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Skill Specificity and Attitudes towards Immigration

Abstract

Labor market competition theories explaining anti-immigrant attitudes have received limited or no empirical validation in recent literature. This has led researchers to highlight education and cultural values as the main, if not the sole drivers of attitudes towards immigration. We present a new labor market competition theory focusing on job availability rather than foreign labor supply. This theory predicts that individuals with low transferable skills in the labor market will articulate a subjective sense of job insecurity, and a higher hostility towards migrants. Our cross-classified, longitudinal, and difference-in-differences models reveal that skill specificity is a strong driver of anti-immigrant attitudes, and suggest that economic competition theories cannot be dismissed. By shifting the attention from supply to demand in the labor market, and from actual to potential competition with migrants, we show that the highly educated are far from immune to anti-immigrant attitudes.

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Introduction

Understanding the causes of anti-immigrant backlash in public opinion seems particularly important in an era of increasing immigration inflows, economic and cultural globalization, and unprecedented collapse of historical mainstream parties in favor of populist extreme right parties (Arzheimer, 2009). Despite the intuitive appeal of economic threat when trying to make sense of anti-immigrant attitudes, theories based on labor market competition between natives and immigrants have been severely discredited in recent scholarship. Contrary to a longstanding belief in the social sciences, native workers are not systematically sensitive to increased competition with foreigners at the same level of skill (Hainmueller and Hiscox, 2010). Except for very particular scenarios of high exposure to foreign competition in specific industries and periods of general economic downturn, (Malhotra, Margalit and Mo, 2013; Pecoraro and Ruedin, 2015; Dancygier and Donnelly, 2013), low levels of education seem to be the main driver of anti-immigrant hostility against low-skilled immigration, and independently of positions in the labor market (Hainmueller and Hiscox, 2007). This has highlighted theoretical frameworks based on social identity, cultural values, and sociotropic considerations as the most valid to understand opposition to globalization and conflictual relations between ethnic groups (Margalit, 2012; Hainmueller and Hangartner, 2013; Helbling and Traunmuller, 2016).

Classical labor-market competition theory, however, has overwhelmingly focused on increased inflows of foreign labor at similar level of skill, and has ignored the important role of availability of jobs at similar levels of skill. We argue that an increased inflow of foreign labor supply can be inconsequential if there are enough exit options and demand in the labor market. Our theoretical mechanism is based on skill specificity and job availability [1]. Occupations involving high investments, low skill transferability, and

[1] On the basis of the comparative political economy and labor economics literatures, we understand skill specificity as high investments in human capital and low job transferability (Iversen and Soskice, 2001; Kambourov and Manovskii, 2009). This use of the concept departs from some work in sociology equating skill specificity with high levels of education. Our aim is precisely to analyze the impact of labor market demand within and not between levels of education.

fewer exit options are expected to increase subjective perceptions of job insecurity in the event of an economic shock. This insecurity, in turn, is expected to increase hostility towards immigration. We theorize and empirically show that the relationship between skill specificity and anti-immigrant attitudes cross-cuts educational and socio-economic levels, and that it is a strong driver of labor-market fears even among highly educated individuals and regardless of the level of employment protection and inflow of migrant co-workers.

In this article we make three main contributions. First, we present a new labor market competition theory focusing on the demand of jobs at similar skill levels in a given occupational group, rather than on actual exposure to foreign labor supply. Our findings confirm the important role of education net of socio-economic status and the invalidity of the classical labor market competition hypothesis. However, we also show that economic frameworks and *potential* (rather than actual) labor-market competition cannot be dismissed, and that the highly educated are far from immune to anti-immigrant attitudes when their exit options in the labor market are scarce.

Second, we confirm the important role of skill specificity when understanding economic risk (Finseraas, 2012) and extend it to a new set of attitudes. However, our focus on labor demand (rather than supply) and expected competition challenges the conventional wisdom that high educational investments invariably insulate individuals from labor-market competition, and provides a mechanism to shed light on why risk is an important driver of anti-immigrant attitudes also among highly skilled native workers (Helbling, 2011; Pecoraro and Ruedin, 2015). Our argument is theoretically consistent with a tradition of research in labor economics focusing on occupation-specific investment in human capital as a key determinant of wage inequality and labor-market performance (Becker, 1962). Our results are consistent with a variety of ways to measure specificity and labor demand, including the compartmentalization of occupational groups(Iversen and Soskice, 2001), occupational unemployment(Rehm, 2009), length of tenure in a specific job (Zangelidis, 2008; Kambourov and Manovskii, 2009; Sullivan, 2010), and longitudinal

transition rates across occupations(Shaw, 1987).

Third, we triangulate three different methodological strategies and reach a strong balance between external and internal validity. In the first part of the paper, we provide cross-sectional and over-time evidence of our theory via random cross-classified hierarchical models using the cumulative file of the European Social Survey. We then fit a series of fixed and random-effects models using the German Socio-Economic Panel from 1999 to 2014. This allows us to tighten unit homogeneity and to validate the skill specificity mechanism in a particularly difficult case for our theory, given the high levels of employment protection and focus on vocational training qualifications in the German labor market, which could insulate workers from economic anxieties. Finally, we exploit the implementation of the Hartz policy reforms implemented in Germany between 2003 and 2005, which were intended to reverse unemployment figures and stimulate an increasingly sclerotic labor market at the time. This legislation allowed unemployed workers to access the labor market via private temporary work agencies, non-standard forms of employment, and lower qualification requirements among other work incentives (Eichhorts and Marx, 2015). We use a difference-in-differences design to show that the increase in labor supply was compensated by the fluidity of the labor market, and that unemployed German workers became less rather than more concerned with immigration during the implementation of those reforms.

Classical frameworks of labor-market competition

There is a long tradition of studies on anti-immigrant attitudes (Hainmueller and Hopkins, 2010; Dancygier and Laitin, 2014). The literature has developed along two essential and usually competing paradigms: economic competition and social identity. The economic competition paradigm is loosely integrated in different versions of the so-called *group-conflict* or *realistic group-conflict* theory. Essentially, this theory expects members of the in-group to become more hostile against the out-group when competition

for material scarce resources increases (Meuleman and Billiet, 2009).

Group-conflict theories based more specifically on labor-market competition have their origin in the factor-proportions model (Hainmueller, Hiscox and Margalit, 2015). This closed-economy model expects immigrants to lower the wages of native workers with similar skills. Assuming perfect substitutability between immigrant and native workers, low (resp. high) skilled workers are supposed to fear low (resp. high) skilled workers and to like high (resp. low) skilled workers. Even when relaxing the assumption of perfect substitutability across all occupations, immigration is still expected to lower wages at skill levels where immigrants can substitute natives. Ortega and Polavieja (2015), for instance, find that working in jobs that require high levels of human capital and communication skills insulates local workers from competition, but that the opposite is true in jobs requiring manual skills.

The Heckscher-Ohlin model is another variant of labor-market competition in open economies. The basic prediction of this model is that immigration has negligible effects on wages of local workers, since trade minimizes the effect of immigration as the economy adjusts to changes in labor supply by importing fewer goods that can be produced locally at lower cost (Hainmueller, Hiscox and Margalit, 2015). A yet another variant of the same open-economy model is the 'specific-factors' model, assuming that some factors are employable only in specific industries (Jones, 1971). The main prediction is that wages of high (low)-skilled native workers will rise with inflows of low(high)-skilled immigrants. The model also implies, however, that native workers will fear immigration of the same level of skill, which was the basic prediction of the more basic factor-proportions model.

Despite some theoretical variations, the intuition that labor-market competition matters in inter-ethnic relations has prevailed over quite some time. The empirical literature has developed under the assumption that immigration is usually low-skilled, and shown that low levels of education predict anti-immigrant attitudes (Scheve and Slaughter, 2001; Mayda, 2006).

An important new wave of research on anti-immigrant attitudes, however, has shed serious doubts on classical labor-market competition theories. By exposing individuals to randomized skill levels of immigration, there is no evidence that patterns of competition emerge at similar levels of skill (Hainmueller and Hiscox, 2007, 2010). Recent research has not found either that anti-immigrant sentiment is conditional on specific levels of skill-intensity or reliance on immigrant labor at the industry level. These results seem rather consistent with ethnocentrism and sociotropic considerations about the effects of immigration on the country as a whole as the main triggers of attitudes (Hainmueller, Hiscox and Margalit, 2015). Education and value orientations have emerged as the most robust predictors of preferences over immigration, and have strengthened the interest in social identity as a framework explaining the causes and consequences of anti-immigrant backlash (Sniderman and Hagendoorn, 2007).

Classical forms of labor-market competition are still found in specific occupations exposed to remarkable inflows of high-skilled immigration (Pecoraro and Ruedin, 2015). However, Malhotra, Margalit and Mo (2013) identify these instances of classical labor-market competition as *conditional* on exposure being high and salient, and confirm that the prevalence of native-immigrant economic competition across the whole population is negligible. Along similar lines, Dancygier and Donnelly (2013) find that labor-market competition exists but only when economic conditions deteriorate and in some occupational groups. These findings still suggest that sectoral concerns are not based on how immigration affects one's self-interest, and that are independent of whether worker skill profiles mirror those of immigrants or not.

Skill specificity and potential competition

This section presents our argument, which can be summarized as follows: when individuals develop highly specific occupational skills that are difficult to transfer to other jobs, and when their exit options in the labor market are scarce, they will become more

wary of potential immigrant competitors. The relationship between skill specificity and immigration attitudes should thus be independent from current levels of immigrant competitors (i.e. labor supply), and rather dependent on risks associated with low labor demand. The remainder of the section presents the shortcomings of previous conceptualizations of labor market competition, the assumptions of our theory, and the specific causal mechanisms that we intend to test.

Previous tests of classical labor-market competition have mostly modeled the consequences of increases in labor supply at similar levels of skill for the wages and threat of native workers. However, we believe that this approach suffers from 3 shortcomings. First, it assumes a fixed or undefined level of demand of workers at similar levels of skill. For a constant level of foreign labor supply, an increase in labor demand for both native and foreign workers should increase wage rates since it increases competition among employers who are in need of a suitable workforce.

Second, previous approaches focus on *actual* competition and exposure to immigrant co-workers, rather than on *potential* competition even in the absence of actual immigration inflows. Sociological studies have shown that lower classes have more limited time horizons and are more constrained by short-term financial calculations (O'Rand and Ellis, 1974). It is thus plausible to expect that above certain levels of skill, the time horizon of perceptions of economic threat includes the consequences of eventual rather than actual economic shocks or job losses. This fits into a tradition of research in political economy studies based on preferences for social policy as a function of expected risk and demands for insurance in case of downward income mobility or job loss, which has been mostly ignored in the immigration literature (Cusack, Iversen and Rehm, 2006; Rehm, 2009).

Third, proponents and critiques of classical labor-market competition theory tend to split the labor market into skilled and non-skilled camps. However, our focus on skill transferability highlights the importance of the variation *within* rather than *between* skill levels, especially since differences between educational and skill levels must naturally be confounded by values and cultural preferences (Kitschelt and Rehm, 2014). This pushes

us to take the structure of occupational groups seriously, and to focus on the possibility of skill transferability within occupations.

Our theory builds upon three main assumptions. First, skill specificity is not completely dependent on education and income. The data used in our empirical analyses below suggest that this is a reasonable assumption [2]. Second, there is a significant variation of skill specificity and occupational risk within levels of education, income, and skill [3]. Third, the costs of inter-occupational mobility for workers in highly specific jobs are assumed to be very high. This means that the risks of lack of transferability outlined below are not offset by the possibility of switching to a very different job with similar or lower levels of skill. This is a reasonable assumption if one takes into account previous research showing that the experience accumulated in one job might not be useful in another (Dancygier and Donnelly, 2013), and that skill transferability has been shown to empirically correlate with occupational change (Shaw, 1987).

On the basis of these assumptions, the link between skill specificity and anti-immigrant attitudes should follow two causal nexuses. First, high skill specificity and low availability of jobs in a given occupational group should lead to a subjective sense of job insecurity or perceived difficulty to be re-absorbed by the labor market in case of need. This is so because of a low level of skill transferability, and because one might find it more difficult to compensate high investments in qualifications or human capital outside one's specific job. This expectation is consistent with a tradition of research in labor economics focusing on occupation-specific investments and ignored in the immigration literature.

[2] Table A2 in the Appendix shows that the Pearson bivariate correlations between our baseline measure of skill specificity, occupational unemployment, education, and income are non-significant or small.

[3] Tables A3 to A6 in the Appendix shows comparable means and standard deviations of our variables of interest within categories of education and income in our data. A few examples can illustrate these levels of variation. When focusing on Germany in 2012 (on the basis of the cumulative file of the European Social Survey used below), the minimal value of skill specificity among the very low educated corresponded to housekeeping and restaurant services workers, and to shop salespersons and demonstrators among others. The maximal value of specificity among the low educated corresponded to mineral-ore and stone-processing-plant operators, or metal melters, casters and rolling-mill operators. When focusing on upper-secondary levels of educational qualification only, the lowest levels of specificity are found among travel guides, child-care workers, hairdressers and beauticians, and prison guards among others. By contrast, the highest level of specificity is found in jobs related to machine and plant operation in the wood-processing, chemical-treating, and cement industries among others

Becker (1962)'s original concept of firm-specific human capital has been extended to occupation-specific human capital (Shaw, 1987). According to this perspective, high levels of occupation-specific capital ties workers to their occupations and makes switching them difficult. Occupational specificity has proved to be an important determinant of wage inequality (Kambourov and Manovskii, 2009; Sullivan, 2010). Importantly for our argument, occupational experience is estimated to make a significant contribution to wage growth (Zangelidis, 2008). Therefore, the prospect of switching occupations after the accumulation of experience and occupational capital can also be related to income losses.

As regards the second causal nexus, a subjective sense of difficulties of re-employment in a suitable occupation in case of a shock exacerbates wariness against immigrants that could compete at some point for scarce jobs. This kind of wariness against potential newcomers does not presuppose actual exposure to newcomers, and it is not necessarily equivalent to overt forms of racism, cultural conservatism, or ethnocentric views. The idea of prospective competition can help to account for puzzling patterns of xenophobic attitudes identified among highly skilled citizens (Helbling, 2011). This second nexus is plausible even in jobs and countries with high levels of legal and social employment protection, since current job protection does not mean future job protection. As the new post-2008 austerity agenda has shown, economic shocks, welfare cutbacks, increased dualization, and technological change can increase vulnerability also in traditionally secure and highly qualified occupations (Eichhorts and Marx, 2015).

The link between individual job security and the perception of immigration as an outside threat presupposes some level of saliency of labor immigration in the public debate. This is a plausible scenario if one takes into account the focus of the media and party competition on these issues, and the expansionist immigration policies that Western liberal democracies have adopted at least since the 1980s (Joppke, 1998). This is further emphasized by the narrative of both trade unions and employer associations, which has been essentially positive concerning immigration with different skill levels (Donnelly,

2016), and even in highly protected labor-markets like the German one[4]. Given the focus of the media, immigration policies, trade-unions and business on immigration and labor markets, it is not strange that individuals can frame immigrants as a potential threat without much difficulties, and regardless of how substitutable they actually are.

Cross-national analysis

Data and method

The analysis presented in this section focuses on the external validity of our claims, and relies on cumulative data from the first six rounds of the European Social Survey (ESS). Only countries for which there's information available for all rounds have been included (2002-2012). The ESS includes several questions aiming to tap perceptions on immigration. Three of these questions ask respondents on a 0-10 scale whether (1) immigration is bad or good for the country's economy, (2) the country's cultural life is undermined or enriched by immigrants and, (3) immigrants make the country a worse or better place to live. A Cronbach's alpha reliability coefficient of 0.85 for the three items above indicates that the questions are measuring the same underlying concept or latent variable (i.e. attitudes towards immigration). The high inter-item covariance justifies the creation of an **additive index**, the dependent variable, ranging from 0 to 30, capturing positive/negative attitudes towards immigration. The index has been recoded so that higher values indicate higher anti-immigration attitudes[5].

We measure skill specificity and labor market demand in four different ways. The first two ways are reported in both our cross-sectional and longitudinal sections, and the two latter ways only in the longitudinal section (due to data availability). First, we measure the level of **compartmentalization of occupational tasks within major occupational**

[4] `https://www.wsj.com/articles/germanys-efforts-to-integrate-migrants-into-its-workforce-falter-14 mod=Evernote_wsj`

[5] Table A7.1 in the Appendix shows consistent results if a factor score variable is used as a dependent variable instead.

groups, following the influential approach by Iversen and Soskice (2001). This measure consists of the share of ISCO-88 unit groups over the total number of unit groups in a major occupational cluster, divided by the share of workforce that the major group represents[6]. The intuition behind this measure is the following: higher values mean a high level of task specificity within a major occupational group (high numerator), and a relatively low share of the workforce performing those tasks (low denominator).

The second main variable of interest is **occupational unemployment rates**, which we borrow from Rehm (2009)[7]. Occupational unemployment captures an important dimension of our argument, namely the availability of jobs in a specific occupational group. We interpret higher occupational unemployment rates as lower fluidity in that labor market, and we expect them to be associated with higher levels of wariness towards potential newcomers.

The third way to measure skill specificity is very established in the labor economics literature, and captures occupation-specific work experience (Zangelidis, 2008; Kambourov and Manovskii, 2009; Sullivan, 2010). The specific variable is the occupation-year average of **years spent doing the same job**, calculated from the variable 'When did you start working for your current employer' available in the German Socio-Economic Panel used below. The intuition behind this measure is that the longer a worker has been used to do a specific task in a specific firm, the less likely it is that one can fully transfer that experience to a different job.

The fourth and last measure is the **permanency rate of occupation** *j* between *t-1*

[6]It could still be argued that high values in the numerator of our skill specificity variable do not fully capture lack of skill transferability, since jobs requiring advanced training could allow workers to switch from one unit group to another without much difficulties. In order to deal with this, we follow Iversen and Soskice (2001) and build a second measure, by dividing average skill specialization by ISCO level of skills. We also compute a third variable to deal with the same problem, by dividing the baseline value by the level of individual education of the respondent. The correlations between these three measures are very high (r = 0.86 between 'skill specificity 1' and 'skill specificity 2'; r = 0.71 between 'skill specificity' and 'skill specificity 3'; r = 0.74 between 'skill specificity 2' and 'skill specificity 3'). As shown in Table A7 in the Appendix, the results presented in this section remain unchanged when using these alternative measures of skill specificity.

[7](number of people unemployed in occupation j)/(number of people unemployed in j + number of people employed in j)

and t, adapted from Shaw (1987). More specifically, we calculate transition rates across 2-digit ISCO codes from the previous to the current year using panel data, and retrieve the diagonal matrix as a measure of occupational permanency. Higher values in this measure correspond to higher permanency rates, indicating labor markets with low fluidity where it is difficult to change jobs over time. Once again, this measure requires longitudinal levels of variation and will only be analyzed below in the section using the German Socio-Economic Panel.

We also add a number of control variables [8]: manual worker (Erikson, Goldthorpe and Portocarero, 1979), income, being unemployed, years of education, religiosity, left-right ideology, satisfaction with the government and the national economy, age, and gender. In addition, we include a set of aggregate variables in order to control for specific country characteristics (from the Organisation for Economic Co-operation and Development, OECD)[9]. We control for the share of foreign born population in the country, GDP purchasing power partita per capita (measured in US dollars), and the country's level of unemployment. We also control for the level of employment protection in each country through three variables. On the one hand, we use unemployment expenditure as a percentage of GDP. On the other hand, we include two variables imported from the Employment Protection Legislation dataset compiled by the OECD: 'EPL 1', which captures the strictness of employment protection against individual dismissal, and 'EPL 2', as an indicator of the strictness of regulation on the use of fixed-term and temporary work agency contracts. Higher values in the three latter variables mean more employment protection. All independent variables have been centered to their grand mean in order to obtain meaningful intercepts and intercept variances. Table A8 in the Appendix shows identical substantive results with further individual and country controls, like having a temporary job contract, being a member of a trade union, trade openness, aggregate social spending, and social spending on unemployment benefits.

[8] See Table A1 in Appendix for descriptive statistics.

[9] Since the survey fieldwork in each wave took between 1 and 2 years for each country, we have calculated the average value of the variables in order to obtain comparable information per wave and country. In those cases where the OECD only includes information for one of the fieldwork years, this value has been imputed for the previous or following year.

Our dataset has a multilevel structure with 4 levels of analysis: individuals, occupations, countries, and waves. In order to avoid inefficient estimates and deflated standard errors for the coefficients of variables measured at higher levels of analysis, we use hierarchical linear cross-classified models (Hox, 2010). While individuals are always nested in one single occupation, country and wave, the same occupational groups appear in different countries, and the same country appears in different waves. In order to conservatively identify occupational-levels of variation (ISCO 2-digits), we fix wave and country-level variation, and model occupational-level random intercepts.[10] More specifically, the models reported in this section can be represented as follows:

$$Y_{ikjt} = \alpha + \beta_1 X_{ikjt} + \gamma_1 Z_{kjt} + \theta_1 V_{jt} + \lambda_k + \Sigma\zeta_j d_j + \Sigma\mu_t d_t + \epsilon_{ikjt} \quad (1)$$

Where,

Y_{ikjt} is the level of anti-immigrant attitudes for a given individual i, in occupation k, in country j, in wave t

α is the average level of anti-immigrant attitudes in the sample

X_{ikjt} is a vector of individual-level covariates

Z_{kjt} is a vector of occupational-level covariates

V_{jt} is a vector of country-level covariates

β_1 is the fixed-effect parameter for individual-level covariates

γ_1 is the fixed-effect parameter for occupational-level covariates

θ_1 is the fixed-effect parameter for country-level covariates

λ is the random intercept parameter between occupations

ζ is the random intercept parameter for each country dummy d

μ is the random intercept parameter for each wave dummy d

ϵ_{it} is the individual-level error term

[10] Beyond the usual assumptions of independence between covariates and error terms and normality of residuals, in this modeling strategy it is conventional to assume an identity covariance structure whereby the random variation of wave and country dummies is set to be equal, and the covariance between random effects across levels is set to be 0.

Findings

Table 1 reports 4 model specifications with anti-immigrant attitudes as the dependent variable. The first two models show the effects of our skill specificity and occupational unemployment variables including only pre-treatment controls. The last two models show the effects of the same variables, but adding the full set of controls. As shown in all model specifications, specificity and occupational unemployment have robust and significant effects (at the 99% confidence level) in the expected anti-immigrant direction[11]. Social class does not have significant effects, but income and education do in the expected direction: having lower levels of income and education is associated with higher anti-immigrant attitudes.

[Table 1 here]

In order to conservatively compare effect magnitudes, we simulated 10,000 random draws of the coefficients obtained in the fully specified models in Table 1[12]. We then saved the averages and the 95% confidence intervals of the resulting distribution. On the basis of these simulations, Figures 1a and 1b[13] depict the change in anti-immigrant attitudes (Y axis) when switching from a minimal to a maximal level of skill specificity, occupational unemployment, social class, income, and education (X axis)[14]. Consistently with recent research casting doubts on classical labor-market competition theories, the effect magnitudes of social class and income net of education are negligible. By contrast, the effect of education reducing anti-immigrant attitudes is strong and significant. The strong effect of education even after controlling for class, income, and skill specificity suggests that education is indeed capturing attributes not necessarily related to positions

[11]Table A9 in the Appendix tests the effect of occupational unemployment in a very conservative specification with country-occupational random effects.

[12]Using the *drawnorm* routines in Stata 14.

[13]Figures produced using Bischof (2017)'s graph schemes for Stata.

[14]Figures 5 and 6 in the Appendix show the standardized coefficients of our variables of interest to rule out the possibility that Figure 1 is capitalizing on extreme values

in the labor market. More relevant to our theory, however, is that the effect of skill specificity increasing anti-immigrant attitudes is always very strong and significant even after including all our controls. The magnitude of the effect of our specificity variable is comparable to education in the complete opposite direction. The effect of occupational unemployment rates is smaller than that of skill specificity and education, but more than twice larger than the effect of social class and income. Even if the individual-level mechanism behind these findings is only unpacked in the next section, the ESS dataset allows us to rule out the possibility that skill specificity and occupational unemployment are only triggering negative perceptions of the national economy and operating through sociotropic mechanisms. Table A10 in the Appendix shows negligible or null effects of our variables of interest on sociotropic economic satisfaction.

[Figures 1a and 1b here.]

In order to rule out that the average effects of specificity and job availability are only driven by very specific socio-economic strata, we added interactions with education and income. As shown in Figures 2a and 2b, the confidence intervals of the effects of our variables of interest overlap across all values of education, revealing an insignificant interaction effect[15]. If anything, the marginal effect of skill specificity is statistically distinct from zero as education increases. However, the slope of the interaction is still insignificant. Figures 3a, and 3b show that the marginal effects of our variables of interest are also constant across the whole income continuum. These interactions suggest that the effects of skill specificity and occupational demand are prevalent across the population, and that higher levels of education or income are not immune to the labor-market mechanism tested here.

[Figures 2a and 2b here.]

[Figures 3a and 3b here.]

[15]Figures 1 and 2 in the Appendix show identical marginal effects across levels of education, but dropping the few individuals who reported more than 30 years of education to avoid capitalizing on measurement error and outliers

Figures 4a and 4b report the interactions between our variables of interest and the share of immigrants present in a given occupational group (measured by ISCO groups in 2 digits). Interestingly, the interactions are once again insignificant, suggesting that skill specificity and occupational unemployment have the expected effects regardless of how many migrants there are in different occupations [16]. If anything, prospective labor market anxieties driving anti-immigrant attitudes are different from zero in occupations with fewer migrants, but the slope of the interaction is far from reaching statistical significance.

[Figures 4a and 4b here.]

[16] Figures 3 and 4 in the Appendix show equally insignificant effects across inter-wave changes in occupational migrant composition.

Longitudinal analysis

Data and method

Our second set of analysis focuses on internal validity and aims to narrow down the causal mechanisms behind the relationships described in the previous section. We use individual panel data from the core module of the German Socio-Economic Panel (GSOEP), consisting of 16 waves (yearly surveys from 1999 to 2014). We see Germany as a crucial case study particularly difficult for our theory. Germany is a canonical example of a highly regulated labor market, with high levels of social and legal employment protection, and a strong focus on vocational training programs as means to access highly specialized occupations. This level of protection theoretically insulating native workers from foreign competition is a strong rival mechanism to our theory.

The GSOEP is a high quality dataset particularly suited for our purposes for two reasons. First, it tracks the same individuals over time and therefore allows us to get rid of all time-invariant unobserved factors that may be driving both the selection into some occupations and anti-immigrant attitudes. Tables B5 and B6 in the Appendix replicate the models presented in this section with occupational fixed-effects capturing the effect of further unobserved confounders at the job level, and show that our results remain consistent if ISCO group dummies are included in the models.

Second, the GSOEP has items capturing subjective perceived difficulties of job scarcity finding an appropriate job in case of need, which is the key intermediate variable connecting specificity with anti-immigrant concern according to our hypothesized mechanism. We will first test whether the ISCO-based specificity and job availability measures used above really translate into more subjective perceptions of job scarcity, and whether these perceptions are in turn related to more anti-immigrant concern.

The dependent variable is based on the following question: 'How concerned are you about '**Immigration to Germany**'?', with three potential answer categories: 'Very

concerned', 'Somewhat concerned', 'Not concerned at all'. Responses have been coded '1' if respondents are 'Very concerned' and '0' otherwise[17]. This specific item has been validated as a proxy for anti-immigrant concern before (Lancee and Pardos-Prado, 2013). The robustness and direction of the effects of well-known determinants of anti-immigrant attitudes clearly suggest at face value that our dependent variable captures negativity towards immigration.

We account for the perceived **difficulty of finding a new job** as follows: 'If you were currently looking for a new job: Is it or would it be easy, difficult, or almost impossible to find an appropriate position?'. The variable has been coded '1' for 'almost impossible' and '0' otherwise. We include exactly the same variables for **skill specificity** and **occupational unemployment** used in the previous section. We also add two further measures of skill specificity described above but only available in the German panel: **length of tenure** in the same job (as a proxy for occupational-specific experience and investment), and **permanency rates of occupations over time** (i.e. the diagonal of a transition matrix of occupations from t-1 to t, as a proxy for low fluidity or high task specificity). As discussed above, all these measures have been validated in previous influential research in political science and economics as reliable proxies for skill specificity and occupational human capital. Despite the different aspects of labor market dynamics captured by these measures, the models below show that they all consistently predict subjective difficulties of finding a new job in case of need, and therefore plausibly capture low levels of occupational transferability.

We include controls for manual worker, income, unemployed, religiosity, having a temporary work contract, gender, age, years of education, and the share of immigrants working in the same occupational group. We implement a series of logit fixed-effects and random-effects models predicting perceived difficulty of finding an appropriate job, and anti-immigrant concern. Fixed-effects models allow us to get rid of time-invariant confounders by de-meaning all the variables to their person-specific mean, but reduce

[17]Tables B11 and B12 in the Appendix show identical substantive results if a linear specification of our dependent variables is used.

statistical power and increase the chances of committing Type II errors. The opposite could be said of random-effects models, which borrow strength from individual and time levels of variation but are more vulnerable to time-invariant unobserved confounders (Bell and Jones, 2015). We rely on both modeling strategies in order to maximize their advantages, and report substantively similar findings. For space reasons, fixed-effects models are presented below and random-effects models in Tables B8 and B9 in the Appendix. Table B15 shows a number of Hausman specification tests showing that fixed-effects are preferred over random-effects models. Table B4 shows identical results if a hybrid longitudinal form is used, simultaneously combining the intra-individual de-meaned variable of interest (fixed effect) with the individual average of that same variable (random effect).

Findings

Table 2 reports a number of fully-specified fixed-effects models predicting perceived difficulties of finding an appropriate job with the four alternative ways of measuring skill specificity described above. As expected, a unit of increase in occupational compartmentalization (95% significance), occupational unemployment (95%) , individual job tenure (95%), and occupational permanency rates (90%) increases the log odds of perceiving difficulties to find a new suitable job in case of need. Income and our four measures of skill specificity and labor-market demand are significantly and positively associated with perceived difficulties to find a job in case of need. By contrast, educational levels and belonging to the working class *reduce* the probability to perceive difficulties in the labor-market. This result highlights once again that skill specificity does not necessarily mirror the effects of education. The highly educated feel significantly more confident to find jobs than the highly specific in a given occupation with fewer exit options in the job market[18].

[18]Similarly to the ESS analyses above, the interactions between education and skill specificity predicting our dependent variables of interest are not statistically significant at conventional levels. See Tables B13-B14 and Figures 7-8 in the Appendix.

[Table 2 here.]

Table 3 replicates similar models, but including perceived difficulties to find a suitable job as the main independent variable and anti-immigrant concern as the dependent variable. As shown in all model specifications, perceptions of scarcity of options in the labor market have robust, positive, and highly significant effects on anti-immigrant concern. Interestingly, it is precisely when including subjective perceptions of job availability when the effect of our skill specificity, length of tenure, and transitional rate variables become insignificant[19]. This suggests that subjective perceptions of limited exit options in the labor market mediate the effect of the latter skill specificity variables on anti-immigrant concern. The significance of the coefficient of occupational unemployment does not completely vanish when including perceived difficulties to find a job in the model, but the reduction of the coefficient from Table 2 is statistically significant ($Z > 2$; $p < 95\%$)[20].

[Table 3 here.]

[Figures 5a to 5d here]

Figures 5a to 5d show the Average Marginal Effects (AMEs) of the variables of interest on the basis of the models obtained in Table 2 and Table B9. For each variable of interest, we plot the AMEs predicting perceived difficulties to find a job in case of need (left panel) and anti-immigrant concern (right panel). When looking at the models predicting subjective difficulties of finding a new job in case of need, the magnitude of education is comparable to skill specificity and transitional rates, and bigger than occupational unemployment and length of tenure. However, the AMEs of education are less precisely estimated than skill specificity in three of our four model specifications.

When looking at the fixed-effects models predicting anti-immigrant concern, lower levels

[19]Table B10 in the Appendix shows that the effects of temporary contract increase anti-immigrant concern only in occupations with low transferability and labor-market fluidity (with positive and significant interactions with length of tenure and permanency rates).

[20]Table B7 in the Appendix presents a number of structural equations models confirming significant indirect effects of skill specificity on anti-immigrant concern via difficulties to find a new job

of education as such never appear to be a significant predictor of anti-immigrant concern in the fixed-effects models reported here. Education is only robust and significant in random-effects models reported in Table B9 in the Appendix. This suggests that the strong effects of education could capitalize mostly on differences between individuals driving them to different educational paths, or that are completely mediated by (increased) confidence in prospective job market relocation. While Figures 5a to 5d reflect statistically insignificant effects of education, they also show consistently positive and significant effects of perceived difficulties to find suitable options in the labor market on anti-immigrant concern [21].

Difference-in-differences

Finally, in order to identify more local causal effects, we exploit a liberalisation shock in the German labor-market that took place in the early 2000s as a response from the red-green coalition led by Gerhard Schroeder to stagnating employment figures and increasing electoral pressure. More specifically, we focus on the reforms implemented between 2003 and 2005 that were generally known as the Hartz reforms. The Hartz reforms have been considered as 'the biggest change in German labor-market policy in a generation' (Tompson, 2009, p. 225), and consisted of a set of four legal packages designed to increase the incentives of the unemployed to try to find jobs as quickly as possible. The different reforms were implemented in stages between December 2002 and January 2005 through the 'Laws for Reform of the Job Market' federal laws (popularly known as Hartz I to IV) (Gaskarth, 2014, p. 15).

The Hartz I reforms established the so-called 'Personnel-Service Agencies' all over Germany, which liberalized temporary agency work (Spermann, 2011). This de-regulation of access to the labor market exponentially increased non-standard forms of employment and relaxed the educational qualifications and mandatory apprenticeships that were

[21] Tables B2 and B3 in the Appendix show that the models presented in this section are consistent if further alternative measures of occupational compartmentalization (weighted by occupational level of skill and education) are used (Iversen and Soskice, 2001).

previously required in some sectors (Eichhorts and Marx, 2015). This was combined with stricter rules for taking up 'reasonable' employment and the introduction of training vouchers. Hartz II complemented the reform with the provision of new benefits for business start-ups, and incentivized minor employment relationships that were short-term and had less worker protection to encourage employers to hire ('mini-jobs' and 'midi-jobs') (Gaskarth, 2014, p. 16). Hartz III focused on measures to foster the reintegration of the unemployed and introduced some changes in the rules governing partial retirement. Finally, Hartz IV restructured unemployment benefits (Tompson, 2009). Even if adopted relatively smoothly, the reform laws subsequently generated a backlash partly due to an improvement of the employment situation, and to the unpopularity of some benefit cuts. 'Unemployment continued to increase between 2003 and 2005 while the reforms were introduced (...) before declining in each subsequent year' from 2006 (Gaskarth, 2014, p. 39) onwards. 'The improvement in fiscal and labor-market performance after 2005 reduced the sense of urgency about reform, while the rise of the new Left Party on a strongly anti-Hartz platform and intensifying electoral competition increased the incentives to restore benefits and relax some of the most rigorous elements of the reform' (Tompson, 2009, p. 235). By 2006, some of the flagship policies like the 'Personnel-Service Agencies' had completely disappeared, and some welfare benefits restored.

We exploit the political saliency of these changes in labor-market regulations in the middle of our time span by analyzing anti-immigrant concerns of unemployed workers before and after the implementation of the reforms. We interpret the Hartz reforms as a policy package incentivising job demand, lowering legal and educational bars to access less regulated employment, and incentivizing transferability within and across occupations. We should therefore expect the target of this policy (i.e. the unemployed) to be associated with *decreased* (rather than increased) anti-immigrant concerns. Our treatment variable is a dummy where the value 1 corresponds to unemployed workers in the years 2003-2005. The value 0 includes unemployed workers outside the time span of the policy implementation, and employed workers. Table 4 reports linear difference in differences models predicting

anti-immigrant concern with individual fixed effects, year fixed effects, and standard errors clustered at the individual level.

[Table 4 here.]

The first model in Table 4 is implemented in the whole sample, and the treatment is, as expected, negative and significant (p = 0.057). In theory, however, this effect should be especially driven by unemployed individuals previously employed in occupations with high levels of skill specificity and low transferability. The second model just uses the subsample of individuals in occupations above the average in our first measure of skill specificity. According to our expectations the treatment is still negative and more highly significant (p = 0.027). By contrast, when running the same model in the sub-sample with values below the mean in the skill specificity distribution, the treatment keeps the expected sign but fails to reach statistical significance at conventional levels.

This finding is consistent with the idea that a policy shock intended to increase labor-market demand was particularly consequential for unemployed workers in occupational groups with low skill transferability, and independently from a wide range of individual and time-varying confounders. Columns 4 to 9 in Table 4 replicate the same analysis using the subsample of individuals with high and low occupational risk, length of tenure, and occupational permanency rates respectively (above and below the mean values of the respective measures of specificity and demand). Strikingly, the policy treatment is always negative and highly significant among the unemployed who were previously working in occupations with high risk or low transferability ($p < 0.05$), but insignificant in labor-markets with more fluidity and availability of jobs.

Table 5 shows a number of models isolating the mechanism behind the Hartz reforms from other possible effects related to welfare benefits or dualization. The upper panel of the table predicts the probability of finding a 'mini' or 'midi-job' (part-time and non-standard jobs introduced by the Hartz package) among unemployed individuals at t-1. More specifically the dependent variable gets the value 1 if the respondent states to

be employed in a mini or midi-job during 2003-2005, but was unemployed at t-1. Everyone else gets the value 0. The lower panel of Table 5 reports a different set of models where the dependent variable gets the value 1 if respondents would find it very difficult to find a job in case of need (exactly as in the models above) and found a 'mini' or 'midi-job' job during the Hartz reforms, and 0 everyone else. The results indicate that unemployed individuals at t-1 in our sample were more likely to find a part-time job during the implementation of the Hartz reforms (first column, upper panel), exactly as intended by the policy package. Moreover, those previously unemployed respondents who got a part-time job between 2003 and 2005 became less concerned about their job prospects (first column, lower panel)[22].

[Table 5 here.]

Figure 9 in the Appendix reflects parallel trends of treatment and control groups before the policy implementation. Table C1 shows some placebo analyses interacting the unemployed with the years before and after the implementation of the policy at stake (2002 and 2006). The effect of the treatment is in both cases positive (indicating higher and not lower anti-immigrant attitudes among the unemployed, as conventionally expected) and insignificant. Table C1 also shows insignificant differences between treated and control groups when interacted with each pre-treatment period, thus reinforcing the plausibility of the parallel trends assumption. We also replicate our results using Abadie (2005)'s semi-parametric difference-in-differences estimator. This technique consists of weighting the trend for the untreated respondents based on their propensity to select into the treatment, in order to give more weight to untreated respondents who were highly likely to get treated and to make the parallel trends assumption more realistic. This score is

[22]Tables C2 and C3 in the Appendix rule out the possibility that the effects of the Hartz reforms are due to increased levels of dualization, and that labor-market insiders reduced their attachment to the center-left party implementing those reforms and felt increasingly sympathetic to center-right parties and anti-immigrant narratives. The treatment variable is coded 1 if the respondent is an insider (employed with permanent contract) during the implementation of the Hartz reforms, and 0 if the respondent is an outsider (unemployed or employed with a temporary contract). The dependent variables in Table C2 are leaning towards SPD (dummy) and strength of that leaning (linear). The dependent variables in Table C3 are leaning towards CDU-CSU (dummy) and strength of that leaning (linear). The treatment is generally far from reaching statistical significance, either on average or for occupations with values above average in all our skill specificity variables.

calculated on the basis of a fourth polynomial series of the following observable predictors: skill specificity, occupational unemployment, education, income, age, gender, social class, and having a temporary contract. According to Abadie's method, the average treatment effect on the treated is negative and highly significant (b=-0.38; SE=0.04; p=0.000).

Conclusions

Anti-immigrant attitudes and parties are experiencing a new and to some extent unprecedented upsurge in the post-WWII world. The spread of anti-immigrant narratives reshaping established party systems and public debates is broad enough these days, and unlikely to be rooted in a single socio-demographic group. Despite the appeal of classical labor-market competition theories, the effects of increases in labor supply at similar levels of skill have proved to be negligible on average, and conditional on specific situations of economic downturn and immigrant exposure (Dancygier and Donnelly, 2013). The consensus in recent literature is that education, identity, and sociotropic considerations disconnected from self-interest are the main drivers of anti-immigrant attitudes, and that natives tend to be less favorable to culturally dissimilar migrants (Margalit, 2012; Hainmueller and Hangartner, 2013; Hainmueller and Hopkins, 2010; Helbling and Traunmuller, 2016).

Our analyses confirm that education (net of skill, income, and social class effects) is a strong driver of anti-immigrant attitudes, and that classical labor-market competition theory is empirically weak. However, by focusing on changes in labor demand rather than labor supply, our analyses reveal strong, widespread, and consistent effects of labor-market positions on anti-immigrant attitudes. Low levels of skill transferability and high levels of job scarcity seem to increase subjective perceptions of job insecurity and anti-immigrant concern. More importantly, these effects are consistent across all levels of education, income, and immigrant exposure, and robust to the inclusion of levels of employment legal protection, unemployment social expenditure, and occupation fixed-effects. This

finding is particularly relevant to explain cross-class mechanisms behind anti-immigrant backlash that are not exclusive of a single income or educational group. The implication, then, is that policy-makers can reduce anti-immigrant backlash with policies stimulating labor-market demand, even when there is an increase in foreign labor supply.

The effects of skill specificity and occupational unemployment are consistent when using hierarchical cross-classified models using the ESS cumulative file over a decade, and when using fixed and random-effects models with the German Socio-Economic Panel, which constitutes a particularly difficult case of high employment protection for our theory. In fact, the effects of education on anti-immigrant concern prove to be insignificant when removing all possible time-invariant individual differences with person fixed-effects. By contrast, our four skill specificity and labor-market demand variables had consistent effects on anti-immigrant concern. Our longitudinal analysis allows us to narrow down the causal path by showing that our variables of interest are consistent drivers of perceptions of difficulties of finding a similar job in case of need, and that those perceptions are in turn related to anti-immigrant concern. The causal effects of job availability become particularly plausible in our difference-in-differences models, when unemployed individuals previously working in highly specific occupations became less (rather than more) concerned with immigration when a set of policies incentivizing employment and smoothing the legal and educational thresholds to access standard and non-standard jobs (the Hartz reforms) were implemented in the early 2000s.

Our theory fits into soft rational choice frameworks of analysis, since the mechanism is based on self-interest but does not require high levels of sophistication. Anti-immigrant attitudes can rationally respond to perceptions of potential competition with migrants, even if the degree of actual substitutability by migrants is misperceived. Importantly, our theory is independent from frameworks based on values and ideological perceptual screens, since it proves valid across a number of educational and socio-demographic profiles. Our findings thus do not allow us to rule out labor-market positions to explain rising levels of anti-immigrant concern in post-industrial democracies. Labor-market anxieties, however,

are related to labor-market fluidity and potential risks, and independent from the actual exposure to foreign labor.

References

Abadie, Alberto. 2005. "Semiparametric difference-in-differences estimators." *Review of Economic Studies* 72(1):1–19.

Arzheimer, Kai. 2009. "Contextual Factors and the Extreme Right Vote in Western Europe, 1980-2002." *American Journal of Political Science* 53(2):259–275.

Becker, Gary S. 1962. "Investment n Human Capital: a Theoretical Analysis." *Journal of Political Economy* 70(5):9–49.

Bell, Andrew and Kelvyn Jones. 2015. "Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data." *Political Science Research and Methods* 3(1):133–153.

Bischof, Daniel. 2017. "New Graphic Schemes for Stata: plotplain and plottig." *The Stata Journal* 17(3):748–759.

Cusack, Thomas, Torben Iversen and Philipp Rehm. 2006. "Risks at work: the demand and supply sides of government redistribution." *Oxford Review of Economic Policy* 22(3).

Dancygier, Rafaela M. and David D. Laitin. 2014. "Immigration Into Europe: Economic Discrimination, Violence, and Public Policy." *Annual Review of Political Science* 17(1):43–64.

Dancygier, Rafaela M. and Michael J. Donnelly. 2013. "Sectoral Economies, Economic Contexts, and Attitudes toward Immigration." *The Journal of Politics* 75(1):17–35.

Donnelly, Michael. 2016. "Competition and solidarity: union members and immigration in Europe." *West European Politics* 39(4):688–709.

Eichhorts, Werner and Paul Marx. 2015. *Non-Standard Employment in Post-Industrial Labour Markets*. Edward Elgar.

Erikson, Robert, John H Goldthorpe and Lucienne Portocarero. 1979. "Intergenerational class mobility in three Western European societies: England, France and Sweden." *The British Journal of Sociology* 30(4):415–441.

Finseraas, Henning. 2012. "Poverty, ethnic minorities among the poor, and preferences for redistribution in European regions." *Journal of European Social Policy* 22(2):164–180.

Gaskarth, Glyn. 2014. The Hartz Reforms. Technical report Centre for Policy Studies. **URL:** *https://www.cps.org.uk/files/reports/original/141024133732-TheHartzReforms.pdf*

Hainmueller, Jens and Daniel J. Hopkins. 2010. "Public Attitudes Toward Immigration." *Annual Review of Political Science* 17:225–49.

Hainmueller, Jens and Dominik Hangartner. 2013. "Who Gets a Swiss Passport? A Natural Experiment in Immigrant Discrimination." *American Political Science Review* 107(1):159–187.

Hainmueller, Jens and Michael J. Hiscox. 2007. "Educated Preferences: Explaining Attitudes Toward Immigration in Europe." *International Organization* 61(2):399–422.

Hainmueller, Jens and Michael J. Hiscox. 2010. "Attitudes toward Highly Skilled and Low-skilled Immigration: Evidence from a Survey Experiment." *American Political Science Review* 104:61–84.

Hainmueller, Jens, Michael J. Hiscox and Yotam Margalit. 2015. "Do concerns about labor market competition shape attitudes toward immigration? New evidence." *Journal of International Economics* 97:193–207.

Helbling, Marc. 2011. "Why Swiss-Germans dislike Germans. Opposition to culturally similar and highly skilled immigrants." *European Societies* 13(1):5–27.

Helbling, Marc and Richard Traunmuller. 2016. "How State Support for Religion Shapes Attitudes Toward Muslim Immigrants." *Comparative Political Studies* 49(3):391–424.

Hox, Joop J. 2010. *Multilevel Analysis. Techniques and Applications.* New York: Routledge.

Iversen, Torben and David Soskice. 2001. "An asset theory of social policy preferences." *American Political Science Review* 95(4):875–894.

Jones, R.W. 1971. "A Three-Factor Model in Theory, Trade, and History." *Trade, Balance of Payments, and Growth* pp. 3–21.

Joppke, Christian. 1998. "Why Liberal States Accept Unwanted Immigration." *World Politics* 50:266–293.

Kambourov, Gueorgui and Iourii Manovskii. 2009. "Occupational Mobility and Wage Inequality." *Review of Economic Studies* 76:731–759.

Kitschelt, Herbert and Philipp Rehm. 2014. "Occupations as a Site of Political Preference Formation." *Comparative Political Studies* 47(2):1670–1706.

Lancee, Bram and Sergi Pardos-Prado. 2013. "Group Conflict Theory in a Longitudinal Perspective: Analyzing the Dynamic Side of Ethnic Competition." *International Migration Review* 47:106–131.

Malhotra, Neil, Yotam Margalit and Cecilia Hyunjung Mo. 2013. "Economic Explanations for Opposition to Immigration: Distinguishing between Prevalence and Conditional Impact." *American Journal of Political Science* 57(2):391–410.

Margalit, Yotam. 2012. "Lost in Globalization: International Economic Integration and the Sources of Popular Discontent." *International Studies Quarterly* 56:484–500.

Mayda, Anna Maria. 2006. "Who is Against Immigration? A Cross-Country Investigation of Individual Attitudes toward Immigrants." *Review of Economics and Statistics* 88(3):510–530.

Meuleman, B., E. Davidov and J. Billiet. 2009. "Changing attitudes toward immigration in Europe, 2002-2007: a dynamic group conflict approach." *Social Science Research* 38(2):352–365.

O'Rand, Angela and Robert A. Ellis. 1974. "Social Class and Social Time Perspective." *Social Forces* 53(1):53–62.

Ortega, Francesc and Javier G. Polavieja. 2015. "Labor-market exposure as a determinant of attitudes toward immigration." *Labour Economics* 19:298–311.

Pecoraro, Marco and Didier Ruedin. 2015. "A Foreigner Who Does not Steal My Job: The Role of Unemployment Risk and Values in Attitudes toward Equal Opportunities." *International Migration Review* (1-53).

Rehm, Philipp. 2009. "Risks and Redistribution. An Individual-Level Analysis." *Comparative Political Studies* 42(7):855–881.

Scheve, Kenneth F. and Matthew J. Slaughter. 2001. "Labor Market Competition and Individual Preferences over Immigration Policy." *The Review of Economics and Statistics* 83(1):133–145.

Shaw, Kathryn L. 1987. "Occupational Change, Employer Change, and the Transferability of Skills." *Southern Economic Journal* 53(3):702–719.

Sniderman, P. L. and L. Hagendoorn. 2007. *When Ways of Life Collide: Multiculturalism and Its Discontents in the Netherlands*. Princeton: Princeton University Press.

Spermann, Alexander. 2011. The New Role of Temporary Agency Work in Germany. Technical report Institut for the Study of Labor.
URL: *https://d-nb.info/1018664084/34*

Sullivan, Paul. 2010. "Empirical Evidence on Occupation and Industry Specific Human Capital." *Labor Economics* 17(3):567–580.

Tompson, William. 2009. The Political Economy of Reform. Lessons from Pensions, Product Markets and Labour Markets in Ten OECD Countries. Technical report OECD.
URL: *http://www.oecd.org/site/sgemrh/46190166.pdf*

Zangelidis, Alexandros. 2008. "Occupational and Industry Specificity of Human Capital in the British Labour Market." *Scottish Journal of Political Economy* 55(4):420–443.

Tables

Table 1: **Cross-classified models predicting anti-immigrant attitudes with skill specificity**

	Model 1	Model 2	Model 3	Model 4
Skill specificity	0.646***		0.652***	
	(0.14)		(0.12)	
Occupational unemployment		0.243***		0.174***
		(0.02)		(0.02)
Education	-0.362***	-0.347***	-0.325***	-0.312***
	(0.01)	(0.02)	(0.01)	(0.01)
Religiosity	-0.158***	-0.155***	-0.157***	-0.156***
	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.024***	0.026***	0.019***	0.021***
	(0.00)	(0.00)	(0.00)	(0.00)
Male	0.515***	0.411***	0.344***	0.254**
	(0.12)	(0.11)	(0.11)	(0.11)
Manual worker			0.289	-0.140
			(0.32)	(0.31)
Income			-0.187***	-0.172***
			(0.02)	(0.02)
Unemployed			0.019	-0.048
			(0.20)	(0.20)
Left-right			0.660***	0.654***
			(0.03)	(0.03)
Government satisfaction			-0.155***	-0.151***
			(0.03)	(0.03)
Economic satisfaction			-0.443***	-0.437***
			(0.03)	(0.03)
Occupational migrant share	-0.006	-0.012	-0.011	-0.014*
	(0.01)	(0.01)	(0.01)	(0.01)
Country Foreign born	-1.844	-1.710	-3.657***	-3.516***
	(1.26)	(1.14)	(0.42)	(0.42)
Country GDP (log)	0.818**	0.749**	0.963***	0.937***
	(0.37)	(0.34)	(0.18)	(0.18)
Country unemployment	0.723***	0.449*	0.698***	0.518***
	(0.27)	(0.25)	(0.10)	(0.11)
Employment Legislation 1	-42.686*	-38.461*	-0.387	-1.122
	(25.00)	(23.10)	(9.41)	(9.40)
Employment Legislation 2	-88.255***	-80.326***	-52.609***	-51.613***
	(25.39)	(24.09)	(11.90)	(11.89)
Unemployment social spending (log)	0.330	0.672	-1.359**	-1.097**
	(1.39)	(1.27)	(0.56)	(0.56)
Intercept	-65.624***	-65.060***	-41.796***	-43.417***
	(16.05)	(15.05)	(7.89)	(7.89)
Wave intercept variance	0.095	0.076	0.00	0.00
	(0.13)	(0.13)	(0)	(0)
Country intercept variance	0.00	0.00	0.00	0.00
	(0)	(0)	(0)	(0)
Occupation intercept variance	1.550***	0.841***	0.891***	0.590
	(0.24)	(0.16)	(0.17)	(0)
Individual intercept variance	31.004***	31.060***	28.675***	28.732
	(0.39)	(0.39)	(0.36)	(0)
N individuals	13212	13212	13212	13212
N occupations	413	413	413	413
N waves	5	5	5	5
N countries	13	13	13	13
Log Likelihood	-41580	-41546	-41023	-41010
BIC	83321.9	83253.3	82264.2	82200.6

Standard errors in parenthesis. Significance level * p<0.1, ** p<0.05, *** p<0.01

Table 2: **Fixed-effects models predicting difficulty to find an appropriate job**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Skill specificity	0.167***			
	(0.05)			
Occupational unemployment		0.087***		
		(0.01)		
Tenure			0.019***	
			(0.01)	
Transition				0.283*
				(0.17)
Income	0.108***	0.126***	0.106***	0.115***
	(0.03)	(0.03)	(0.03)	(0.03)
Manual worker	-0.214***	-0.536***	-0.134*	-0.147**
	(0.07)	(0.08)	(0.07)	(0.07)
Unemployed	-0.048	0.041	-0.048	-0.028
	(0.15)	(0.15)	(0.15)	(0.15)
Age	0.130***	0.144***	0.128***	0.133***
	(0.00)	(0.01)	(0.00)	(0.01)
Church attendance	-0.092	-0.078	-0.075	-0.119
	(0.23)	(0.24)	(0.23)	(0.24)
Temporary contract	0.061	0.058	0.072	0.035
	(0.07)	(0.07)	(0.07)	(0.07)
Education	-0.228***	-0.201***	-0.229***	-0.291***
	(0.05)	(0.05)	(0.05)	(0.05)
Occupational migrant share	0.002**	0.001	0.001	0.001*
	(0.00)	(0.00)	(0.00)	(0.00)
N observations	20014	20014	20014	19554
N individuals	4528	4528	4528	4469
Log Likelihood	-7061	-7011	-7064	-6917
BIC	14211.7	14110.6	14217.5	13922.6

Standard errors in parenthesis. Significance level * p<0.1, ** p<0.05, *** p<0.01

Table 3: **Fixed-effects models predicting immigration concern**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Difficulty new job	0.277***	0.256***	0.277***	0.279***
	(0.05)	(0.05)	(0.05)	(0.05)
Skill specificity	0.039			
	(0.04)			
Occupational unemployment		0.062***		
		(0.01)		
Tenure			0.005	
			(0.01)	
Transition				-0.192
				(0.14)
Income	0.024	0.037	0.024	0.029
	(0.02)	(0.02)	(0.02)	(0.02)
Manual worker	0.088	-0.149**	0.105**	0.103*
	(0.05)	(0.06)	(0.05)	(0.05)
Unemployed	-0.130	-0.067	-0.131	-0.123
	(0.13)	(0.13)	(0.13)	(0.13)
Age	-0.040***	-0.032***	-0.040***	-0.041***
	(0.00)	(0.00)	(0.00)	(0.00)
Church attendance	-0.315	-0.307	-0.311	-0.309
	(0.20)	(0.20)	(0.20)	(0.20)
Temporary contract	0.065	0.063	0.067	0.088*
	(0.05)	(0.05)	(0.05)	(0.05)
Education	-0.034	-0.019	-0.034	-0.019
	(0.03)	(0.03)	(0.03)	(0.04)
Occupational migrant share	-0.001	-0.001**	-0.001*	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)
N observations	28061	28061	28061	27178
N individuals	6296	6296	6296	6171
Log Likelihood	-10636	-10590	-10636	-10283
BIC	21374.3	21282.5	21374.7	20668.4

Standard errors in parenthesis. Significance level * p<0.1, ** $p < 0.05$, *** $p < 0.01$

Table 4: **Difference in differences predicting anti-immigrant concern (1999-2014)**

	Whole sample	High skill specificity	Low skill specificity	High occupational unemployment	Low occupational unemployment	High Tenure	Low Tenure	High Transition	Low Transition
Treated	-0.019*	-0.023**	0.01	-0.02*	-0.042	-0.044***	-0.001	-0.024**	0.05
	(0.01)	(0.01)	(0.04)	(0.01)	(0.04)	(0.02)	(0.01)	-0.01)	(0.04)
Individual fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Intercept	2.094***	2.106***	1.910***	2.117***	1.856***	2.083***	2.032***	2.097***	1.906***
	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
N **N observations**	346674	298546	48128	298792	47882	207734	138940	303095	43579
N individuals	61778	60149	20881	59774	20106	56904	45284	60688	20325
Log Likelihood	-235854	-200953	-21360	-202368	-20413	-128047	-81844	-202895	-19281
BIC	471913	402106.8	42881	404937.4	40987.3	256289.4	163865	405992.8	38712.3

Standard errors in parenthesis. Significance level * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

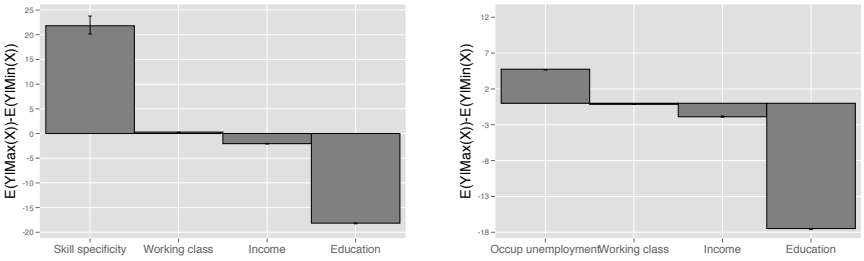
Table 5: **Difference in differences predicting (1) probability of finding a mini-job during Hartz and (2) difficulty of finding a new job for unemployed who got a mini-job during Hartz**

	Whole sample	High skill specificity	Low skill specificity	High occupational unemployment	Low occupational unemployment	High Tenure	Low Tenure	High Transition	Low Transition
(1)									
Unemployed Hartz	0.072***	0.085***	0.139*	0.073***	0.066	0.071	0.081**	0.080***	0.185*
	(0.03)	(0.03)	(0.08)	(0.03)	(0.12)	(0.05)	(0.04)	(0.03)	(0.11)
Individual fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Intercept	0.455***	0.458***	0.460***	0.506***	0.277***	0.436***	0.496***	0.459***	0.453***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)	(0.02)
N observations	41457	28606	12851	32977	8480	22012	19445	31829	9628
N individuals	14545	13678	6971	13793	4972	11512	9779	13819	5912
Log Likelihood	-139	2733	2510	1063	2787	4752	1555	2128	2345
BIC	426.6	-5322.0	-4887.9	-1980.5	-5446.7	-9363.4	-2971.9	-4110.5	-4560.8
(2)									
Unem Mini job Hartz	-0.088***	-0.095***	0.045	-0.074**	-0.537*	0.041	-0.117***	-0.050	-0.269**
	(0.03)	(0.03)	(0.10)	(0.03)	(0.30)	(0.06)	(0.04)	(0.03)	(0.12)
Individual fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Intercept	1.801***	1.817***	1.750***	1.814***	1.793***	1.819***	1.768***	1.809***	1.690***
	(0.01)	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
N observations	207683	161193	46490	159781	47902	119614	88069	163075	44608
N individuals	40992	40790	19644	40760	18895	38225	30516	40852	21143
Log Likelihood	-104926	-75484	-14985	-74567	-16804	-50899	-34779	-77595	-11802
BIC	210048.1	151160.2	30131.3	149325.3	33769.7	101984.9	69729.1	155382.3	23754.4

Standard errors in parenthesis. Significance level * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

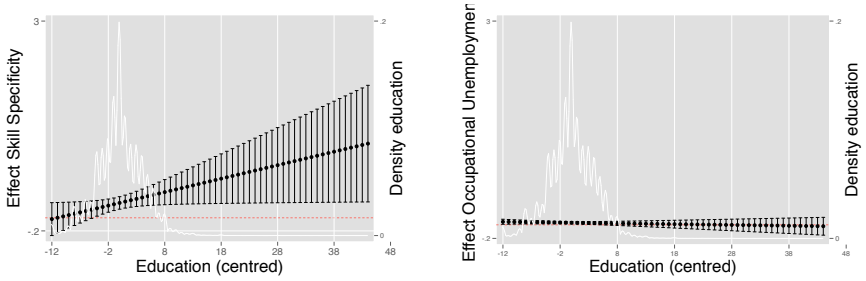
Figures

Figure 1: **Simulations of effect magnitudes**



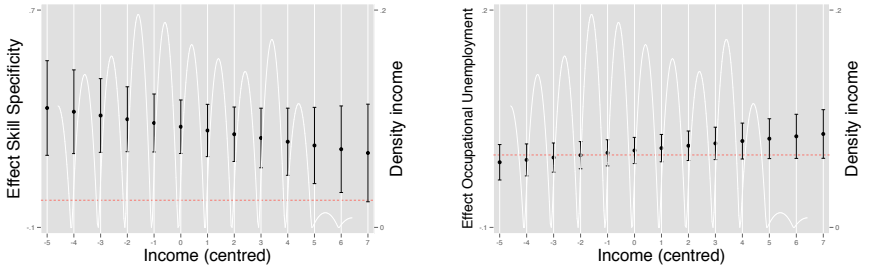
(a) Skill specificity (b) Occupational unemployment

Figure 2: **Marginal effects across educational levels**



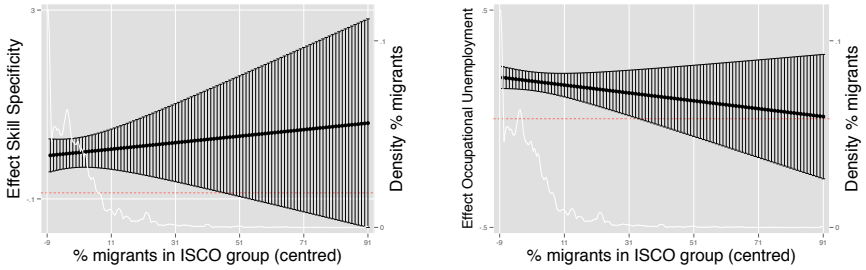
(a) Skill specificity (b) Occupational unemployment

Figure 3: **Marginal effects across income levels**



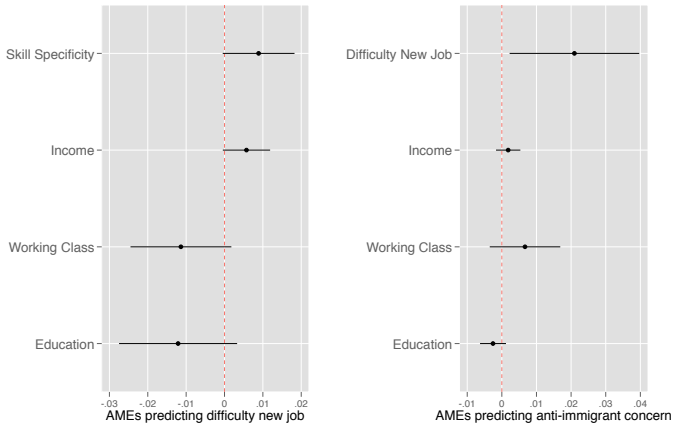
(a) Skill specificity (b) Occupational unemployment

Figure 4: **Marginal effects across % migrants in ISCO group**

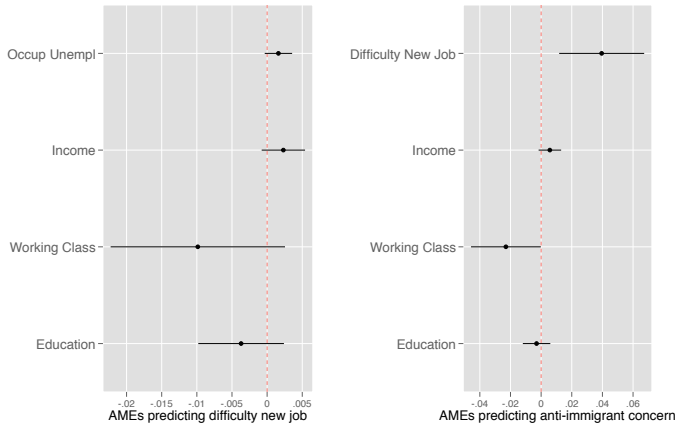


(a) Skill specificity (b) Occupational unemployment

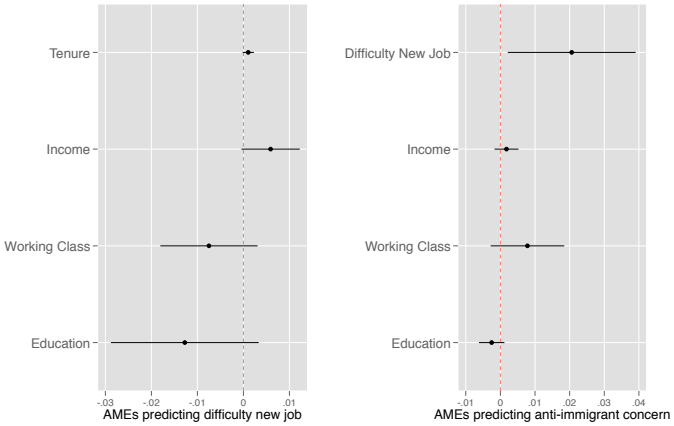
Figure 5: **Average Marginal Effects for key variables predicting difficulty to find a new job**



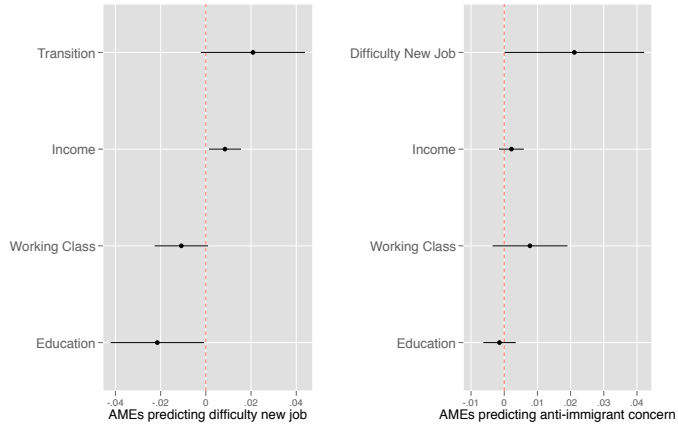
(a) Skill specificity



(b) Occupational unemployment



(c) Tenure



(d) Transition

Skill Specificity and Attitudes towards Immigration

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Online Appendix

Appendix A

Table A1: **Descriptive statistics from European Social Survey cumulative file**

	Mean	Standard Deviation	Min	Max	N
Attitudes (index)	-16.02	5.91	-30	0	65,968
Skill specificity	1	0.64	0.23	7.15	68,406
Skill specificity 2	0.44	0.33	0.11	3.57	68,187
Skill specificity 3	0.37	0.38	0.05	5.84	67,957
Manual work	0.06	0.23	0	1	68,406
Income	6.50	2.64	1	12	68,406
Unemployed	0.05	0.22	0	1	68,406
Education	13.04	3.75	0	56	68,406
Religiosity	4.43	2.90	0	10	68,406
Age	48.73	16.74	16	97	68,406
Male	0.50	0.50	0	1	68,406
Left-right	5.13	2.02	0	10	68,406
Government satisfaction	4.61	2.34	0	10	68,406
Economic satisfaction	5.23	2.45	0	10	68,406
Foreign born (%)	11.60	6.39	2.90	26.90	68,406
GDP	44002.50	17994.30	8876.48	94110.70	68,406
Country unemployment	6.70	2.56	2.90	14.70	68,406
Employment Legislation 1	2.10	0.52	1.26	3.31	68,406
Employment Legislation 2	1.41	0.75	0.31	3	68,406
Unemployment social spending	21073.17	38105.07	68.75	226426.20	68,406

Table A2: **Correlation matrix between skill specificity, occupational unemployment, education, and income**

	Skill specificity	Occupational unemployment	Education
Skill specificity			
Occupational unemployment	-0.0347***		
Education	-0.0449***	-0.2971***	
Income	-0.0027	-0.3046***	0.2670***

* p<0.1, ** p<0.05, *** p<0.01

Distribution of skills specificity by education

Table A3: **Mean skills specificity by level of education**

	Mean	**Std Deviation**	**N**
Less than lower Secondary	1.053	0.774	5,259
Lower secondary completed	1.027	0.829	10,441
Upper secondary completed	0.995	0.668	28,220
Post-secondary, not tertiary	1.027	0.596	2,286
Tertiary completed	0.979	0.430	21,969
One-way ANOVA			
F = 20.7, p < 0.000			
Bartlett's test χ^2, p < 0.000			

Distribution of skills specificity by Income

Table A4: **Mean skills specificity by Income quintiles**

	Mean	**Std Deviation**	**N**
Quintile 1	0.980	0.670	10,236
Quintile 2	1.009	0.676	15,024
Quintile 3	1.027	0.652	7,818
Quintile 4	1.014	0.653	15,249
Quintile 5	0.984	0.576	20,079
One-way ANOVA			
$F = 11.64$, $p < 0.000$			
Bartlett's test χ^2, $p < 0.000$			

Distribution of occupational unemployment by education

Table A5: **Mean occupational unemployment by level of education**

	Mean	**Std Deviation**	**N**
Less than lower Secondary	9.295	4.638	5,259
Lower secondary completed	8.257	5.334	10,441
Upper secondary completed	7.324	4.479	28,220
Post-secondary, not tertiary	6.861	4.690	2,286
Tertiary completed	4.572	2.946	21,969
One-way ANOVA			
F = 2397.10, p < 0.000			
Bartlett's test χ^2, p < 0.000			

Distribution of occupational unemployment over income

Table A6: **Mean occupational unemployment by Income quintiles**

	Mean	**Std Deviation**	**N**
Quintile 1	8.632	5.385	10,236
Quintile 2	7.813	4.847	15,024
Quintile 3	7.370	4.613	7,818
Quintile 4	6.445	4.028	15,249
Quintile 5	4.862	3.147	20,079
One-way ANOVA			
$F = 1749.49$, $p < 0.000$			
Bartlett's test χ^2, $p < 0.000$			

Table A7: **Robustness models with alternative measures of skill specificity**

	Model 1	**Model 2**
Skill specificity 2	1.859***	
	(0.22)	
Skill specificity 3		1.718***
		(0.23)
Manual worker	0.110	0.265
	(0.31)	(0.32)
Income	-0.176***	-0.179***
	(0.02)	(0.02)
Unemployed	-0.013	0.009
	(0.20)	(0.20)
Education	-0.314***	-0.300***
	(0.01)	(0.02)
Religiosity	-0.159***	-0.160***
	(0.02)	(0.02)
Age	0.020***	0.019***
	(0.00)	(0.00)
Male	0.372***	0.326***
	(0.11)	(0.11)
Left-right	0.664***	0.662***
	(0.03)	(0.03)
Government satisfaction	-0.156***	-0.156***
	(0.03)	(0.03)
Economic satisfaction	-0.441***	-0.444***
	(0.03)	(0.03)
Occupational migrant share	-0.016**	-0.011
	(0.01)	(0.01)
Foreign born (%)	-3.813***	-3.617***
	(1.15)	(0.42)
GDP (log)	1.328***	0.980***
	(0.34)	(0.18)
Unemployment (country)	0.951***	0.696***
	(0.25)	(0.10)
Employment Legislation 1	-34.214	-4.882
	(22.90)	(9.43)
Employment Legislation 2	-102.388***	-58.655***
	(23.64)	(11.92)
Unemployment social spending	-1.182	-1.329**
	(1.26)	(0.56)
Intercept	-66.139***	-44.368***
	(14.84)	(7.90)
Wave Intercept Variance	0.076	0.00
	(0.12)	(0.00)
Country Intercept Variance	0.00	0.00
	(0.00)	(0.00)
Occupation Intercept Variance	0.654***	0.851
	(0.14)	(0.00)
Individual Intercept Variance	28.674***	28.610
	(0.36)	(0.00)
N individuals	13158	13152
N occupations	412	412
N waves	5	5
LogLik	-40840	-40819
BIC	81898.3	81817.7

* p<0.1, ** p<0.05, *** p<0.01

Table A7.1: **Robustness models with a factor as dependent variable**

	Model 1	**Model 2**
Skill specificity	0.033***	
	(0.01)	
Occupational unemployment		0.005***
		(0.00)
Manual worker	0.015	0.010
	(0.02)	(0.02)
Income	-0.015***	-0.015***
	(0.00)	(0.00)
Unemployed	-0.006	-0.008
	(0.01)	(0.01)
Education	-0.038***	-0.037***
	(0.00)	(0.00)
Religiosity	-0.012***	-0.012***
	(0.00)	(0.00)
Age	0.002***	0.002***
	(0.00)	(0.00)
Male	0.055***	0.054***
	(0.01)	(0.01)
Left-right	0.060***	0.060***
	(0.00)	(0.00)
Government satisfaction	-0.047***	-0.047***
	(0.00)	(0.00)
Economic satisfaction	-0.051***	-0.051***
	(0.00)	(0.00)
Occupational migrant share	-0.003***	-0.003***
	(0.00)	(0.00)
Foreign born (%)	0.029***	0.028***
	(0.01)	(0.01)
GDP	-0.000	-0.000
	(0.00)	(0.00)
Unemployment (country)	-0.017***	-0.021***
	(0.00)	(0.00)
Employment Legislation 1	-0.170***	-0.173***
	(0.04)	(0.04)
Employment Legislation 2	-0.245***	-0.245***
	(0.02)	(0.02)
Unemployment social spending	0.000***	0.000***
	(0.00)	(0.00)
Intercept	-0.105	-0.103
	(0.10)	(0.10)
Wave Intercept Variance	0.005	0.005
	(0.00)	(0.00)
Country Intercept Variance	0.110	0.108
	(0.03)	(0.03)
Occupation Intercept Variance	0.018***	0.017***
	(0.00)	(0.00)
Individual Intercept Variance	0.509***	0.509***
	(0.00)	(0.00)
N individuals	65968	65968
N occupations	489	489
N waves	5	5
LogLik	-71684	-71689
BIC	143623.0	143632.4

* p<0.1, ** p<0.05, *** p<0.01

Table A8: **Robustness models controlling for temporary contract, union membership, employment protection, spending on labour market, and trade oppenness**

	Model 1	**Model 2**
Skill specificity	0.310***	
	(0.06)	
Occupational unemployment		0.067***
		(0.01)
Manual work	-0.021	-0.066
	(0.16)	(0.16)
Income	-0.110***	-0.107***
	(0.01)	(0.01)
Unemployed	-0.028	-0.056
	(0.11)	(0.11)
Education	-0.291***	-0.291***
	(0.01)	(0.01)
Religiosity	-0.097***	-0.097***
	(0.01)	(0.01)
Age	0.015***	0.015***
	(0.00)	(0.00)
Gender	0.477***	0.458***
	(0.06)	(0.06)
Left-right	0.462***	0.464***
	(0.01)	(0.01)
Government satisfaction	-0.306***	-0.308***
	(0.01)	(0.01)
Economic satisfaction	-0.421***	-0.418***
	(0.01)	(0.01)
Temporary	-0.128	-0.135
	(0.09)	(0.09)
Union membership	-0.160***	-0.165***
	(0.06)	(0.06)
Occupational migrant share	-0.024***	-0.025***
	(0.00)	(0.00)
Social spending	-0.180***	-0.236***
	(0.03)	(0.03)
Labour spending	-0.000***	-0.000***
	(0.00)	(0.00)
Employment Legislation 1	0.665**	0.917***
	(0.29)	(0.29)
Trade openess	0.024***	0.020***
	(0.01)	(0.01)
Intercept	-13.665***	-12.545***
	(1.30)	(1.30)
Wave Intercept Variance	0.074	0.039
	(0.06)	(0.03)
Country Intercept Variance	7.01**	7.36**
	(3.4)	(3.5)
Occupation Intercept Variance	0.998***	0.861***
	(0.11)	(0.11)
Individual Intercept Variance	27.791***	27.810***
	(0.18)	(0.18)
N individuals	48770	48770
N occupations	488	488
N waves	5	5
LogLik	-150584	-150580
BIC	301416.2	301409.2

* p<0.1, ** p<0.05, *** p<0.01

Table A9: **Predicting attitudes towards immigration using country-occupation fixed effects.**

	Model Occupation
Occupational unemployment	0.041***
	(0.01)
Manual Work	-0.244**
	(0.12)
income	-0.092***
	(0.01)
Unemployed	-0.043
	(0.11)
Education	-0.289***
	(0.01)
Religiosity	-0.088***
	(0.01)
Age	0.009***
	(0.00)
Male	0.292***
	(0.05)
Left-Right	0.543***
	(0.01)
Government Satisfaction	-0.363***
	(0.01)
Economic Satisfaction	-0.352***
	(0.01)
Occupational migrant share	-0.022***
	(0.00)
Foreign born (%)	-0.047*
	(0.03)
GDP	-0.305***
	(0.06)
Unemployment (country)	-0.092***
	(0.02)
Employment Legislation 1	0.232
	(0.45)
Employment Legislation 2	-0.089
	(0.32)
Intercept	-13.656***
	(0.65)
Occupation Random Slopes Variance	0.001**
	(0.0004)
Country Intercept Variance	0.792**
	(0.40)
Individual Intercept Variance	26.81***
	(0.17)
N	51410
LogLik	-157531
BIC	315289.2

* p<0.1, ** p<0.05, *** p<0.01

Table A10: **Robustness models predicting sociotropic economic satisfaction**

	Model 1	**Model 2**
Skill specificity	0.011	
	(0.03)	
Occupational unemployment		-0.025***
		(0.01)
Manual work	0.031	0.106
	(0.09)	(0.09)
Income	0.079***	0.074***
	(0.01)	(0.01)
Unemployed	-0.503***	-0.489***
	(0.07)	(0.07)
Education	0.023***	0.017***
	(0.00)	(0.00)
Religiosity	0.028***	0.027***
	(0.01)	(0.01)
Age	0.003**	0.002**
	(0.00)	(0.00)
Male	-0.396***	-0.404***
	(0.03)	(0.03)
Left-right	-0.029***	-0.028***
	(0.01)	(0.01)
Government satisfaction	0.480***	0.479***
	(0.01)	(0.01)
Occupational migrant share	-0.002	-0.001
	(0.00)	(0.00)
Foreign born (%)	-2.704***	-2.738***
	(0.15)	(0.15)
GDP (log)	0.687***	0.697***
	(0.06)	(0.06)
Unemployment (country)	0.150***	0.180***
	(0.04)	(0.04)
Employment Legislation 1	36.828***	36.665***
	(3.34)	(3.48)
Employment Legislation 2	15.820***	15.133***
	(4.17)	(4.31)
Unemployment social spending	-2.476***	-2.516***
	(0.19)	(0.20)
Intercept	20.575***	20.558***
	(2.69)	(2.76)
Wave Intercept Variance	0.00	0.00
	(0.00)	(0.00)
Country Intercept Variance	0.00	0.00
	(0.00)	(0.00)
Occupation Intercept Variance	0.020**	0.017***
	(0.01)	(0.01)
Individual Intercept Variance	3.156***	3.155***
	(0.04)	(0.04)
N	13723	13723
LogLik	-27393	-27385
BIC	54994.9	54970.5

* p<0.1, ** p<0.05, *** p<0.01

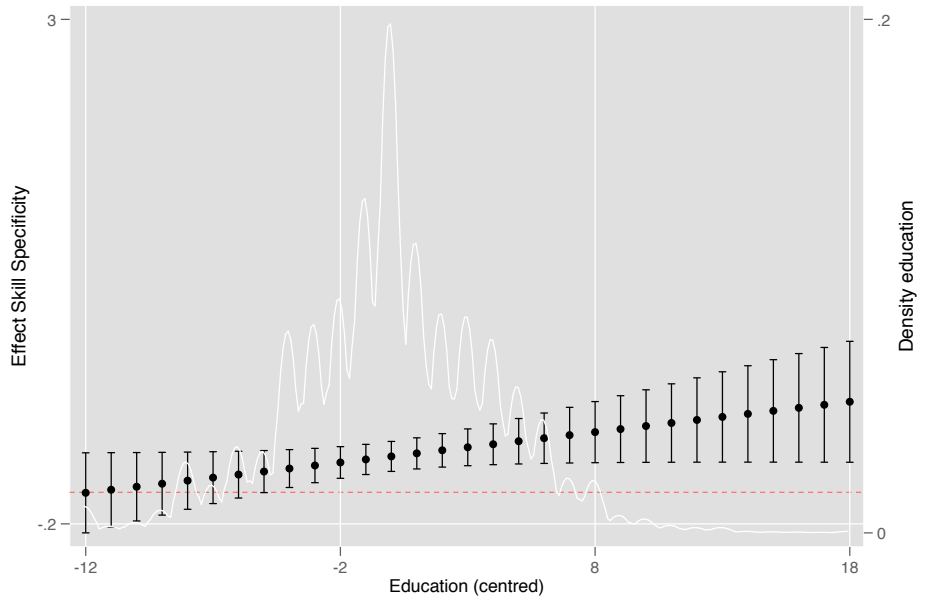


Figure 1: Marginal Effect of interaction between Education and Skill Specificity

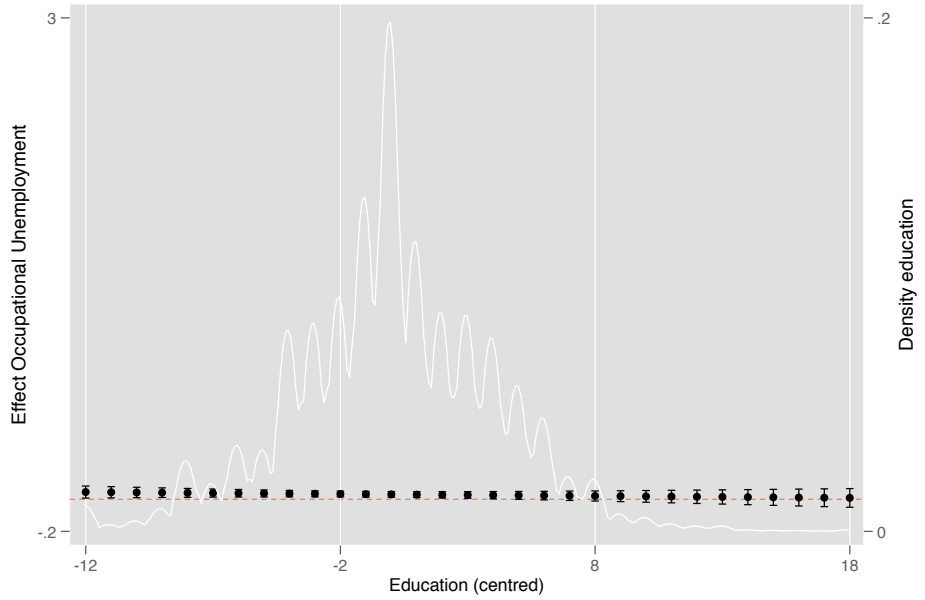


Figure 2: Marginal Effect of interaction between Education and Occupational Unemployment

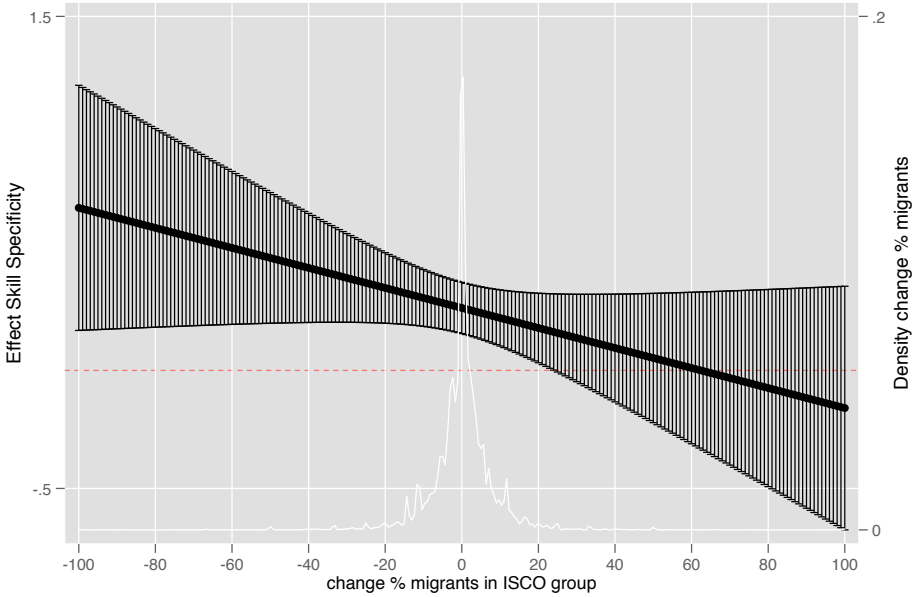


Figure 3: Marginal Effect of interaction between inter-wave changes in occupational migrant composition and Skill Specificity

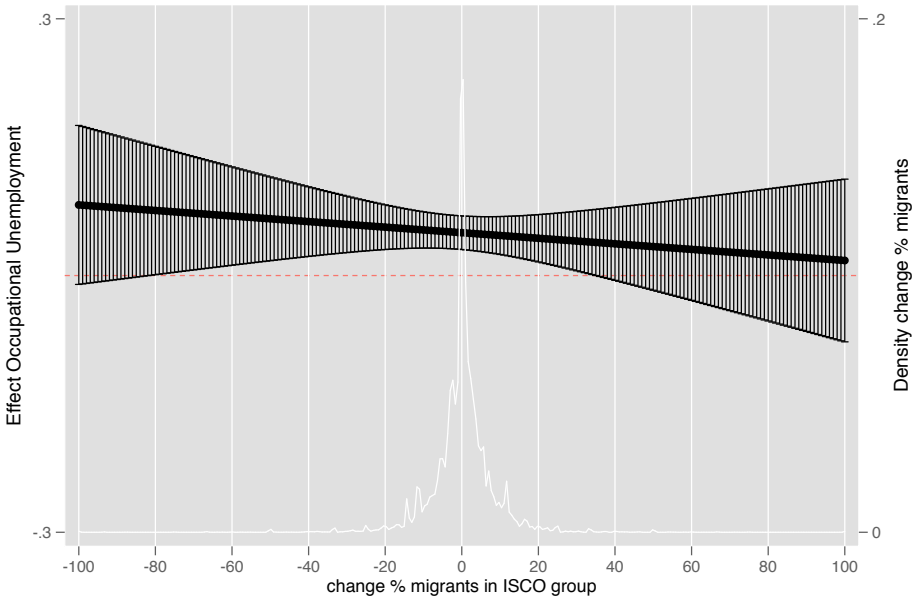


Figure 4: Marginal Effect of interaction between inter-wave changes in occupational migrant composition and Occupational Unemployment

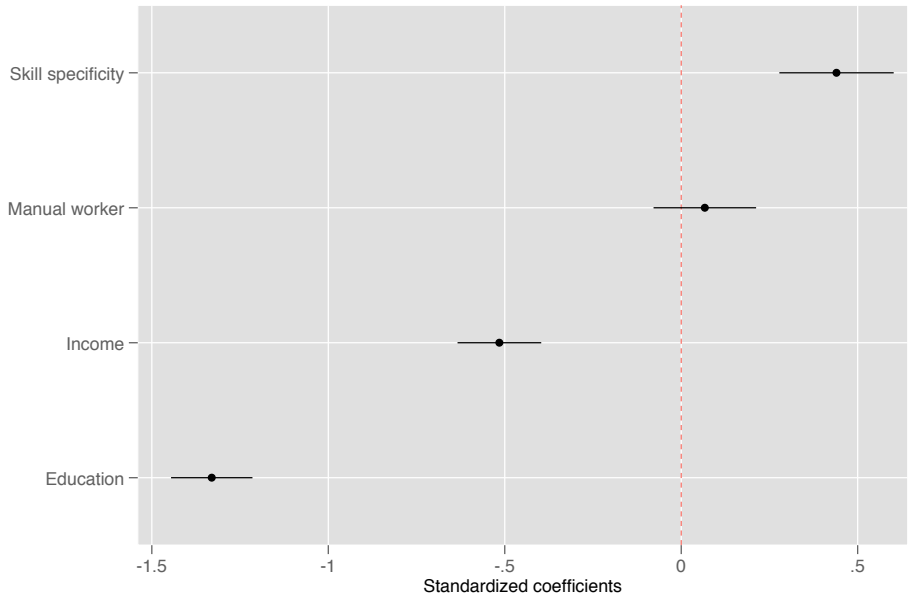


Figure 5: Standardized coefficients: Skill Specificity

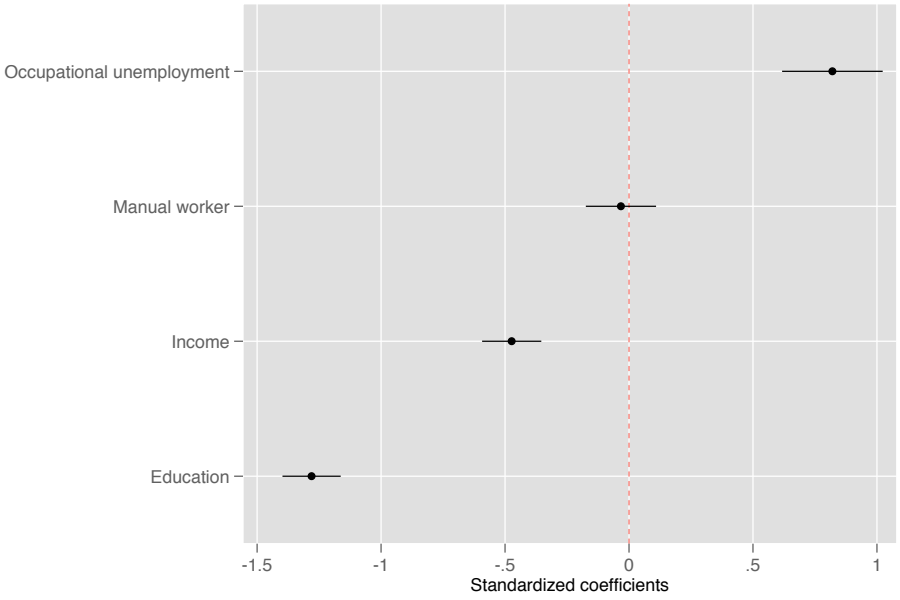


Figure 6: Standardized coefficients: Occupational Unemployment

Appendix B

Table B1: **Descriptive statistics from German Socio-Economic Panel**

	Mean	**Std Dev**	**Min**	**Max**	**N**
Dependent variable	0.26	0.44	0	1	72264
Difficulty finding job	0.18	0.38	0	1	72264
Skill specificity	0.99	0.59	0.37	6.10	72264
Occupational unemployment	8	3.96	2.42	18.72	72264
Tenure	9.47	3.42	0.5	16.83	72264
Transition	0.69	0.12	0	1	71279
Income	2.87	1.38	1	5	72264
Manual work	0.33	0.47	0	1	72264
Unemployed	1.98	0.12	1	2	72264
Male	1.48	0.50	1	2	72264
Age	41.2	11.91	17	85	72264
Church attendance	1.01	0.08	1	2	72264
Temporary	0.15	0.35	0	1	72264
Education	12.44	2.66	7	18	72264
Occupational migrant share	66.3	26.39	0	100	72264

Table B2: **Replication of models predicting difficulty to find a new job with alternative measures of skill specificity**

	Fixed effects	**Fixed effects**	**Random effects**	**Random effects**
Skill specificity 2	0.254**		0.044	
	(0.10)		(0.07)	
Skill specificity 3		1.849***		1.300***
		(0.49)		(0.35)
Income	0.111***	0.108***	0.128***	0.125***
	(0.03)	(0.03)	(0.02)	(0.02)
Manual work	-0.237***	-0.214***	-0.158***	-0.190***
	(0.08)	(0.07)	(0.05)	(0.05)
Unemployed	-0.040	-0.048	-0.230*	-0.241*
	(0.15)	(0.15)	(0.12)	(0.12)
Age	0.130***	0.130***	0.134***	0.134***
	(0.00)	(0.00)	(0.00)	(0.00)
Church attendance	-0.087	-0.094	-0.421**	-0.426**
	(0.23)	(0.23)	(0.20)	(0.20)
Temporary	0.061	0.061	0.207***	0.207***
	(0.07)	(0.07)	(0.06)	(0.06)
Education	-0.225***	-0.216***	-0.109***	-0.101***
	(0.05)	(0.05)	(0.01)	(0.01)
Occupational migrant share	0.002**	0.002**	0.002***	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept			-6.630***	-6.810***
			(0.38)	(0.38)
Intercept Variance			4.436***	4.441***
			[4.154,4.738]	[4.158,4.743]
N	20,014	20,014	72,672	72,672
LogLik	-7065	-7061	-25960	-25954
BIC	14218.3	14210.9	52055.0	52041.4

* p<0.1, ** p<0.05, *** p<0.01

Table B3: **Replication of models predicting concern over immigration with alternative measures of skill specificity**

	Fixed effects	**Fixed effects**	**Random effects**	**Random effects**
Difficulty finding job (dummy)	0.277***	0.277***	0.364***	0.364***
	(0.05)	(0.05)	(0.04)	(0.04)
Skill specificity 2	0.087		0.137**	
	(0.08)		(0.06)	
Skill specificity 3		0.429		0.114
		(0.39)		(0.28)
Income	0.025	0.024	-0.011	-0.013
	(0.02)	(0.02)	(0.01)	(0.01)
Manual work	0.075	0.088	0.194***	0.234***
	(0.06)	(0.05)	(0.04)	(0.04)
Unemployed	-0.128	-0.130	-0.250**	-0.252**
	(0.13)	(0.13)	(0.10)	(0.10)
Age	-0.040***	-0.040***	0.002	0.002
	(0.00)	(0.00)	(0.00)	(0.00)
Church attendance	-0.315	-0.315	-0.400**	-0.398**
	(0.20)	(0.20)	(0.16)	(0.16)
Temporary	0.065	0.065	-0.047	-0.048
	(0.05)	(0.05)	(0.04)	(0.04)
Education	-0.033	-0.031	-0.245***	-0.247***
	(0.03)	(0.03)	(0.01)	(0.01)
Occupational migrant share	-0.001	-0.001	-0.001***	-0.001**
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept			2.318***	2.385***
			(0.30)	(0.31)
Intercept variance			4.068***	4.072***
			[3.850,4.299]	[3.854,4.303]
N	28,061	28,061	72,264	72,264
LogLik	-10636	-10636	-35812	-35815
BIC	21374.3	21374.3	71768.9	71774.6

* p<0.1, ** p<0.05, *** p<0.01

Table B4: **Mixed effects models predicting difficulty to find a new job and concern over immigration.**

	Hybrid 1	**Hybrid 2**	**Hybrid 3**	**Hybrid 4**	**Hybrid 5**	**Hybrid 6**	**Hybrid 7**	**Hybrid 8**
	[Difficulty to find new job]				[Concern over immigration]			
Skill specificity	0.269***				-0.002			
	(0.07)				(0.05)			
Skill specificity (mean)	0.128*				0.074			
	(0.07)				(0.05)			
Occupational unemployment		0.151***				0.100***		
		(0.01)				(0.01)		
Occupational unemployment (Mean)		0.135***				0.111***		
		(0.01)				(0.01)		
Tenure			0.011				-0.013**	
			(0.01)				(0.00)	
Tenure (mean)			0.127***				-0.030**	
			(0.02)				(0.01)	
Transition				0.586***				-0.040
				(0.21)				(0.17)
Transition (mean)				0.357				0.568**
				(0.31)				(0.23)
Difficulty finding job					0.126***	0.102***	0.127***	0.130***
					(0.03)	(0.03)	(0.03)	(0.03)
Difficulty finding job (mean)					0.473***	0.443***	0.479***	0.474***
					(0.04)	(0.04)	(0.04)	(0.04)
Income	0.053***	0.064***	0.033*	0.053***	-0.003	0.022	0.005	0.002
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Manual work	-0.164**	-0.542***	-0.077	-0.118	0.334***	-0.065	0.337***	0.348***
	(0.08)	(0.09)	(0.08)	(0.08)	(0.06)	(0.06)	(0.05)	(0.05)
Unemployed	-0.454***	-0.427***	-0.479***	-0.436***	-0.270**	-0.232**	-0.254**	-0.291***
	(0.13)	(0.14)	(0.13)	(0.14)	(0.11)	(0.11)	(0.11)	(0.11)
Male	0.102*	0.155***	0.099*	0.100*	-0.109**	-0.082*	-0.123***	-0.135***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Age	0.142***	0.147***	0.139***	0.143***	-0.001	0.001	0.000	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Church attendance	-0.498**	-0.509**	-0.506**	-0.525**	-0.293*	-0.303*	-0.292*	-0.285*
	(0.22)	(0.22)	(0.22)	(0.22)	(0.17)	(0.17)	(0.17)	(0.17)
Temporary	0.200***	0.221***	0.256***	0.205***	-0.041	-0.015	-0.057	-0.040
	(0.06)	(0.06)	(0.06)	(0.06)	(0.04)	(0.04)	(0.04)	(0.05)
Education	-0.135***	-0.127***	-0.139***	-0.137***	-0.225***	-0.206***	-0.226***	-0.231***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Occupational migrant share	0.003***	0.002***	0.002***	0.002***				
	(0.00)	(0.00)	(0.00)	(0.00)				
Intercept	-6.274***	-7.529***	-7.161***	-6.397***	0.887***	-0.216	1.198***	0.699*
	(0.42)	(0.45)	(0.44)	(0.46)	(0.34)	(0.35)	(0.34)	(0.36)
Occupation Intercept Variance	0.368***	0.587***	0.337***	0.381***	0.088***	0.101***	0.084***	0.084***
	[0.266,0.470]	[0.425,0.748]	[0.240,0.434]	[0.276,0.487]	[0.050,0.125]	[0.061,0.141]	[0.048,0.120]	[0.047,0.120]
Individual Intercept Variance	4.806***	4.997***	4.782***	4.865***	4.463***	4.551***	4.463***	4.480***
	[4.421,5.191]	[4.590,5.404]	[4.398,5.167]	[4.472,5.259]	[4.167,4.759]	[4.248,4.853]	[4.167,4.758]	[4.179,4.781]
N	72672	72672	72672	71279	72264	72264	72264	70872
LogLik	-26422	-26311	-26401	-26106	-37195	-37081	-37190	-36414
BIC	53000.0	52778.7	52958.7	52368.2	74557.9	74329.2	74548.8	72996.2

* p<0.1, ** p<0.05, *** p<0.01

Table B5: **Predicting difficulty in finding a new job with occupational fixed effects.**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Skill specificity	0.313**			
	(0.12)			
Occupational unemployment		0.201***		
		(0.01)		
Tenure			0.015**	
			(0.01)	
Transition				0.259
				(0.20)
Income	0.104***	0.104***	0.100***	0.106***
	(0.03)	(0.03)	(0.03)	(0.03)
Manual work	-0.192**	-0.341***	-0.206**	-0.181*
	(0.09)	(0.10)	(0.09)	(0.10)
Unemployed_reg	-0.063	0.021	-0.073	-0.058
	(0.15)	(0.15)	(0.15)	(0.15)
Age	0.130***	0.166***	0.129***	0.133***
	(0.00)	(0.01)	(0.01)	(0.01)
Church attendance	-0.097	-0.133	-0.098	-0.151
	(0.23)	(0.24)	(0.23)	(0.24)
Temporary	0.056	0.056	0.069	0.036
	(0.07)	(0.07)	(0.07)	(0.07)
Education	-0.233***	-0.221***	-0.233***	-0.302***
	(0.05)	(0.05)	(0.05)	(0.05)
ISCO category 1	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)
ISCO category 2	0.050	0.107	-0.102	-0.133
	(0.13)	(0.12)	(0.12)	(0.13)
ISCO category 3	0.000	-0.331***	-0.120	-0.177
	(0.12)	(0.11)	(0.11)	(0.11)
ISCO category 4	-0.074	-0.932***	-0.284**	-0.370***
	(0.15)	(0.13)	(0.12)	(0.13)
ISCO category 5	-0.183	-1.542***	-0.351**	-0.491***
	(0.16)	(0.15)	(0.14)	(0.14)
ISCO category 6	-0.616	-1.614***	-0.049	-0.131
	(0.41)	(0.36)	(0.34)	(0.36)
ISCO category 7	0.100	-1.273***	0.141	0.032
	(0.15)	(0.17)	(0.15)	(0.16)
ISCO category 8	-0.445*	-1.195***	0.050	-0.019
	(0.24)	(0.18)	(0.16)	(0.17)
ISCO category 9	-0.074	-2.381***	-0.159	-0.287*
	(0.16)	(0.20)	(0.15)	(0.15)
N	20,014	20,014	20,014	19,554
LogLik	-7054	-6908	-7055	-6905
BIC	14267.2	13975.3	14268.8	13967.1

* p<0.1, ** p<0.05, *** p<0.01

Table B6: **Predicting concern over immigration with occupational fixed effects.**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Difficulty finding job (dummy)	0.276***	0.231***	0.277***	0.279***
	(0.05)	(0.05)	(0.05)	(0.05)
Skill specificity	0.058			
	(0.09)			
Occupational unemployment		0.118***		
		(0.01)		
Tenure			0.001	
			(0.00)	
Transition				-0.360**
				(0.16)
Income	0.024	0.027	0.024	0.029
	(0.02)	(0.02)	(0.02)	(0.02)
Manual work	0.100	0.038	0.097	0.115
	(0.07)	(0.07)	(0.07)	(0.07)
Unemployed	-0.134	-0.079	-0.135	-0.133
	(0.13)	(0.13)	(0.13)	(0.13)
Age	-0.040***	-0.023***	-0.039***	-0.041***
	(0.00)	(0.00)	(0.00)	(0.00)
Church attendance	-0.314	-0.316	-0.315	-0.315
	(0.20)	(0.20)	(0.20)	(0.20)
Temporary	0.064	0.056	0.064	0.082
	(0.05)	(0.05)	(0.05)	(0.05)
Education	-0.034	-0.034	-0.034	-0.020
	(0.03)	(0.03)	(0.03)	(0.04)
ISCO category 1	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)
ISCO category 2	0.065	0.159	0.035	0.160
	(0.12)	(0.11)	(0.11)	(0.12)
ISCO category 3	0.039	-0.098	0.013	0.092
	(0.10)	(0.10)	(0.09)	(0.10)
ISCO category 4	0.042	-0.363***	-0.002	0.082
	(0.13)	(0.11)	(0.10)	(0.11)
ISCO category 5	0.032	-0.667***	-0.010	0.059
	(0.13)	(0.12)	(0.11)	(0.11)
ISCO category 6	0.377	-0.372	0.475*	0.644**
	(0.30)	(0.27)	(0.26)	(0.27)
ISCO category 7	0.038	-0.776***	0.039	0.138
	(0.12)	(0.14)	(0.12)	(0.13)
ISCO category 8	-0.060	-0.702***	0.024	0.103
	(0.19)	(0.15)	(0.13)	(0.14)
ISCO category 9	0.039	-1.272***	0.010	0.019
	(0.13)	(0.16)	(0.13)	(0.13)
N	28,061	28,061	28,061	27,178
LogLik	-10635	-10548	-10635	-10280
BIC	21444.7	21270.2	21445.1	20733.1

* p<0.1, ** p<0.05, *** p<0.01

Table B7: **Linear structural equations models: direct and indirect effects of skill specificity (via difficulty to find a new job) predicting anti-immigrant concern**

	DV: difficulty to find job	**Direct effect**	**Indirect effect**
Skill specificity	0.22*** (0.006)	0.013* (0.007)	0.002*** (0.0004)
Controls	YES	YES	YES
N observations	72458	72458	72458
N individuals	24825	24825	24825
Variance difficulty new job		0.348*** (0.002)	
Variance immigrant concern		0.52*** (0.002)	
Occupational unemployment	0.006*** (0.001)	0.017*** (0.001)	0.0004*** (.0001)
Controls	YES	YES	YES
N observations	72458	72458	72458
N individuals	24825	24825	24825
Variance difficulty new job		0.348*** (0.002)	
Variance immigrant concern		0.52*** (0.002)	
Tenure	0.011*** (0.001)	-0.003*** (0.001)	0.001*** (0.0001)
Controls	YES	YES	YES
N observations	129913	129913	129913
N individuals	26463	26463	26463
Variance difficulty new job		0.344*** (0.002)	
Variance anti-immigrant concern		0.522*** (0.002)	
Transition	-0.024 (0.022)	0.163*** (0.028)	-0.002 (0.002)
Controls	YES	YES	YES
N observations	71060	71060	71060
N individuals	24607	24607	24607
Variance difficulty new job		0.35*** (0.002)	
Variance immigrant concern		0.522*** (0.003)	

Clustered standard errors at the individual level between brackets. * p<0.1, ** p<0.05, *** p<0.01

Table B8: **Random-effects models predicting difficulty to find an appropriate job**

	Model 1	Model 2	Model 3	Model 4
Skill specificity	0.117***			
	(0.03)			
Occupational unemployment		0.049***		
		(0.01)		
Tenure			0.046***	
			(0.01)	
Transition				0.187
				(0.14)
Income	0.125***	0.151***	0.106***	0.129***
	(0.02)	(0.02)	(0.02)	(0.02)
Manual worker	-0.188***	-0.374***	-0.070	-0.139***
	(0.05)	(0.06)	(0.05)	(0.05)
Unemployed	-0.240*	-0.191	-0.270**	-0.217*
	(0.12)	(0.12)	(0.12)	(0.13)
Male	-0.008	-0.024	-0.034	-0.044
	(0.05)	(0.05)	(0.05)	(0.05)
Age	0.134***	0.135***	0.132***	0.134***
	(0.00)	(0.00)	(0.00)	(0.00)
Church attendance	-0.425**	-0.420**	-0.428**	-0.455**
	(0.20)	(0.20)	(0.20)	(0.20)
Temporary contract	0.208***	0.216***	0.241***	0.200***
	(0.06)	(0.06)	(0.06)	(0.06)
Education	-0.108***	-0.094***	-0.117***	-0.112***
	(0.01)	(0.01)	(0.01)	(0.01)
Occupational migrant share	0.002***	0.002***	0.001	0.002***
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	-6.732***	-7.351***	-6.643***	-6.717***
	(0.38)	(0.39)	(0.37)	(0.39)
Intercept variance	4.441***	4.526***	4.366***	4.486***
	[4.159,4.743]	[4.236,4.835]	[4.088,4.663]	[4.199,4.793]
N observations	72672	72672	72672	71279
N individuals	24831	24831	24831	24616
Log Likelihood	-25954	-25931	-25930	-25648
BIC	52042.6	51996.8	51994.1	51430.8

p<0.1, ** p<0.05, *** p<0.01

Table B9: **Random-effects models predicting immigration concern**

	Model 1	Model 2	Model 3	Model 4
Difficulty new job	0.364***	0.352***	0.367***	0.369***
	(0.04)	(0.04)	(0.04)	(0.04)
Skill specificity	0.045*			
	(0.03)			
Occupational unemployment		0.072***		
		(0.01)		
Tenure			-0.013***	
			(0.00)	
Transition				0.221**
				(0.11)
Income	-0.014	0.020	-0.006	-0.009
	(0.01)	(0.02)	(0.01)	(0.01)
Manual worker	0.223***	-0.085**	0.218***	0.226***
	(0.04)	(0.04)	(0.04)	(0.04)
Unemployed	-0.255**	-0.185*	-0.238**	-0.274***
	(0.10)	(0.10)	(0.10)	(0.10)
Male	-0.188***	-0.179***	-0.204***	-0.208***
	(0.04)	(0.04)	(0.04)	(0.04)
Age	0.002	0.003*	0.002	0.002
	(0.00)	(0.00)	(0.00)	(0.00)
Church attendance	-0.398**	-0.403**	-0.397**	-0.391**
	(0.16)	(0.16)	(0.16)	(0.16)
Temporary contract	-0.047	-0.030	-0.053	-0.040
	(0.04)	(0.04)	(0.04)	(0.04)
Education	-0.247***	-0.225***	-0.247***	-0.253***
	(0.01)	(0.01)	(0.01)	(0.01)
Occupational migrant share	-0.001**	-0.002***	-0.001	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	2.355***	1.395***	2.417***	2.314***
	(0.30)	(0.31)	(0.30)	(0.31)
Intercept variance	4.070***	4.107***	4.071***	4.100***
	[3.852,4.301]	[3.886,4.339]	[3.853,4.302]	[3.878,4.335]
N observations	72264	72264	72264	70872
N individuals	24751	24751	24751	24535
Log Likelihood	-35813	-35717	-35810	-35072
BIC	71772.0	71578.6	71766.4	70288.8

p<0.1, ** p<0.05, *** p<0.01

Table B10: **Fixed-effects models predicting immigration concern: skill specificity as a moderator of temporary contract**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Temporary	0.006	0.032	-0.032*	-0.084**
	(0.02)	(0.02)	(0.02)	(0.04)
Skill Specificity	-0.003			
	(0.01)			
Temporary x Skill Specificity	-0.003			
	(0.01)			
Occupational unemployment		0.015***		
		(0.00)		
Temporary x Occupational unemployment		-0.003		
		(0.00)		
Tenure			-0.001	
			(0.00)	
Temporary x Tenure			0.004**	
			(0.00)	
Transition				-0.067**
				(0.03)
Temporary x Transition				0.130**
				(0.06)
Difficulty New Job	0.052***	0.047***	0.052***	0.051***
	(0.01)	(0.01)	(0.01)	(0.01)
Income	0.002	0.005	0.003	0.003
	(0.00)	(0.00)	(0.00)	(0.00)
Manual Worker	0.019*	-0.039***	0.018*	0.017
	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	-0.036	-0.022	-0.035	-0.032
	(0.02)	(0.02)	(0.02)	(0.02)
Age	-0.012***	-0.010***	-0.012***	-0.012***
	(0.00)	(0.00)	(0.00)	(0.00)
Church Attendance	-0.066*	-0.066**	-0.066**	-0.060*
	(0.03)	(0.03)	(0.03)	(0.03)
Education	-0.005	-0.001	-0.005	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Occupational migrant share	-0.000*	-0.000***	-0.000*	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	2.653***	2.395***	2.659***	2.629***
	(0.09)	(0.10)	(0.09)	(0.10)
N	72264	72264	72264	70872
LogLik	-41177	-41070	-41172	-40126
BIC	82487.6	82275.2	82478.6	80386.4

* p<0.1, ** p<0.05, *** p<0.01

Table B11: **Replication with linear specification (fixed-effects models) - DV difficulty finding job**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Skill Specificity	0.026***			
	(0.01)			
Occupational unemployment		0.014***		
		(0.00)		
Tenure			0.003***	
			(0.00)	
Transition				0.035
				(0.02)
Income	0.013***	0.016***	0.013***	0.015***
	(0.00)	(0.00)	(0.00)	(0.00)
Manual Worker	-0.052***	-0.103***	-0.042***	-0.045***
	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	0.016	0.032	0.016	0.011
	(0.02)	(0.02)	(0.02)	(0.02)
Age	0.021***	0.023***	0.020***	0.022***
	(0.00)	(0.00)	(0.00)	(0.00)
Church Attendance	-0.060**	-0.059**	-0.059**	-0.063**
	(0.03)	(0.03)	(0.03)	(0.03)
Temporary Contract	0.064***	0.064***	0.065***	0.059***
	(0.01)	(0.01)	(0.01)	(0.01)
Education	-0.030***	-0.025***	-0.031***	-0.036***
	(0.00)	(0.00)	(0.00)	(0.01)
Occupational migrant share	0.000*	0.000	0.000	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	1.433***	1.180***	1.454***	1.470***
	(0.08)	(0.08)	(0.08)	(0.09)
N	72672	72672	72672	71279
LogLik	-29599	-29468	-29601	-28824
BIC	59310.4	59048.2	59314.2	57759.1

* p<0.1, ** p<0.05, *** p<0.01

Table B12: **Replication with linear specification (fixed-effects models) - DV concern with immigration**

	Model 5	**Model 6**	**Model 7**	**Model 8**
Difficulty New Job	0.031***	0.027***	0.030***	0.030***
	(0.01)	(0.01)	(0.01)	(0.01)
Skill Specificity	-0.004			
	(0.01)			
Occupational unemployment		0.014***		
		(0.00)		
Tenure			0.000	
			(0.00)	
Transition				-0.039
				(0.03)
Income	0.002	0.005	0.002	0.002
	(0.00)	(0.00)	(0.00)	(0.00)
Manual Worker	0.020*	-0.038***	0.019*	0.017*
	(0.01)	(0.01)	(0.01)	(0.01)
Unemployed	-0.036	-0.022	-0.037	-0.032
	(0.02)	(0.02)	(0.02)	(0.02)
Age	-0.012***	-0.010***	-0.012***	-0.012***
	(0.00)	(0.00)	(0.00)	(0.00)
Church Attendance	-0.064*	-0.065*	-0.064*	-0.059*
	(0.03)	(0.03)	(0.03)	(0.03)
Temporary Contract	0.002	0.002	0.002	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Education	-0.005	-0.000	-0.005	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)
Occupational migrant share	-0.000*	-0.000***	-0.000*	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)
Intercept	2.606***	2.352***	2.606***	2.560***
	(0.09)	(0.10)	(0.09)	(0.10)
N	72672	72672	72672	71279
LogLik	-29599	-29468	-29601	-28824
BIC	59310.4	59048.2	59314.2	57759.1

* p<0.1, ** p<0.05, *** p<0.01

Table B13: **Fixed-effects models predicting difficulty finding new job: interaction between skill specificity and education**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Skill Specificity	0.410			
	(0.27)			
Education	-0.207***	-0.224***	-0.234***	-0.207***
	(0.05)	(0.05)	(0.05)	(0.07)
Skill Specificity x Education	-0.022			
	(0.02)			
Occupational unemployment		0.044		
		(0.04)		
Occupational unemployment x Education		0.004		
		(0.00)		
Tenure			0.012	
			(0.03)	
Tenure x Education			0.001	
			(0.00)	
Transition				1.697**
				(0.83)
Transition x Education				-0.120*
				(0.07)
Income	0.107***	0.126***	0.106***	0.115***
	(0.03)	(0.03)	(0.03)	(0.03)
Manual Worker	-0.213***	-0.533***	-0.135*	-0.150**
	(0.07)	(0.08)	(0.07)	(0.07)
Unemployed	-0.048	0.047	-0.047	-0.032
	(0.15)	(0.15)	(0.15)	(0.15)
Age	0.130***	0.144***	0.128***	0.132***
	(0.00)	(0.01)	(0.00)	(0.01)
Church Attendance	-0.095	-0.077	-0.074	-0.112
	(0.23)	(0.24)	(0.23)	(0.24)
Temporary Contract	0.061	0.058	0.072	0.035
	(0.07)	(0.07)	(0.07)	(0.07)
Occupational migrant share	0.002**	0.001	0.001	0.001*
	(0.00)	(0.00)	(0.00)	(0.00)
N	20014.000	20014.000	20014.000	19554.000
LogLik	-7061	-7010	-7064	-6915
BIC	14220.8	14119.3	14227.3	13929.4

* p<0.1, ** p<0.05, *** p<0.01

Table B14: **Fixed-effects models predicting immigration concern: interaction between difficulty to find a new job and education**

	Model 1	**Model 2**	**Model 3**	**Model 4**
Difficulty new job	0.430*	0.405	0.437*	0.431*
	(0.25)	(0.25)	(0.25)	(0.25)
Education	-0.033	-0.018	-0.033	-0.018
	(0.03)	(0.03)	(0.03)	(0.04)
Difficulty new job x Education	-0.013	-0.013	-0.014	-0.013
	(0.02)	(0.02)	(0.02)	(0.02)
Skill Specificity	0.039			
	(0.04)			
Occupational unemployment		0.062***		
		(0.01)		
Tenure			0.005	
			(0.01)	
Transition				-0.192
				(0.14)
Income	0.024	0.037	0.024	0.028
	(0.02)	(0.02)	(0.02)	(0.02)
Manual Worker	0.089	-0.149**	0.105**	0.103*
	(0.05)	(0.06)	(0.05)	(0.05)
Unemployed	-0.130	-0.067	-0.131	-0.123
	(0.13)	(0.13)	(0.13)	(0.13)
Age	-0.040***	-0.032***	-0.040***	-0.041***
	(0.00)	(0.00)	(0.00)	(0.00)
Church Attendance	-0.316	-0.308	-0.312	-0.310
	(0.20)	(0.20)	(0.20)	(0.20)
Temporary Contract	0.065	0.063	0.067	0.088*
	(0.05)	(0.05)	(0.05)	(0.05)
Occupational migrant share	-0.001	-0.001**	-0.001*	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)
N	20014.000	20014.000	20014.000	19554.000
LogLik	-7061	-7010	-7064	-6915
BIC	14220.8	14119.3	14227.3	13929.4

* p<0.1, ** p<0.05, *** p<0.01

Table B15: **Hausman Tests between fixed and random-effects models**

	Model 1				**Model 2**				**Model 3**				**Model 4**			
	FE	**RE**	**Diff**	**S.E.**	**FE**	**RE**	**Diff**	**S.E.**	**FE**	**RE**	**Diff**	**S.E.**	**FE**	**RE**	**Diff**	**S.E.**
Skill Specificity	0.17	0.12	0.05	0.03	0.09	0.05	0.04	0.01	0.02	0.05	-0.03	0.00	0.28	0.19	0.10	0.10
Income	0.11	0.13	-0.02	0.02	0.13	0.15	-0.03	0.02	0.11	0.11	0.00	0.02	0.12	0.13	-0.01	0.02
Manual Worker	-0.21	-0.19	-0.03	0.05	-0.54	-0.37	-0.16	0.06	-0.13	-0.07	-0.06	0.05	-0.15	-0.14	-0.01	0.05
Unemployed	-0.05	-0.24	0.19	0.08	0.04	-0.19	0.23	0.09	-0.05	-0.27	0.22	0.08	-0.03	-0.22	0.19	0.09
Age	0.13	0.13	0.00	0.00	0.14	0.14	0.01	0.00	0.13	0.13	0.00	0.00	0.13	0.13	0.00	0.00
Church Attendance	-0.09	-0.43	0.33	0.12	-0.08	-0.42	0.34	0.13	-0.07	-0.43	0.35	0.12	-0.12	-0.45	0.34	0.13
Temporary Contract	0.06	0.21	-0.15	0.04	0.06	0.22	-0.16	0.04	0.07	0.24	-0.17	0.04	0.04	0.20	-0.16	0.04
Education	-0.23	-0.11	-0.12	0.05	-0.20	-0.09	-0.11	0.05	-0.23	-0.12	-0.11	0.05	-0.29	-0.11	-0.18	0.05
Occupational Migrant Share	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
χ^2			38.25				90.89				132.52				40.26	
P> χ^2			0.00				0.00				0.00				0.00	

Figure 7: **Marginal effects of the Education (interaction terms in Table B13)**

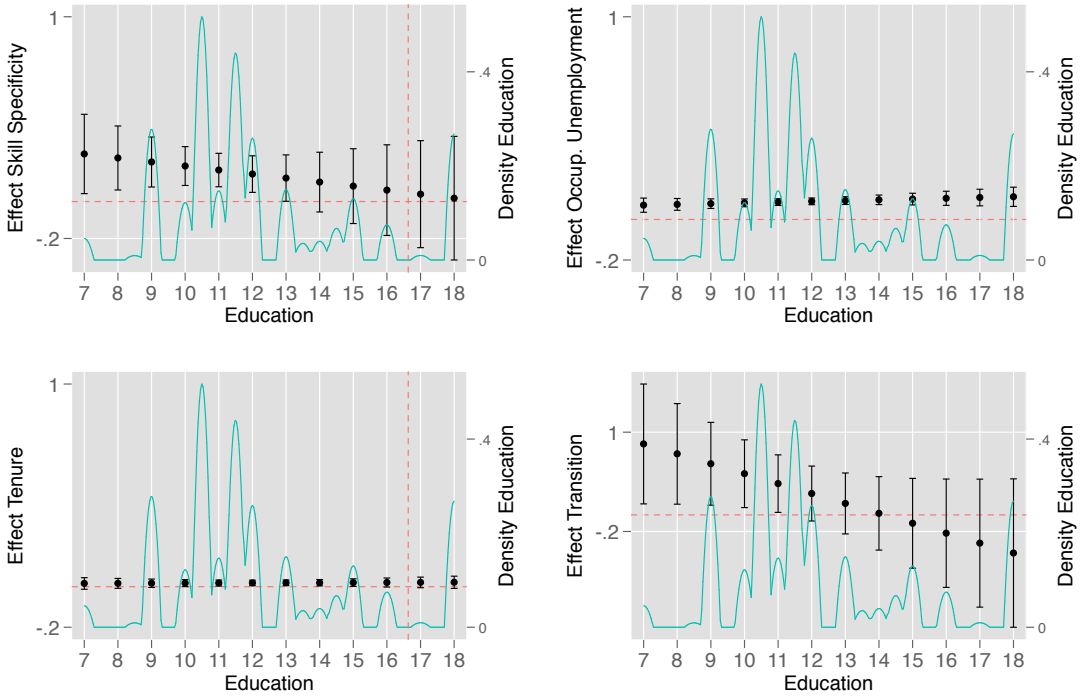
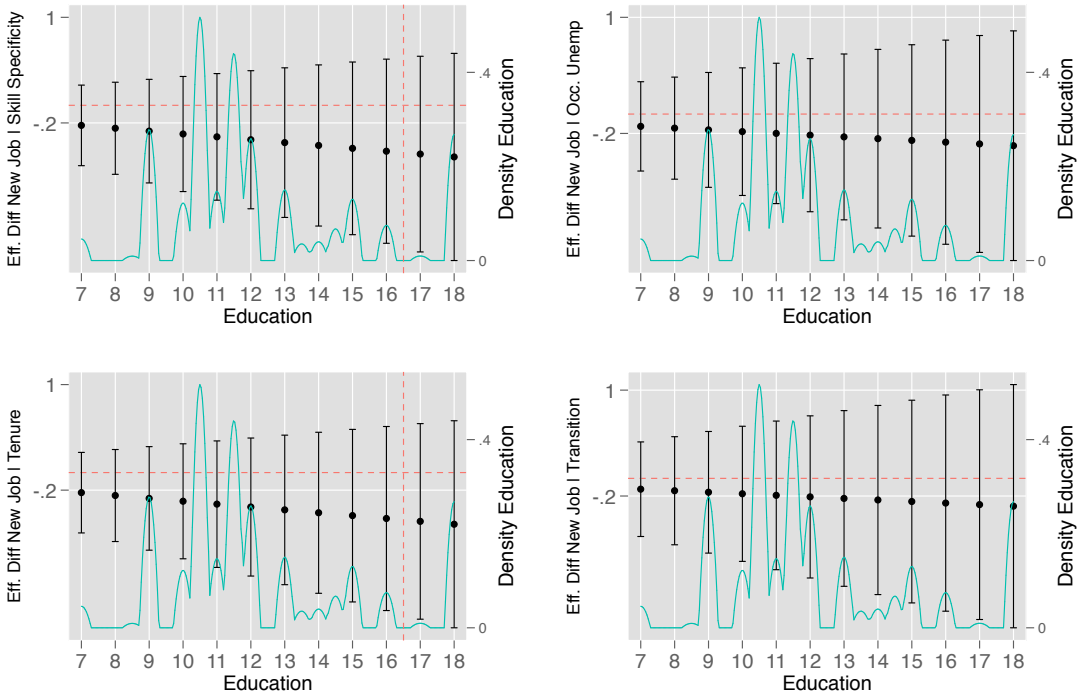


Figure 8: **Marginal effects of the Education (interaction terms in Table B14)**



Appendix C

Table C1: **Placebo test: Treatment assigned to unemployed in years indicated in each column on predicting concern over immigration**

	Unemployed 1999	**Unemployed 2000**	**Unemployed 2001**	**Unemployed 2002**	**Unemployed 2006**
Treated	-0.029	-0.002	0.010	0.020	0.008
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
1999	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
2000	-0.085***	-0.083***	-0.083***	-0.083***	-0.083***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2001	-0.168***	-0.166***	-0.167***	-0.166***	-0.166***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2002	-0.093***	-0.091***	-0.091***	-0.092***	-0.091***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2003	-0.139***	-0.137***	-0.137***	-0.137***	-0.137***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2004	-0.031***	-0.029***	-0.029***	-0.029***	-0.029***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2005	0.075***	0.077***	0.077***	0.077***	0.077***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2006	0.007	0.009	0.009	0.009	0.009
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2007	-0.065***	-0.063***	-0.063***	-0.063***	-0.063***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2008	-0.139***	-0.137***	-0.137***	-0.137***	-0.137***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2009	-0.237***	-0.235***	-0.235***	-0.235***	-0.235***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2010	-0.230***	-0.228***	-0.228***	-0.228***	-0.228***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2011	-0.179***	-0.177***	-0.177***	-0.177***	-0.177***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2012	-0.294***	-0.292***	-0.292***	-0.292***	-0.292***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2013	-0.228***	-0.226***	-0.226***	-0.226***	-0.226***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2014	-0.118***	-0.116***	-0.116***	-0.116***	-0.116***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	2.096***	2.094***	2.094***	2.094***	2.094***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N	346674	346674	346674	346674	346674
LogLik	-235856	-235857	-235857	-235856	-235857
F	444.0	443.7	443.8	443.9	443.7
R^2	0.02	0.02	0.02	0.02	0.02
BIC	471915.6	471918.3	471917.8	471916.2	471917.9

* p<0.1, ** p<0.05, *** p<0.01

Table C2: **Difference in differences models predicting SPD party leaning (binary) and SPD leaning strength (linear)**

	Unconstrained	Skill Specificity $> \tilde{\mu}$	Occupational Unemployment $> \tilde{\mu}$	Tenure $> \tilde{\mu}$	Transition $> \tilde{\mu}$
SPD					
Treated	0.847	1.074	0.897	-0.038	0.828
	(0.63)	(0.72)	(0.71)	(0.92)	(0.71)
1999	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
2000	-0.200***	-0.194***	-0.186***	-0.260***	-0.198***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
2001	-0.283***	-0.265***	-0.328***	-0.193*	-0.316***
	(0.05)	(0.05)	(0.05)	(0.11)	(0.05)
2002	-0.345***	-0.337***	-0.338***	-0.323***	-0.345***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2003	-1.334**	-1.549**	-1.385*	-0.506	-1.312*
	(0.63)	(0.72)	(0.71)	(0.92)	(0.71)
2004	-1.938***	-2.153***	-1.973***	-1.023	-1.920***
	(0.63)	(0.72)	(0.71)	(0.92)	(0.71)
2005	-1.617**	-1.839**	-1.663**	-0.800	-1.603**
	(0.63)	(0.72)	(0.71)	(0.93)	(0.71)
2006	-0.539***	-0.544***	-0.523***	-0.534***	-0.548***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2007	-0.934***	-0.927***	-0.922***	-0.908***	-0.928***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2008	-1.103***	-1.134***	-1.098***	-1.114***	-1.089***
	(0.05)	(0.05)	(0.05)	(0.09)	(0.05)
2009	-1.288***	-1.290***	-1.266***	-1.245***	-1.257***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2010	-0.702***	-0.577***	-0.606***	-0.801***	-0.686***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2011	-1.462***	-1.380***	-1.336***	-1.282***	-1.362***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2012	-1.438***	-1.437***	-1.394***	-1.399***	-1.464***
	(0.05)	(0.06)	(0.06)	(0.08)	(0.06)
2013	-1.381***	-1.305***	-1.282***	-1.223***	-1.288***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
2014	-0.727***	-0.752***	-0.729***	-0.799***	-0.760***
	(0.05)	(0.05)	(0.06)	(0.10)	(0.05)
N	103916	85242	85586	49670	86679
LogLik	-37452	-30800	-30889	-17893	-31372
BIC	75087.8	61781.0	61960.3	35959.4	62925.9
SPD strength					
Treated	0.001	-0.022	-0.105*	-0.041	-0.016
	(0.07)	(0.07)	(0.06)	(0.08)	(0.07)
1999	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
2000	-0.023	-0.026	-0.022	0.027	-0.021
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
2001	-0.033**	-0.032*	-0.037**	0.029	-0.032*
	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)
2002	-0.046***	-0.048***	-0.047***	-0.028	-0.049***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2003	-0.123*	-0.098	-0.011	-0.059	-0.103
	(0.07)	(0.08)	(0.06)	(0.08)	(0.07)
2004	-0.316***	-0.296***	-0.210***	-0.256***	-0.305***
	(0.07)	(0.08)	(0.06)	(0.08)	(0.07)
2005	-0.148**	-0.130*	-0.040	-0.066	-0.129*
	(0.07)	(0.08)	(0.06)	(0.08)	(0.07)
2006	-0.094***	-0.094***	-0.089***	-0.071***	-0.095***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2007	-0.188***	-0.188***	-0.185***	-0.168***	-0.186***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2008	-0.199***	-0.192***	-0.188***	-0.159***	-0.187***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
2009	-0.225***	-0.219***	-0.220***	-0.196***	-0.218***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2010	-0.130***	-0.121***	-0.122***	-0.106***	-0.129***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2011	-0.104***	-0.095***	-0.096***	-0.070***	-0.098***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2012	-0.157***	-0.160***	-0.163***	-0.090***	-0.149***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
2013	-0.137***	-0.132***	-0.134***	-0.111***	-0.140***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2014	-0.134***	-0.121***	-0.134***	-0.129***	-0.132***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Intercept	3.504***	3.499***	3.489***	3.495***	3.502***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N	52695	46008	45411	32083	46694
LogLik	-34667	-29824	-29555	-18171	-30169
BIC	69507.8	59819.0	59281.6	36508.2	60510.0

* p<0.1, ** p<0.05, *** p<0.01

Table C3: **Difference in differences models predicting CDU party leaning (binary) and CDU leaning strength (linear)**

	Unconstrained	Skill Specificity $> \tilde{\mu}$	Occupational Unemployment $> \tilde{\mu}$	Tenure $> \tilde{\mu}$	Transition $> \tilde{\mu}$
CDU					
Treated	-0.130	-0.020	0.213	-0.552	-0.240
	(0.50)	(0.54)	(0.55)	(0.72)	(0.55)
1999	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
2000	-0.196***	-0.183***	-0.212***	-0.149**	-0.199***
	(0.05)	(0.05)	(0.05)	(0.07)	(0.05)
2001	-0.358***	-0.351***	-0.322***	-0.734***	-0.339***
	(0.05)	(0.05)	(0.05)	(0.12)	(0.05)
2002	-0.178***	-0.175***	-0.181***	-0.139***	-0.165***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2003	0.452	0.346	0.150	0.742	0.558
	(0.50)	(0.54)	(0.55)	(0.73)	(0.55)
2004	0.103	-0.009	-0.253	0.559	0.211
	(0.50)	(0.54)	(0.55)	(0.72)	(0.55)
2005	0.052	-0.067	-0.295	0.332	0.137
	(0.50)	(0.54)	(0.55)	(0.73)	(0.55)
2006	0.195***	0.197***	0.187***	0.230***	0.197***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2007	-0.189***	-0.178***	-0.190***	-0.161***	-0.191***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
2008	-0.006	-0.057	-0.073	0.052	-0.056
	(0.05)	(0.06)	(0.06)	(0.09)	(0.06)
2009	0.069	0.042	0.040	0.088	0.055
	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
2010	0.678***	0.804***	0.719***	0.530***	0.646***
	(0.05)	(0.06)	(0.05)	(0.06)	(0.05)
2011	-0.498***	-0.411***	-0.386***	-0.303***	-0.394***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
2012	-0.577***	-0.531***	-0.568***	-0.546***	-0.605***
	(0.05)	(0.06)	(0.06)	(0.07)	(0.06)
2013	-0.263***	-0.184***	-0.156***	-0.070	-0.151***
	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)
2014	0.604***	0.569***	0.440***	0.635***	0.548***
	(0.05)	(0.06)	(0.06)	(0.10)	(0.05)
N	106499	87045	85788	50185	88429
LogLik	-38651	-31806	-31224	-18572	-32321
BIC	77488.1	63793.9	62629.4	37316.9	64824.0
CDU strength					
Treated	-0.016	-0.065	-0.095	-0.144	0.019
	(0.11)	(0.15)	(0.06)	(0.11)	(0.11)
1999	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
2000	-0.177***	-0.175***	-0.182***	-0.155***	-0.180***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
2001	-0.198***	-0.198***	-0.193***	-0.240***	-0.194***
	(0.02)	(0.02)	(0.02)	(0.04)	(0.02)
2002	-0.090***	-0.089***	-0.094***	-0.089***	-0.093***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2003	-0.011	0.035	0.058	0.112	-0.050
	(0.11)	(0.15)	(0.06)	(0.11)	(0.11)
2004	-0.132	-0.086	-0.058	-0.006	-0.174
	(0.11)	(0.15)	(0.06)	(0.11)	(0.11)
2005	-0.115	-0.061	-0.041	0.019	-0.158
	(0.11)	(0.15)	(0.06)	(0.11)	(0.11)
2006	-0.088***	-0.092***	-0.095***	-0.087***	-0.092***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2007	-0.200***	-0.199***	-0.206***	-0.196***	-0.199***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2008	-0.159***	-0.156***	-0.174***	-0.132***	-0.156***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2009	-0.117***	-0.120***	-0.127***	-0.119***	-0.118***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2010	-0.168***	-0.154***	-0.168***	-0.163***	-0.172***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2011	-0.198***	-0.196***	-0.203***	-0.196***	-0.199***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2012	-0.244***	-0.245***	-0.253***	-0.237***	-0.249***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2013	-0.180***	-0.177***	-0.183***	-0.174***	-0.174***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2014	-0.128***	-0.128***	-0.137***	-0.141***	-0.129***
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Intercept	3.583***	3.585***	3.581***	3.595***	3.583***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
N	65934	57538	55940	41275	58581
LogLik	-42854	-36780	-35746	-23176	-37331
BIC	85885.2	73735.9	71667.5	46522.8	74838.4

* p<0.1, ** p<0.05, *** p<0.01

Figure C9: **Parallel trends assumption: Average Immigration concern for respondents registered as unemployed and not registered as unemployed (1999-2003)**

