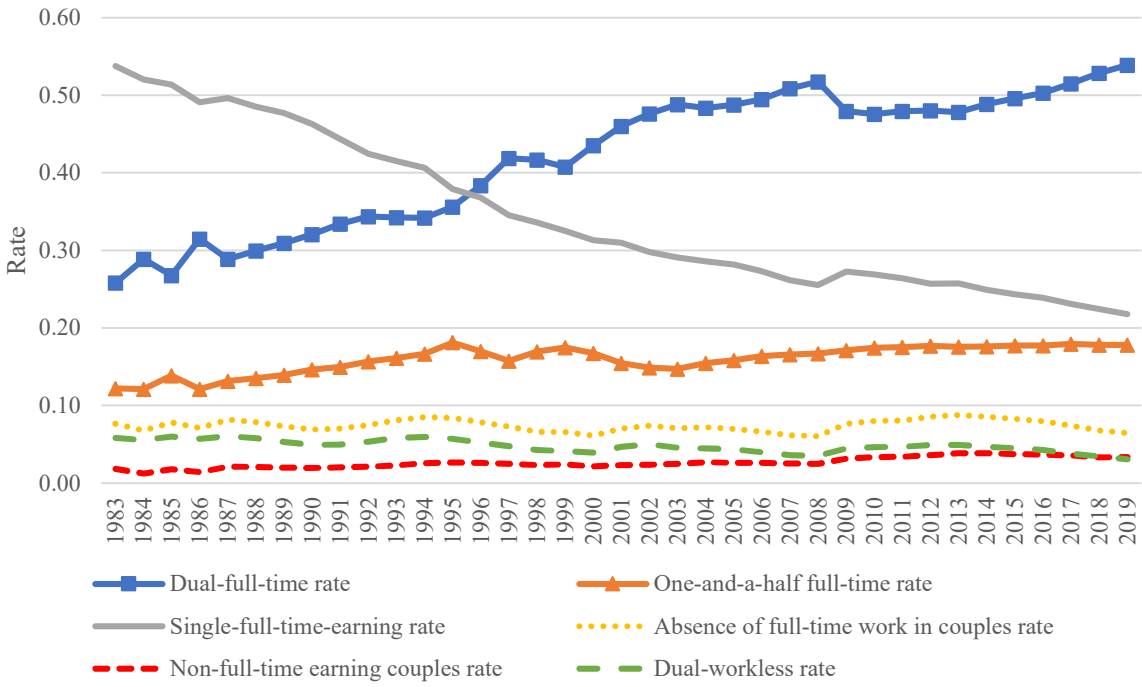
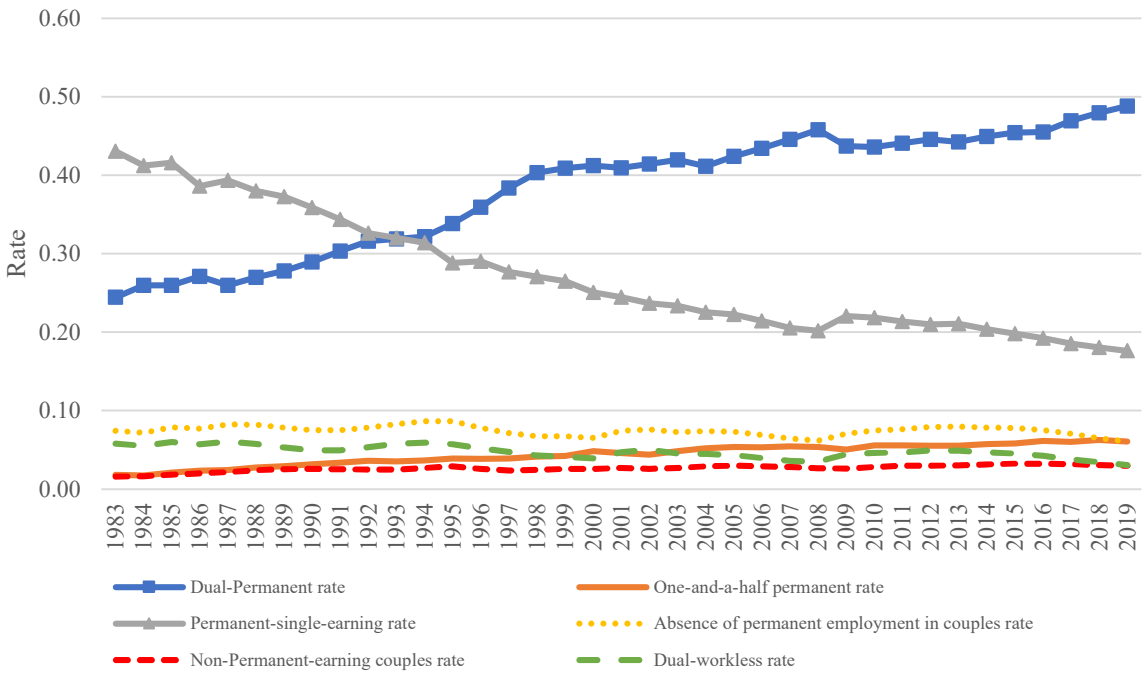
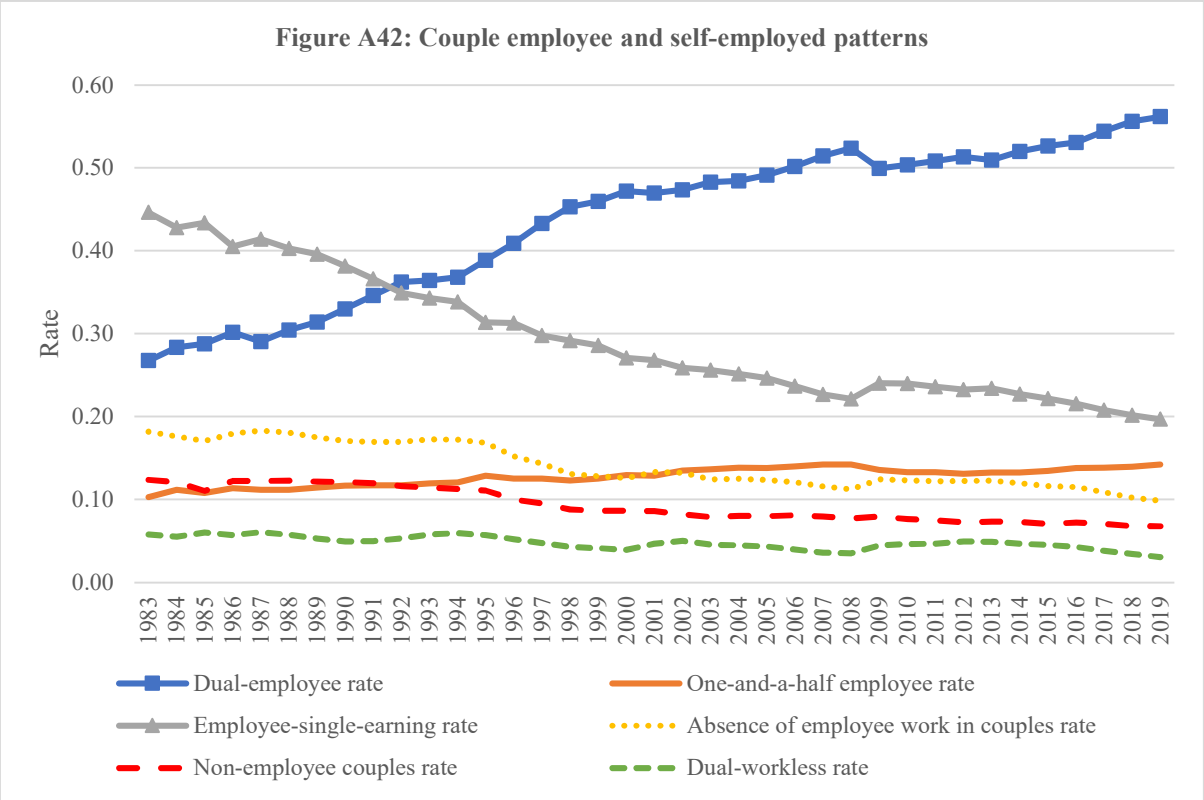


Figure A41: Couple temporary and permament employment





Note: these graphs reproduce results shown in Chapter 9 this time distinguishing between specific forms of non-standard-employment: part-time work (and its counterpart, full-time work), temporary work (and its counterpart permanent work) and self-employed work (and its counterpart, employee work)

Table A13: Regression models for the evolution over time of polarisation indicators for different forms of standard employment

Variable	*Model 1. Dependent variable: polarization indicator for the absence of full-time employment*	*Model 2. Dependent variable: polarization indicator for the absence of full-time employment*	*Model 3. Dependent variable: polarization indicator for the absence of permanent employment*	*Model 4. Dependent variable: polarization indicator for the absence of permanent employment*	*Model 5: Dependent variable: polarization indicator for the absence of employee work*	*Model 6: Dependent variable: polarization indicator for the absence of employee work*
Time t	0.004*** *(0.0004)*	0.007*** *(0.001)*	0.007*** *(0.0005)*	0.008*** *(0.001)*	0.007*** *(0.0005)*	0.008*** *(0.001)*
Square of time variable	-0.00005*** *(0.000001)*	-0.0002*** *(0.00006)*	-0.00008*** *(0.00001)*	-0.0002** *(0.00007)*	-0.0001*** *(0.00001)*	-0.0002** *(0.00008)*
Cube of time variable		0.000003*** *(0.000001)*		0.000002 *(0.000001)*		0.000001 *(0.000001)*
GDP growth	-0.0007** *(0.0003)*	-0.001*** *(0.0003)*	-0.0001 *(0.0003)*	-0.0002 *(0.0004)*	0.0005 *(0.0003)*	0.0004 *(0.0004)*
Constant	-0.17***	-0.18*** *(0.006)*	-0.14*** *(0.005)*	-0.14** *(0.006)*	-0.06*** *(0.005)*	-0.07*** *(0.007)*

	(0.004)					
Country fixed-effects	YES	YES	YES	YES	YES	YES
N	662	662	662	662	662	662
r2	0.22	0.21	0.31	0.32	0.26	0.26

Note: coefficients obtained from country fixed-effects regressions, run over 662 country-years. The polarisation indicators have been derived in the way described in appendix 1, and they represent the difference between the actual rate of a given couple type and its counterfactual rate, for a specific type of non-standard-employment. Absence of full-time-employment means couples that are either dual-workless, or whose only source of labour income is from part-time employment. Absence of permanent-employment means couples that are either dual-workless, or whose only source of labour income is from temporary employment. Absence of employee-employment means couples that are either dual-workless, or whose only source of labour income is from self-employment. 3 stars indicate significance at the 1% level, 2 stars indicate significance at the 5% level, a single star indicates significance at the 10% level. The data are weighted EU-LFS, used to construct the variables needed for the analysis. Luxembourg in 1995 and is excluded due to the unreliability of the data for this country-year.

Table A14: Regression models for the evolution over time of polarisation indicators for different forms of non-standard employment

Variable	*Model 1. Dependent variable: polarization indicator for non-full-time-earning couples*	*Model 2. Dependent variable: polarization indicator for non-full-time-earning couples*	*Model 3. Dependent variable: polarization indicator for non-permanent-earning couples*	*Model 4. Dependent variable: polarization indicator for non-permanent-earning couples*	*Model 5: Dependent variable: polarization indicator for employee-earning couples*	*Model 6: Dependent variable: polarization indicator for non-employee-earning couples*
Time t	-0.004*** *(0.0003)*	-0.001 *(0.001)*	-0.002*** *(0.0002)*	-0.001** *(0.0006)*	-0.00007 *(0.0004)*	0.00006 (*0.001)*
Square of time variable	0.00007*** *(0.000007)*	-0.00008 *(0.00005)*	0.00004*** *(0.000005)*	- -0.0000001 *(0.00003)*	-0.000005 *(0.000009)*	-0.00001 *(0.00006)*
Cube of time variable		0.000002*** *(0.0000001)*		0.0000006 *(0.0000005)*		0.0000001 *(0.000001)*
GDP growth	-0.0003** *(0.0002)*	-0.0005* *(0.0002)*	0.0001 *(0.0001)*	0.0001 *(0.0002)*	0.0006** *(0.0003)*	0.0006 *(0.0003)*
Constant	-0.03*** *(0.003)*	-0.04*** *(0.004)*	0.01*** *(0.002)*	0.01** *(0.003)*	0.06*** *(0.004)*	0.06*** *(0.005)*
Country fixed-effects	YES	YES	YES	YES	YES	YES
N	662	662	662	662	662	662
r2	0.01	0.01	0.02	0.02	0.01	0.01

Note: coefficients obtained from country fixed-effects regressions, run over 662 country-years. The polarisation indicators have been derived in the way described in appendix 1, and they represent the difference between the actual rate of a given couple type and its counterfactual rate, for a specific type of non-standard-employment. Non-full-time-earning couples means couples whose only source of labour income is from part-time work. Non-permanent-earning couples means couples whose only source of

labour income is from temporary work. Non-employee-earning couples means couples whose only source of labour income is from self-employed work. 3 stars indicate significance at the 1% level, 2 stars indicate significance at the 5% level, a single star indicates significance at the 10% level. The data are weighted EU-LFS, used to construct the variables needed for the analysis. Luxembourg in 1995 and is excluded due to the unreliability of the data for this country-year.

Figure A43: Low-education in the general population of couples and amongst different forms of non-standard-earning couples

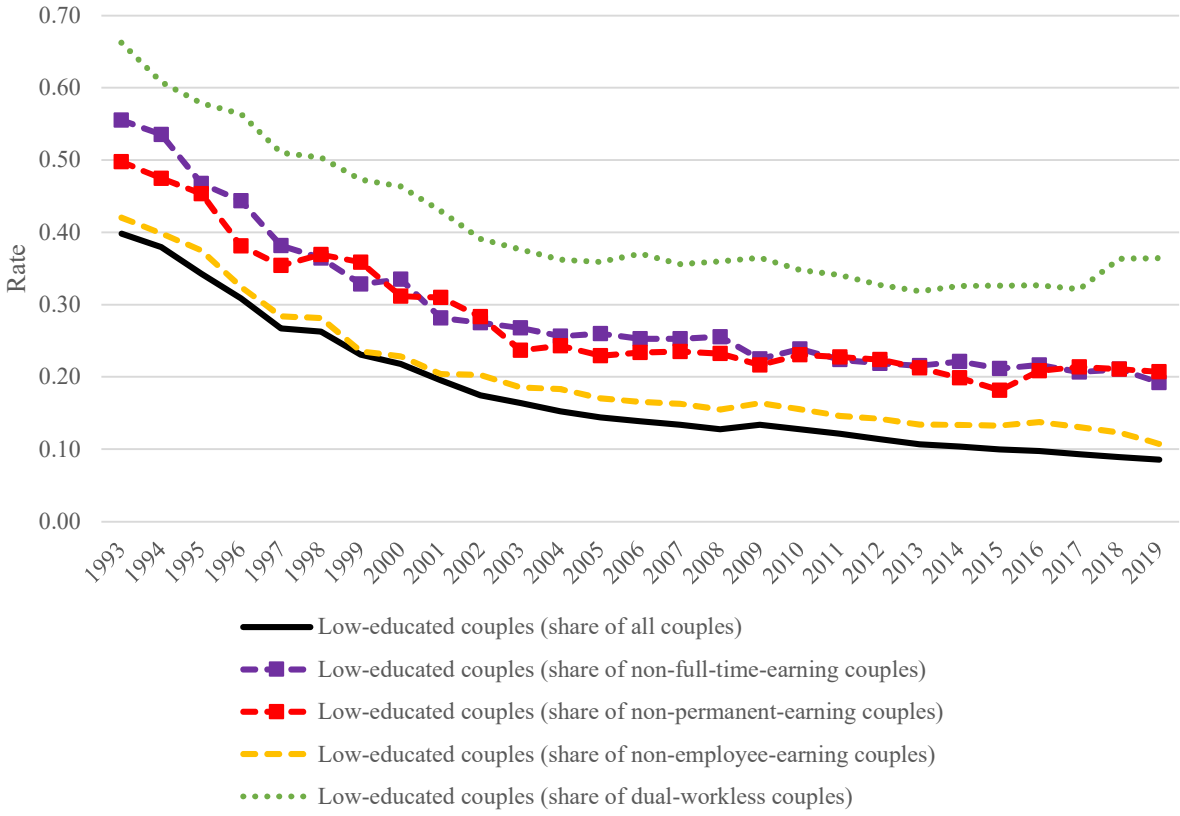


Figure A44: High and low-educated couples in dual-worklessness and non-full-time-earning

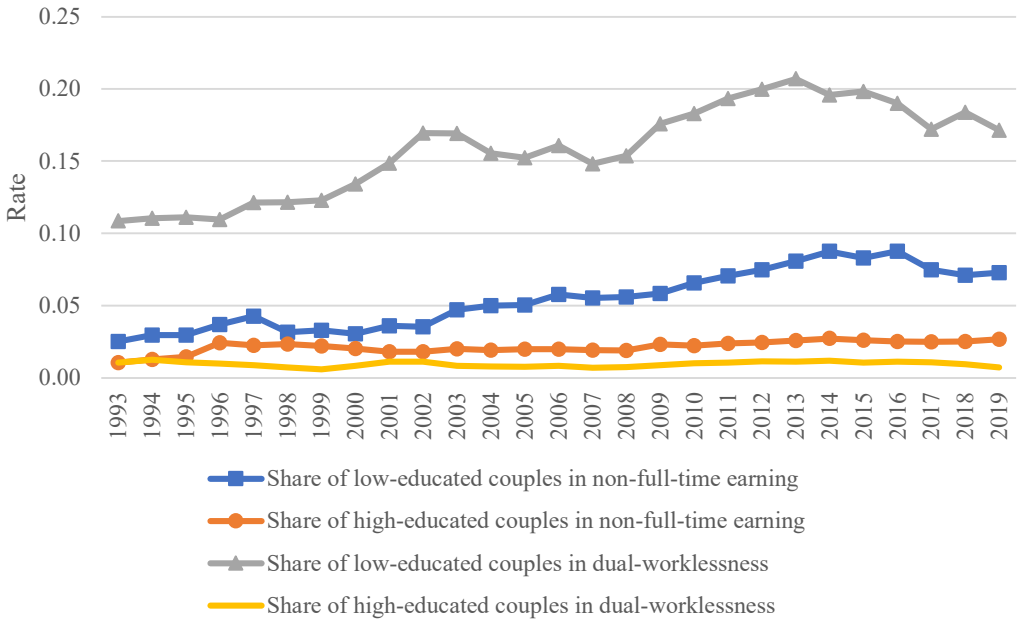


Figure A45: High and low-educated couples in dual-worklessness and non-permanent-earning

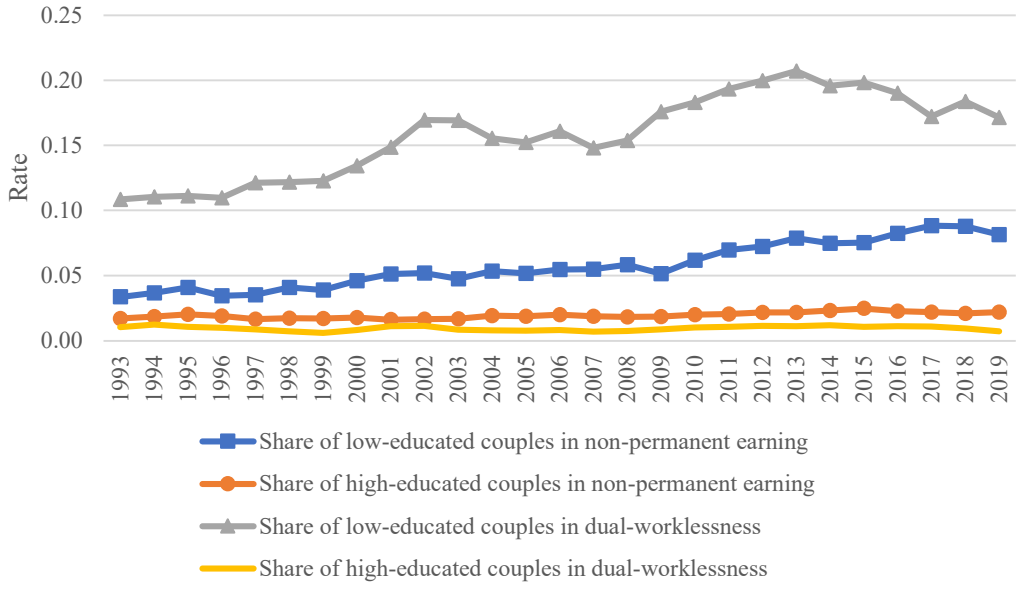
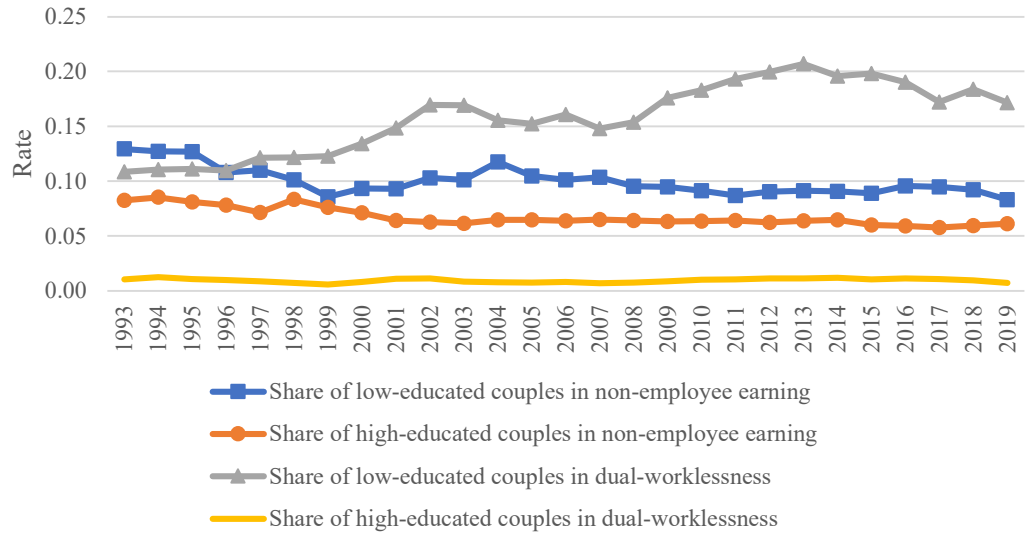
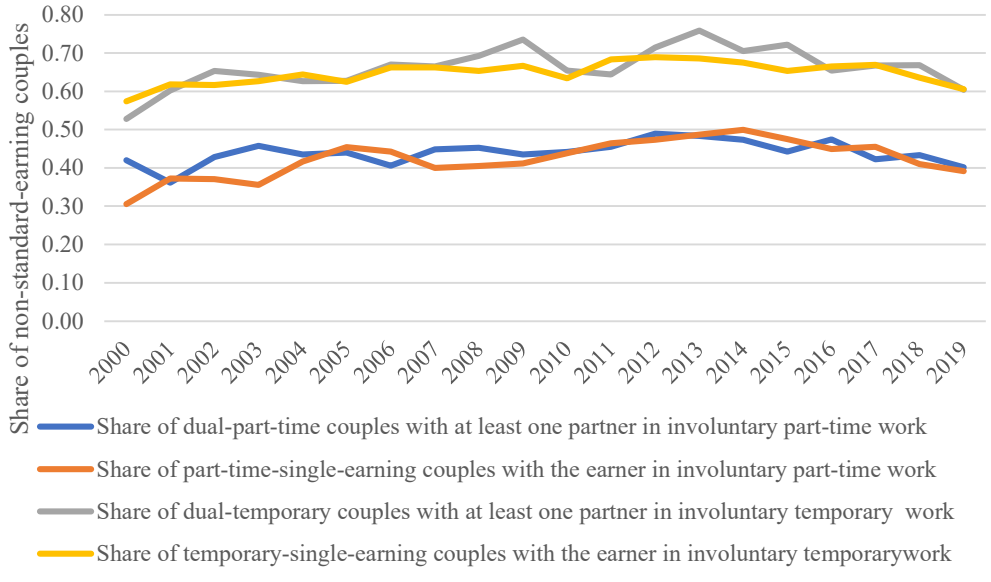


Figure A46: High and low-educated couples in dual-worklessness and non-employee-earning



Note: Figures A43, A44, A45, A46, analyse the educational profiles of non-standard-earning couples, when distinguishing between different forms of non-standard-employment. A43 compares the proportion of low-educated couples in the population of couples, to that in the population relying solely on one of these different forms of non-standard-employment as a source of labour income. The three next figures analyse, for each form of non-standard-work, the proportion of high and low-educated couples found in that form of work. All data are weighted EU-LFS data for couples aged 25-55.

Figure A47: Involuntariness of different forms of non-standard employment, in non-standard-earning couples



Note: this graph explores the degree to which different forms of non-standard-employment are associated to involuntary non-standard-employment in non-standard-earning couples. Involuntary part-time work is defined for an observation stating they work part-time because full-time work was not available. Involuntary temporary work is defined for an observation stating they work a temporary job because permanent work was not available. Data are weighted EU-LFS data for couples aged 25-5

B. Appendix to chapter 10

B.1. Proportion of partnered people by year and country

Table B1: Partnered people by year and country

Year	Average	BE	FR	DE	GE	IE	IT	LU	NL	PT	ES	UK
1983	0.67	0.72	0.67		0.65	0.64	0.66	0.66	0.72			0.69
1984	0.67	0.73	0.66	0.66	0.64	0.65	0.66	0.65				0.69
1985	0.67	0.73	0.67	0.66	0.63	0.66	0.67	0.65	0.72			0.68
1986	0.66	0.70	0.67	0.65	0.63	0.66	0.67	0.62		0.69		0.68
1987	0.67	0.68	0.67	0.65	0.63	0.67	0.67	0.62	0.71	0.68	0.69	0.68
1988	0.66	0.67	0.67	0.64	0.62	0.67	0.66	0.63	0.71	0.67	0.68	0.68
1989	0.66	0.68	0.67	0.64	0.62	0.67	0.66	0.61	0.70	0.67	0.68	0.68
1990	0.66	0.67	0.67	0.64	0.62	0.68	0.66	0.61	0.69	0.68	0.68	0.68
1991	0.67	0.66	0.67	0.64	0.62	0.68	0.67	0.64	0.70	0.69	0.68	0.68
1992	0.66	0.64	0.67	0.65	0.62	0.69	0.66	0.60	0.73	0.69	0.68	0.67
1993	0.66	0.63	0.67	0.64	0.61	0.69	0.66	0.64	0.73	0.70	0.68	0.66
1994	0.67	0.63	0.68	0.63	0.62	0.68	0.65	0.67	0.72	0.70	0.68	0.66
1995	0.66	0.62	0.67	0.63	0.61	0.68	0.65		0.72	0.69	0.69	0.65
1996	0.67	0.65	0.67	0.63	0.62	0.67	0.65	0.70	0.73	0.68	0.70	0.65
1997	0.66	0.62	0.67	0.63	0.62	0.67	0.64	0.69	0.72	0.67	0.69	0.64
1998	0.66	0.64	0.67	0.63	0.62		0.64	0.70	0.72	0.67	0.69	0.64
1999	0.65	0.62	0.66	0.62	0.62		0.64	0.68	0.71	0.66	0.68	0.63
2000	0.65	0.59	0.66	0.63	0.62		0.64	0.70	0.72	0.66	0.68	0.63
2001	0.65	0.60	0.66	0.62	0.62		0.63	0.70	0.73	0.66	0.68	0.62
2002	0.65	0.58	0.65	0.62	0.61		0.62	0.70	0.73	0.66	0.67	0.61
2003	0.64	0.57	0.64	0.61	0.61		0.61	0.68	0.73	0.65	0.67	0.61
2004	0.64	0.59	0.63	0.61	0.62		0.64	0.70	0.71	0.66	0.66	0.60
2005	0.64	0.57	0.63	0.61	0.61		0.64	0.69	0.71	0.66	0.67	0.60
2006	0.64	0.56	0.62	0.60	0.62	0.66	0.65	0.70	0.69	0.67	0.68	0.60
2007	0.64	0.55	0.62	0.60	0.61	0.66	0.64	0.70	0.69	0.68	0.68	0.60
2008	0.64	0.55	0.62	0.59	0.61	0.66	0.64	0.72	0.69	0.67	0.67	0.60
2009	0.63	0.55	0.61	0.59	0.60	0.65	0.63	0.66	0.69	0.66	0.67	0.60
2010	0.62	0.54	0.61	0.59	0.60	0.65	0.62	0.64	0.70	0.66	0.66	0.59
2011	0.62	0.52	0.61	0.58	0.60	0.65	0.62	0.64	0.70	0.64	0.66	0.57
2012	0.62	0.58	0.61	0.57	0.60	0.65	0.61	0.66	0.70	0.62	0.66	0.57
2013	0.61	0.57	0.61	0.55	0.58	0.65	0.60	0.65	0.68	0.62	0.65	0.58
2014	0.61	0.57	0.59	0.55	0.58	0.65	0.61	0.63	0.68	0.63	0.64	0.58
2015	0.61	0.56	0.58	0.56	0.58	0.65	0.60	0.64	0.67	0.64	0.64	0.59
2016	0.61	0.56	0.58	0.56	0.59	0.64	0.59	0.68	0.67	0.63	0.63	0.58
2017	0.60	0.57	0.58	0.56	0.58	0.64	0.59	0.59	0.66	0.63	0.63	0.59
2018	0.60	0.57	0.57	0.56	0.58	0.65	0.59	0.56	0.66	0.62	0.63	0.59
2019	0.60	0.56	0.57	0.56	0.58	0.65	0.58	0.55	0.66	0.62	0.62	0.59
Diff	**-0.08**	**-0.16**	**-0.09**	**0.56**	**-0.06**	**0.01**	**-0.08**	**-0.11**	**-0.05**	**0.62**	**0.62**	**-0.10**

Note: this table represents the proportion of people aged 35-55 who are partnered (not necessarily married), by year and country.
Source: author's own calculations using the EU-LFS.

B.2. further descriptive statistics, and sample sizes

Table B2: Further descriptive statistics

	Average	Standard deviation	Min	Max	Number of country-year observations
Standard-employment (overall 35-55 population) rate	0.58	0.06	0.42	0.72	388
Male standard-employment (overall 35-55 population) rate	0.8	0.06	0.6	0.94	388
Female standard-employment (overall 35-55 population) rate	0.36	0.11	0.09	0.67	388
Non-standard-employment (overall 35-55 population) rate	0.15	0.08	0.03	0.41	388
Male non-standard-employment (overall 35-55 population) rate	0.07	0.04	0.005	0.19	388
Female non-standard-employment (overall 35-55 population) rate	0.23	0.14	0.04	0.63	388
Full-time employment rate (partnered men)	0.88	0.04	0.72	0.96	388
Full-time employment rate (partnered women)	0.38	0.14	0.07	0.78	388
Part-time employment rate (partnered men)	0.03	0.03	0.002	0.14	388
Part-time employment rate (partnered women)	0.23	0.17	0.02	0.67	388
Permanent employment rate (partnered men)	0.66	0.1	0.38	0.88	388
Permanent employment rate (partnered women)	0.47	0.16	0.1	0.73	388
Temporary employment rate (partnered men)	0.03	0.03	0.001	0.13	388
Temporary employment rate (partnered women)	0.04	0.03	0.005	0.13	388
Employee rate (partnered men)	0.7	0.09	0.45	0.89	388
Employee rate (partnered women)	0.54	0.15	0.16	0.77	388
Self-employment rate (partnered men)	0.2	0.08	0.06	0.46	388
Self-employment rate (partnered women)	0.07	0.03	0.02	0.2	388

Note: this table gives further descriptive statistics relative to the ones given in the core chapter. These are variables that are used "indirectly" in the analysis, to construct variables that are used directly in the analysis of the core chapter.
Source: author's own calculations using the EU-LFS.

Table B3: Sample sizes, by country, for the overall population of individuals, and the population of couples

Year	Belgium (35-55 individual population)	Belgium (35-55 couple population)	France (35-55 individual population)	France (35-55 couple population)	Germany (35-55 individual population)	Germany (35-55 couple population)	Greece (35-55 individual population)	Greece (35-55 couple population)	Ireland (35-55 individual population)	Ireland (35-55 couple population)	Italy (35-55 individual population)	Italy (35-55 couple population)	Luxembourg (35-55 individual population)	Luxembourg (35-55 couple population)	Netherlands (35-55 individual population)	Netherlands (35-55 couple population)	Portugal (35-55 individual population)	Portugal (35-55 couple population)	Spain (35-55 individual population)	Spain (35-55 couple population)	UK (35-55 individual population)	UK (35-55 couple population)
1983	27261	9843	40094	13354			34015	11007	29936	9541	92324	30252	7621	2521	41012	14689					52773	18253
1984	11313	4135	40692	13525	62426	20639	38035	12133	31705	10351	92916	30612	7427	2406							39942	13702
1985	23187	8412	40959	13695	60615	20027	37680	11927	32729	10861	89835	29921	7206	2324	40692	14647					40437	13774
1986	20101	7021	41207	13739	59669	19465	37547	11870	32431	10673	88790	29603	6537	2028			22417	7664			40910	13891
1987	18243	6162	41619	13846	60244	19434	37784	11844	33439	11141	93986	31383	6503	2006	13565	4830	22320	7577	42748	14640	40672	13847
1988	19205	6439	42466	14163	60976	19566	37857	11714	33775	11352	94031	31140	6704	2117	20291	7238	21804	7293	45158	15316	41965	14198
1989	18262	6247	42661	14335	60466	19431	37056	11475	35210	11878	101463	33659	6681	2040	21237	7430	20965	7049	45188	15310	42223	14426
1990	18433	6129	42470	14317	65725	20987	36800	11417	34884	11832	101714	33782	6777	2072	20975	7286	21010	7125	46287	15739	41475	14103
1991	19358	6350	43034	14358	81527	26177	36302	11229	35150	11992	51633	17368	6681	2122	21333	7420	21421	7337	45968	15683	41199	13958
1992	19739	6315	44548	14845	90029	29139	35713	11067	36598	12643	53163	17466	4284	1284	22332	8117	12328	4273	45342	15451	41693	13950
1993	21295	6701	47398	15881	91028	29063	43413	13324	36915	12716	53502	17562	3871	1233	21809	7934	12676	4396	44539	15209	42463	14045
1994	21485	6728	49368	16776	89827	28480	42624	13136	36952	12589	52795	17183	3938	1313	24562	8843	12385	4330	45299	15431	41888	13752
1995	21618	6735	49584	16651	89743	28399	42502	13060	37234	12708	54424	17634			26551	9614	11646	4025	47464	16305	40897	13281
1996	22654	7398	50134	16718	89546	28162	43175	13393	37062	12496	54265	17501	5248	1824	24331	8838	11739	3992	48787	16964	40996	13239
1997	22508	6972	49826	16658	90737	28437	43178	13420	37992	12648	54666	17616	5149	1775	28353	10264	11843	3960	49330	17038	40456	12919
1998	22690	7217	50505	16787	92666	28961	22261	6870			55503	17826	5120	1783	17407	6241	12866	4317	50122	17176	40194	12812
1999	7786	2424	50886	16739	93117	28949	22249	6890			56086	17894	4812	1642	16845	5979	12125	3990	52522	17943	39965	12554
2000	7761	2296	51439	16959	95258	29821	21858	6791			57118	18238	4494	1564	22739	8199	11901	3933	48876	16694	39223	12264
2001	7455	2217	50632	16682	97806	30458	21592	6646			56756	18010	4554	1591	31249	11365	12290	4075	47372	16033	38674	12041
2002	8464	2468	49574	16154	98187	30336	20809	6363			55905	17267	4095	1426	33962	12479	12333	4062	47955	16141	38536	11751
2003	8280	2353	24762	7883	99850	30672	19795	6035			55314	17003	5123	1737	33419	12179	12713	4145	48858	16237	36794	11173
2004	8690	2562	24595	7755	99871	30669	22447	6942			49514	15844	6765	2359	39052	13920	14429	4784	49385	16355	35422	10656
2005	33579	9578	95236	29908	145518	44165	87649	26853			203691	65110	28536	9824	162628	57642	54040	17672	177656	59228	34832	10468
2006	35287	9962	93802	29242	15315	4585	84540	26006	23985	7855	196869	64175	27364	9536	36212	12482	50236	16887	31092	10562	34169	10235
2007	34621	9590	96386	29600	15247	4604	82713	25324	89002	29318	194008	62449	6643	2338	35180	12048	48232	16298	31722	10781	33843	10156

2008	32544	8938	95318	29295	14575	4307	82418	24954	78085	25867	194180	61616	4416	1576	36037	12340	47530	15961	32545	10961	54250	16121
2009	32203	8785	113649	34847	15060	4442	83595	25133	76131	24745	190008	59450	6558	2147	30850	10665	46672	15361	33747	11226	26483	7890
2010	31328	8378	135021	41090	14361	4272	85605	25632	68056	22021	190824	59259	6280	1989	27117	9477	46195	15211	34262	11242	25470	7472
2011	28997	7560	140857	42804	14240	4144	77009	23050	63561	20646	186955	57499	6532	2073	28889	10107	45293	14419	33546	11021	24031	6839
2012	28713	8391	139845	42864	141704	40162	67834	20208	65290	21157	174086	52913	7568	2477	26891	9329	45059	13969	34875	11424	23107	6585
2013	28359	8137	127621	39098	138644	38429	68410	19965	58455	18875	175712	52947	5193	1670	27237	9259	45319	14091	33922	10944	22487	6460
2014	29697	8473	139328	40953	137317	37770	65720	19093	58972	19075	172830	52260	4239	1319	24608	8357	49850	15751	34212	10997	22828	6583
2015	27954	7880	138001	40051	137443	38226	64834	18821	54608	17645	168985	50585	3739	1198	23315	7808	49995	15846	33836	10823	21915	6431
2016	28200	7952	139509	40348	146997	40942	69924	20453	48339	15370	162241	47667	6825	2312	22601	7576	48084	15046	31456	9903	21004	6107
2017	13301	3797	133985	38515	149844	41898	68264	19721	42788	13698	160353	47084	5961	1745	21094	6912	46375	14554	31050	9782	21260	6308
2018	12071	3433	132032	37791	145225	40762	65091	18876	39120	12671	158252	46235	5258	1464	23659	7807	43425	13307	30730	9712	21533	6350
2019	13233	3719	128078	36618	141861	39782	59906	17454	40702	13132	153141	44080	5872	1625	20980	6934	40486	12451	31224	9744	21748	6421
Average (individual sample size)	**49467**																					
Average (couple sample size)	**15621**																					
Min (individual sample size)	**3739**																					
Min (couple sample size)	**1198**																					
Max (individual sample size)	**203691**																					
Max (couple sample size)	**65110**																					

Note: this table gives the sample size by year and country for the overall population of individuals aged 35-55, and for the population of couples with partners aged 35-55.
Source: author's own calculations using the EU-LFS.

B.3. Full derivation of the polarisation indicators and the shift-share equation, for ILO-employment and standard/non-standard-employment

To formally study the distribution of jobs across couples, I use and adapt the approach developed in the seminal works of Gregg and Wadsworth (2001, 2009, 2010). They develop a model to formalise and capture the idea of employment polarisation. They do it to measure employment polarisation across all households.

But, as will become clear below, their model is also directly applicable to specific types of households and I indeed adapt it to concentrate on couples only, and to integrate considerations of employment quality (standard and non-standard employment). These indicators of employment distribution can then be incorporated into a shift-share analysis as an explanatory variable for the evolution of couple employment patterns.

The intuition behind the indicator is to compare a counterfactual in which (standard) employment is completely randomly and equally distributed across households and the real, empirical distribution of work across households. In the counterfactual, each individual is assumed to have the same probability of being non-employed. This probability is the aggregate non-employment rate. Formally, if μ denotes the aggregate non-employment rate, an individual non-employment probability under the counterfactual is μ, and the counterfactual prediction of couple worklessness it is the square of the non-employment rate.

$$\gamma_2 = \mu^2$$

(B.1)

And by construction, using the exact same logic to derive it, the counterfactual couple dual earner rate α is given by

$$\alpha_2 = (1-\mu)^2$$

(B.2)

As $(1-\mu)$ is equal to the aggregate employment rate θ, this is equivalent to saying that the counterfactual dual earner employment rate, under the assumption of random allocation of employment across couples, is the square of the employment rate.

Finally, the counterfactual predicted rate of single earner couple is given as:

$$\lambda = [(1-\mu^2) - (1-\mu)^2]$$

(B.3)

Which means that the predicted single-earner rate is the counterfactual probability that the couple is not dual-workless (i.e. that at least someone is employed) minus the counterfactual probability that the couple is dual-earner (i.e. that both partners are employed). In this chapter, I focus on dual-earning couples.

Once we have the predicted/counterfactual rates, we can compute the polarisation indicators, which aim to compare how unequally or equally distributed employment actually is in the population of couples, when compared to these "predicted rates" based upon the idea of a random allocation of employment. If we define *de* the dual earner rate in the population of couples, then the polarisation indicator is:

$$\rho_{de} = de - \alpha_2$$

(B.4)

The core chapter discussed and illustrated how to interpret a positive/null/negative value on this indicator. In turn, this indicator can be used in a shift-share analysis to study the evolution of couple employment patterns, when re-writing equations (B.4):

$$de = \alpha_2 + \rho_{de} = \theta^2 + \rho_{de}$$

(B.5)

This that the rate of dual-earner couple is the sum of the predicted dual-earning rate and the polarisation of dual-earning. In other words, the first component is the "employment component" – dual-earning depends on how high the individual employment rate is – and the second component is the "polarisation component" – dual-earning depends on how much individual employment clusters in couples as opposed to being evenly distributed across them.

. To adapt the model to a world in which employment is increasingly divided between standard and non-standard work and where non-standard work is disproportionately taken-up by women, I propose an extension of the polarisation model and shift-share analysis to take account of whether employment is standard or non-standard.

Starting with dual-earning, the employment rate θ, which makes up the predicted dual-earner rate, can be decomposed as the sum of standard and non-standard employment θs and θns.

$$\theta^2 = (\theta s + \theta ns)^2$$

The polarisation component can also be decomposed: indeed, dual-earning can be with both partners in standard employment, one in standard employment and the other in non-standard employment ("one-and-a-half-earning), and both partners in non-standard employment, and the polarisation of dual-earning indicator can be decomposed accordingly, such that it is the sum of the polarisation of dual-standard-earning, one-and-a-half-earning, and dual-non-standard-earning. These sub-polarisation indicators are calculated using the usual approach of deriving a counterfactual and comparing it to the actual rates of couples of this type.

The counterfactual is now based not upon the idea of random allocation of employment, but upon the idea of random allocation of standard and non-standard employment. Following this

logic, the sub-polarisation indicators are derived in the following way, with ρ_{ds} ρ_{oh} and ρ_{dns} denoting the polarisation of dual-standard, one-and-a-half and dual-non-standard-earning respectively, δs denoting the standard employment rate amongst employed people, δns denoting the non-standard employment rate amongst employed people, and *ds* denoting the rate of dual-standard couples, *doh* the rate of one-and-a-half-earning couples and *dns* the rate of dual-non-standard-earning couples:

$$\rho_{ds} = ds - \left[(\theta^2) * ({\delta_s}^2)\right]$$

$$\rho_{oh} = doh - \left\{(\theta^2) * \left[\left(1 - {\delta_s}^2\right) - \left({\delta_{ns}}^2\right)\right]\right\}$$

$$\rho_{dns} = dns - \left[(\theta^2) * ({\delta_{ns}}^2)\right]$$

(B.6, B.7, and B.8)

The polarisation of dual-standard couple is therefore the actual rate of dual-standard couples minus its predicted rate under the assumption of random allocation of (standard) employment. This predicted rate is the product of the predicted-dual-earning rate, i.e. the probability that both partners are in employment under a random allocation of employment assumption, and the probability that, given that both partners are in employment, they are in standard employment, which, under the assumption of random allocation of standard employment, we obtain as the square of the rate of standard employment amongst employed people.

The exact same reasoning applies for the polarisation of dual-non-standard couples, except that the predicted rate now comes from the product of the dual-employment probability and the probability that, given that both partners are employed, they are in non-standard employment, given by the square of the non-standard employment rate amongst employed people, and still under the assumption of random allocation of employment and non-standard employment.

For one-and-a-half-earning couples, the predicted rate is, again, obtained as the product of the dual-earning probability under the assumption of employment being randomly allocated, and the probability that, under a random allocation of standard employment, and given that both partners are employed, one is in standard employment and the other is in non-standard employment. This latter component is given by the probability, under the assumption of random allocation of non-standard employment, that at least one of them is in non-standard employment, to which we subtract the probability that both of them are in non-standard employment.

. This means that the full shift-share analysis of couple work patterns is given by:

$$de = \ (\theta s + \theta ns)^2 + \langle \left(ds - \left[(\theta^2) * ({\delta_s}^2)\right]\right) + \left(doh - \left\{(\theta^2) * \left[\left(1 - {\delta_s}^2\right) - \left({\delta_{ns}}^2\right)\right]\right\}\right) + \left(dns - \left[(\theta^2) * ({\delta_{ns}}^2)\right]\right)\rangle$$

(B.9)

Which means that the dual-earning rate depends on the sum of standard employment and non-standard employment, and the sum of the polarisation of dual-standard, one-and-a-half, and dual-non-standard couples. In other words, it depends on standard and non-standard employment rates and how they are distributed across dual-earning couples.

B.4. Evolution over type of the proportion of each for of dual-earning couple as a share of all couples, and of standard and non-standard employment rates

Figure B1: proportion of different types of dual-earning couples in the overall proportion of couples

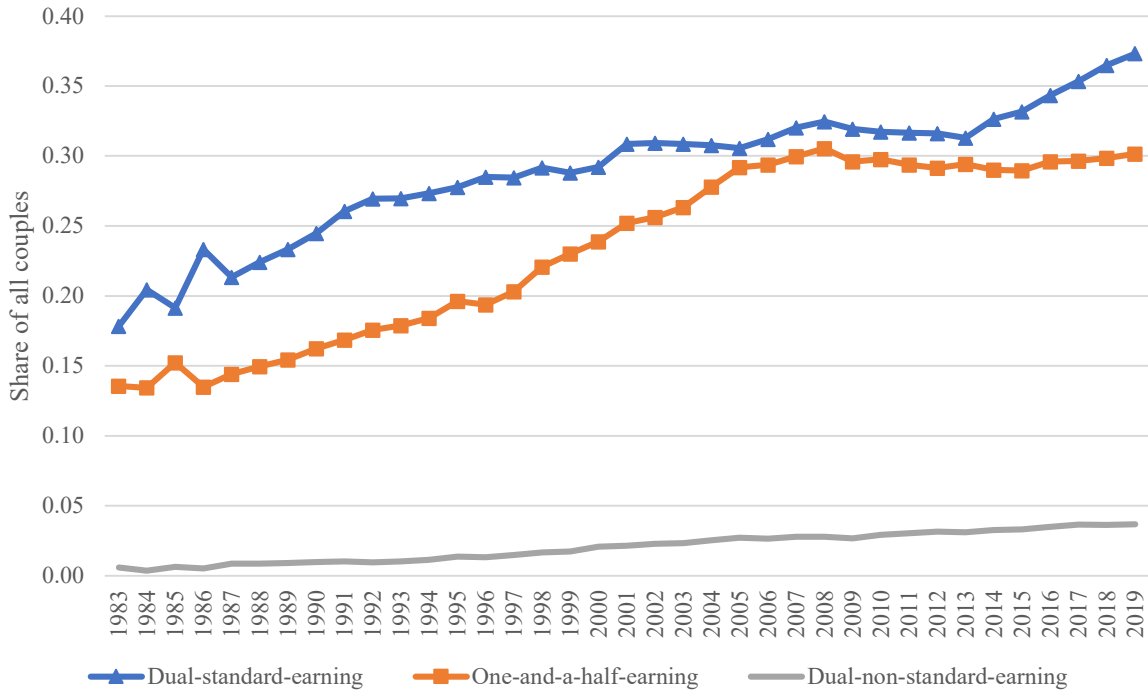
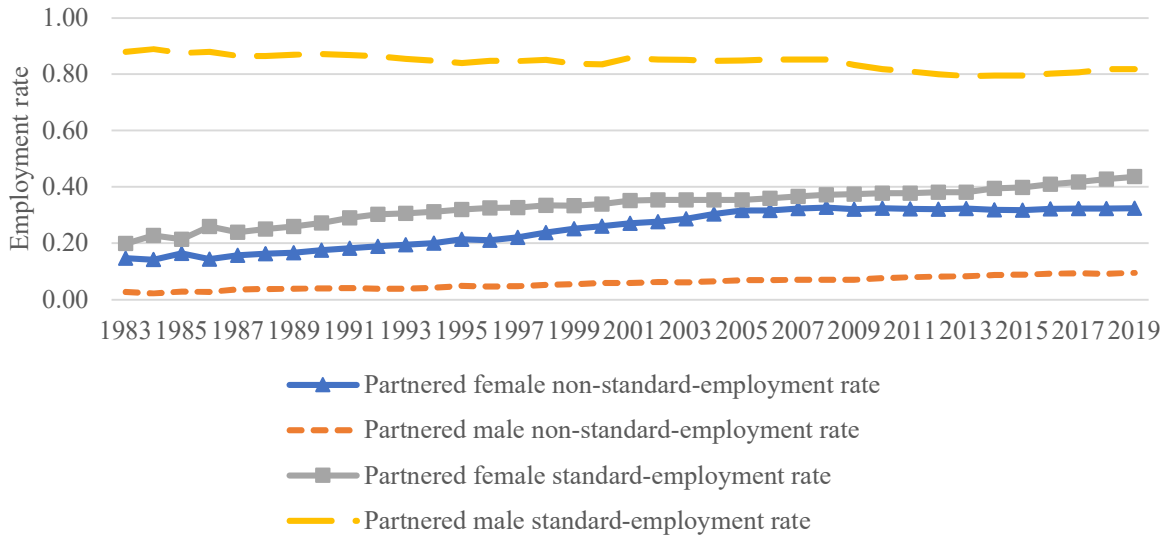


Figure B2: standard and non-standard employment rates of partnered women and men in the sample



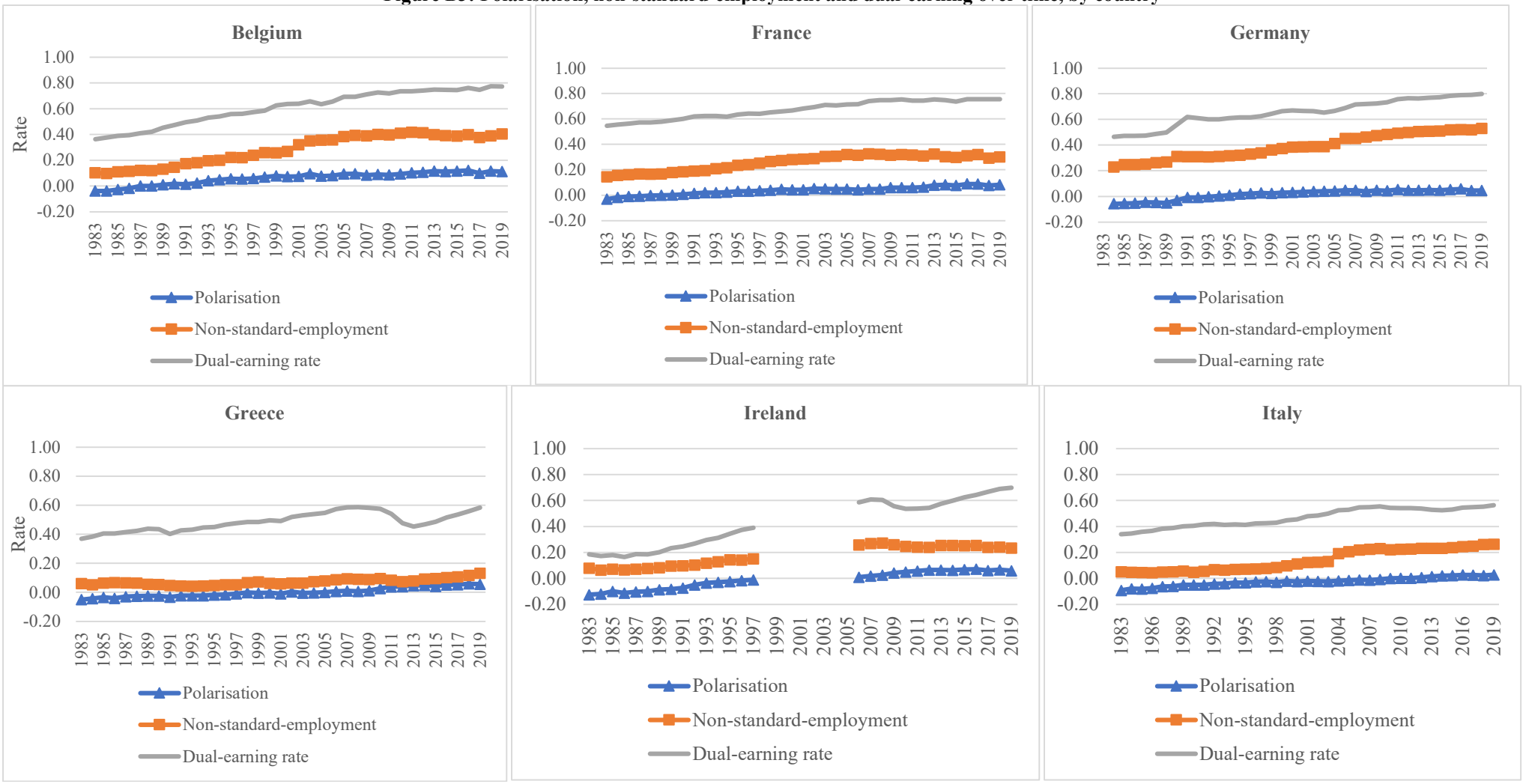
Note: The top graph represents the proportion of different sub-types of dual-earning couples once standard and non-standard employment are distinguished, as a proportion of all couples with partners aged 35-55, on average in Europe. The bottom graph represents the standard and non-standard employment rate of partnered men and women aged 35-55, in Europe.
Source: author's own calculations using the EU-LFS.

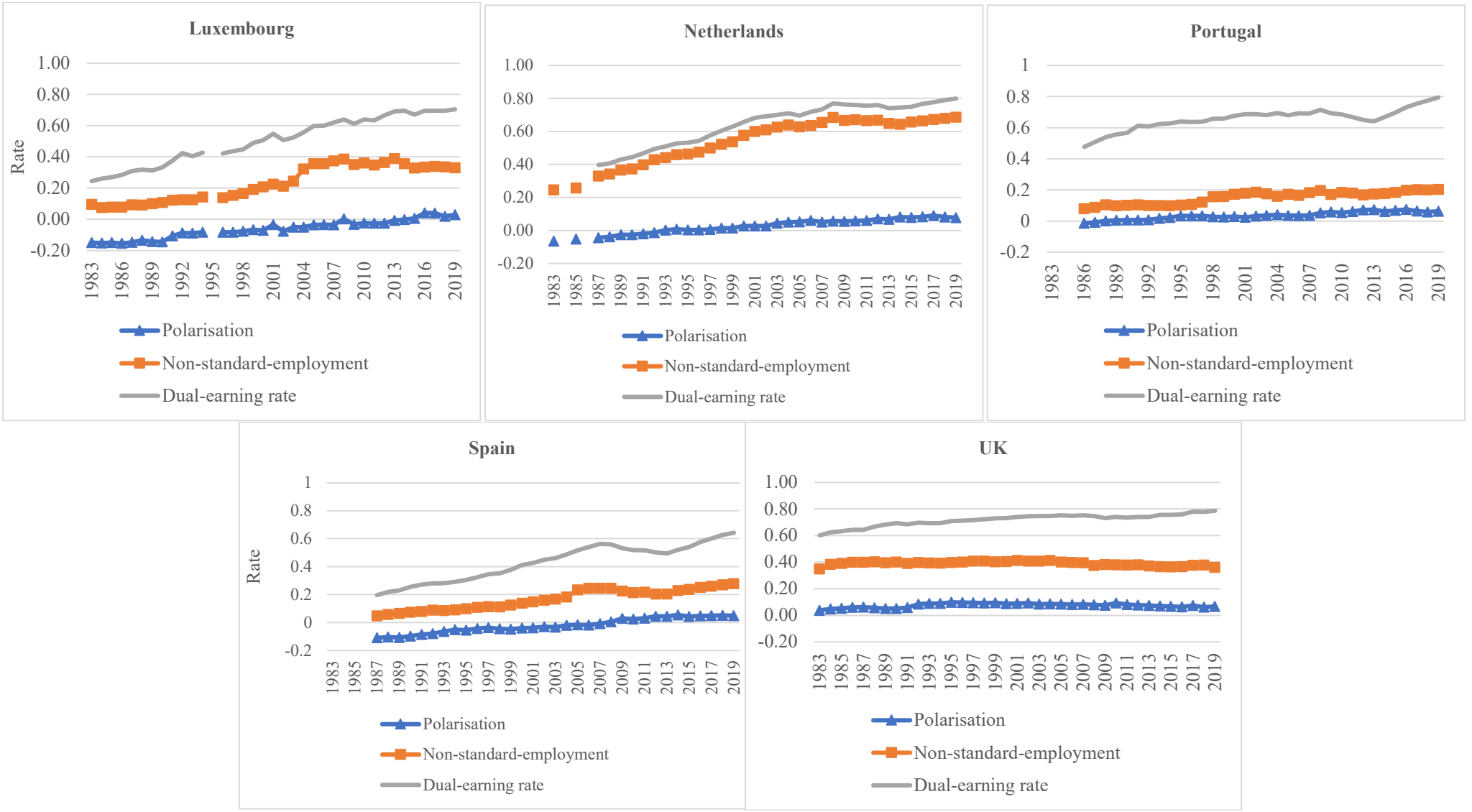
Table B4: Standard and non-standard employment rates for the entire population of individuals aged 35-55 on average in Europe and over time						
Year	Non-standard-employment rate (overall population)	Standard-employment rate (overall population)	Female non-standard-employment rate	Male non-standard-employment rate	Female standard-employment rate	Male standard-employment rate
1983	0.08	0.55	0.14	0.03	0.24	0.86
1984	0.08	0.57	0.13	0.03	0.27	0.86
1985	0.09	0.55	0.15	0.03	0.25	0.85
1986	0.08	0.58	0.13	0.03	0.30	0.85
1987	0.09	0.56	0.14	0.04	0.28	0.84
1988	0.10	0.56	0.15	0.04	0.28	0.84
1989	0.10	0.57	0.15	0.04	0.29	0.84
1990	0.10	0.58	0.16	0.05	0.30	0.84
1991	0.10	0.58	0.16	0.05	0.32	0.84
1992	0.11	0.58	0.17	0.04	0.33	0.83
1993	0.11	0.58	0.17	0.04	0.33	0.82
1994	0.11	0.58	0.18	0.05	0.34	0.81
1995	0.12	0.57	0.19	0.06	0.34	0.80
1996	0.12	0.58	0.19	0.05	0.35	0.81
1997	0.13	0.58	0.20	0.06	0.35	0.81
1998	0.14	0.58	0.21	0.06	0.35	0.81
1999	0.14	0.58	0.23	0.06	0.35	0.80
2000	0.15	0.58	0.24	0.07	0.36	0.80
2001	0.16	0.60	0.24	0.07	0.37	0.82
2002	0.16	0.60	0.25	0.07	0.38	0.81
2003	0.17	0.59	0.26	0.07	0.38	0.81
2004	0.17	0.59	0.27	0.08	0.38	0.81
2005	0.18	0.59	0.28	0.08	0.38	0.80
2006	0.18	0.60	0.28	0.08	0.39	0.81
2007	0.19	0.60	0.29	0.08	0.39	0.81
2008	0.19	0.60	0.30	0.08	0.40	0.81
2009	0.19	0.59	0.29	0.08	0.40	0.78
2010	0.19	0.58	0.29	0.09	0.40	0.77
2011	0.19	0.58	0.29	0.09	0.40	0.76
2012	0.19	0.57	0.29	0.09	0.40	0.75
2013	0.19	0.57	0.30	0.09	0.40	0.74
2014	0.20	0.57	0.29	0.10	0.41	0.74
2015	0.20	0.58	0.29	0.10	0.41	0.74
2016	0.20	0.58	0.30	0.10	0.42	0.74
2017	0.20	0.59	0.30	0.10	0.42	0.75
2018	0.20	0.60	0.30	0.10	0.44	0.76
2019	0.20	0.60	0.30	0.11	0.45	0.76
Diff	**0.12**	**0.05**	**0.16**	**0.08**	**0.21**	**-0.09**

Note: while the previous graph was concerned with partnered men and women, this table represents, for every year and for Europe on average, the standard and non-standard-employment rates, in general and by gender, for the whole population aged 35-55.
Source: author's own calculations using the EU-LFS.

B.5. Evolution over time of the prevalence of dual-earning couples with at least a partner in non-standard-employment, of overall polarisation, and of dual-earning rates, by country

Figure B3: Polarisation, non-standard-employment and dual-earning over time, by country





Note: these graphs present the same information as in the core chapter, broken-down by country.
Source: author's own calculations based on the EU-LFD.

B.6. Values of the variables making-up the shift-share equation, for each year and each country

Table B5: shift-share equation by year and country

Country	Year	Dual-earning rate	Counterfactual dual-earning rate	Polarisation dual-earning indicator	Standard employment rate	Non-standard-employment rate	Polarisation dual-standard-earning indicator	Polarisation one-and-a-half-earning indicator	Polarisation dual-non-standard-earning indicator
Belgium	1983	0.36	0.40	-0.04	0.55	0.06	-0.10	0.01	0.00
Belgium	1984	0.38	0.41	-0.04	0.56	0.06	-0.10	0.00	0.00
Belgium	1985	0.39	0.42	-0.03	0.56	0.06	-0.09	0.01	0.00
Belgium	1986	0.40	0.41	-0.02	0.56	0.06	-0.08	0.02	0.00
Belgium	1987	0.41	0.41	0.00	0.56	0.06	-0.07	0.03	0.00
Belgium	1988	0.42	0.42	0.00	0.57	0.06	-0.06	0.03	0.00
Belgium	1989	0.45	0.44	0.01	0.58	0.07	-0.06	0.03	0.00
Belgium	1990	0.47	0.46	0.02	0.59	0.07	-0.06	0.03	0.00
Belgium	1991	0.50	0.48	0.01	0.60	0.08	-0.07	0.05	0.00
Belgium	1992	0.51	0.49	0.02	0.59	0.09	-0.07	0.05	0.00
Belgium	1993	0.53	0.49	0.04	0.59	0.09	-0.06	0.06	0.00
Belgium	1994	0.54	0.49	0.05	0.59	0.09	-0.05	0.06	0.00
Belgium	1995	0.56	0.50	0.06	0.59	0.10	-0.05	0.07	0.00
Belgium	1996	0.56	0.51	0.05	0.59	0.11	-0.05	0.07	-0.01
Belgium	1997	0.57	0.52	0.06	0.59	0.12	-0.05	0.08	-0.01
Belgium	1998	0.59	0.52	0.07	0.58	0.13	-0.04	0.08	-0.01
Belgium	1999	0.62	0.55	0.08	0.46	0.14	-0.02	-0.06	-0.01
Belgium	2000	0.64	0.57	0.07	0.47	0.15	-0.03	-0.06	-0.01
Belgium	2001	0.64	0.56	0.07	0.58	0.16	-0.05	0.09	0.00
Belgium	2002	0.66	0.56	0.09	0.57	0.17	-0.06	0.13	-0.01
Belgium	2003	0.64	0.56	0.08	0.56	0.18	-0.06	0.12	-0.01
Belgium	2004	0.66	0.58	0.08	0.57	0.18	-0.05	0.12	-0.02
Belgium	2005	0.69	0.60	0.09	0.57	0.19	-0.04	0.12	-0.01
Belgium	2006	0.69	0.60	0.09	0.57	0.20	-0.05	0.13	-0.01
Belgium	2007	0.71	0.63	0.08	0.58	0.20	-0.04	0.11	-0.01

Belgium	2008	0.73	0.64	0.09	0.58	0.21	-0.04	0.12	-0.02
Belgium	2009	0.72	0.63	0.09	0.58	0.21	-0.04	0.12	-0.02
Belgium	2010	0.74	0.64	0.09	0.58	0.21	-0.03	0.12	-0.02
Belgium	2011	0.74	0.63	0.10	0.57	0.22	-0.02	0.12	-0.01
Belgium	2012	0.74	0.63	0.11	0.57	0.22	-0.01	0.12	-0.01
Belgium	2013	0.75	0.63	0.11	0.58	0.21	0.01	0.11	-0.01
Belgium	2014	0.75	0.63	0.11	0.58	0.21	0.01	0.11	-0.01
Belgium	2015	0.75	0.63	0.12	0.58	0.21	0.01	0.11	-0.01
Belgium	2016	0.76	0.64	0.12	0.58	0.21	0.01	0.11	-0.01
Belgium	2017	0.75	0.65	0.10	0.59	0.21	0.02	0.08	-0.01
Belgium	2018	0.78	0.66	0.11	0.59	0.22	0.03	0.09	-0.01
Belgium	2019	0.77	0.66	0.11	0.59	0.22	0.01	0.11	-0.02
France	1983	0.55	0.58	-0.03	0.65	0.08	-0.09	0.00	0.00
France	1984	0.56	0.57	-0.02	0.65	0.08	-0.08	0.00	0.00
France	1985	0.56	0.57	-0.01	0.65	0.09	-0.07	0.01	0.00
France	1986	0.57	0.58	-0.01	0.65	0.09	-0.07	0.01	0.00
France	1987	0.57	0.57	0.00	0.64	0.09	-0.06	0.01	0.00
France	1988	0.58	0.58	0.00	0.65	0.09	-0.05	0.01	0.00
France	1989	0.59	0.59	0.00	0.65	0.10	-0.05	0.01	0.00
France	1990	0.60	0.59	0.01	0.65	0.10	-0.05	0.01	0.00
France	1991	0.62	0.61	0.01	0.65	0.10	-0.04	0.01	0.00
France	1992	0.62	0.60	0.02	0.65	0.11	-0.03	0.02	0.00
France	1993	0.62	0.60	0.02	0.64	0.12	-0.03	0.02	-0.01
France	1994	0.62	0.59	0.02	0.63	0.12	-0.03	0.02	-0.01
France	1995	0.63	0.60	0.03	0.63	0.13	-0.03	0.03	-0.01
France	1996	0.64	0.61	0.03	0.63	0.14	-0.03	0.04	-0.01
France	1997	0.64	0.61	0.03	0.62	0.14	-0.03	0.04	-0.01
France	1998	0.65	0.61	0.04	0.62	0.15	-0.02	0.04	-0.01
France	1999	0.66	0.61	0.05	0.62	0.15	-0.02	0.05	-0.01
France	2000	0.67	0.62	0.04	0.62	0.16	-0.02	0.04	-0.01
France	2001	0.68	0.64	0.04	0.63	0.16	-0.02	0.05	-0.01
France	2002	0.69	0.64	0.05	0.63	0.16	-0.01	0.05	-0.01

France	2003	0.71	0.66	0.05	0.64	0.17	-0.02	0.06	-0.01
France	2004	0.71	0.66	0.05	0.64	0.17	-0.02	0.07	-0.01
France	2005	0.71	0.67	0.05	0.63	0.18	-0.02	0.07	-0.01
France	2006	0.72	0.67	0.04	0.64	0.18	-0.02	0.06	-0.01
France	2007	0.74	0.69	0.05	0.64	0.18	-0.01	0.06	-0.01
France	2008	0.75	0.70	0.05	0.65	0.18	-0.01	0.06	-0.01
France	2009	0.75	0.69	0.06	0.65	0.18	0.01	0.05	-0.01
France	2010	0.75	0.69	0.06	0.65	0.18	0.01	0.06	-0.01
France	2011	0.74	0.68	0.06	0.64	0.18	0.01	0.06	-0.01
France	2012	0.74	0.68	0.06	0.64	0.18	0.02	0.05	-0.01
France	2013	0.75	0.68	0.08	0.63	0.19	0.02	0.06	-0.01
France	2014	0.75	0.67	0.08	0.63	0.18	0.04	0.04	-0.01
France	2015	0.74	0.66	0.08	0.63	0.18	0.04	0.04	-0.01
France	2016	0.75	0.67	0.09	0.63	0.19	0.05	0.04	-0.01
France	2017	0.75	0.67	0.09	0.61	0.20	0.06	0.04	-0.01
France	2018	0.75	0.68	0.08	0.64	0.18	0.05	0.03	-0.01
France	2019	0.76	0.68	0.08	0.63	0.19	0.06	0.03	-0.01
Germany	1984	0.47	0.52	-0.06	0.59	0.11	-0.15	0.06	-0.01
Germany	1985	0.47	0.53	-0.05	0.58	0.13	-0.15	0.06	-0.01
Germany	1986	0.47	0.52	-0.05	0.57	0.13	-0.14	0.06	-0.01
Germany	1987	0.47	0.52	-0.05	0.57	0.13	-0.14	0.07	-0.01
Germany	1988	0.49	0.54	-0.05	0.58	0.13	-0.14	0.08	-0.01
Germany	1989	0.50	0.55	-0.05	0.59	0.14	-0.14	0.08	-0.01
Germany	1990	0.56	0.59	-0.03	0.59	0.15	-0.14	0.09	-0.02
Germany	1991	0.62	0.63	-0.01	0.62	0.16	-0.10	0.08	-0.01
Germany	1992	0.61	0.62	-0.01	0.61	0.16	-0.10	0.08	-0.01
Germany	1993	0.60	0.60	0.00	0.61	0.16	-0.09	0.08	-0.01
Germany	1994	0.60	0.60	0.00	0.60	0.16	-0.09	0.09	-0.01
Germany	1995	0.61	0.60	0.01	0.60	0.17	-0.08	0.09	-0.01
Germany	1996	0.61	0.60	0.02	0.60	0.17	-0.08	0.09	-0.01
Germany	1997	0.62	0.59	0.02	0.59	0.17	-0.08	0.10	-0.02
Germany	1998	0.62	0.60	0.03	0.59	0.18	-0.07	0.10	-0.02

Germany	1999	0.64	0.62	0.02	0.59	0.19	-0.08	0.11	-0.02
Germany	2000	0.66	0.64	0.03	0.60	0.20	-0.08	0.11	-0.02
Germany	2001	0.67	0.64	0.03	0.59	0.20	-0.08	0.12	-0.02
Germany	2002	0.67	0.63	0.03	0.59	0.20	-0.08	0.13	-0.02
Germany	2003	0.66	0.63	0.04	0.58	0.20	-0.07	0.12	-0.02
Germany	2004	0.65	0.61	0.04	0.57	0.21	-0.07	0.12	-0.02
Germany	2005	0.67	0.62	0.04	0.57	0.22	-0.07	0.14	-0.03
Germany	2006	0.69	0.64	0.05	0.56	0.24	-0.08	0.15	-0.03
Germany	2007	0.72	0.67	0.05	0.57	0.24	-0.07	0.14	-0.03
Germany	2008	0.72	0.68	0.04	0.59	0.24	-0.09	0.16	-0.03
Germany	2009	0.72	0.68	0.05	0.57	0.25	-0.09	0.16	-0.04
Germany	2010	0.73	0.69	0.04	0.57	0.26	-0.08	0.16	-0.04
Germany	2011	0.76	0.70	0.05	0.58	0.25	-0.08	0.16	-0.03
Germany	2012	0.77	0.72	0.05	0.59	0.26	-0.08	0.16	-0.03
Germany	2013	0.76	0.72	0.05	0.58	0.26	-0.09	0.17	-0.04
Germany	2014	0.77	0.72	0.05	0.58	0.26	-0.08	0.17	-0.04
Germany	2015	0.77	0.72	0.05	0.59	0.26	-0.08	0.17	-0.04
Germany	2016	0.78	0.73	0.05	0.59	0.27	-0.08	0.17	-0.04
Germany	2017	0.79	0.73	0.06	0.59	0.27	-0.08	0.17	-0.04
Germany	2018	0.79	0.75	0.05	0.59	0.27	-0.08	0.16	-0.04
Germany	2019	0.80	0.75	0.05	0.59	0.27	-0.08	0.16	-0.04
Greece	1983	0.37	0.42	-0.05	0.51	0.06	-0.11	-0.10	0.00
Greece	1984	0.38	0.43	-0.04	0.51	0.06	-0.10	-0.11	0.01
Greece	1985	0.41	0.44	-0.04	0.51	0.07	-0.09	-0.12	0.01
Greece	1986	0.41	0.45	-0.04	0.52	0.07	-0.10	-0.12	0.01
Greece	1987	0.42	0.44	-0.03	0.52	0.07	-0.09	-0.11	0.01
Greece	1988	0.42	0.45	-0.03	0.53	0.07	-0.08	-0.11	0.00
Greece	1989	0.44	0.46	-0.02	0.54	0.06	-0.07	-0.11	0.00
Greece	1990	0.44	0.46	-0.03	0.55	0.06	-0.06	-0.11	0.01
Greece	1991	0.40	0.43	-0.03	0.55	0.05	-0.06	-0.09	0.01
Greece	1992	0.43	0.45	-0.02	0.57	0.04	-0.06	-0.08	0.00
Greece	1993	0.43	0.45	-0.02	0.58	0.04	-0.07	-0.08	0.00

Greece	1994	0.45	0.47	-0.02	0.59	0.04	-0.06	-0.09	0.00
Greece	1995	0.45	0.47	-0.02	0.59	0.04	-0.06	-0.08	0.01
Greece	1996	0.47	0.48	-0.02	0.59	0.05	-0.05	-0.09	0.01
Greece	1997	0.48	0.49	-0.01	0.60	0.05	-0.05	-0.08	0.01
Greece	1998	0.48	0.49	0.00	0.59	0.05	-0.04	-0.07	0.01
Greece	1999	0.48	0.49	-0.01	0.60	0.06	-0.04	-0.07	0.01
Greece	2000	0.50	0.50	0.00	0.61	0.05	-0.03	-0.07	0.01
Greece	2001	0.49	0.50	-0.01	0.62	0.05	-0.03	-0.07	0.01
Greece	2002	0.52	0.52	0.00	0.63	0.05	-0.02	-0.06	0.01
Greece	2003	0.53	0.54	0.00	0.64	0.05	-0.03	-0.07	0.01
Greece	2004	0.54	0.54	0.00	0.65	0.06	-0.02	-0.06	0.01
Greece	2005	0.55	0.55	0.00	0.65	0.06	-0.02	-0.05	0.00
Greece	2006	0.57	0.57	0.01	0.66	0.06	-0.02	-0.04	0.00
Greece	2007	0.59	0.57	0.01	0.67	0.06	-0.01	-0.04	0.01
Greece	2008	0.59	0.58	0.01	0.67	0.06	-0.01	-0.05	0.01
Greece	2009	0.58	0.57	0.01	0.66	0.07	-0.01	-0.06	0.01
Greece	2010	0.58	0.55	0.03	0.64	0.07	0.01	-0.05	0.01
Greece	2011	0.54	0.50	0.04	0.61	0.07	0.03	-0.05	0.01
Greece	2012	0.48	0.44	0.04	0.57	0.07	0.03	-0.04	0.01
Greece	2013	0.45	0.41	0.05	0.55	0.07	0.03	-0.03	0.01
Greece	2014	0.47	0.42	0.05	0.55	0.08	0.03	-0.03	0.01
Greece	2015	0.49	0.44	0.04	0.57	0.08	0.03	-0.04	0.01
Greece	2016	0.52	0.46	0.05	0.58	0.09	0.04	-0.04	0.01
Greece	2017	0.54	0.48	0.05	0.59	0.09	0.05	-0.04	0.01
Greece	2018	0.56	0.50	0.06	0.60	0.09	0.04	-0.03	0.01
Greece	2019	0.58	0.53	0.06	0.62	0.09	0.04	-0.02	0.01
Ireland	1983	0.18	0.31	-0.12	0.50	0.05	-0.16	0.02	0.00
Ireland	1984	0.17	0.29	-0.12	0.49	0.04	-0.15	0.01	0.00
Ireland	1985	0.18	0.28	-0.10	0.47	0.04	-0.13	0.02	0.00
Ireland	1986	0.16	0.28	-0.11	0.48	0.05	-0.14	0.02	0.00
Ireland	1987	0.19	0.29	-0.10	0.48	0.05	-0.13	0.01	0.00
Ireland	1988	0.18	0.28	-0.10	0.47	0.06	-0.12	0.02	0.00

Ireland	1989	0.20	0.29	-0.09	0.47	0.06	-0.12	0.02	0.00
Ireland	1990	0.23	0.32	-0.08	0.49	0.06	-0.12	0.02	0.00
Ireland	1991	0.25	0.32	-0.07	0.49	0.07	-0.10	0.02	0.00
Ireland	1992	0.27	0.32	-0.05	0.49	0.07	-0.09	0.03	0.00
Ireland	1993	0.30	0.33	-0.03	0.49	0.08	-0.07	0.03	0.00
Ireland	1994	0.31	0.34	-0.03	0.50	0.08	-0.07	0.03	0.00
Ireland	1995	0.34	0.37	-0.02	0.51	0.09	-0.06	0.03	0.00
Ireland	1996	0.37	0.39	-0.02	0.53	0.09	-0.06	0.04	0.00
Ireland	1997	0.39	0.40	-0.01	0.53	0.10	-0.05	0.04	0.00
Ireland	2006	0.58	0.58	0.01	0.61	0.14	-0.05	0.07	-0.01
Ireland	2007	0.61	0.59	0.02	0.61	0.15	-0.04	0.06	-0.01
Ireland	2008	0.60	0.58	0.03	0.60	0.15	-0.04	0.07	-0.01
Ireland	2009	0.56	0.51	0.04	0.55	0.16	-0.02	0.06	-0.01
Ireland	2010	0.54	0.49	0.05	0.54	0.16	0.00	0.06	-0.01
Ireland	2011	0.54	0.48	0.06	0.53	0.16	0.01	0.05	-0.01
Ireland	2012	0.54	0.48	0.06	0.53	0.16	0.02	0.04	0.00
Ireland	2013	0.57	0.51	0.06	0.54	0.17	0.02	0.04	0.00
Ireland	2014	0.60	0.53	0.06	0.56	0.16	0.02	0.04	0.00
Ireland	2015	0.62	0.56	0.07	0.58	0.16	0.03	0.04	-0.01
Ireland	2016	0.64	0.57	0.07	0.60	0.16	0.03	0.04	-0.01
Ireland	2017	0.67	0.61	0.06	0.63	0.15	0.03	0.04	-0.01
Ireland	2018	0.69	0.62	0.07	0.64	0.15	0.04	0.04	-0.01
Ireland	2019	0.70	0.64	0.06	0.66	0.14	0.03	0.03	-0.01
Italy	1983	0.34	0.43	-0.09	0.59	0.04	-0.11	-0.03	0.00
Italy	1984	0.35	0.43	-0.08	0.59	0.04	-0.10	-0.03	0.00
Italy	1985	0.36	0.44	-0.08	0.60	0.03	-0.10	-0.03	0.00
Italy	1986	0.37	0.44	-0.08	0.61	0.03	-0.10	-0.03	0.00
Italy	1987	0.38	0.45	-0.06	0.61	0.04	-0.08	-0.03	0.00
Italy	1988	0.39	0.45	-0.06	0.61	0.04	-0.08	-0.03	0.00
Italy	1989	0.40	0.45	-0.05	0.61	0.04	-0.07	-0.02	0.00
Italy	1990	0.41	0.46	-0.05	0.62	0.03	-0.07	-0.02	0.00
Italy	1991	0.42	0.47	-0.05	0.63	0.04	-0.07	-0.02	0.00

Italy	1992	0.42	0.46	-0.04	0.61	0.05	-0.06	-0.02	0.00
Italy	1993	0.41	0.45	-0.04	0.61	0.04	-0.06	-0.02	0.00
Italy	1994	0.42	0.45	-0.03	0.60	0.05	-0.05	-0.02	0.00
Italy	1995	0.41	0.44	-0.03	0.60	0.05	-0.05	-0.02	0.00
Italy	1996	0.42	0.45	-0.03	0.60	0.05	-0.04	-0.02	0.00
Italy	1997	0.43	0.45	-0.02	0.60	0.05	-0.04	-0.01	0.00
Italy	1998	0.43	0.46	-0.03	0.60	0.06	-0.05	-0.01	0.00
Italy	1999	0.45	0.47	-0.02	0.60	0.07	-0.04	-0.01	0.00
Italy	2000	0.45	0.48	-0.02	0.60	0.07	-0.04	-0.01	0.00
Italy	2001	0.48	0.50	-0.02	0.61	0.08	-0.04	0.00	0.00
Italy	2002	0.49	0.51	-0.02	0.62	0.08	-0.05	0.00	0.00
Italy	2003	0.50	0.52	-0.02	0.63	0.08	-0.05	0.00	0.00
Italy	2004	0.52	0.54	-0.02	0.61	0.12	-0.06	0.03	0.00
Italy	2005	0.53	0.54	-0.01	0.60	0.12	-0.06	0.03	0.00
Italy	2006	0.55	0.56	-0.01	0.61	0.13	-0.06	0.03	0.00
Italy	2007	0.55	0.56	-0.01	0.61	0.14	-0.06	0.03	0.00
Italy	2008	0.55	0.56	-0.01	0.60	0.14	-0.06	0.04	0.00
Italy	2009	0.54	0.54	0.00	0.60	0.13	-0.05	0.04	0.00
Italy	2010	0.54	0.54	0.00	0.59	0.14	-0.04	0.04	0.00
Italy	2011	0.54	0.54	0.00	0.58	0.14	-0.04	0.03	0.00
Italy	2012	0.54	0.53	0.01	0.57	0.15	-0.03	0.03	0.00
Italy	2013	0.53	0.51	0.01	0.56	0.16	-0.02	0.03	0.00
Italy	2014	0.52	0.50	0.02	0.55	0.16	-0.02	0.03	0.00
Italy	2015	0.53	0.51	0.02	0.54	0.16	-0.01	0.03	0.00
Italy	2016	0.55	0.52	0.03	0.55	0.17	-0.01	0.03	0.00
Italy	2017	0.55	0.52	0.03	0.55	0.17	-0.01	0.03	0.00
Italy	2018	0.55	0.53	0.02	0.55	0.18	-0.02	0.03	0.00
Italy	2019	0.57	0.54	0.03	0.55	0.18	-0.01	0.03	0.00
Luxembourg	1983	0.25	0.39	-0.15	0.56	0.05	-0.19	0.01	0.00
Luxembourg	1984	0.26	0.41	-0.15	0.58	0.04	-0.19	0.01	0.00
Luxembourg	1985	0.27	0.42	-0.15	0.59	0.04	-0.19	0.01	0.00
Luxembourg	1986	0.28	0.44	-0.15	0.61	0.04	-0.19	0.01	0.00

Luxembourg	1987	0.31	0.46	-0.15	0.61	0.05	-0.20	0.01	0.00
Luxembourg	1988	0.32	0.45	-0.13	0.62	0.04	-0.18	0.02	0.00
Luxembourg	1989	0.31	0.46	-0.14	0.62	0.05	-0.20	0.03	0.00
Luxembourg	1990	0.33	0.48	-0.15	0.63	0.05	-0.20	0.03	0.00
Luxembourg	1991	0.38	0.48	-0.11	0.61	0.06	-0.16	0.02	0.00
Luxembourg	1992	0.42	0.51	-0.09	0.65	0.06	-0.14	0.03	0.00
Luxembourg	1993	0.40	0.49	-0.09	0.63	0.06	-0.15	0.04	0.00
Luxembourg	1994	0.43	0.51	-0.08	0.64	0.06	-0.15	0.05	0.00
Luxembourg	1996	0.42	0.50	-0.08	0.64	0.06	-0.14	0.05	0.00
Luxembourg	1997	0.44	0.52	-0.08	0.65	0.07	-0.14	0.05	0.00
Luxembourg	1998	0.45	0.53	-0.08	0.64	0.08	-0.13	0.05	0.00
Luxembourg	1999	0.49	0.56	-0.07	0.65	0.09	-0.14	0.06	0.00
Luxembourg	2000	0.51	0.58	-0.07	0.65	0.10	-0.13	0.06	0.00
Luxembourg	2001	0.55	0.58	-0.04	0.66	0.10	-0.11	0.08	-0.01
Luxembourg	2002	0.51	0.58	-0.08	0.65	0.11	-0.14	0.06	-0.01
Luxembourg	2003	0.52	0.58	-0.05	0.63	0.13	-0.12	0.08	-0.01
Luxembourg	2004	0.56	0.61	-0.05	0.62	0.16	-0.15	0.11	-0.01
Luxembourg	2005	0.60	0.63	-0.04	0.62	0.18	-0.15	0.12	-0.02
Luxembourg	2006	0.60	0.63	-0.04	0.62	0.17	-0.15	0.13	-0.02
Luxembourg	2007	0.62	0.66	-0.04	0.62	0.19	-0.14	0.13	-0.02
Luxembourg	2008	0.64	0.64	0.00	0.61	0.18	-0.13	0.15	-0.02
Luxembourg	2009	0.61	0.64	-0.03	0.63	0.17	-0.14	0.12	-0.02
Luxembourg	2010	0.64	0.66	-0.02	0.63	0.18	-0.13	0.11	-0.02
Luxembourg	2011	0.63	0.66	-0.03	0.62	0.18	-0.11	0.09	-0.02
Luxembourg	2012	0.67	0.69	-0.03	0.63	0.19	-0.10	0.10	-0.02
Luxembourg	2013	0.69	0.70	-0.01	0.64	0.19	-0.11	0.11	-0.02
Luxembourg	2014	0.70	0.70	0.00	0.64	0.19	-0.08	0.09	-0.02
Luxembourg	2015	0.67	0.66	0.01	0.61	0.19	-0.06	0.05	-0.01
Luxembourg	2016	0.70	0.65	0.04	0.60	0.19	-0.03	0.05	-0.02
Luxembourg	2017	0.70	0.66	0.04	0.61	0.19	-0.04	0.06	-0.02
Luxembourg	2018	0.69	0.68	0.02	0.62	0.19	-0.05	0.06	-0.01
Luxembourg	2019	0.70	0.67	0.03	0.63	0.18	-0.04	0.05	-0.01

Netherlands	1983	0.31	0.37	-0.07	0.45	0.15	-0.17	0.08	-0.01
Netherlands	1985	0.33	0.38	-0.05	0.45	0.15	-0.16	0.09	-0.01
Netherlands	1987	0.40	0.44	-0.04	0.45	0.21	-0.15	0.09	0.00
Netherlands	1988	0.41	0.44	-0.04	0.45	0.21	-0.15	0.11	-0.01
Netherlands	1989	0.43	0.46	-0.03	0.45	0.22	-0.15	0.12	-0.01
Netherlands	1990	0.44	0.47	-0.03	0.45	0.22	-0.15	0.12	-0.01
Netherlands	1991	0.47	0.49	-0.02	0.46	0.24	-0.15	0.13	-0.01
Netherlands	1992	0.49	0.51	-0.01	0.47	0.24	-0.16	0.16	-0.02
Netherlands	1993	0.51	0.51	0.00	0.46	0.25	-0.15	0.17	-0.02
Netherlands	1994	0.53	0.52	0.01	0.46	0.26	-0.15	0.17	-0.02
Netherlands	1995	0.53	0.53	0.00	0.46	0.26	-0.15	0.17	-0.03
Netherlands	1996	0.54	0.54	0.00	0.46	0.27	-0.15	0.17	-0.03
Netherlands	1997	0.58	0.57	0.01	0.47	0.28	-0.15	0.18	-0.03
Netherlands	1998	0.60	0.59	0.01	0.47	0.29	-0.15	0.18	-0.03
Netherlands	1999	0.63	0.62	0.01	0.48	0.30	-0.14	0.18	-0.03
Netherlands	2000	0.66	0.63	0.03	0.46	0.33	-0.14	0.19	-0.03
Netherlands	2001	0.68	0.65	0.03	0.47	0.34	-0.14	0.20	-0.04
Netherlands	2002	0.69	0.66	0.03	0.46	0.35	-0.13	0.20	-0.04
Netherlands	2003	0.70	0.66	0.04	0.45	0.36	-0.13	0.21	-0.04
Netherlands	2004	0.71	0.66	0.05	0.44	0.37	-0.13	0.22	-0.04
Netherlands	2005	0.70	0.64	0.05	0.44	0.36	-0.13	0.22	-0.04
Netherlands	2006	0.72	0.66	0.06	0.45	0.36	-0.12	0.22	-0.04
Netherlands	2007	0.73	0.68	0.05	0.45	0.38	-0.12	0.21	-0.04
Netherlands	2008	0.77	0.71	0.06	0.46	0.39	-0.12	0.22	-0.05
Netherlands	2009	0.76	0.71	0.06	0.45	0.39	-0.11	0.22	-0.05
Netherlands	2010	0.76	0.70	0.06	0.44	0.39	-0.11	0.22	-0.05
Netherlands	2011	0.76	0.70	0.06	0.44	0.39	-0.11	0.21	-0.05
Netherlands	2012	0.76	0.69	0.07	0.44	0.39	-0.10	0.22	-0.05
Netherlands	2013	0.74	0.67	0.07	0.42	0.39	-0.09	0.20	-0.05
Netherlands	2014	0.75	0.66	0.08	0.42	0.39	-0.08	0.20	-0.04
Netherlands	2015	0.75	0.67	0.08	0.42	0.39	-0.09	0.21	-0.04
Netherlands	2016	0.77	0.68	0.08	0.43	0.40	-0.09	0.20	-0.04

Netherlands	2017	0.78	0.69	0.09	0.43	0.40	-0.08	0.21	-0.04
Netherlands	2018	0.79	0.71	0.08	0.44	0.40	-0.08	0.21	-0.05
Netherlands	2019	0.80	0.72	0.08	0.44	0.41	-0.08	0.20	-0.04
Portugal	1986	0.48	0.49	-0.01	0.62	0.06	-0.01	-0.03	0.00
Portugal	1987	0.51	0.52	-0.01	0.64	0.07	0.00	-0.03	0.01
Portugal	1988	0.54	0.54	0.00	0.65	0.08	0.00	-0.02	0.01
Portugal	1989	0.56	0.55	0.00	0.66	0.07	0.01	-0.02	0.01
Portugal	1990	0.57	0.56	0.01	0.67	0.08	0.01	-0.02	0.00
Portugal	1991	0.61	0.61	0.01	0.69	0.08	0.01	-0.03	0.00
Portugal	1992	0.61	0.60	0.01	0.70	0.07	0.01	-0.01	0.00
Portugal	1993	0.62	0.61	0.02	0.70	0.07	0.02	-0.01	0.00
Portugal	1994	0.63	0.60	0.02	0.70	0.07	0.02	-0.01	0.00
Portugal	1995	0.64	0.61	0.03	0.70	0.07	0.03	-0.02	0.00
Portugal	1996	0.64	0.60	0.03	0.69	0.07	0.04	-0.02	0.00
Portugal	1997	0.64	0.60	0.03	0.68	0.09	0.04	-0.02	0.00
Portugal	1998	0.66	0.63	0.03	0.67	0.11	0.03	-0.02	0.01
Portugal	1999	0.66	0.63	0.03	0.67	0.11	0.03	-0.03	0.00
Portugal	2000	0.68	0.65	0.03	0.67	0.12	0.03	-0.03	0.00
Portugal	2001	0.69	0.66	0.02	0.69	0.12	0.03	-0.02	0.01
Portugal	2002	0.69	0.65	0.03	0.67	0.13	0.03	-0.02	0.01
Portugal	2003	0.68	0.64	0.04	0.67	0.13	0.04	-0.02	0.00
Portugal	2004	0.69	0.65	0.04	0.68	0.12	0.06	-0.03	0.01
Portugal	2005	0.68	0.64	0.04	0.68	0.12	0.04	-0.02	0.01
Portugal	2006	0.69	0.66	0.03	0.69	0.12	0.05	-0.03	0.01
Portugal	2007	0.69	0.66	0.04	0.67	0.14	0.05	-0.03	0.01
Portugal	2008	0.72	0.66	0.05	0.67	0.14	0.06	-0.02	0.01
Portugal	2009	0.69	0.63	0.06	0.66	0.13	0.07	-0.03	0.01
Portugal	2010	0.69	0.63	0.05	0.66	0.14	0.06	-0.02	0.01
Portugal	2011	0.67	0.61	0.06	0.64	0.14	0.07	-0.02	0.01
Portugal	2012	0.65	0.58	0.07	0.63	0.13	0.09	-0.03	0.01
Portugal	2013	0.64	0.57	0.07	0.62	0.13	0.08	-0.02	0.01
Portugal	2014	0.67	0.61	0.06	0.64	0.14	0.08	-0.03	0.01

Portugal	2015	0.70	0.63	0.07	0.65	0.14	0.08	-0.02	0.00
Portugal	2016	0.73	0.66	0.08	0.66	0.14	0.09	-0.02	0.01
Portugal	2017	0.75	0.69	0.06	0.68	0.14	0.08	-0.02	0.01
Portugal	2018	0.77	0.72	0.06	0.70	0.15	0.08	-0.03	0.01
Portugal	2019	0.79	0.73	0.06	0.72	0.14	0.08	-0.02	0.01
Spain	1987	0.20	0.31	-0.11	0.47	0.05	-0.12	-0.04	0.00
Spain	1988	0.22	0.32	-0.10	0.48	0.07	-0.10	-0.05	0.01
Spain	1989	0.23	0.34	-0.11	0.48	0.08	-0.10	-0.05	0.00
Spain	1990	0.25	0.35	-0.10	0.48	0.09	-0.09	-0.05	0.00
Spain	1991	0.27	0.36	-0.09	0.48	0.09	-0.08	-0.05	0.00
Spain	1992	0.28	0.36	-0.08	0.48	0.10	-0.07	-0.04	0.00
Spain	1993	0.28	0.35	-0.06	0.47	0.10	-0.06	-0.04	0.00
Spain	1994	0.29	0.34	-0.05	0.46	0.10	-0.04	-0.04	0.00
Spain	1995	0.30	0.36	-0.05	0.47	0.11	-0.05	-0.04	0.00
Spain	1996	0.32	0.37	-0.04	0.48	0.12	-0.03	-0.04	0.01
Spain	1997	0.35	0.38	-0.04	0.49	0.12	-0.03	-0.04	0.01
Spain	1998	0.35	0.40	-0.04	0.50	0.12	-0.03	-0.04	0.01
Spain	1999	0.38	0.42	-0.05	0.52	0.13	-0.03	-0.04	0.00
Spain	2000	0.41	0.45	-0.04	0.53	0.13	-0.02	-0.04	0.00
Spain	2001	0.43	0.46	-0.04	0.53	0.14	-0.02	-0.04	0.00
Spain	2002	0.45	0.48	-0.03	0.53	0.15	-0.01	-0.04	0.01
Spain	2003	0.46	0.49	-0.03	0.54	0.15	-0.02	-0.04	0.01
Spain	2004	0.49	0.51	-0.02	0.54	0.16	0.00	-0.04	0.01
Spain	2005	0.52	0.53	-0.02	0.53	0.19	-0.01	-0.02	0.01
Spain	2006	0.54	0.56	-0.02	0.55	0.20	-0.01	-0.02	0.00
Spain	2007	0.56	0.57	-0.01	0.56	0.19	0.00	-0.01	0.00
Spain	2008	0.56	0.55	0.00	0.55	0.19	0.00	-0.01	0.00
Spain	2009	0.53	0.50	0.03	0.54	0.17	0.01	0.01	0.00
Spain	2010	0.52	0.49	0.02	0.53	0.17	0.02	0.00	0.00
Spain	2011	0.52	0.49	0.03	0.52	0.17	0.02	0.00	0.00
Spain	2012	0.50	0.46	0.04	0.51	0.16	0.03	0.00	0.01
Spain	2013	0.49	0.45	0.04	0.50	0.17	0.04	0.00	0.00

Spain	2014	0.52	0.47	0.05	0.51	0.17	0.03	0.01	0.01
Spain	2015	0.54	0.50	0.04	0.52	0.18	0.03	0.01	0.00
Spain	2016	0.58	0.53	0.05	0.53	0.19	0.04	0.00	0.00
Spain	2017	0.60	0.55	0.05	0.55	0.20	0.04	0.00	0.01
Spain	2018	0.63	0.58	0.05	0.56	0.20	0.04	0.00	0.00
Spain	2019	0.64	0.59	0.05	0.56	0.21	0.04	0.00	0.00
UK	1983	0.60	0.56	0.04	0.57	0.18	-0.09	0.13	-0.02
UK	1984	0.62	0.58	0.05	0.56	0.19	-0.09	0.15	-0.03
UK	1985	0.63	0.58	0.05	0.57	0.19	-0.08	0.16	-0.03
UK	1986	0.64	0.58	0.06	0.57	0.19	-0.08	0.17	-0.03
UK	1987	0.64	0.58	0.06	0.56	0.20	-0.07	0.16	-0.03
UK	1988	0.67	0.61	0.06	0.58	0.20	-0.07	0.16	-0.03
UK	1989	0.68	0.63	0.05	0.60	0.19	-0.07	0.15	-0.03
UK	1990	0.69	0.64	0.05	0.60	0.20	-0.07	0.15	-0.03
UK	1991	0.68	0.63	0.06	0.59	0.19	-0.06	0.15	-0.03
UK	1992	0.70	0.61	0.08	0.57	0.20	-0.04	0.14	-0.03
UK	1993	0.69	0.60	0.09	0.56	0.20	-0.04	0.13	-0.03
UK	1994	0.69	0.60	0.09	0.56	0.20	-0.03	0.13	-0.03
UK	1995	0.71	0.61	0.10	0.57	0.20	-0.03	0.14	-0.02
UK	1996	0.71	0.62	0.09	0.57	0.21	-0.03	0.14	-0.03
UK	1997	0.71	0.62	0.09	0.57	0.21	-0.03	0.14	-0.02
UK	1998	0.72	0.63	0.09	0.58	0.21	-0.03	0.14	-0.03
UK	1999	0.73	0.64	0.09	0.59	0.21	-0.02	0.14	-0.03
UK	2000	0.73	0.64	0.09	0.59	0.21	-0.03	0.14	-0.02
UK	2001	0.74	0.65	0.09	0.60	0.21	-0.03	0.14	-0.02
UK	2002	0.74	0.65	0.09	0.60	0.20	-0.03	0.14	-0.02
UK	2003	0.75	0.66	0.08	0.61	0.21	-0.03	0.14	-0.02
UK	2004	0.75	0.66	0.08	0.61	0.20	-0.04	0.14	-0.02
UK	2005	0.75	0.67	0.08	0.61	0.20	-0.03	0.13	-0.02
UK	2006	0.75	0.67	0.08	0.62	0.20	-0.03	0.13	-0.02
UK	2007	0.75	0.67	0.08	0.62	0.20	-0.03	0.13	-0.02
UK	2008	0.75	0.67	0.08	0.63	0.19	-0.02	0.12	-0.02

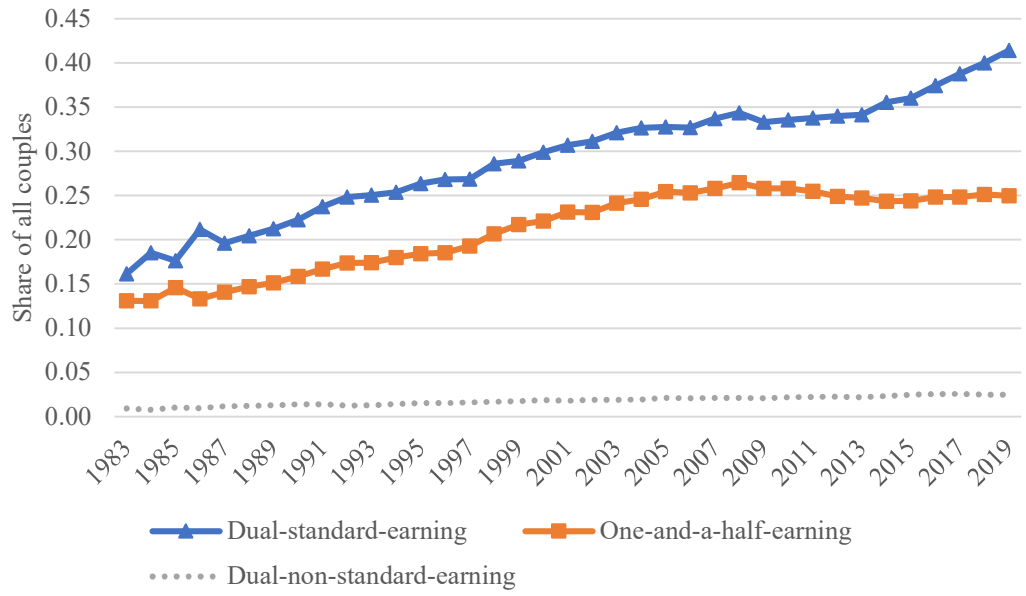
UK	2009	0.73	0.66	0.07	0.61	0.20	-0.03	0.12	-0.02
UK	2010	0.74	0.65	0.09	0.60	0.20	-0.01	0.12	-0.02
UK	2011	0.73	0.66	0.08	0.60	0.20	-0.01	0.11	-0.02
UK	2012	0.74	0.66	0.08	0.61	0.21	-0.01	0.11	-0.02
UK	2013	0.74	0.67	0.07	0.61	0.20	-0.01	0.10	-0.02
UK	2014	0.76	0.69	0.07	0.62	0.20	0.00	0.09	-0.02
UK	2015	0.76	0.69	0.07	0.63	0.20	0.00	0.09	-0.02
UK	2016	0.76	0.70	0.06	0.63	0.20	-0.01	0.09	-0.02
UK	2017	0.78	0.71	0.07	0.63	0.20	0.00	0.09	-0.02
UK	2018	0.78	0.72	0.06	0.64	0.20	-0.02	0.09	-0.02
UK	2019	0.79	0.72	0.07	0.65	0.19	0.00	0.08	-0.02

Note: the core chapter shows the evolution of each country between their first and last year in the dataset, in terms of the values of the variables making-up the shift-share equation. This table presents the value of these variables for each year and each country.
Source: author's own calculations using the EU-LFS.

B.7. Results of the robustness analysis

B.7.1. Analyses using the alternative part-time variable

Figure B4: Proportion of each subtype of dual-earning couples as a share of all couples, on average in Europe (alternative PT)



Note: This graph represents the proportion of different sub-types of dual-earning couples once standard and non-standard employment are distinguished, as a proportion of all couples with partners aged 35-55, on average in Europe, using the hours-based part-time variable.
Source: author's own calculations using the EU-LFS.

Figure B5: Evolution of overall polarisation, the prevalence of dual-earning couples with non-standard-employment, and dual-earning rate on average in Europe (alternative PT)

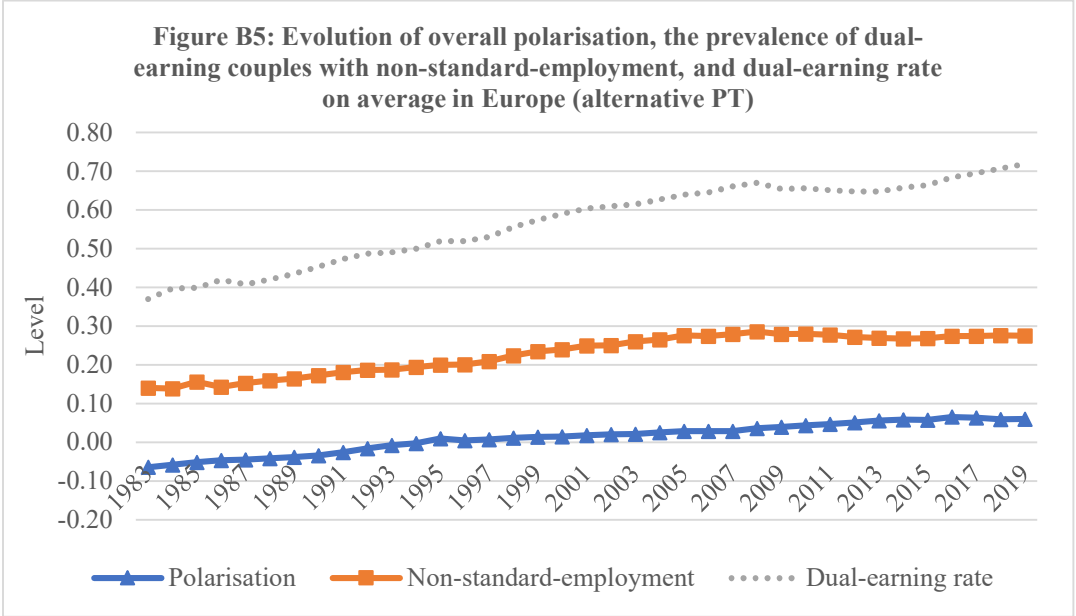


Figure B6: Correlation between overall polarisation and the prevalence of dual-earning couples with non-standard employment, across all country-years (alternative PT)

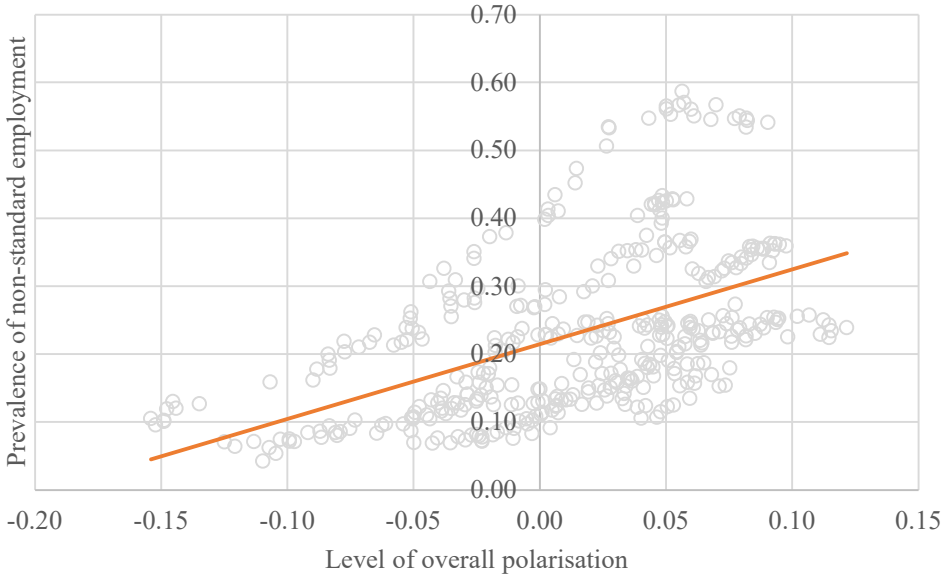
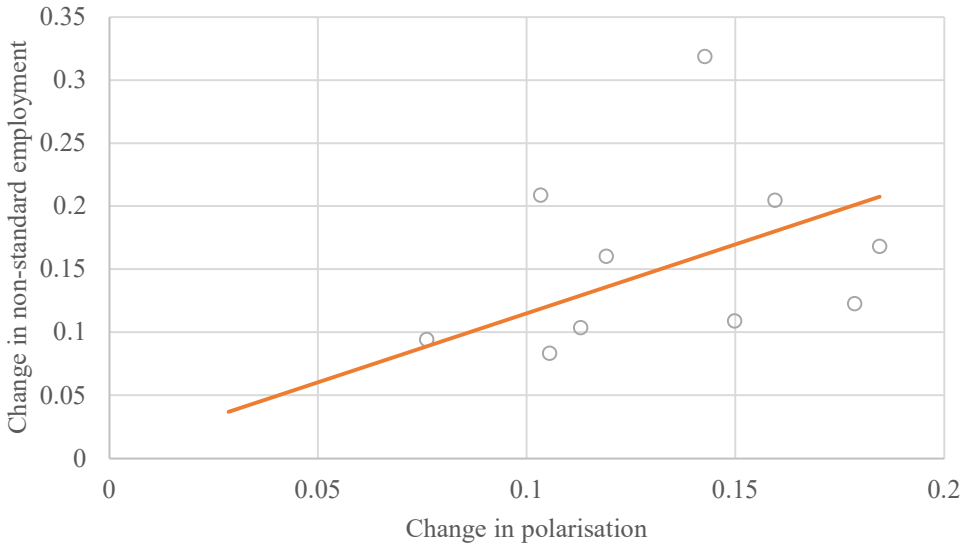
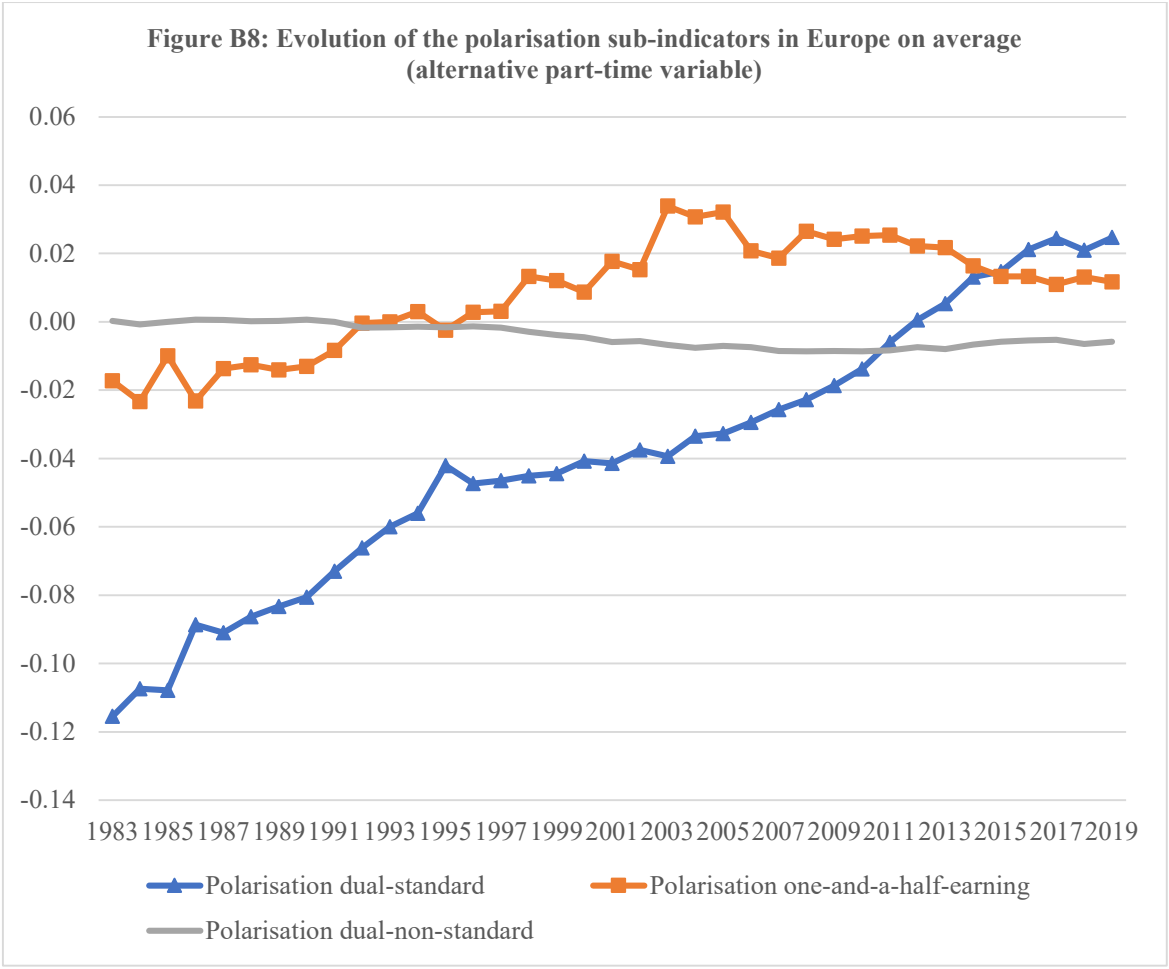


Figure B7: Correlation in change over time in polaisation and non-standard-employment



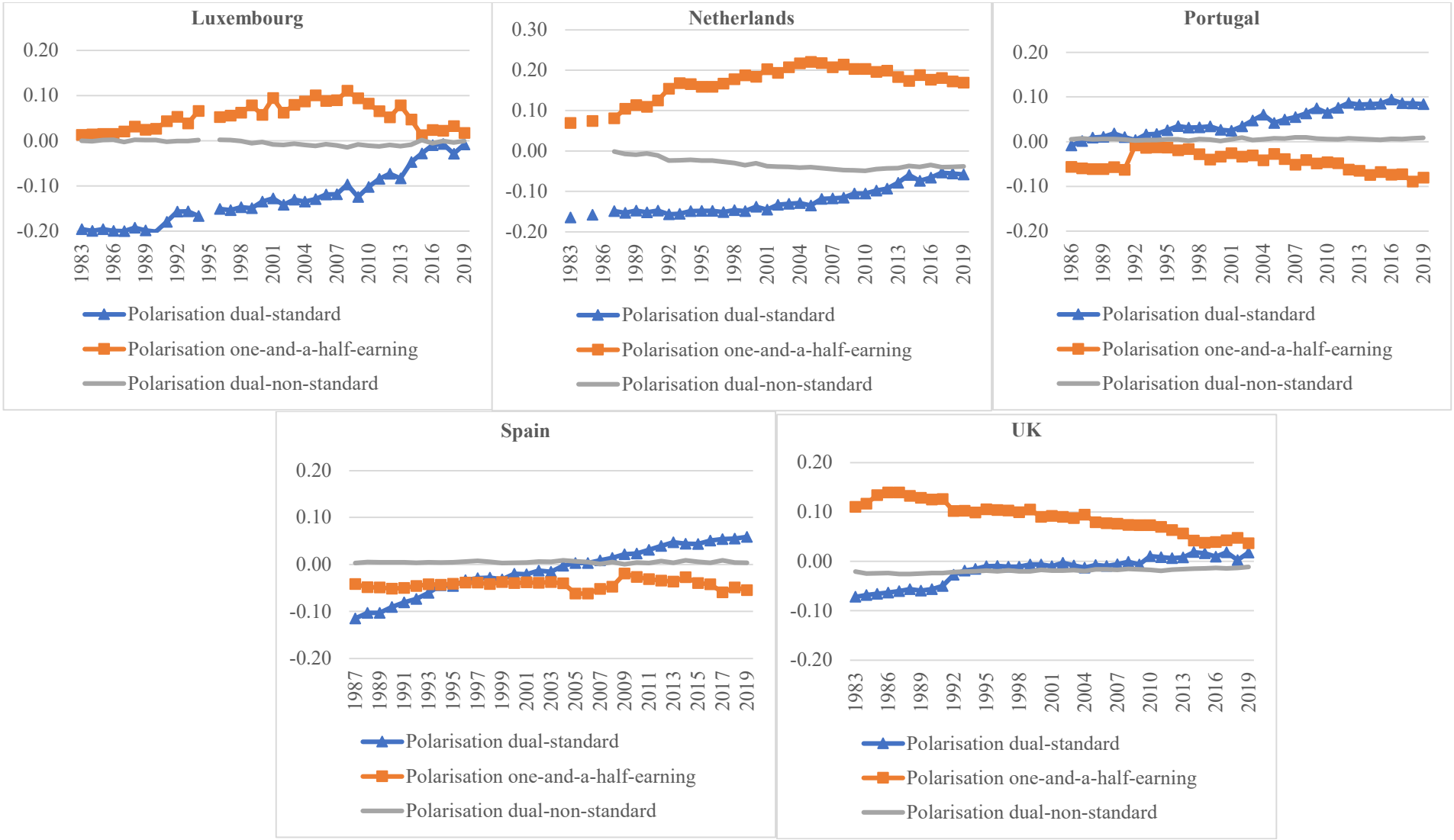
Note: Figures B5 to B7 replicate the exact same information as the core paper, this time using the hours-based part-time variable to construct the non-standard employment variable. The correlation coefficient for figure B6 is 0.52, the one for figure B7 is 0.58. Results broken-down by country for figure B7 are available on request from the author.

Figure B8: Evolution of the polarisation sub-indicators in Europe on average (alternative part-time variable)



Note: this graph shows the evolution over time of the polarisation sub-indicators derived for each subtype of dual-earning couples as the difference between the actual rate of this subtype of couple and its counterfactual based on a random distribution of standard and non-standard-employment, this time using the hours-based part-time variable to construct the non-standard-employment variable.
The early fluctuations at the start of the 1980s are due to different countries joining the dataset in slightly different years.
Source: author's own calculations using the EU-LFS.

Figure B9: Evolution over time of the distribution of standard and non-standard employment across countries (alternative PT)



Note: these graphs show the exact same information as in the core chapter, this time, using the alternative part-time variable, broken-down by country.
Source: author's own calculations using the EU-LFS.

Table B6: Shift-share equation components on average in Europe (alternative PT)

	Year	Dual-earning rate	Counterfactual dual-earning rate	Polarisation dual-earning indicator	Standard employment rate	Non-standard-employment rate	Polarisation dual-standard-earning indicator	Polarisation one-and-a-half-earning indicator	Polarisation dual-non-standard-earning indicator
Europe	1983	0.34	0.41	-0.07	0.52	0.09	-0.12	0.00	0.00
Europe	2019	0.72	0.66	0.06	0.62	0.17	0.02	0.01	-0.01
Europe	**Difference**	**0.37**	**0.24**	**0.13**	**0.11**	**0.08**	**0.15**	**0.01**	**-0.01**

Table B7: Evolution in the shift-share equation components between 1983 and 2019 by country in Europe (alternative PT)

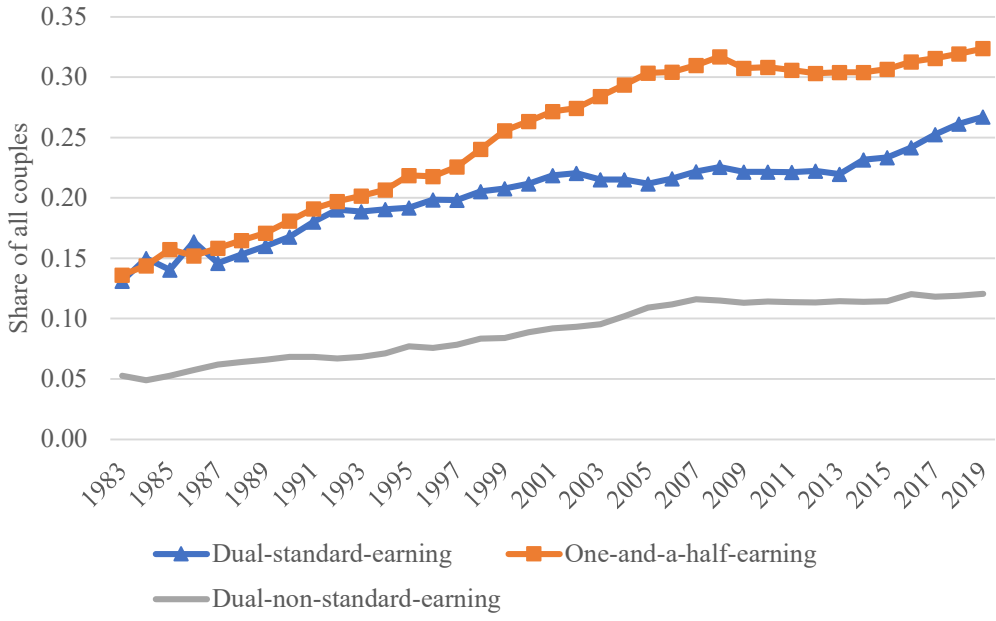
Country	Year	Dual-earning rate	Counterfactual dual-earning rate	Polarisation dual-earning indicator	Standard employment rate	Non-standard-employment rate	Polarisation dual-standard-earning indicator	Polarisation one-and-a-half-earning indicator	Polarisation dual-non-standard-earning indicator
Belgium	1983	0.36	0.40	-0.04	0.53	0.07	-0.09	-0.01	0.01
Belgium	2019	0.77	0.66	0.11	0.61	0.14	0.08	-0.05	0.00
	Difference	**0.41**	**0.26**	**0.15**	**0.08**	**0.07**	**0.17**	**-0.04**	**-0.01**
France	2003	0.71	0.66	0.05	0.66	0.14	0.01	0.02	0.00
France	2019	0.76	0.68	0.08	0.67	0.15	0.09	-0.01	0.00
	Difference	**0.05**	**0.02**	**0.03**	**0.00**	**0.02**	**0.08**	**-0.03**	**0.00**
Germany	1984	0.47	0.52	-0.06	0.60	0.11	-0.15	0.05	-0.01
Germany	2019	0.80	0.75	0.05	0.65	0.21	-0.05	0.12	-0.02
	Difference	**0.33**	**0.23**	**0.10**	**0.06**	**0.11**	**0.09**	**0.07**	**-0.02**
Greece	1983	0.37	0.42	-0.05	0.49	0.07	-0.11	-0.12	0.01
Greece	2019	0.58	0.53	0.06	0.60	0.11	0.03	-0.02	0.01
	Difference	**0.21**	**0.11**	**0.11**	**0.11**	**0.03**	**0.14**	**0.09**	**0.00**
Ireland	1983	0.18	0.31	-0.12	0.44	0.06	-0.12	-0.05	0.00
Ireland	2019	0.70	0.64	0.06	0.62	0.15	0.03	-0.01	-0.01
	Difference	**0.33**	**0.22**	**0.11**	**0.13**	**0.08**	**0.14**	**0.11**	**-0.02**
Italy	1983	0.34	0.43	-0.09	0.56	0.06	-0.11	-0.04	0.01
Italy	2019	0.57	0.54	0.03	0.55	0.17	0.00	0.01	0.00
	Difference	**0.22**	**0.10**	**0.12**	**-0.01**	**0.11**	**0.11**	**0.05**	**-0.01**

Luxembourg	1983	0.25	0.39	-0.15	0.55	0.06	-0.20	0.01	0.00
Luxembourg	2019	0.70	0.67	0.03	0.68	0.12	-0.01	0.02	0.00
	Difference	**0.46**	**0.28**	**0.18**	**0.13**	**0.07**	**0.19**	**0.00**	**0.00**
Netherlands	1983	0.31	0.37	-0.07	0.46	0.13	-0.16	0.07	-0.01
Netherlands	2019	0.80	0.72	0.08	0.55	0.29	-0.06	0.17	-0.04
	Difference	**0.49**	**0.35**	**0.14**	**0.10**	**0.16**	**0.11**	**0.10**	**-0.03**
Portugal	1986	0.48	0.49	-0.01	0.59	0.07	-0.01	-0.06	0.01
Portugal	2019	0.79	0.73	0.06	0.69	0.13	0.08	-0.08	0.01
	Difference	**0.32**	**0.24**	**0.08**	**0.10**	**0.06**	**0.09**	**-0.02**	**0.00**
Spain	1987	0.20	0.31	-0.11	0.47	0.05	-0.11	-0.04	0.00
Spain	2019	0.64	0.59	0.05	0.54	0.19	0.06	-0.05	0.00
	Difference	**0.45**	**0.29**	**0.16**	**0.07**	**0.14**	**0.17**	**-0.01**	**0.00**
UK	1983	0.60	0.56	0.04	0.57	0.17	-0.07	0.11	-0.02
UK	2019	0.79	0.72	0.07	0.66	0.17	0.02	0.04	-0.01
	Difference	**0.19**	**0.16**	**0.03**	**0.09**	**0.00**	**0.09**	**-0.07**	**0.01**

Note: Table B6 replicates the shift-share analysis shown in the core chapter for Europe on average, using the hours-based part-time variable to construct the non-standard-employment variable. Table B7 does the same, breaking the information-down by country..
Source: author's own calculations using the EU-LFS.

B.7.2. Analyses classifying self-employment as non-standard

Figure B.10: Proportion of each subtype of dual-earning couples as a share of all couples, on average in Europe (self-employed as non-standard)



Note: This graph represents the proportion of different sub-types of dual-earning couples once standard and non-standard employment are distinguished, as a proportion of all couples with partners aged 35-55, on average in Europe, classifying self-employment as non-standard
Source: author's own calculations using the EU-LFS.

Figure B11: Evolution of overall polarisation, the prevalence of dual-earning couples with non-standard-employment, and dual-earning rate on average in Europe (self-employed as non-standard)

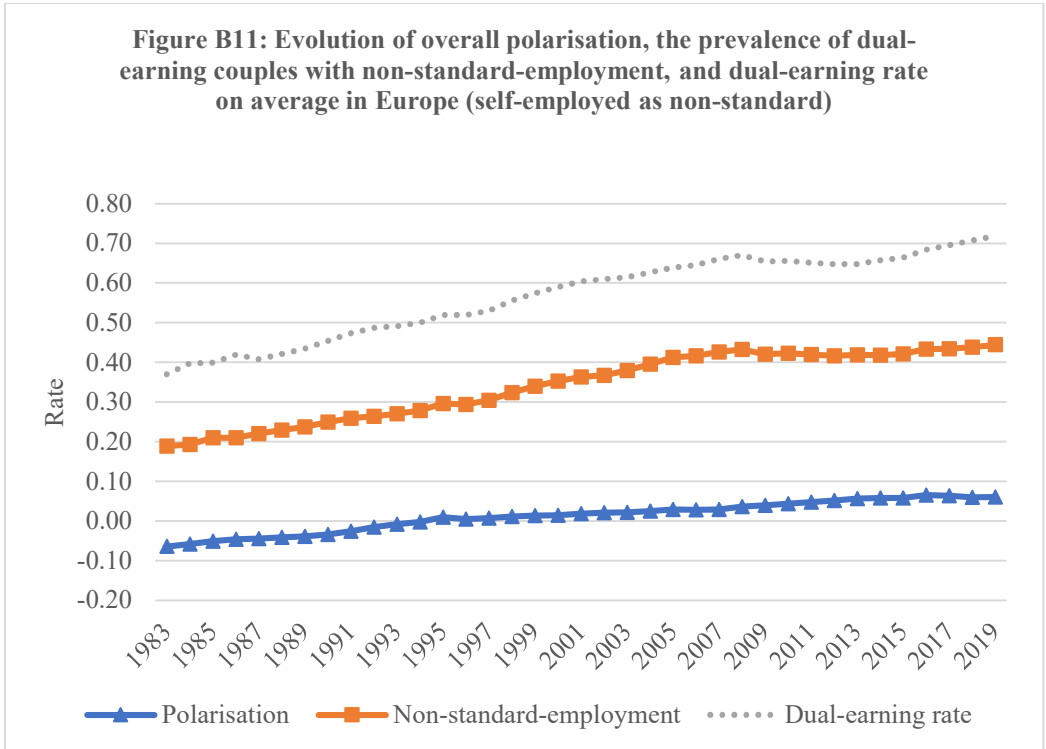


Figure B12: Correlation between overall polarisation and the prevalence of dual-earning couples with non-standard employment, across all country-years (self-employed as non-standard)

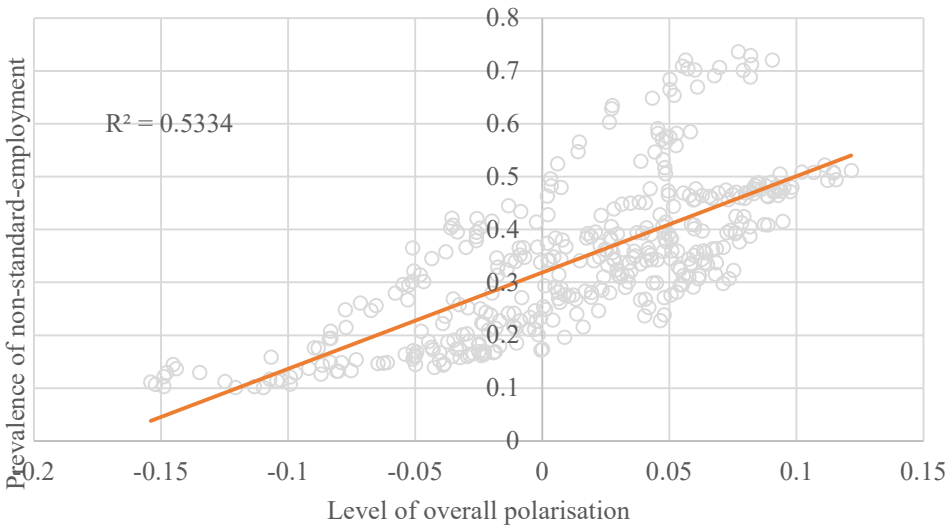
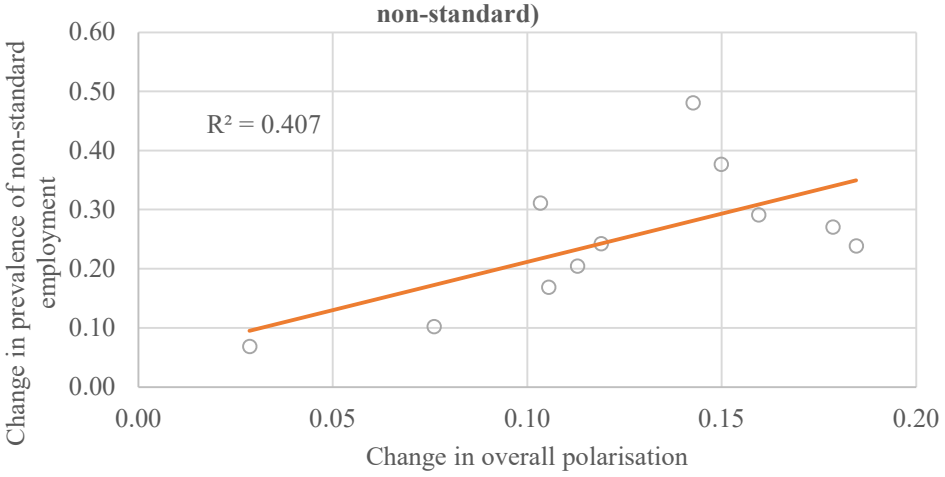
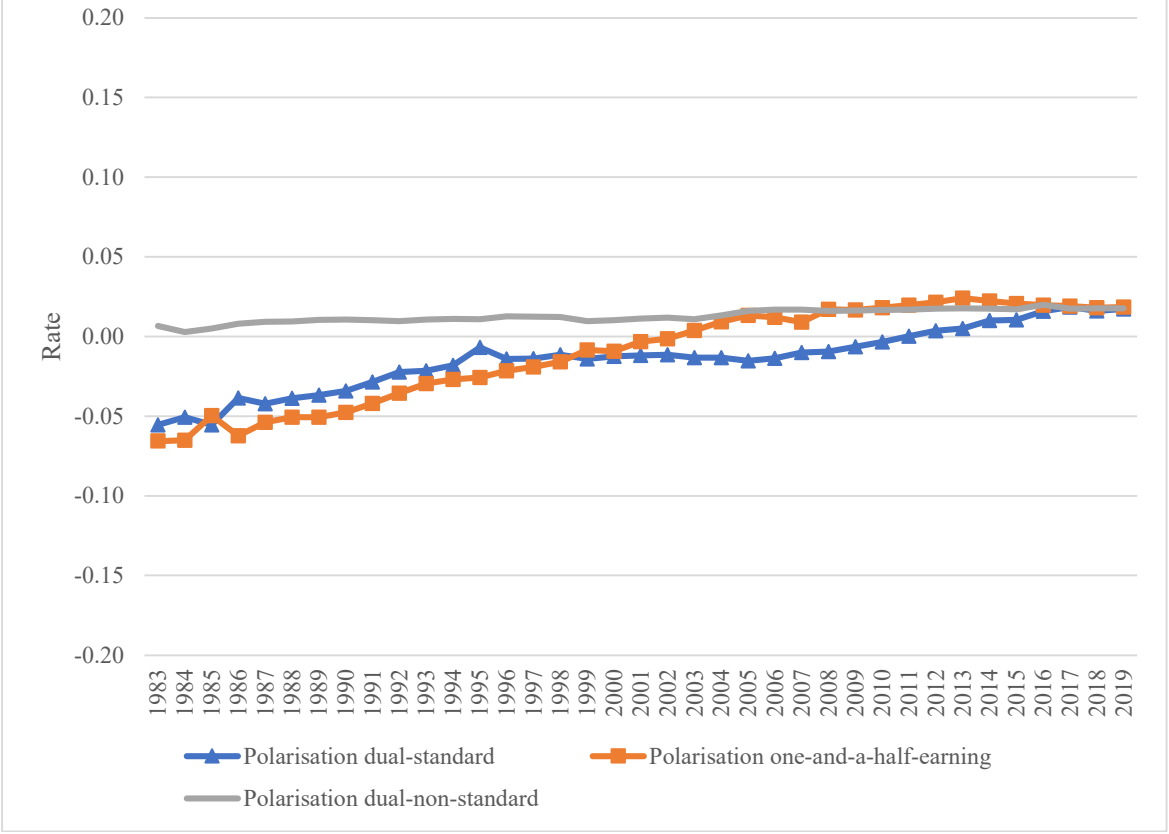


Figure B13: Correlation between the evolution from the first to the last year of data of overall polarisation, and of the prevalence of dual-earning couples with non-standard employment (self-employed as non-standard)



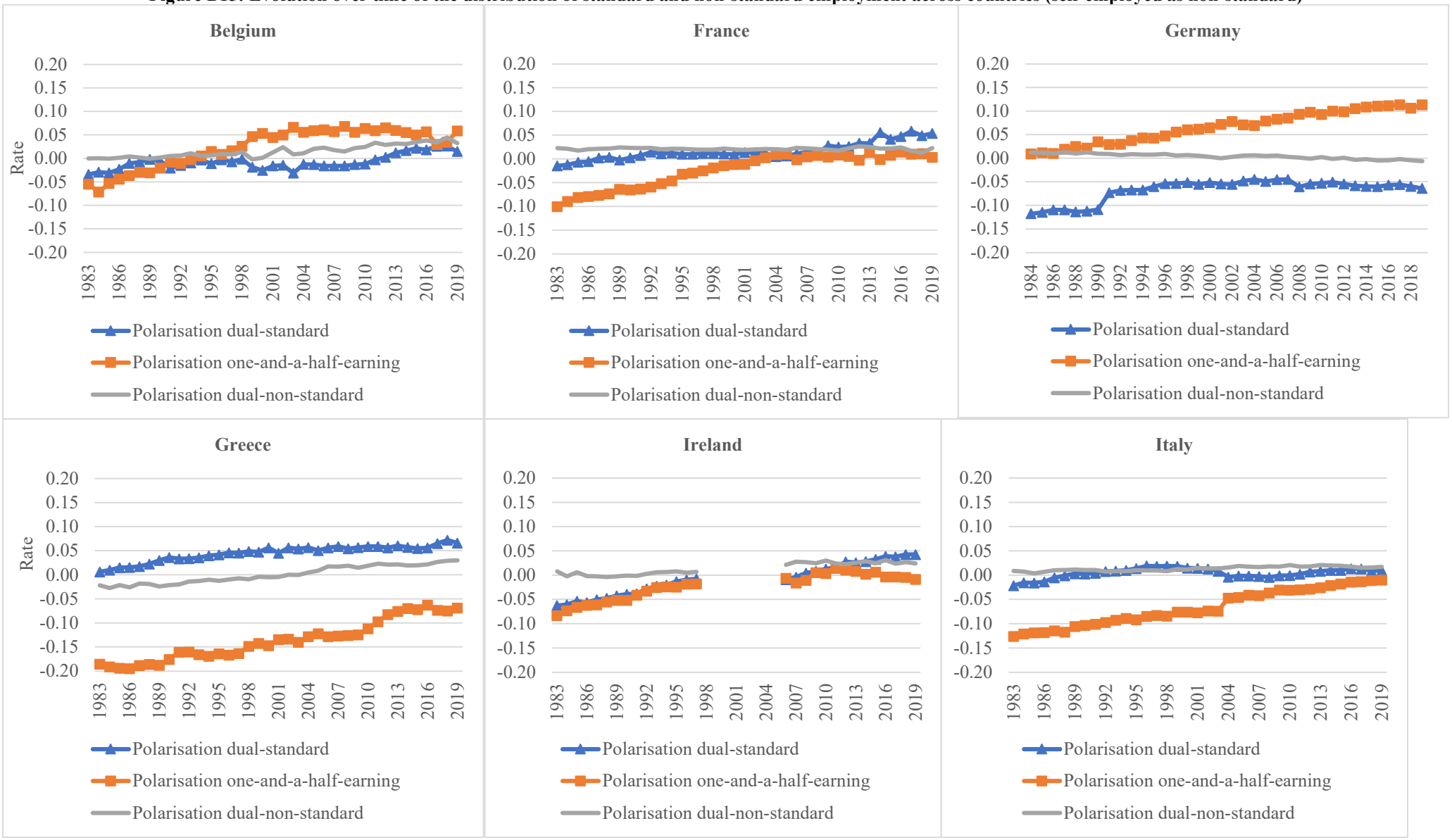
Note: Figures B11 to B13 replicate the exact same information as analyses in the core paper, this time classifying self-employment as non-standard employment. The correlation coefficient for figure B12 is 0.73, the one for figure B13 is 0.64. Results broken-down by country for figure B11 are available on request from the author.

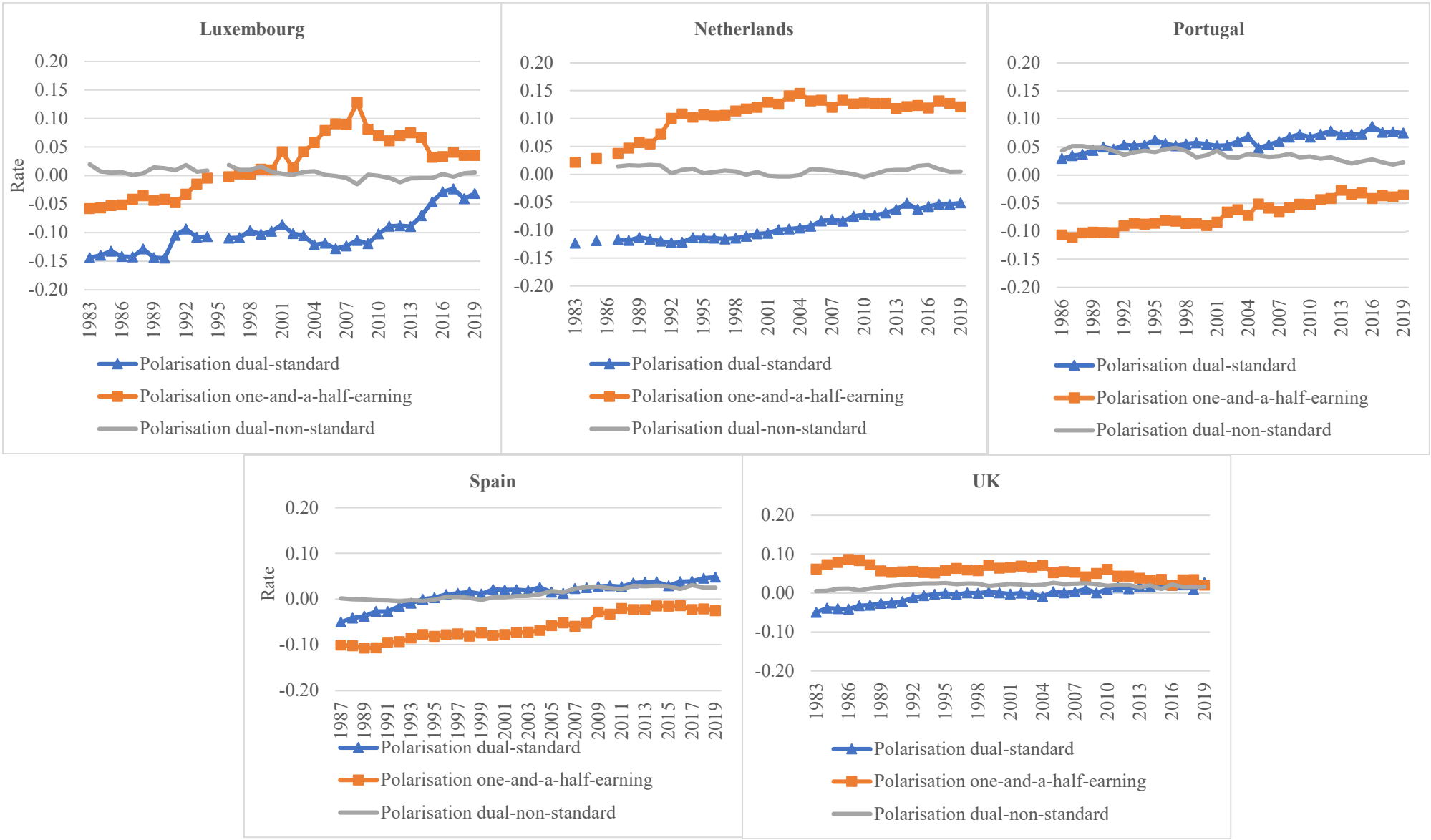
Figure B14: Evolution of the polarisation sub-indicators, European average (self-employed as non-standard)



Note: this graph shows the evolution over time of the polarisation sub-indicators derived for each subtype of dual-earning couples as the difference between the actual rate of this subtype of couple and its counterfactual based on a random distribution of standard and non-standard-employment, this time using the hours-based part-time variable to construct the non-standard-employment classifying self-employment as non-standard. The early fluctuations at the start of the 1980s are due to different countries joining the dataset in slightly different years.
Source: author's own calculations using the EU-LFS.

Figure B15: Evolution over time of the distribution of standard and non-standard employment across countries (self-employed as non-standard)





Note: these graphs show the exact same information as figure B14, broken-down by country.
Source: author's own calculations using the EU-LFS.

Table B8: Shift-share equation components on average in Europe (self-employed as non-standard)

Country	Year	Dual-earning rate	Counterfactual dual-earning rate	Polarisation dual-earning indicator	Standard employment rate	Non-standard-employment rate	Polarisation dual-standard-earning indicator	Polarisation one-and-a-half-earning indicator	Polarisation dual-non-standard-earning indicator
Europe	1983	0.37	0.43	-0.06	0.42	0.21	-0.06	-0.07	0.01
Europe	2019	0.72	0.66	0.06	0.49	0.31	0.02	0.02	0.02
Europe	**Difference**	**0.35**	**0.22**	**0.12**	**0.07**	**0.10**	**0.07**	**0.08**	**0.01**

Table B9: Evolution in the shift-share equation components between 1983 and 2019 by country in Europe (self-employed as non-standard)

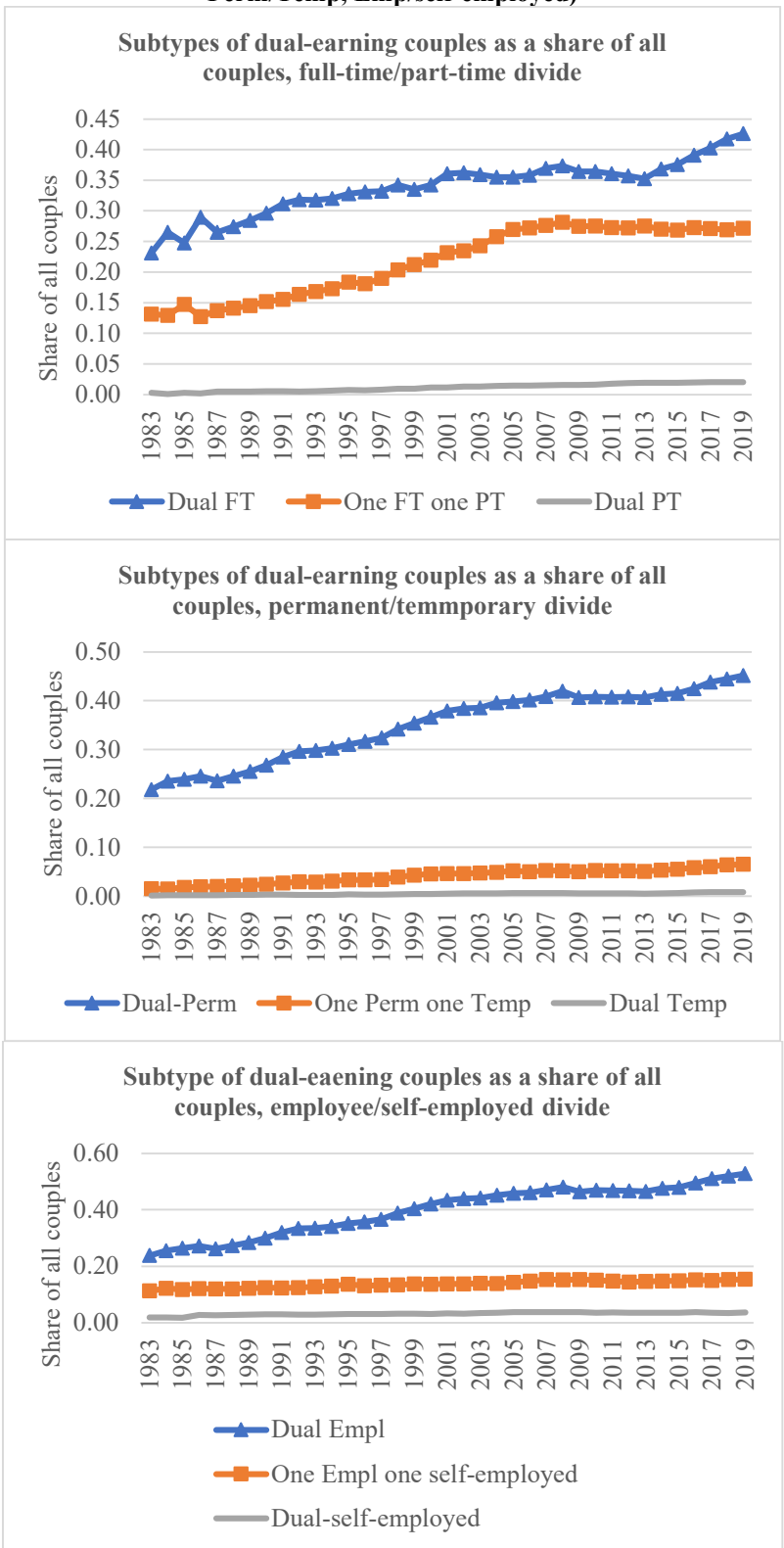
Country	Year	Dual-earning rate	Counterfactual dual-earning rate	Polarisation dual-earning indicator	Standard employment rate	Non-standard-employment rate	Polarisation dual-standard-earning indicator	Polarisation one-and-a-half-earning indicator	Polarisation dual-non-standard-earning indicator
BE	1983	0.36	0.40	-0.04	0.45	0.16	-0.03	-0.05	0.00
BE	2019	0.77	0.66	0.11	0.48	0.33	0.01	0.06	0.03
Difference		**0.41**	**0.26**	**0.15**	**0.03**	**0.17**	**0.05**	**0.11**	**0.03**
FR	1983	0.55	0.58	-0.03	0.55	0.18	-0.01	-0.10	0.02
FR	2019	0.76	0.68	0.08	0.54	0.28	0.05	0.00	0.02
Difference		**0.21**	**0.10**	**0.11**	**0.00**	**0.09**	**0.07**	**0.10**	**0.00**
DE	1984	0.47	0.52	-0.06	0.51	0.19	-0.12	0.01	0.01
DE	2019	0.80	0.75	0.05	0.52	0.35	-0.06	0.11	-0.01
Difference		**0.33**	**0.23**	**0.10**	**0.01**	**0.16**	**0.05**	**0.10**	**-0.02**
EL	1983	0.37	0.42	-0.05	0.26	0.32	0.01	-0.19	-0.02
EL	2019	0.58	0.53	0.06	0.42	0.29	0.07	-0.07	0.03
Difference		**0.21**	**0.11**	**0.11**	**0.16**	**-0.02**	**0.06**	**0.12**	**0.05**
IE	1983	0.18	0.31	-0.12	0.35	0.20	-0.06	-0.08	0.01
IE	2019	0.70	0.64	0.06	0.55	0.25	0.04	-0.01	0.02
Difference		**0.52**	**0.33**	**0.18**	**0.20**	**0.05**	**0.11**	**0.07**	**0.02**
IT	1983	0.34	0.43	-0.09	0.42	0.21	-0.02	-0.13	0.01
IT	2019	0.57	0.54	0.03	0.41	0.32	0.01	-0.01	0.02
Difference		**0.22**	**0.10**	**0.12**	**-0.02**	**0.11**	**0.03**	**0.12**	**0.01**

LU	1983	0.25	0.39	-0.15	0.48	0.12	-0.14	-0.06	0.02
LU	2019	0.70	0.67	0.03	0.57	0.24	-0.03	0.04	0.01
Difference		**0.46**	**0.28**	**0.18**	**0.08**	**0.11**	**0.11**	**0.09**	**-0.01**
NL	1983	0.31	0.37	-0.07	0.39	0.21	-0.12	0.02	0.01
NL	2019	0.80	0.72	0.08	0.34	0.51	-0.05	0.12	0.01
Difference		**0.49**	**0.35**	**0.14**	**-0.05**	**0.30**	**0.07**	**0.10**	**-0.01**
PT	1986	0.48	0.49	-0.01	0.43	0.26	0.03	-0.11	0.04
PT	2019	0.79	0.73	0.06	0.61	0.24	0.07	-0.04	0.02
Difference		**0.32**	**0.24**	**0.08**	**0.18**	**-0.01**	**0.05**	**0.07**	**-0.02**
ES	1987	0.20	0.31	-0.11	0.32	0.20	-0.05	-0.10	0.00
ES	2019	0.64	0.59	0.05	0.45	0.32	0.05	-0.03	0.03
Difference		**0.45**	**0.29**	**0.16**	**0.12**	**0.12**	**0.10**	**0.08**	**0.02**
UK	1983	0.60	0.56	0.04	0.49	0.26	-0.05	0.06	0.01
UK	2019	0.79	0.72	0.07	0.54	0.30	0.03	0.02	0.02
Difference		**0.19**	**0.16**	**0.03**	**0.06**	**0.05**	**0.08**	**-0.04**	**0.01**

Note: Table B8 replicates the shift-share analysis shown in the core chapter for Europe on average, classifying self-employment as non-standard. Table B9 does the same, breaking the information-down by country.
Source: author's own calculations using the EU-LFS.

B.7.3. Analyses separated for full-time/part-time, permanent/temporary and employee/self-employed

Figure B16: Subtypes of dual-earning couples as a share of all couples (separately for FT/PT, Perm/Temp, Emp/self-employed)



Note: This graph represents the proportion of different sub-types of dual-earning couples once standard and non-standard employment are distinguished, as a proportion of all couples with partners aged 35-55, on average in Europe, for different potential forms of non-standard employment.

Source: author's own calculations using the EU-LFS.

Figure B17: European evolution: different forms of non-standard-employment and the rise of polarisation and dual-earning

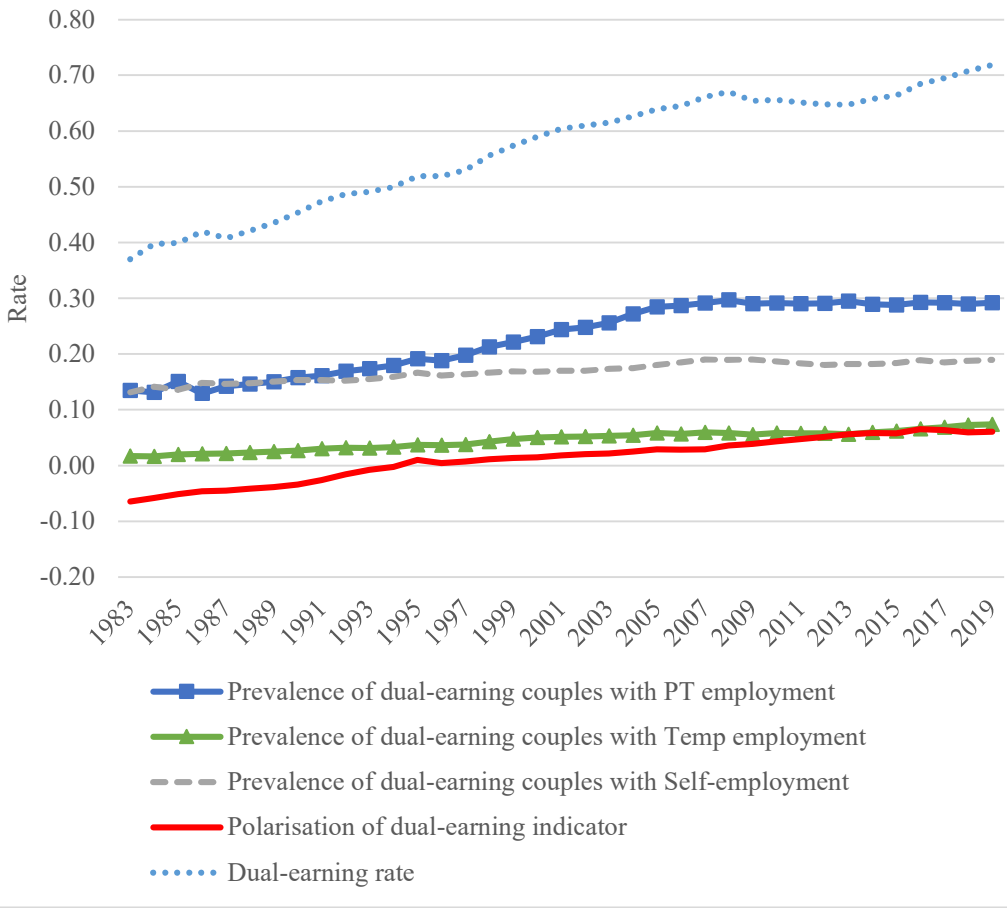
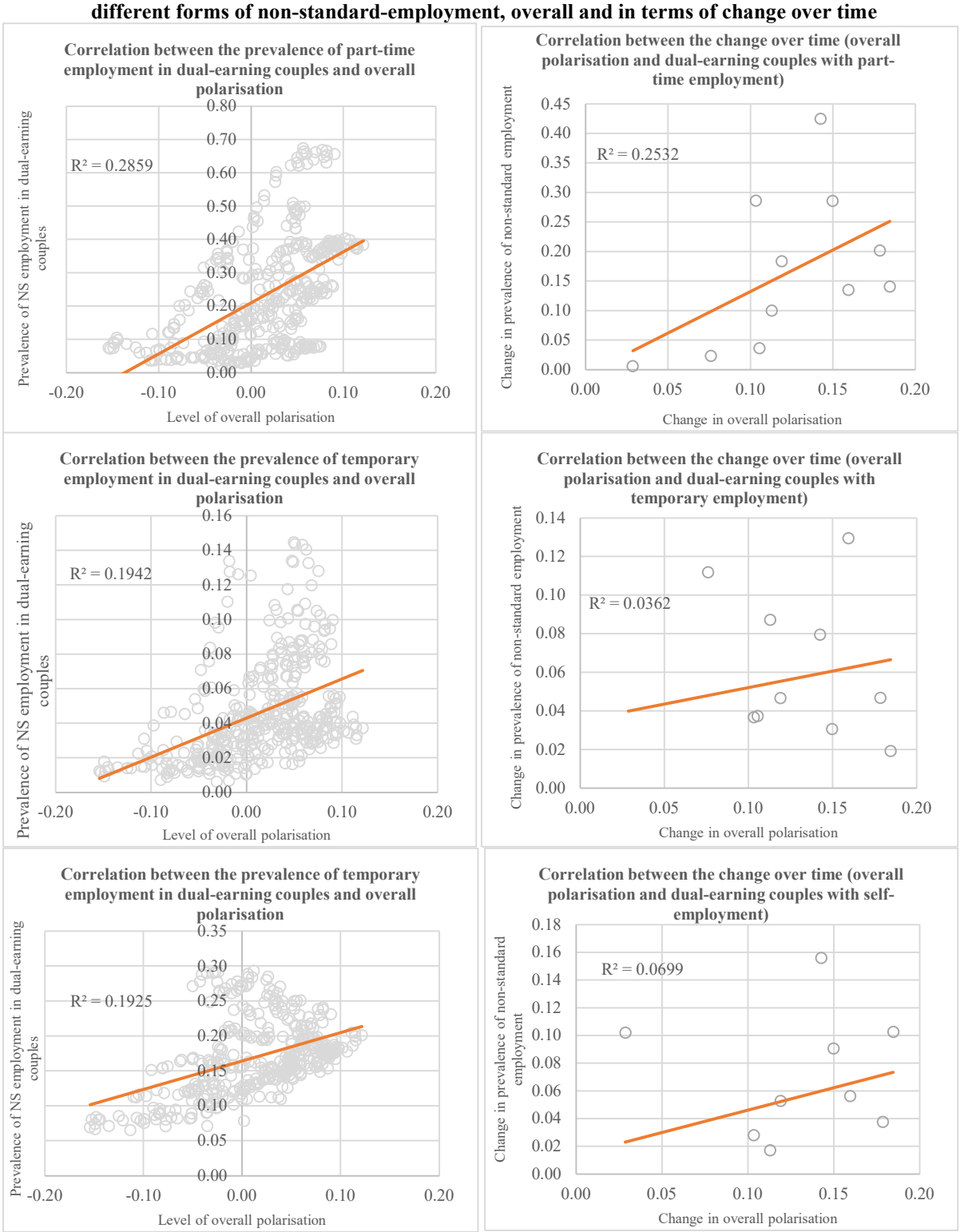
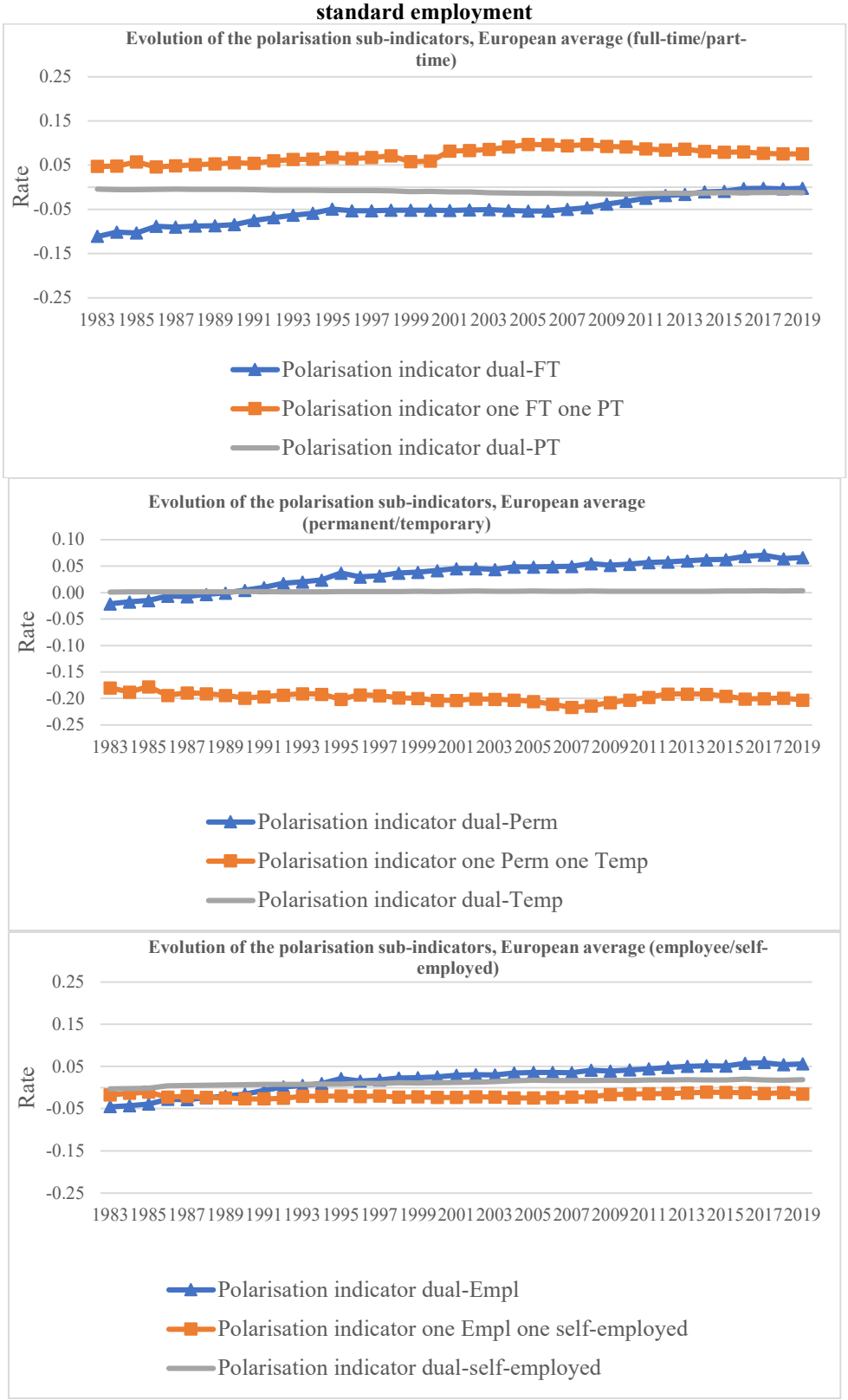


Figure B18: correlations between overall polarisation and the prevalence of dual-earning couples with different forms of non-standard-employment, overall and in terms of change over time



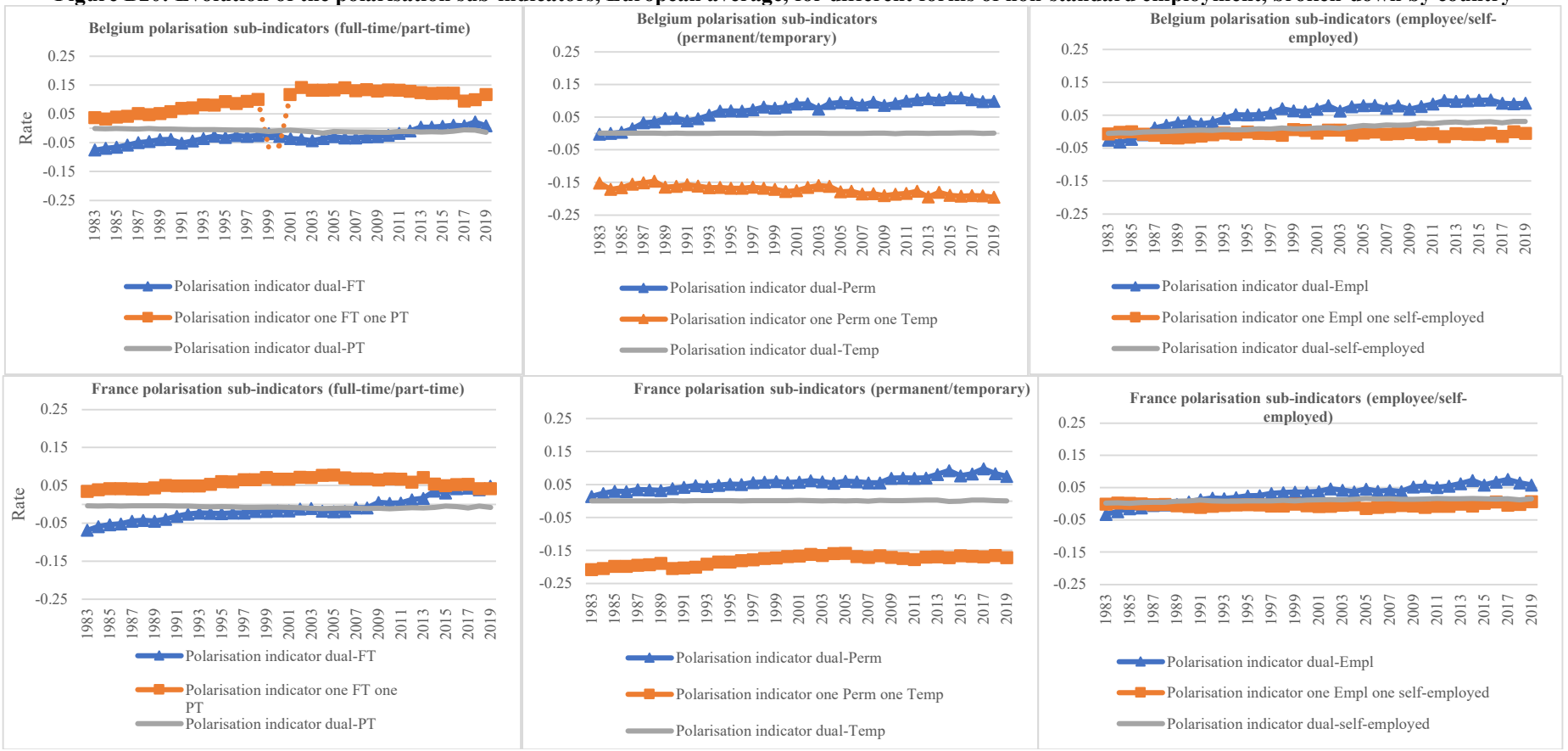
Note: Figures B17 and B18 replicate the exact same information as analyses in the core paper, distinguishing between different forms of non-standard-employment. The correlation coefficients are, in order the graphs appear: 0.53, 0.50 (part-time employment), 0.44, 0.19 (temporary employment), 0.44, 0.26 (self-employment)
Source: author's own calculations using the EU-LFS.

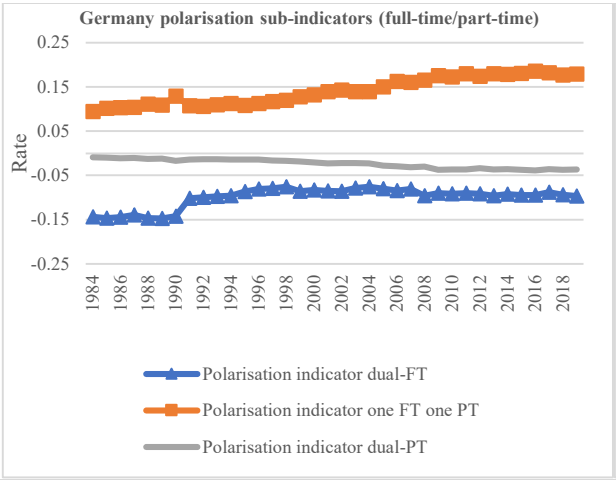
Figure B19: Evolution of the polarisation sub-indicators, European average, for different forms of non-standard employment

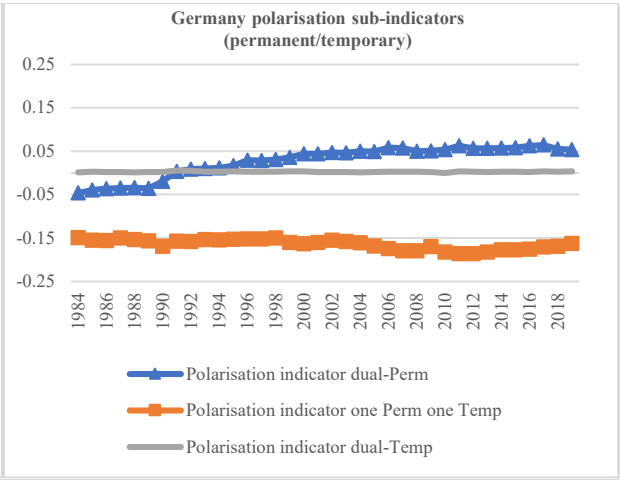


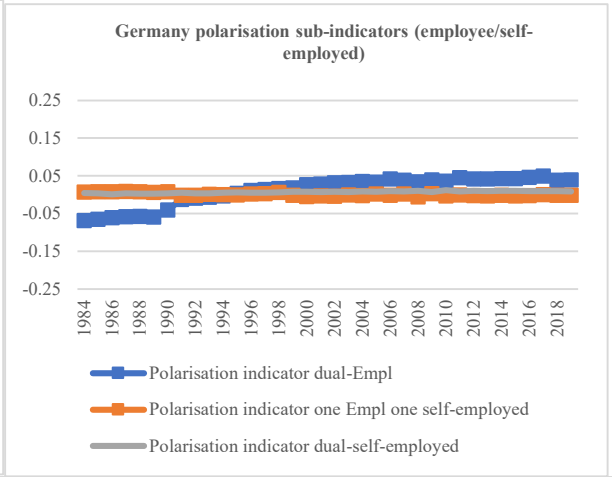
Note: this graph shows the evolution over time of the polarisation sub-indicators derived for each subtype of dual-earning couples as the difference between the actual rate of this subtype of couple and its counterfactual based on a random distribution of standard and non-standard-employment, separately for full-time/part-time, permanent/temporary and employee/self-employed.
Source: author's own calculations using the EU-LFS

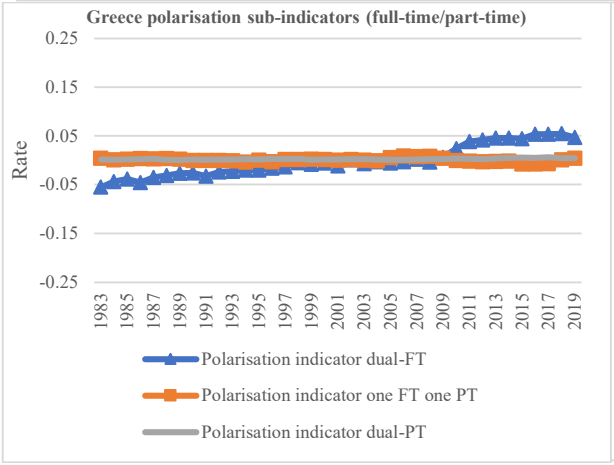
Figure B20: Evolution of the polarisation sub-indicators, European average, for different forms of non-standard employment, broken-down by country

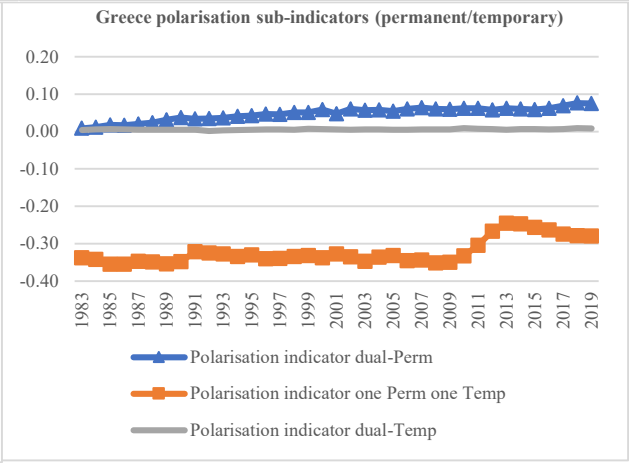


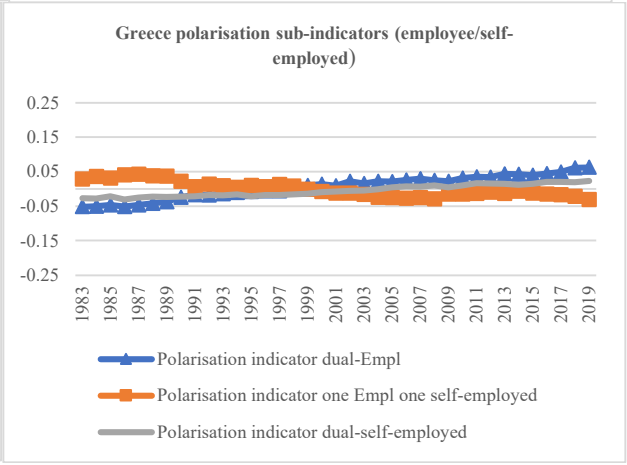

Germany polarisation sub-indicators (full-time/part-time)
Rate
0.25
0.15
0.05
-0.05
-0.15
-0.25
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Polarisation indicator dual-FT
Polarisation indicator one FT one PT
Polarisation indicator dual-PT

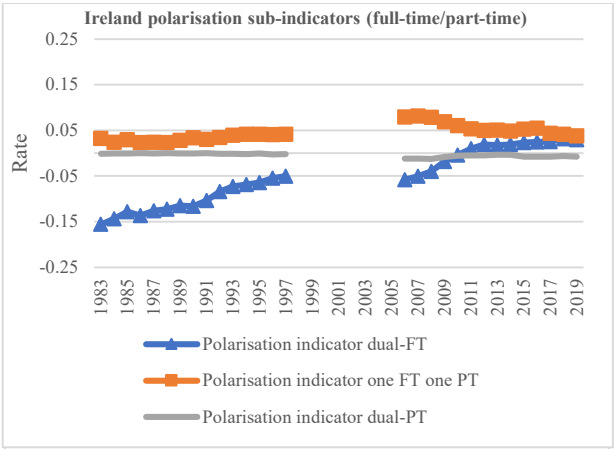

Germany polarisation sub-indicators (permanent/temporary)
0.25
0.15
0.05
-0.05
-0.15
-0.25
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Polarisation indicator dual-Perm
Polarisation indicator one Perm one Temp
Polarisation indicator dual-Temp

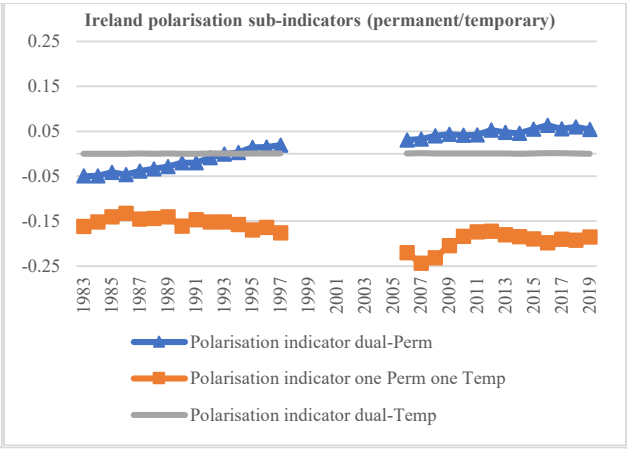

Germany polarisation sub-indicators (employee/self-employed)
0.25
0.15
0.05
-0.05
-0.15
-0.25
1984 1986 1988 1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Polarisation indicator dual-Empl
Polarisation indicator one Empl one self-employed
Polarisation indicator dual-self-employed

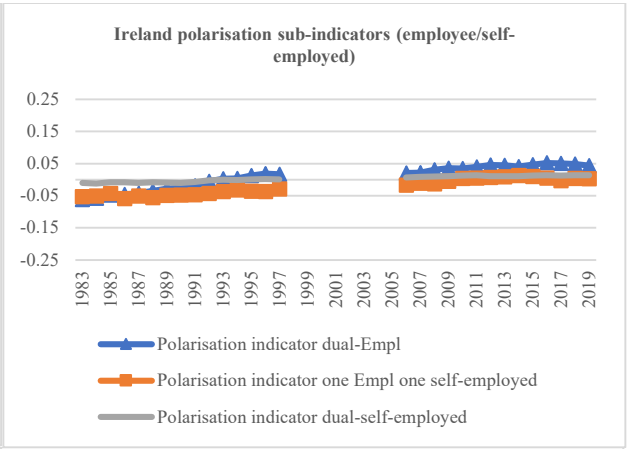

Greece polarisation sub-indicators (full-time/part-time)
Rate
0.25
0.15
0.05
-0.05
-0.15
-0.25
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-FT
Polarisation indicator one FT one PT
Polarisation indicator dual-PT

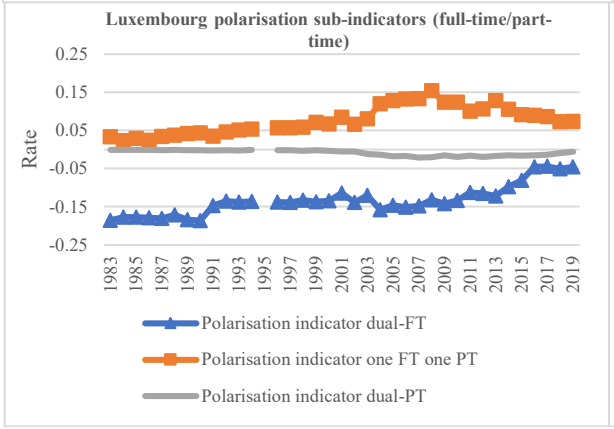

Greece polarisation sub-indicators (permanent/temporary)
0.20
0.10
0.00
-0.10
-0.20
-0.30
-0.40
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-Perm
Polarisation indicator one Perm one Temp
Polarisation indicator dual-Temp

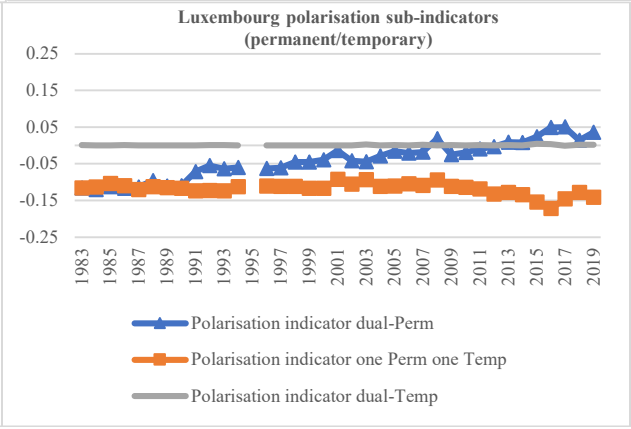

Greece polarisation sub-indicators (employee/self-employed)
0.25
0.15
0.05
-0.05
-0.15
-0.25
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-Empl
Polarisation indicator one Empl one self-employed
Polarisation indicator dual-self-employed

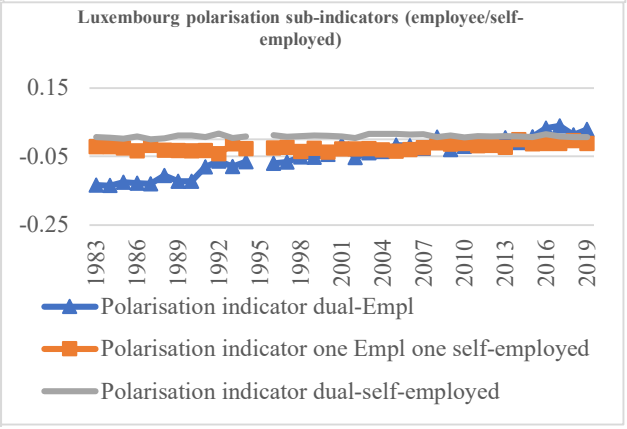

Ireland polarisation sub-indicators (full-time/part-time)
Rate
0.25
0.15
0.05
-0.05
-0.15
-0.25
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-FT
Polarisation indicator one FT one PT
Polarisation indicator dual-PT

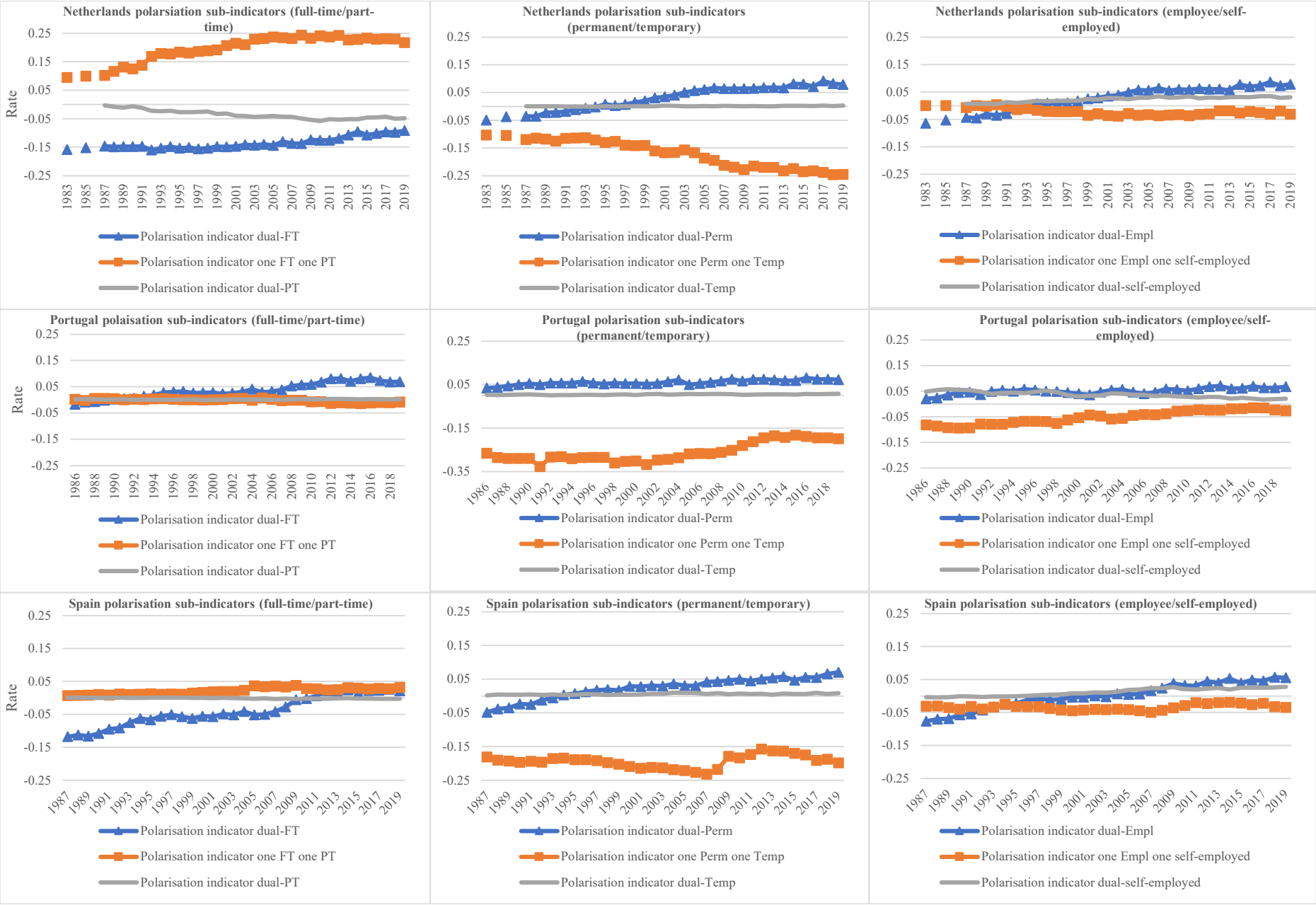

Ireland polarisation sub-indicators (permanent/temporary)
0.25
0.15
0.05
-0.05
-0.15
-0.25
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-Perm
Polarisation indicator one Perm one Temp
Polarisation indicator dual-Temp

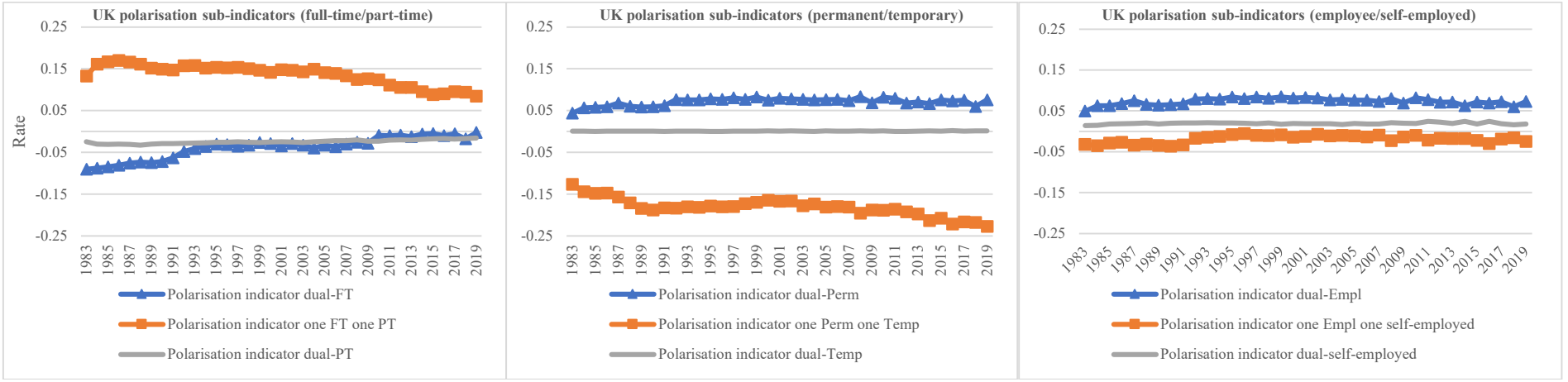

Ireland polarisation sub-indicators (employee/self-employed)
0.25
0.15
0.05
-0.05
-0.15
-0.25
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-Empl
Polarisation indicator one Empl one self-employed
Polarisation indicator dual-self-employed


Luxembourg polarisation sub-indicators (full-time/part-time)
Rate
0.25
0.15
0.05
-0.05
-0.15
-0.25
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-FT
Polarisation indicator one FT one PT
Polarisation indicator dual-PT


Luxembourg polarisation sub-indicators (permanent/temporary)
0.25
0.15
0.05
-0.05
-0.15
-0.25
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019
Polarisation indicator dual-Perm
Polarisation indicator one Perm one Temp
Polarisation indicator dual-Temp


Luxembourg polarisation sub-indicators (employee/self-employed)
0.15
-0.05
-0.25
1983 1986 1989 1992 1995 1998 2001 2004 2007 2010 2013 2016 2019
Polarisation indicator dual-Empl
Polarisation indicator one Empl one self-employed
Polarisation indicator dual-self-employed


Netherlands polarsiation sub-indicators (full-time/part-time)
Rate
Polarisation indicator dual-FT
Polarisation indicator one FT one PT
Polarisation indicator dual-PT
Netherlands polarisation sub-indicators (permanent/temporary)
Polarisation indicator dual-Perm
Polarisation indicator one Perm one Temp
Polarisation indicator dual-Temp
Netherlands polarisation sub-indicators (employee/self-employed)
Polarisation indicator dual-Empl
Polarisation indicator one Empl one self-employed
Polarisation indicator dual-self-employed
Portugal polaisation sub-indicators (full-time/part-time)
Portugal polarisation sub-indicators (permanent/temporary)
Portugal polarisation sub-indicators (employee/self-employed)
Spain polarisation sub-indicators (full-time/part-time)
Spain polarisation sub-indicators (permanent/temporary)
Spain polarisation sub-indicators (employee/self-employed)



Note: these graphs show the exact same information as figure B19, broken-down by country.
Source: author's own calculations using the EU-LFS.

Table B10: Shift-share equation components on average in Europe (separate for part-time/full-time, permanent/temporary, employee/self-employed)

Country	Year	Dual-earning rate	Dual-earning counterfactual	Polarisation dual-earning	Full-time employment rate	Part-time employment rate	Permanent employment rate	Temporary employment rate	Employee rate	Self-employed rate	Polarisation dual-FT	Polarisation one FT one PT	Polarisation dual-PT	Polarisation dual-Perm	Polarisation one Perm one Temp	Polarisation dual-Temp	Polarisation dual-Empl	Polarisation one Empl one self-employed	Polarisation dual-self-employed
Europe	1983	0.37	0.43	-0.06	0.58	0.07	0.48	0.02	0.52	0.13	-0.11	0.05	0.00	-0.02	-0.18	0.00	-0.05	-0.02	0.00
Europe	2019	0.72	0.66	0.06	0.65	0.16	0.61	0.06	0.68	0.13	0.00	0.08	-0.01	0.07	-0.20	0.00	0.06	-0.02	0.02
Europe	**Diff**	**0.35**	**0.22**	**0.12**	**0.07**	**0.09**	**0.14**	**0.05**	**0.16**	**-0.01**	**0.11**	**0.03**	**-0.01**	**0.09**	**-0.02**	**0.00**	**0.10**	**0.00**	**0.02**

Table B11: Evolution in the shift-share equation components between 1983 and 2019 by country in Europe (separate for part-time/full-time, permanent/temporary, employee/self-employed)

Country	Year	Dual-earning rate	Dual-earning counterfactual	Polarisation dual-earning	Full-time employment rate	Part-time employment rate	Permanent employment rate	Temporary employment rate	Employee rate	Self-employed rate	Polarisation dual-FT	Polarisation one FT one PT	Polarisation dual-PT	Polarisation dual-Perm	Polarisation one Perm one Temp	Polarisation dual-Temp	Polarisation dual-Empl	Polarisation one Empl one self-employed	Polarisation dual-self-employed
Belgium	1983	0.36	0.40	-0.04	0.58	0.05	0.49	0.01	0.52	0.11	-0.08	0.04	0.00	0.00	-0.15	0.00	-0.03	-0.01	-0.01
Belgium	2019	0.77	0.66	0.11	0.62	0.20	0.65	0.04	0.69	0.12	0.01	0.12	-0.01	0.10	-0.20	0.00	0.09	-0.01	0.03
Difference		**0.41**	**0.26**	**0.15**	**0.03**	**0.15**	**0.16**	**0.03**	**0.17**	**0.01**	**0.08**	**0.08**	**-0.01**	**0.10**	**-0.04**	**0.00**	**0.11**	**0.00**	**0.04**
France	1983	0.55	0.58	-0.03	0.69	0.07	0.60	0.01	0.65	0.11	-0.07	0.03	0.00	0.01	-0.21	0.00	-0.03	0.00	0.00
France	2019	0.76	0.68	0.08	0.69	0.14	0.64	0.08	0.72	0.10	0.05	0.04	-0.01	0.08	-0.17	0.00	0.06	0.01	0.02
Difference		**0.21**	**0.10**	**0.11**	**0.00**	**0.07**	**0.04**	**0.07**	**0.07**	**-0.01**	**0.12**	**0.01**	**0.00**	**0.06**	**0.04**	**0.00**	**0.09**	**0.01**	**0.01**
Germany	1984	0.47	0.52	-0.06	0.62	0.10	0.60	0.02	0.64	0.08	-0.14	0.09	-0.01	-0.05	-0.15	0.00	-0.07	0.01	0.00
Germany	2019	0.80	0.75	0.05	0.62	0.25	0.74	0.04	0.78	0.09	-0.10	0.18	-0.04	0.05	-0.16	0.00	0.04	0.00	0.01
Difference		**0.33**	**0.23**	**0.10**	**0.00**	**0.14**	**0.14**	**0.03**	**0.14**	**0.01**	**0.05**	**0.08**	**-0.03**	**0.10**	**-0.01**	**0.00**	**0.11**	**-0.01**	**0.00**
Greece	1983	0.37	0.42	-0.05	0.62	0.03	0.27	0.04	0.39	0.26	-0.06	0.00	0.00	0.01	-0.34	0.00	-0.05	0.03	-0.03
Greece	2019	0.58	0.53	0.06	0.67	0.05	0.45	0.05	0.52	0.21	0.05	0.00	0.00	0.07	-0.28	0.01	0.06	-0.03	0.02
Difference		**0.21**	**0.11**	**0.11**	**0.06**	**0.02**	**0.18**	**0.01**	**0.13**	**-0.05**	**0.10**	**0.00**	**0.00**	**0.07**	**0.06**	**0.00**	**0.11**	**-0.06**	**0.05**
Ireland	1983	0.18	0.31	-0.12	0.51	0.04	0.36	0.01	0.40	0.16	-0.16	0.03	0.00	-0.05	-0.16	0.00	-0.06	-0.05	-0.01
Ireland	2019	0.70	0.64	0.06	0.67	0.13	0.65	0.03	0.68	0.12	0.03	0.04	-0.01	0.05	-0.19	0.00	0.04	0.00	0.01
Difference		**0.52**	**0.33**	**0.18**	**0.16**	**0.08**	**0.28**	**0.02**	**0.28**	**-0.04**	**0.19**	**0.01**	**-0.01**	**0.10**	**-0.02**	**0.00**	**0.10**	**0.06**	**0.02**
Italy	1983	0.34	0.43	-0.09	0.63	0.02	0.43	0.02	0.48	0.18	-0.10	0.01	0.00	-0.02	-0.23	0.00	-0.04	-0.05	0.00
Italy	2019	0.57	0.54	0.03	0.60	0.13	0.50	0.07	0.58	0.16	-0.02	0.05	0.00	0.04	-0.22	0.00	0.03	-0.01	0.01

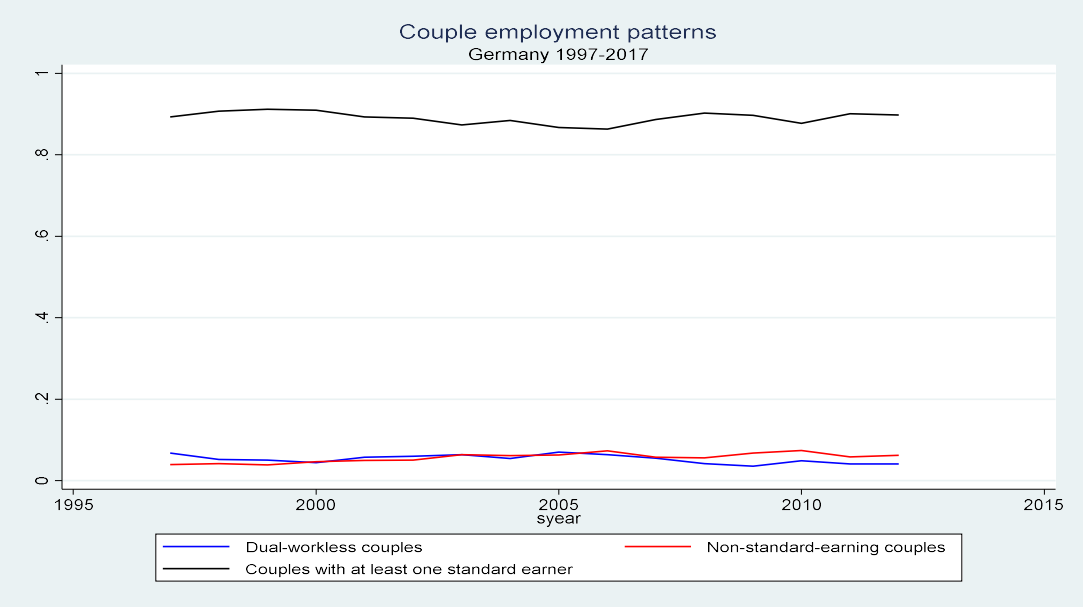
Difference		**0.22**	**0.10**	**0.12**	**-0.03**	**0.11**	**0.07**	**0.04**	**0.10**	**-0.02**	**0.08**	**0.04**	**-0.01**	**0.06**	**0.01**	**0.00**	**0.07**	**0.04**	**0.01**
Luxembourg	1983	0.25	0.39	-0.15	0.58	0.05	0.52	0.01	0.55	0.08	-0.19	0.03	0.00	-0.12	-0.12	0.00	-0.13	-0.02	0.01
Luxembourg	2019	0.70	0.67	0.03	0.67	0.15	0.69	0.04	0.75	0.07	-0.05	0.07	-0.01	0.04	-0.14	0.00	0.03	-0.01	0.01
Difference		**0.46**	**0.28**	**0.18**	**0.09**	**0.10**	**0.17**	**0.03**	**0.19**	**0.00**	**0.14**	**0.04**	**0.00**	**0.15**	**-0.02**	**0.00**	**0.16**	**0.01**	**0.00**
Netherlands	1983	0.31	0.37	-0.07	0.47	0.14	0.50	0.02	0.54	0.07	-0.16	0.09	-0.01	-0.05	-0.10	0.00	-0.06	0.00	0.00
Netherlands	2019	0.80	0.72	0.08	0.47	0.38	0.61	0.08	0.70	0.15	-0.09	0.22	-0.05	0.08	-0.25	0.00	0.08	-0.03	0.03
Difference		**0.49**	**0.35**	**0.14**	**0.01**	**0.24**	**0.12**	**0.06**	**0.16**	**0.08**	**0.07**	**0.12**	**-0.04**	**0.13**	**-0.14**	**0.00**	**0.14**	**-0.03**	**0.03**
Portugal	1986	0.48	0.49	-0.01	0.66	0.04	0.45	0.03	0.49	0.21	-0.02	0.00	0.00	0.03	-0.27	0.00	0.02	-0.08	0.05
Portugal	2019	0.79	0.73	0.06	0.81	0.05	0.63	0.10	0.74	0.12	0.07	-0.01	0.00	0.07	-0.20	0.01	0.07	-0.03	0.02
Difference		**0.32**	**0.24**	**0.08**	**0.14**	**0.01**	**0.19**	**0.07**	**0.25**	**-0.09**	**0.09**	**-0.01**	**0.00**	**0.04**	**0.07**	**0.01**	**0.05**	**0.06**	**-0.03**
Spain	1987	0.20	0.31	-0.11	0.53	0.03	0.33	0.03	0.40	0.15	-0.12	0.01	0.00	-0.05	-0.18	0.00	-0.08	-0.03	0.00
Spain	2019	0.64	0.59	0.05	0.67	0.10	0.51	0.14	0.65	0.12	0.02	0.03	0.00	0.07	-0.20	0.01	0.06	-0.03	0.03
Difference		**0.45**	**0.29**	**0.16**	**0.15**	**0.07**	**0.17**	**0.10**	**0.25**	**-0.03**	**0.14**	**0.02**	**0.00**	**0.12**	**-0.02**	**0.01**	**0.13**	**0.00**	**0.03**
UK	1983	0.60	0.56	0.04	0.58	0.17	0.64	0.02	0.66	0.09	-0.09	0.13	-0.02	0.04	-0.13	0.00	0.05	-0.03	0.01
UK	2019	0.79	0.72	0.07	0.67	0.18	0.69	0.02	0.71	0.14	0.00	0.08	-0.02	0.08	-0.23	0.00	0.07	-0.03	0.02
Difference		**0.19**	**0.16**	**0.03**	**0.09**	**0.02**	**0.05**	**0.00**	**0.05**	**0.05**	**0.09**	**-0.05**	**0.01**	**0.03**	**-0.10**	**0.00**	**0.02**	**0.01**	**0.00**

Note: Table B10 replicates the shift-share analysis shown in the core chapter for Europe on average, separately for part-time/full-time, permanent/temporary, employee/self-employed. Table B11 does the same, breaking the information-down by country.
Source: author's own calculations using the EU-LFS.

C. Appendix to chapter 11

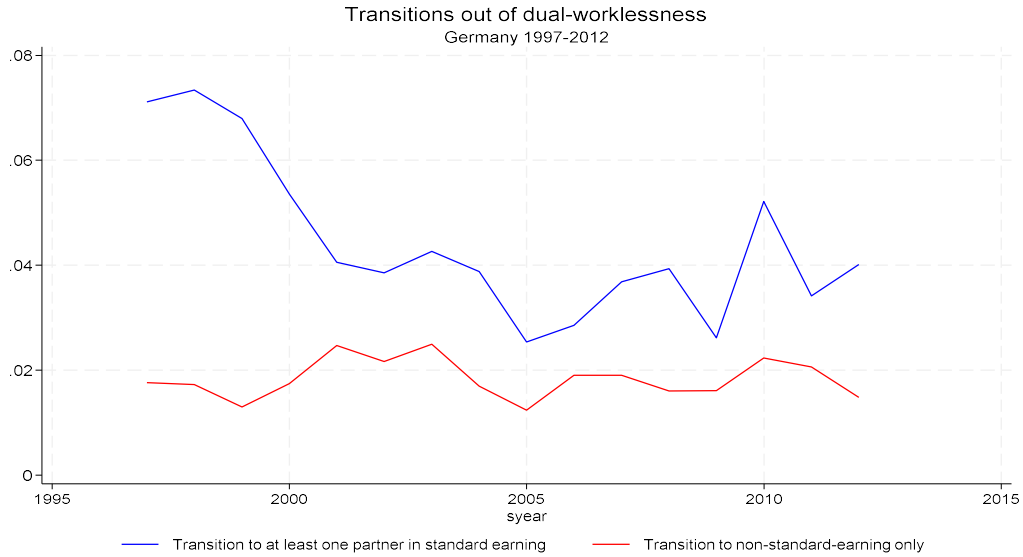
C.1. The prevalence of non-standard-employment as the only source of labour income in German couples over the years

Figure C1: evolution of couple employment patterns in Germany



Note: this graph uses 1997-2013 SOEP data for our population of interest (working age couples 25-65 years old, excluding couples in which both partners are above the age of 57). It shows the proportion of couples that are workless, of couples that are not workless but have no member in standard employment, and of couples that have one partner at least in standard employment.
Source: author's own calculations using the German SOEP

Figure C2: evolution of the type of transitions out of dual-worklessness over time



Note: this graph presents, using 1997-2013 SOEP data for working age couples 25-65 years old, excluding couples in which both partners are above the age of 57, the rate of transition out of dual-worklessness for each year of data, distinguishing between transitions towards having at least one partner in standard employment and transitions with no partner in standard employment.
Source: author's own calculations using the German SOEP

C.2. Placebo tests and pre-reform trends for exits from dual-worklessness

Table C1: Placebo regressions

Independent variables	Model 1: Pre-2005 data only. Fake reform year: 2000.	Model 2: Pre-2005 data only. Fake reform year: 2003.	Model 3: All year of data. Treatment group variable (receiving unemployment support) interacted with yearly dummy variables.
Post-fake-reform years	-0.1 *(0.22)*	-0.09 *(0.28)*	N/A
Couple receives unemployment support	-0.44** *(0.18)*	-0.41*** *(0.14)*	-0.7*** *(0.26)*
Post-fake-reform years*Couple receives unemployment support	-0.006 *(0.22)*	-0.22 *(0.28)*	N/A
Age of female partner	-0.002 (0.01)	-0.001 (0.01)	-0.02* *(0.009)*
Age of male partner	-0.04*** (0.01)	-0.04*** (0.01)	-0.03*** *(0.008)*
Number of children in household	0.08 *(0.09)*	0.08 *(0.09)*	0.06 *(0.07)*
Presence of children below 5 in household	0.13 *(0.14)*	0.13 *(0.14)*	0.17* *(0.1)*
Total number of persons in household	-0.05 *(0.08)*	-0.05 *(0.08)*	-0.07 *(0.06)*
Education of female partner	0.12*** *(0.03)*	0.13*** *(0.03)*	0.12*** *(0.02)*
Education of male partner	0.0009 *(0.03)*	0.0001 *(0.03)*	-0.007 *(0.02)*
Educational homogamy	-0.08** *(0.04)*	-0.08** *(0.04)*	-0.05* *(0.03)*
Couple has migration background	-0.3** (0.16)	-0.31** (0.16)	-0.3*** *(0.11)*
One partner is disabled	0.006 *(0.14)*	0.006 *(0.14)*	-0.12 *(0.11)*
One partner is retired	-1.24*** *(0.18)*	-1.24*** *(0.18)*	-1.05***

			(0.15)
Last gross annual labour income before dual-worklessness spell	0.000007** *(0.000003)*	0.000007** *(0.000003)*	0.000007** *(0.000003)*
Couple had no partner in standard employment before dual-worklessness spell	0.05 *(0.13)*	0.05 *(0.13)*	-0.07 *(0.09)*
Couple owns their dwelling	0.3** *(0.12)*	0.3** *(0.12)*	0.33*** *(0.09)*
Annual asset income of the household	-0.00004* *(0.00002)*	-0.00004* *(0.00002)*	-0.00004*** *(0.00002)*
Year: 1997			0.35 *(0.4)*
Year: 1998			-0.22 *(0.42)*
Year: 1999			-0.2 *(0.41)*
Year: 2000			-0.35 (0.33)
Year: 2001			-0.16 (0.33)
Year: 2002			-0.32 *(0.3)*
Year: 2003			-0.17 *(0.29)*
Year: 2004 (base)			(base)
Year: 2005			-0.05 *(0.32)*
Year: 2006			-0.43 *(0.34)*
Year: 2007			-0.35 *(0.32)*
Year: 2008			0.27 *(0.32)*
Year: 2009			0.37 (0.38)
Year: 2010			0.33 (0.3)
Year: 2011			0.49 (0.32)
Year: 2012			0.48

			(0.29)
1997*couple receives unemployment support			-0.54
			(0.5)
1998*couple receives unemployment support			0.61
			(0.47)
1999*couple receives unemployment support			0.37
			(0.47)
2000*couple receives unemployment support			0.51
			(0.38)
2001*couple receives unemployment support			0.43
			(0.38)
2002*couple receives unemployment support			0.36
			(0.35)
2003*couple receives unemployment support			0.4
			(0.34)
2004*couple receives unemployment support			(base)
2005*couple receives unemployment support			-0.25
			(0.37)
2006*couple receives unemployment support			0.56
			(0.38)
2007*couple receives unemployment support			0.78**
			(0.37)
2008*couple receives unemployment support			-0.12
			(0.4)
2009*couple receives unemployment support			-0.31
			(0.44)
2010*couple receives unemployment support			0.04
			(0.36)
2011*couple receives unemployment support			-0.41
			(0.38)
2012*couple receives unemployment support			-0.81**
			(0.36)
Economic crisis dummy			
Unemployment rate	-2.3	6.37	
	(5.25)	*(7.97)*	
Economic growth rate	-0.02	0.04	
	(0.05)	(0.05)	YES

Lander fixed-effects	YES	YES	
Time dependency	Step function (a dummy per month of spell, t>48 grouped together)	Step function (a dummy per month of spell, t>48 grouped together)	Step function (a dummy per month of spell, t>48 grouped together)
Constant	-1.95** *(0.89)*	-2.89*** *(1.03)*	-1.43*** *(0.53)*
N (couple-months)	12120	12120	24519

The table shows the effect of selected covariates on the hazard rate of dual-worklessness exits, as estimated using discrete-time event-history modelling. The first two models pick-out fake reform dates, using data from pre-reform period only (1997-2004). The third model uses all years of data and interacts yearly dummy variables with the dummy variable capturing whether the couple-month observation receives unemployment benefits. Negative signs indicate a decrease in the hazard of exiting dual-worklessness, positive signs the reverse. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients. Source: author's own calculations using the German SOEP

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C.3. Results of the time dependency modelling for the main specifications (covariates included)

Table C2: time dependency

Independent variables	Model 1: General exits	Model 2: competing-risks (towards non-standard-employment)	Model 3: competing-risks (towards standard-employment)
Month 1 of spell	(base)	(base)	(base)
Month 2 of spell	0.12	-0.03	0.14
	(0.11)	*(0.18)*	*(0.12)*
Month 3 of spell	0.24*	-0.01	0.26*
	(0.13)	*(0.20)*	*(0.15)*
Month 4 of spell	0.11	-0.41*	0.21
	(0.14)	*(0.24)*	*(0.16)*
Month 5 of spell	0.09	-0.04	0.03
	(0.16)	*(0.23)*	*(0.18)*
Month 6 of spell	0.1	-0.58**	0.23
	(0.17)	*(0.29)*	*(0.19)*
Month 7 of spell	0.03	-0.33	0.05
	(0.18)	*(0.28)*	*(0.21)*
Month 8 of spell	-0.31	-0.62	-0.31
	(0.21)	*(0.32)*	*(0.25)*
Month 9 of spell	-0.13	-0.12	-0.34
	(0.21)	*(0.28)*	*(0.28)*
Month 10 of spell	-0.14	-0.51	-0.15
	(0.22)	*(0.35)*	*(0.25)*
Month 11 of spell	-0.1	-0.17	-0.29
	(0.22)	*(0.31)*	*(0.28)*
Month 12 of spell	0.35*	0.12*	0.21
	(0.21)	*(0.29)*	*(0.26)*
Month 13 of spell	-0.39	-0.37	-0.69*
	(0.28)	*(0.38)*	*(0.37)*
Month 14 of spell	-0.11	-0.31	-0.26
	(0.26)	*(0.37)*	*(0.32)*
Month 15 of spell	-0.24	-0.33	-0.5
	(0.29)	*(0.40)*	*(0.37)*
Month 16 of spell	-0.28	-0.58	-0.4
	(0.29)	*(0.45)*	*(0.36)*
Month 17 of spell	-0.32	-1.6**	-0.1
	(0.31)	*(0.73)*	*(0.34)*
Month 18 of spell			

Month 19 of spell	-0.08 *(0.29)*	-0.61 *(0.49)*	-0.09 *(0.34)*
Month 20 of spell	-0.27 *(0.33)*	-0.53 *(0.48)*	-0.45 *(0.43)*
Month 21 of spell	-0.61 *(0.4)*	-0.68 *(0.54)*	-0.94* *(0.54)*
Month 22 of spell	-0.53 *(0.39)*	-1.31* *(0.73)*	-0.45 *(0.46)*
Month 23 of spell	-0.74* *(0.45)*	-1.24* *(0.73)*	-0.77 *(0.53)*
Month 24 of spell	-0.66 *(0.44)*	-0.77 *(0.61)*	-1* *(0.61)*
Month 25 of spell	-1.02* *(0.52)*	-1.14 *(0.74)*	-1.34* *(0.73)*
Month 26 of spell	-0.35 *(0.42)*	-0.11 *(0.49)*	-1.27* *(0.74)*
Month 27 of spell	0.02 *(0.42)*	-0.24 *(0.53)*	-0.28 *(0.48)*
Month 28 of spell	-1.08* *(0.61)*	-1.61 *(1.02)*	-1.15 *(0.75)*
Month 29 of spell	-0.17 *(0.42)*	-1.60 *(1.02)*	0.03 *(0.45)*
Month 30 of spell	-0.24 *(0.44)*	-0.82 *(0.74)*	0.30 *(0.52)*
Month 31 of spell	-0.88 *(0.62)*	-1.47 *(1.03)*	-0.94 *(0.75)*
Month 32 of spell	-1.21 *(0.74)*	-1.39 *(1.02)*	-1.56 *(1.03)*
Month 33 of spell (and more, for model 3)	-1.15 *(0.74)*	-1.33 *(1.03)*	-1.50 *(1.03)*
Month 34 of spell	-1.07 *(0.74)*	-0.58 *(0.73)*	-1.33*** *(0.29)*
Month 35 of spell	-0.60 *(0.62)*	-0.12 *(0.64)*	
Month 36 of spell (and more, for model 2)	-0.55 *(0.61)*	-0.49 *(0.76)*	
Month 37 of spell	-0.95 *(0.73)*	-1.05*** *(0.38)*	
Month 38 of spell	-0.81 *(0.73)*		
Month 39 of spell	0.22 *(0.51)*		

Month 40 of spell	-0.66 *(0.73)*		
Month 41 of spell	-1.31 *(1.03)*		
Month 42 of spell	-0.15 *(0.61)*		
Month 43 of spell	-0.09 *(0.63)*		
Month 44 of spell	-1.17 *(1.03)*		
Month 45 of spell	-0.44 *(0.75)*		
Month 46 of spell	-0.39 *(0.72)*		
Month 47 of spell	-1.04 *(1.03)*		
Month 48 of spell	-0.31 *(0.76)*		
Month 48 of spell (and more, for model 1)	-0.99 *(1.02)*		
Constant	-0.97*** *(0.33)*		
	-1.37*** *(0.53)*	-3.03*** *(0.63)*	-1.91*** *(0.62)*
N (couple-months)	24519	24519	24519
Number of couples	1444	1444	1444
Number of spells	2165	2165	2165
Number of transitions out of dual-worklessness (any type)	1570	1570	1570
Number of transitions out of dual-worklessness towards standard-earning	1132	1132	1132
Number of transitions out of dual-worklessness towards non-standard-earning	438	438	438

The table shows the effect of how long a dual-worklessness spell has lasted, in months, on the hazard rate of dual-worklessness exits, as estimated using discrete-time event-history modelling. Negative signs indicate a decrease in the hazard of exiting dual-worklessness, positive signs the reverse. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients.
Source: author's own calculations using the German SOEP

C.4. Full results of the competing-risks models, with covariates

Table C3: competing-risks models, with covariates

Independent variables	Model 1: exits towards non-standard-employment only	Model 2: exits towards at least one partner in standard employment
Post-2004 years	0.06 *(0.21)*	0.19 *(0.17)*
Couple receives unemployment support	-0.34* *(0.19)*	-0.4*** *(0.14)*
Post-2004 years*Couple receives unemployment support	-0.13 *(0.23)*	-0.42** *(0.18)*
Age of female partner	-0.01 *(0.01)*	-0.01 *(0.01)*
Age of male partner	-0.006 *(0.01)*	-0.04*** *(0.01)*
Number of children in household	0.07 *(0.1)*	0.02 *(0.08)*
Presence of children below 5 in household	0.21 *(0.16)*	0.14 *(0.11)*
Total number of persons in household	-0.11 *(0.09)*	-0.0004 *(0.07)*
Education of female partner	0.08*** *(0.03)*	0.1*** *(0.02)*
Education of male partner	-0.01 *(0.02)*	0.01 *(0.02)*
Educational homogamy	-0.04 *(0.04)*	-0.04 *(0.03)*
Couple has migration background	-0.35** *(0.14)*	-0.17 *(0.12)*
One partner is disabled	-0.11 *(0.14)*	-0.05 *(0.13)*
One partner is retired	-0.61*** *(0.18)*	-1.28*** *(0.18)*

Last gross annual labour income before dual-worklessness spell	0.000001 *(0.000002)*	0.000009** *(0.000004)*
Couple had no partner in standard employment before dual-worklessness spell	0.63*** *(0.12)*	-0.43*** *(0.12)*
Couple owns their dwelling	0.05 *(0.13)*	0.45*** *(0.11)*
Annual asset income of the household	-0.000004 *(0.000009)*	-0.00007*** *(0.00002)*
Economic crisis dummy	0.36* *(0.21)*	0.1 *(0.17)*
Unemployment rate	0.95 (3.16)	-4.12* (2.44)
Economic growth rate	0.05* *(0.03)*	0.02 *(0.02)*
Lander fixed-effects	YES	YES
Time dependency	Step function (a dummy per month of spell, t>35 grouped together)	Step function (a dummy per month of spell, t>33 grouped together)
Constant	-3.03*** *(0.64)*	-1.90*** *(0.62)*
N (couple-months)	24519	24519
Number of couples	1444	1444
Number of spells	2165	2165
Number of transitions out of dual-worklessness (any type)	1570	1570
Number of transitions out of dual-worklessness towards standard-earning	1132	1132
Number of transitions out of dual-worklessness towards non-standard-earning	438	438

Note: this table gives in full the results of the competing-risks shown in the main chapter, displaying the results regarding the covariates.
Source: author's own calculations using the German SOEP

C.5. Further analyses

C.5.1. Further analyses: results of the individual-level regression models (competing-risks)

Table C4: Competing-risks models (individual level)

	Transitions from dual-worklessness to a non-standard-employment arrangement			*Transitions from dual-worklessness to a standard-employed arrangement*		
Independent variables	Model 1: Treatment and period dummy	Model 2: Difference-in-difference (without the covariates)	Model 3: Difference-in-difference (all covariates included)	Model 4: Treatment and period dummy	Model 5: Difference-in-difference (without the covariates)	Model 6: Difference-in-difference (all covariates included)
Post-2004 years	0.09**	0.02	-0.12**	-0.03	-0.06	-0.06
	(0.03)	*(0.04)*	*(0.05)*	*(0.03)*	*(0.05)*	*(0.05)*
Couple receives unemployment support	-0.53***	-0.65***	-0.55***	0.70***	0.68***	-0.11**
	(0.04)	*(0.05)*	*(0.06)*	*(0.04)*	*(0.05)*	*(0.05))*
Post-2004 years*Couple receives unemployment support		0.21***	0.18***		0.05	0.15**
		(0.07)	*(0.07)*		*(0.07)*	*(0.07)*
Time dependency	Step function (a dummy per month of spell, t>95 grouped together)	Step function (a dummy per month of spell, t>95 grouped together)	Step function (a dummy per month of spell, t>95 grouped together)	Step function (a dummy per month of spell, t>54 grouped together)	Step function (a dummy per month of spell, t>54 grouped together)	Step function (a dummy per month of spell, t>54grouped together)
Covariates	NO	NO	YES	NO	NO	YES
Lander fixed-effects	NO	NO	YES	NO	NO	YES
Constant	-3.65***	-3.61***	-3.55***	-4.08***	-4.06***	-1.59***
	(0.06)	*(0.06)*	*(0.2)*	*(0.06)*	*(0.07)*	*(0.21)*
N (individual-months)	319174	319174	315415	319174	319174	315415
Number of individuals	10992	10992	10874	10992	10992	10874
Number of spells of worklessness	18319	18319	18099	18319	18319	18099
Number of transitions out of worklessness (any type)	12550	12550	12372	12550	12550	12372
Number of transitions out of worklessness towards standard-employment	6345	6345	6257	6345	6345	6257
Number of transitions out of worklessness towards non-standard-employment	6205	6205	6115	6205	6205	6115

Logit discrete-time competing risk event-history models estimating the hazard of exiting worklessness for workless individuals, distinguishing between exits towards a standard-earning arrangement and a non-standard-earning arrangement. The models are estimated using repeated models for binary responses, i.e. outcomes other than the transition to the specific state studied are treated as right-censored. Negative signs indicate a decrease in the hazard of exiting worklessness, positive signs the reverse. The difference-in-difference estimator is given by the interaction of receiving unemployment support and the year being post-2004. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients.
Source: author's own calculations using the German SOEP.

C.5.2. Further analyses: results of the models treating all people in mini-jobs as employed (general exits)

Table C5: Regressions treating people who hold a mini-job and receive unemployment benefits as employed

Independent variables	Model 1: Treatment and period dummy	Model 2: Difference-in-difference (without the covariates)	Model 3: Difference-in-difference (all covariates included)
Post-2004 years	0.23*** *(0.07)*	0.75*** *(0.15)*	0.22 *(0.15))*
Couple receives unemployment support	-0.35*** *(0.1)*	-0.03 *(0.13)*	-0.34*** *(0.12)*
Post-2004 years*Couple receives unemployment support		-0.70*** *(0.16)*	-0.3* *(0.16)*
Age of female partner			-0.01* *(0.009)*
Age of male partner			-0.03*** *(0.008)*
Number of children in household			0.09 *(0.07)*
Presence of children below 5 in household			0.10 *(0.1)*
Total number of persons in household			-0.05 *(0.06)*
Education of female partner			0.11*** *(0.02)*
Education of male partner			0.01 *(0.02)*
Educational homogamy			-0.05** *(0.02)*
Couple has migration background			-0.28** *(0.11)*
One partner is disabled			-0.04 *(0.1)*
One partner is retired			-1.17*** *(0.14)*

Last gross annual labour income before dual-worklessness spell			0.000007** *(0.000003)*
Couple had no partner in standard employment before dual-worklessness spell			-0.001 *(0.09)*
Couple owns their dwelling			0.37*** *(0.09)*
Annual asset income of the household			-0.00004*** *(0.00002)*
Economic crisis dummy			0.2 *(0.14)*
Unemployment rate			-4.71** (2.21)
Economic growth rate			0.003 *(0.02)*
Lander fixed-effects	NO	NO	YES
Time dependency	Step function (a dummy per month of spell, t>48 grouped together)	Step function (a dummy per month of spell, t>48 grouped together)	Step function (a dummy per month of spell, t>48 grouped together)
Constant	-2.06*** *(0.11)*	-2.36*** *(0.13)*	-1.46*** *(0.54)*
N (couple-months)	23356	23356	22858
Number of couples	1447	1447	1413
Number of spells of dual-worklessness	2197	2197	2152
Number of transitions out of dual-worklessness	1633	1633	1598

The table shows the effect of selected covariates on the hazard rate of dual-worklessness exits, as estimated using discrete-time event-history modelling. Negative signs indicate a decrease in the hazard of exiting dual-worklessness, positive signs the reverse. The difference-in-difference estimator is given by the interaction of the couple-month observation receiving unemployment support and the time period being from January 2005 onwards. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients.
Source: author's own calculations using the German SOEP

C.5.3. Further analyses: results of the models treating all people in mini-jobs as employed (competing-risks)

Table C6: Regressions treating people who hold a mini-job and receive unemployment benefits as employed (competing-risks)

	Transitions from dual-worklessness to a non-standard-employment arrangement			*Transitions from dual-worklessness to a standard-employed arrangement*		
Independent variables	Model 1: Treatment and period dummy	Model 2: Difference-in-difference (without the covariates)	Model 3: Difference-in-difference (all covariates included)	Model 4: Treatment and period dummy	Model 5: Difference-in-difference (without the covariates)	Model 6: Difference-in-difference (all covariates included)
Post-2004 years	0.44***	0.55**	0.19	0.11	0.75***	0.17
	(0.11)	*(0.22)*	*(0.22)*	*(0.09)*	*(0.17)*	*(0.17)*
Couple receives unemployment support	0.07	0.16	-0.13	-0.48***	-0.0002	-0.37***
	(0.13)	*(0.2)*	*(0.19)*	*(0.11)*	*(0.15)*	*(0.14)*
Post-2004 years*Couple receives unemployment support		-0.16	-0.08		-0.9***	-0.35*
		(0.25)	*(0.24)*		*(0.2)*	*(0.18)*
Time dependency	Step function (a dummy per month of spell, t>32 grouped together)	Step function (a dummy per month of spell, t>32 grouped together)	Step function (a dummy per month of spell, t>32 grouped together)	Step function (a dummy per month of spell, t>33 grouped together)	Step function (a dummy per month of spell, t>33 grouped together)	Step function (a dummy per month of spell, t>323grouped together)
Covariates	NO	NO	YES	NO	NO	YES
Lander fixed-effects	NO	NO	YES	NO	NO	YES
Constant	-4.03***	-4.11***	-3.35***	-2.39***	-2.74***	-1.97***
	(0.2)	*(0.24)*	*(0.66)*	*(0.13)*	*(0.16)*	*(0.62)*
N (couple-months)	23356	23356	22858	23356	23356	22858
Number of couples	1447	1447	1413	1447	1447	1413
Number of spells	2197	2197	2152	2197	2197	2152
Number of transitions out of dual-worklessness (any type)	1633	1633	1598	1633	1633	1598
Number of transitions out of dual-worklessness towards standard-earning	1089	1089	1065	1089	1089	1065
Number of transitions out of dual-worklessness towards non-standard-earning	544	544	533	544	544	533

Logit discrete-time competing risk event-history models estimating the hazard of exiting dual-worklessness for dual-workless couples, distinguishing between exits towards a standard-earning arrangement and a non-standard-earning arrangement. The models are estimated using repeated models for binary responses, i.e. outcomes other than the transition to the specific state studied are treated as right-censored. Negative signs indicate a decrease in the hazard of exiting dual-worklessness, positive signs the reverse. The difference-in-difference estimator is given by the interaction of receiving unemployment support and the year being post-2004. Three stars indicate significance at the 1% level. Two stars indicate significance at the 5% level. One star indicates significance at the 10% level. Standard errors are shown below their respective coefficients.
Source: author's own calculations using the German SOEP

C.5.4. Further analyses: results of the models exploring the transitions that did happen

	Table C7: Probability of transitioning out of dual-worklessness towards a non-standard-employed arrangement as opposed to a standard-employed arrangement.		
Independent variables	Model 1: Treatment and period dummy	Model 2: Difference-in-difference (without the covariates)	Model 3: Difference-in-difference (all covariates included)
Models using whether the couple making the transition was receiving unemployment benefit in the previous year as treatment group			
Post-2004 years	0.24 *(0.15)*	-0.15 *(0.26)*	-0.1 *(0.26)*
Couple receives unemployment support	-0.16 *(0.16)*	-0.47** *(0.23)*	-0.16 *(0.22)*
Post-2004 years*Couple receives unemployment support		0.55* *(0.31)*	0.11 *(0.28)*
Covariates	NO	NO	YES
Lander fixed-effects	NO	NO	YES
Constant	-1.63*** *(0.2)*	-1.37*** *(0.25)*	-1.1*** *(0.83)*
Models using whether the couple making the transition has been receiving any unemployment support during the spell as treatment group			
Post-2004 years	0.24 *(0.15)*	-0.31 *(0.28)*	-0.15 *(0.27)*
Couple receives unemployment support	-0.25 *(0.16)*	-0.68*** *(0.24)*	-0.34 *(0.22)*
Post-2004 years*Couple receives unemployment support		0.75** *(0.33)*	0.29 *(0.29)*
Covariates	NO	NO	YES
Lander fixed-effects	NO	NO	YES
Constant	-1.63*** *(0.2)*	-1.1 *(0.83)*	-0.97

			(0.83)
Number of transitions	1606	1606	1570
Number of transitions towards standard-earning	1158	1158	1132
Number of transitions towards non-standard-earning	448	448	438

Note: these models are logit models where the observations are the transitions made out of dual-worklessness made by dual-workless couples, with the dependent variable taking the value of 0 if the transition is towards a standard-earning arrangement, and 1 if it is towards a non-standard-earning arrangement.
Source: author's own calculations using the German SOEP

C.6. Summary of the robustness tests results

Table C8: Summary of the robustness tests results (general exit models)

Model estimated	Main effect: post-2004	Main effect: unemployment support receipt	Interaction effect: Post-2004 years*Couple receives unemployment support	Covariates	Time dependency modelled
Treatment group is couples who have received unemployment support at any point in their dual-worklessness spell. Control group is couples who have not received any unemployment support at all throughout their dual-worklessness spell. Cut-off date is whether the spell encompasses the year 2005 or not.	-0.27 *(0.17)*	-0.54*** *(0.14)*	-0.54*** *(0.18)*	YES	YES
Sample includes couples below the age of 25, excluding those in which both partners are students/in education	0.11 *(0.13)*	-0.48*** *(0.11)*	-0.28* *(0.15)*	YES	YES
Sample includes couples with both partners older than 57	0.07 *(0.12)*	-0.35*** *(0.11)*	-0.24* *(0.13)*	YES	YES

Model controls for the year and month in which the dual-worklessness spell begins	-0.02 *(0.21)*	-0.41*** *(0.13)*	-0.42*** *(0.16)*	YES	YES
Model controls for year and month in which the dual-worklessness spell begins, as well as for the current calendar month	-0.03 *(0.22)*	-0.41*** *(0.13)*	-0.40** *(0.16)*	YES	YES
Model controls for social class instead of pre-dual-workless gross labour income	0.16 *(0.15)*	-0.46*** *(0.13)*	-0.34**	YES	YES
Model controls for whether the couple is made of two partners above the age of 45 and the year the dual-worklessness spell begins	-0.06 *(0.22)*	-0.47*** *(0.13)*	-0.39** *(0.17)*	YES	YES
Model controls for the interaction of both partners being above the age of 45 and the dual-worklessness spell beginning after 2006	-0.07 *(0.22)*	-0.48*** *(0.13)*	-0.38** *(0.17)*	YES	YES

Model controls for life satisfaction	0.21 *(0.15)*	-0.4*** *(0.13)*	-0.43*** *(0.16)*	YES	YES
Model controls for partnership break-down propensity (number of divorces in biography data)	0.21 *(0.15)*	-0.41*** *(0.13)*	-0.43*** *(0.16)*	YES	YES
Model controls for partnership break-down propensity (number of partnership break-down registered since taking-part in the SOEP)	0.22 *(0.15)*	-0.4*** *(0.13)*	-0.43*** *(0.16)*	YES	YES
Sample excludes couples in which both partners are above the age of 45	-0.14 *(0.19)*	-0.48*** *(0.16)*	-0.11 *(0.2)*	YES	YES
Sample excludes couples whose dual-worklessness spell begins from February 2006 onwards	-0.24 *(0.26)*	-0.39*** *(0.13)*	-0.05 *(0.27)*	YES	YES

Table C9: Summary of the robustness tests results (competing-risks: transitions to a non-standard-employed couple arrangement)

Model estimated	Main effect: post-2004	Main effect: unemployment support receipt	Interaction effect: Post-2004 years*Couple receives unemployment support	Covariates	Time dependency modelled
Treatment group is couples who have received unemployment support at any point in their dual-worklessness spell. Control group is couples who have not received any unemployment support at all throughout their dual-worklessness spell. Cut-off date is whether the spell encompasses the year 2005 or not.	-0.45** *(0.22)*	-0.54*** *(0.2)*	-0.1 *(0.24)*	YES	YES
Sample includes couples below the age of 25 (18-57 sample), excluding those in which both partners are students/in education	0.02 *(0.2)*	-0.31* *(0.19)*	-0.10 *(0.22)*	YES	YES
Sample includes couples with both partners older than 57	-0.04 *(0.16)*	-0.25 *(0.17)*	-0.08 *(0.19)*	YES	YES

Model controls for the year and month in which the dual-worklessness spell begins	-0.26 *(0.3)*	-0.33* *(0.2)*	-0.14 *(0.23)*	YES	YES
Model controls for year and month in which the dual-worklessness spell begins, as well as for the current calendar month	-0.12 *(0.31)*	-0.33* *(0.2)*	-0.13 *(0.23)*	YES	YES
Model controls for social class instead of pre-dual-workless gross labour income	-0.04 *(0.21)*	-0.35* *(0.2)*	0.02 *(0.24)*	YES	YES
Model controls for whether the couple is made of two partners above the age of 45 and the year the dual-worklessness spell begins	-0.16 *(0.32)*	-0.37* *(0.21)*	-0.13 *(0.25)*	YES	YES
Model controls for the interaction of both partners being above the age of 45 and the dual-worklessness spell beginning after 2006	-0.19 *(0.31)*	-0.41* *(0.21)*	-0.08 *(0.25)*	YES	YES
Model controls for life satisfaction	0.07	-0.36* *(0.19)*	-0.16 *(0.23)*	YES	YES

	(0.21)				
Model controls for partnership break-down propensity (number of divorces in biography data)	0.07 *(0.21)*	-0.35* *(0.19)*	-0.16 *(0.23)*	YES	YES
Model controls for partnership break-down propensity (number of partnership break-down registered since taking-part in the SOEP)	0.08 *(0.21)*	-0.35* *(0.19)*	-0.16 *(0.23)*	YES	YES

Table C10: Summary of the robustness tests results (competing-risks: transitions to a standard-employed couple arrangement)

Model estimated	Main effect: post-2004	Main effect: unemployment support receipt	Interaction effect: Post-2004 years*Couple receives unemployment support	Covariates	Time dependency modelled
Treatment group is couples who have received unemployment support at any point in their dual-worklessness spell. Control group is couples who have not received any unemployment support at all throughout their dual-worklessness spell. Cut-off date is whether the spell encompasses the year 2005 or not.	-0.17** *(0.17)*	-0.38** *(0.15)*	-0.58*** *(0.19)*	YES	YES
Sample includes couples below the age of 25 (18-57 sample), excluding those in which both partners are students/in education	0.08 *(0.16)*	-0.51*** *(0.13)*	-0.27 *(0.17)*	YES	YES
Sample includes couples with both partners older than 57	0.13 *(0.15)*	-0.32** *(0.14)*	-0.28* *(0.17)*	YES	YES

Model controls for the year and month in which the dual-worklessness spell begins	-0.07 *(0.29)*	-0.42*** *(0.15)*	-0.41** *(0.19)*	YES	YES
Model controls for year and month in which the dual-worklessness spell begins, as well as for the current calendar month	-0.18 *(0.29)*	-0.43*** *(0.15)*	-0.38** *(0.19)*	YES	YES
Model controls for social class instead of pre-dual-workless gross labour income	-0.2 *(0.17)*	-0.48*** *(0.14)*	-0.4** *(0.19)*	YES	YES
Model controls for whether the couple is made of two partners above the age of 45 and the year the dual-worklessness spell begins	-0.1 *(0.3)*	-0.48*** *(0.16)*	-0.37* *(0.19)*	YES	YES
Model controls for the interaction of both partners being above the age of 45 and the dual-worklessness spell beginning after 2006	-0.11 *(0.3)*	-0.48*** *(0.16)*	-0.37* *(0.2)*	YES	YES
Model controls for life satisfaction	0.2 *(0.17)*	-0.39*** *(0.14)*	-0.42** *(0.19)*	YES	YES

Model controls for partnership break-down propensity (number of divorces in biography data)	0.2 *(0.17)*	-0.4*** *(0.14)*	-0.42** *(0.19)*	YES	YES
Model controls for partnership break-down propensity (number of partnership break-down registered since taking-part in the SOEP)	0.2 *(0.17)*	-0.39*** *(0.15)*	-0.42** *(0.19)*	YES	YES

Note: this table shows the main effects and interaction effects of regarding the date of spell debut, and the receipt or not of unemployment benefits, across different robustness tests. All analyses are the author's own calculations using the German SOEP.

The general take-away from these numerous robustness tests, is that they are very consistent with the results shown in the core of this chapter. Carrying the analysis without excluding couples in which both partners are above the age of 57 means that DID coefficient for general exits from dual-worklessness, remains negative but loses in statistical significance (P>|z=0.087), despite the increased sample size, while the coefficient associated to transitions towards standard-earning in the competing-risk model is no longer significant at the 10% level. Carrying the analysis by including younger couples (from the age of 18) shows results in line with the main specification, although the DID estimators gain in statistical significance and magnitude once we exclude couples in which at least any one of the partners is a student/in education (as opposed to models in which only dual-student couples are excluded).

Analyses adding or modifying the variables used (adding a term capturing the propensity to partnership break-down and/or the life satisfaction spillover, replacing the pre-dual-worklessness earning variable with a social class variable, adding a variable capturing the year and month of entry into dual-worklessness, adding a variable for the current calendar month to capture work seasonality) or tweaking slightly the control and treatment groups such that the treatment are dual-workless couple-months that have received benefits at some point in their spell, and the control are those that have not, also do not change the results and the main takeaway from this chapter.

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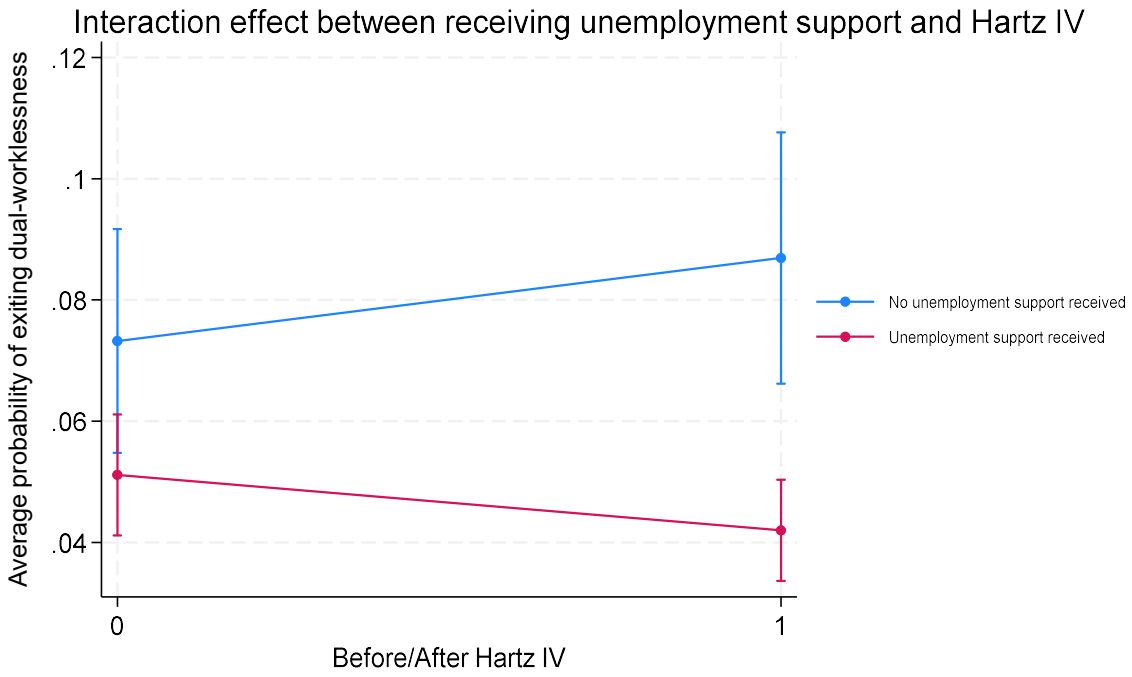
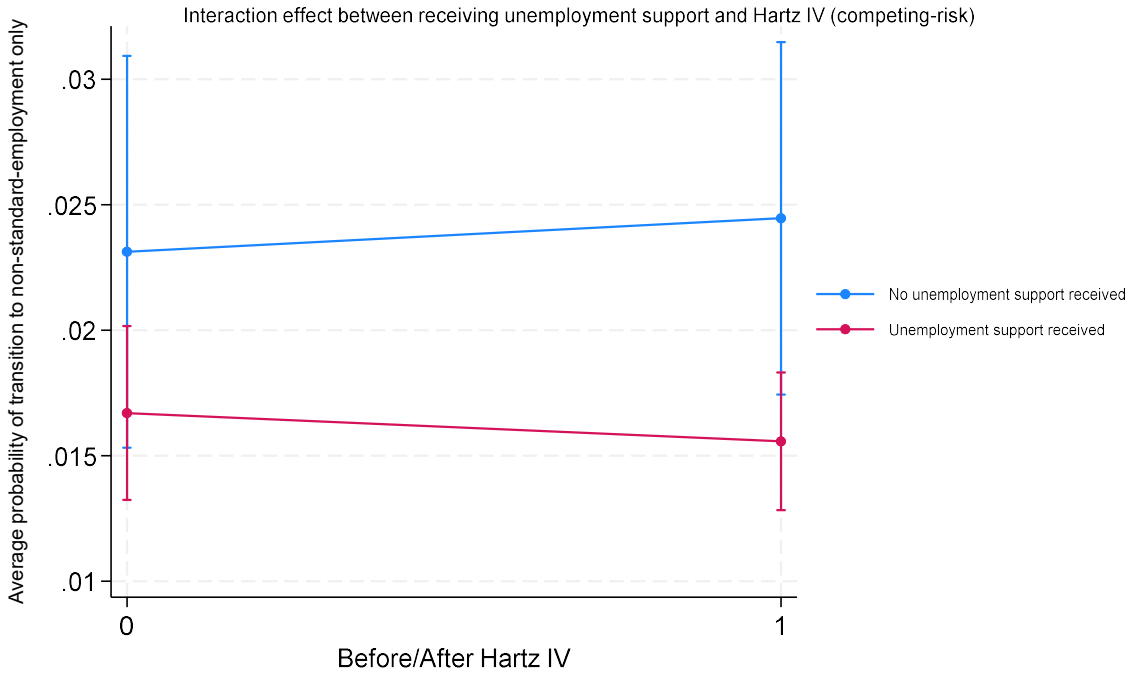
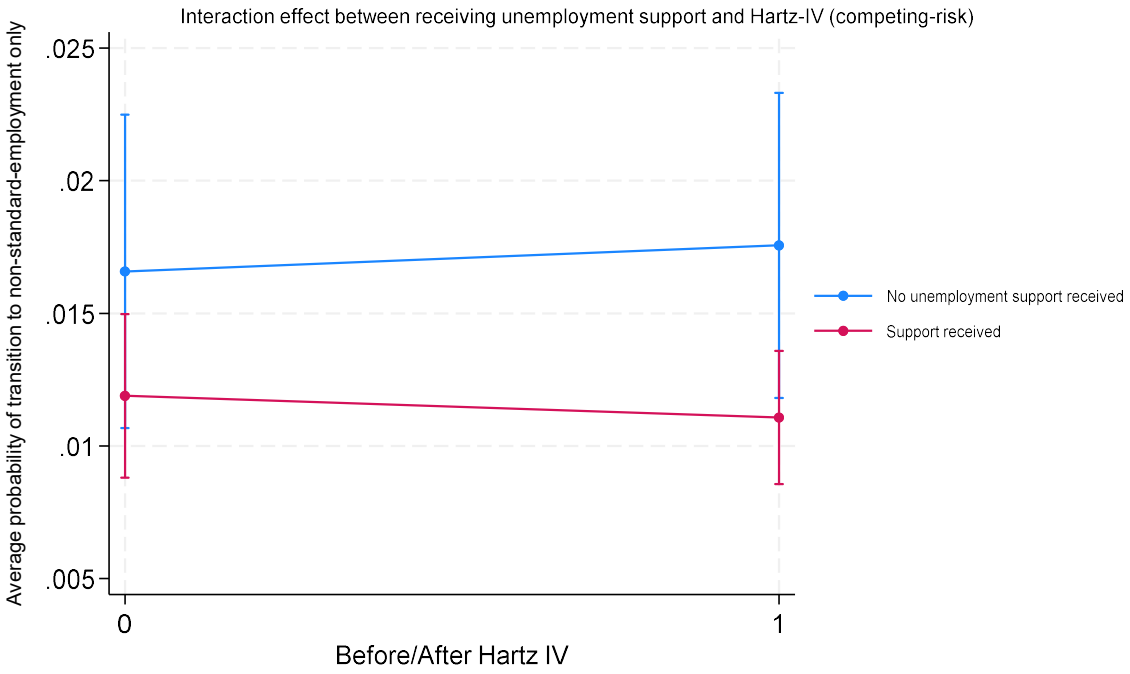
C.7. Alternative illustrations of interaction effects estimated in the main models shown in the chapter

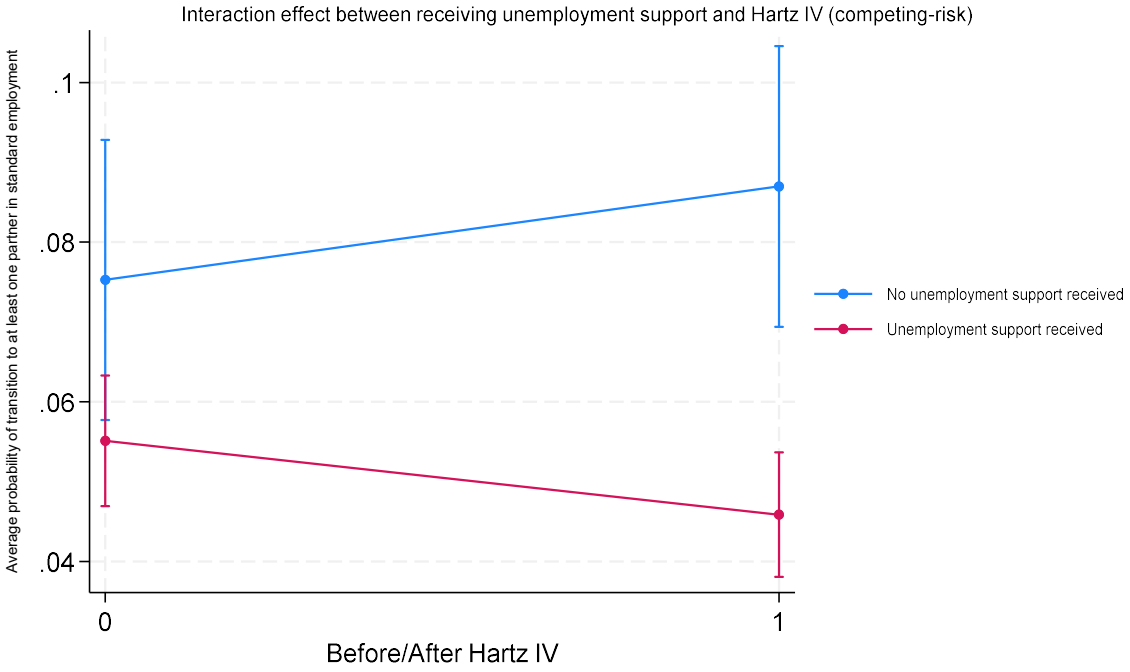


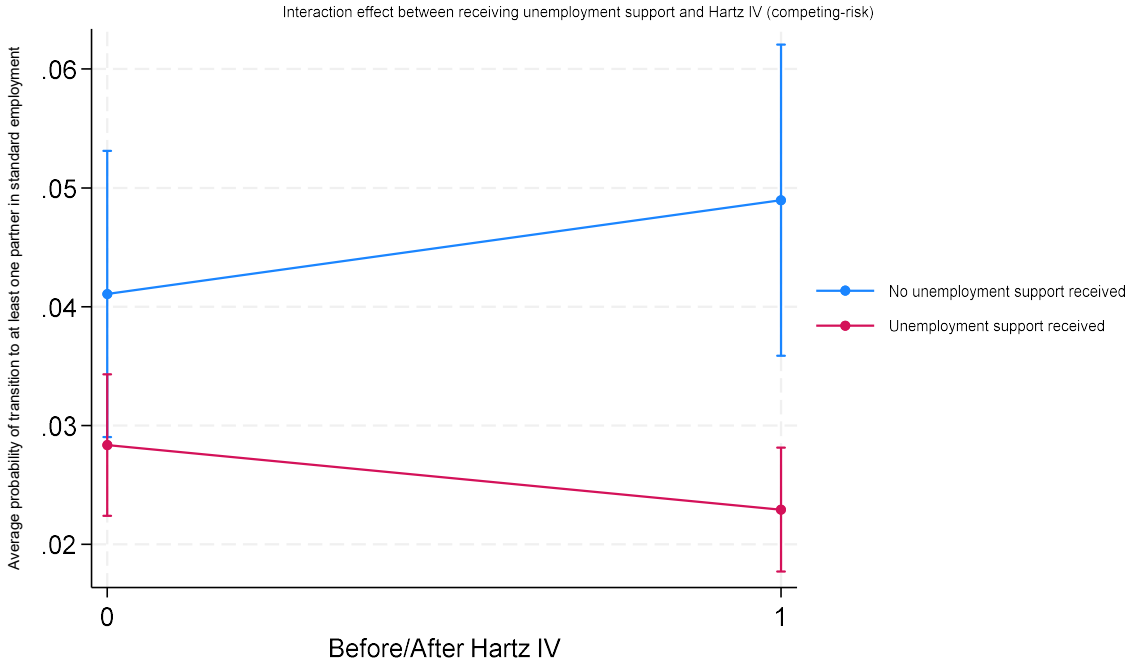
Note: this graph represents the interaction effect estimated in the main specification. The only difference is that, this time, the margins are estimated at the mean value for the covariate in the model, instead of holding the values of the covariates constant as they are in the sample.
Source: author's own calculations using the German SOEP





Note: the top graph represents the interaction effect between receiving unemployment support and the Hartz IV package on the probability of exiting dual-worklessness towards non-standard-employment only holding all the other covariates constant at their actual value, the second does the same at the mean value for all covariates.
Source: author's own calculations using the German SOEP





Note: the top graph represents the interaction effect between receiving unemployment support and the Hartz IV package on the probability of exiting dual-worklessness towards an arrangement with at least one partner in standard employment, only holding all the other covariates constant at their actual value, the second does the same at the mean value for all covariates.
Source: author's own calculations using the German SOEP.

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