Regional Studies

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cres20

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To cite this article: Stefanos Ioannou (2023) Regional and municipal debt in the Eurozone: a cross-country analysis, Regional Studies, 57:1, 97-111, DOI: 10.1080/00343404.2022.2047914

To link to this article: https://doi.org/10.1080/00343404.2022.2047914

REGIONAL STUDIES
2023, VOL. 57, NO. 1, 97–111
https://doi.org/10.1080/00343404.2022.2047914

Routledge Taylor & Francis Group
Regional Studies Association

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ABSTRACT
This paper analyses the development of sub-sovereign debt in the Eurozone, based on a sample of 58 regional and municipal governments for the period 2004–17. The findings show that when examined from the prism of sub-sovereign debt, Eurozone countries cannot be readily divided into core and periphery, as conventionally done nationally. For many countries, a significant domestic variegation in local economic conditions is identified. Driving forces in the rise of debt positions are also varied. Despite such variegations, the analysis also confirms the overarching role of national governments in setting the fiscal and financial boundaries within which local governments operate.

KEYWORDS
regional governance; urban governance; Eurozone; finance

JEL F36, H74, R5
HISTORY Received 15 January 2020; in revised form 15 February 2022

INTRODUCTION

Undoubtedly, one of the most central events of the past decade in Europe was the Eurozone crisis, which originally erupted in 2007/08 and climaxed during the period 2010–15. The crisis hit particularly hard the countries of the European South. Between 2009 and 2015, Greek gross domestic product (GDP) contracted by 25%, the largest GDP decline in times of peace since the US crisis of 1929. Throughout the same period Greece's unemployment hiked at 25%, followed by Spain, with unemployment at 22%.[1]

A voluminous literature soon emerged in macroeconomics, aiming to identify the causes of the crisis. A focal point of the literature, and point of convergence of most accounts, is the distinction of the Eurozone into core and periphery, the first encompassing countries such as Germany and Austria, the latter putting together the countries of the European South (e.g., Hein, 2011; Lapavitsas et al., 2010; and Hale & Obstfeld, 2014). Many of these arguments posited that core economies sustained an export-led economic growth, whereas peripheral economies were identified with declining competitiveness, chronic trade and public deficits, and unsustainable public and private debts. Contrary to Germany's public debt of 73% of GDP in 2009, for example, Greece's public debt had mounted to 127%, thereby making the government's ability to repay its debt particularly vulnerable to the sentiment prevailing in financial markets. Such vulnerability became evident in 2010, when investors became increasingly worried about Greece's debt, thus giving rise to a self-fulfilling spiral, with default becoming more likely due to the fear of default.

Lurking in the shadows of macroeconomic debates and developments has been the consideration of the finances of regional and municipal governments of Eurozone economies. Despite not being the immediate trigger of the crisis themselves, local governments were directly impacted by the crisis. Roca (2018), for example, records how the Spanish real estate crisis of 2007 adversely impacted the spending of the Catalan government on education, welfare benefits, and public sector salaries and pensions. Dodd (2010) writes that more than 1000 cities in France, and 467 cities in Italy, faced steep losses when the derivatives they had purchased, typically for lowering their borrowing costs, imploded in value. Notably, the crisis impacted not just subnational governments located in the European periphery, but also governments located in core European

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Supplemental data for this article can be accessed at https://doi.org/10.1080/00343404.2022.2047914.

economies, such as Austria and Germany (respectively, Möller, 2015; and Hendrikse & Sidaway, 2014).

To date, most literature on local government finance has centred around the United States due to the long tradition of US municipalities in issuing local bonds. Recent studies, however, have also shifted their focus to European experiences (e.g., Lagna, 2015; Rius-Ulldemolins & Gisbert, 2019). In several cases, such works have associated local government finance with the broader debates on urban governance and financialization (for a recent review, see Aalbers, 2019). Common ground in the literature is the identification of a close connection between the contraction of fiscal support from central governments and the increase in the dependency of cities and regions on financial markets, already observed before the crisis (e.g., Hackworth, 2002; Peck & Whiteside, 2016). A notable limitation is that most studies tend to focus on a single locality, or a set of localities in a given country. The wider cross-country investigation of local government finance has thus gone largely unexplored. This is a major gap this paper aims to fill in.

The analysis covers a sample of 58 regional and urban locations from eight Eurozone countries for the period 2004–17.[2] Using a comprehensive set of economic and financial data, an overview of the broad economic conditions of these localities is provided, focusing on economic growth and unemployment. Next, a comprehensive financial analysis is conducted, studying the post-crisis development of the debts and revenues of the corresponding local governments. For each country the analysis is also matched with the economic conditions registered at the national level. Besides quantitative data, interpretation and exemplification also benefit from secondary resources, including academic and newspaper articles, as well as financial analysis reports.

The analytical framework of the paper is informed by the contributions of Hyman Minsky. Minsky categorized debt-to-income profiles of borrowers into hedge, speculative and Ponzi, and argued that euphoric expectations of both borrowers and lenders tend to create an endogenous and re-enforcing mechanism which gradually pushes debts to unsustainable (i.e., speculative and Ponzi) heights (Minsky, 1975, 1986). Minsky's insights are used in two ways. First, his hedge/speculative/Ponzi taxonomy is used as a means to map the debt-to-income positions of the localities of the sample. Second, the paper examines whether, and to what extent, behavioural dynamics of European local governments match Minsky's theoretical insights.

The findings of the paper can be summarized as follows. First, contrary to the core–periphery distinction pointed out at the national level, the evidence suggests a mixed transmission of the dichotomy at the level of local governance. Greece, for example, has been largely absent from municipal borrowing, with Athens maintaining a balanced budget, largely due to institutional constraints. German state governments (*Länder*), on the other hand, have long maintained high debt-to-income positions, already since before the crisis, contrary to the low level of debt-to-GDP registered at the national scale. In several cases, such as Italy and Spain, there seems to be significant domestic variegation in local economic and financial conditions. Furthermore, while there are contexts in which augmented euphoria can be detected pre-crisis, at both the national and local levels, particularly in Spain, this is not so much the case in Germany, where constitutional constraints are more relevant for explaining the need of state governments to issue debt. At the same time, the analysis confirms the influence of national economic conditions over the determination of the fiscal and financial boundaries within which regional and municipal governments operate.

The rest of the paper proceeds as follows. The next section shed light on the institutional background of European Monetary Union. The literature on urban governance and financialization is also reviewed. Additionally, Minsky's theoretical framework is outlined. The paper then provides background information for the countries of the sample, and briefly describe the dataset. The empirical analysis is then conducted and the results presented. The last section summarizes the key findings and highlights their implications for policy.

LITERATURE AND DISCUSSION

The Eurozone as a case study

To appreciate the uniqueness of the Eurozone as a case study, it is important to start with a brief note on its institutional structure. The monetary union was originally launched in 1999 when 11 EU member states locked their currencies against the euro. The Maastricht Treaty of 1992 and the European Stability and Growth Pact (ESGP) of 1997 provided the two pillars for its operationalization, setting targets for the fiscal debts and deficits of member states' central governments. Guided by the neoclassical principles of fiscal prudence, deficits were to be equal or lower than 3% of the country's GDP, while general government debt was to be up to 60%. By design, these thresholds provided a very narrow fiscal space for central government spending, with repercussions on the support of subnational governments.

A unique characteristic of the Eurozone is that admitted member states come to be deprived of their monetary independence (De Grauwe, 2011; Wray, 2003).[3] In effect, this downgrades central governments into the status of regional governance, thus pushing one step further down all other layers of subnational governance within their economies. Such institutional design compromises substantially the capacity of central governments to support lower levels of governance within their jurisdictions. The fact that they operate within a heavily constrained fiscal environment means that any attempt to support regions and municipalities comes at the cost of their own limited fiscal space. It also endangers their own creditworthiness, as contrary to countries with control over their currency, such as the UK and the United States, the central governments of Eurozone members can default.

Such possibility became evident when the European crisis broke out in 2010. Although the detailed discussion over the causes of the crisis lies beyond the scope of this paper, it is important to note that in their vast majority, macroeconomic accounts – whether heterodox or mainstream – draw a distinction between the European core and periphery when explaining the pre-crisis differences in growth regimes (e.g., Bellofiore, 2013; Chen et al., 2012; Hale & Obstfeld, 2014; Hein, 2011; Lapavitsas et al., 2010; Palley, 2013). Germany is the most typical representative of the European core, along with countries such as Austria and Belgium, whereas Greece, Italy, Spain and Portugal are grouped as the European periphery. The argument, in its broad strokes, is that whereas core Eurozone economies were experiencing an export-led growth before the crisis, peripheral ones were largely dependent on debt accumulation. By and large countries such as Germany came to be seen as exemplars of prudence and financially sustainable growth, whereas peripheral economies such as Greece and Spain were flagged as 'sinners', on the basis of their ballooning debts and sustained trade deficits. Peripheral economies were the most vulnerable to the reversal in financial market sentiment that took place in 2010, and the ones that experienced the deepest recession in the years that followed.

Financialization of local governance

Despite the ambiguity surrounding the term, 'financialization' has been widely adopted in social sciences for describing the 'increasing role of financial motives, financial markets, financial actors and financial institutions' since circa 1980 (Epstein, 2005, p. 3). As a result, it has become a valuable point of reference for studies offering critical insights in the inner workings of finance and its impact upon the economy and society (Ioannou & Wójcik, 2019).

Various scholars have attempted to ground financialization to the realm of local governance. At a basic level, Möller (2015) associates it with the penetration of financial rules, performances and rationalities in local governance. Peck and Whiteside (2016) offer a similar elaboration, highlighting the increased influence exercised by intermediating financial institutions, such as credit rating agencies, upon local governments (also see Hackworth, 2002). O'Brien and Pike (2019) corroborate these authors, while also underlining the social and spatial variegation in the unfolding of local financialization processes.

Some of the key facets of the financialization of local governance involve the increased use of bond financing, innovative financial schemes for investment in infrastructure, and the use of financial derivatives, such as interest rate swaps (e.g., Dodd, 2010; Lake, 2015; Möller, 2015; O'Brien & Pike, 2019; Weber, 2010). One of the early examples of financial innovation was the switch from general obligation to revenue bonds in the United States, and correspondingly the shift of creditworthiness assessment from the taxing power of the municipality to the revenue streams of the financed projects (Cropf & Wendel, 1998; Kirkpatrick, 2016). Another relevant example, also from the United States, has been the use of tax increment financing (TIF) (Weber, 2010).

The literature commonly identifies reduced fiscal support from central governments and the introduction of fiscal discipline to the budgets of local governments at the root of the financialization of local governance. This is a long-standing observation in the context of the United States, with several researchers pointing out cuts in federal grants to state and local governments already since the 1980s (e.g., Cropf & Wendel, 1998; Hackworth, 2002; Peck & Whiteside, 2016). In more recent years, scholars have made similar observations in the context of Europe (e.g., Christophers, 2019; Lagna, 2015; Möller, 2015).

Mirror reflection of the use of bond financing by local governments has been their demand from the side of investors. In the context of the United States, Peck and Whiteside (2016) note that municipal bonds have traditionally been considered a safe, low-return investment. These characteristics originally established them as an attractive investment for high-income households. In the years that followed the global financial crisis, however, high-quality local bonds and local infrastructure assets, in the United States and Europe, increased in popularity amongst pension, private equity and sovereign wealth funds due to their safety characteristics and the concomitant volatility and uncertainty in the global economy (O'Brien & Pike, 2019; Vammalle & Hulbert, 2013; Vetter & Zipfel, 2014).

The literature also exhibits certain points of tension and divergence. One is whether financialization enables or transforms entrepreneurial governance (Aalbers, 2019). On the side of Europe, Van Loon et al. (2019) suggest that financialization provides local governments the means to pursue their existing entrepreneurial strategies, such as investment in prestigious real estate projects, thereby enabling them to preserve and advance their position in interurban competition. On the side of the United States, Peck and Whiteside (2016) argue that financialization does not just aid entrepreneurial urban strategies but also transforms them, thanks to the increased participation of financial actors in their designing. Such view echoes the earlier observation of Cropf and Wendel (1998) that the switch from general obligation to revenue bonds in the United States created a bias in local infrastructure policies, against traditional projects, such as streets and parks, and in favour of more glamorous projects such as shopping centres and sports stadiums. Weber (2010) argues that local governments are not just passive recipients of the forces of financialization, but also participate actively in the construction of financial markets by creating new investment instruments and the underlying assets that form their collateral.

A further point of ambiguity is whether financialization is necessarily intertwined with entrepreneurial governance. Dodd (2010) points out that prior to the 2008 crisis numerous municipalities in the United States and Europe used interest rate swaps simply for lowering borrowing costs and aiding the financing of welfare expenses, such as improvements to schools and water treatment facilities. Lagna (2015) mentions that since the 1990s Italian municipalities familiarized themselves with the use of bonds and derivatives, not so much for making local governance more entrepreneurial, but for dealing with the fiscal and administrative decentralization experienced at the time, and the decline in fiscal support from the Italian central government. Other case studies with a focus on Europe also confirm local governments' intention to lower their borrowing costs as their primary incentive for purchasing debt-related derivatives.[4]

An internal critique often coming out of the literature is the insufficient attention paid to the surrounding financial contexts within which local experiences unfold. While undoubtedly local agency matters in explaining, for example, the variegation in the degrees in which local authorities are willing to resist or endorse the forces of financialization, the boundaries in which agency operates are often quite narrow (Christophers, 2019). From this point of view, Peck et al. (2013) argue that even the most local of studies must account for extra-local influences, particularly for the macro-structural and macro-regulatory forces that shape the 'rules of the game'.

From financialization to Minsky

Hyman Minsky is mostly known for his theory of financial instability (Minsky, 1975, 1986). The main tenet of his theory is that financial instability is endogenous to the modern capitalist economy, largely driven by the euphoric expectations of economic agents. His analysis builds on the work of John Maynard Keynes, the giant on whose shoulders 'we can stand in order to see far and deep into the essential character of advanced capitalist economies' (Minsky, 1986, p. x). Keynes's notion of fundamental uncertainty (or else uncertainty that goes beyond the reach of numerical calculations), together with the influence of social conventions, are central to his analysis.

According to Minsky, 'stability is destabilising' in the sense of good economic results creating a self-fulfilling euphoria in which both lenders and borrowers feel increasingly comfortable with expanding debt positions. Gradually, the extended use of debt pushes the borrower into a fragile position where her debt exposure becomes disproportionately large compared with her actual net income flows. In the absence of state intervention, the inherent dynamic of the market is thus towards unsustainable debt positions and ultimately financial crises.

While Minsky originally wrote with the corporate sector in mind, his analysis can be applied to any economic unit, including local governments. Related with the broader scope of this paper, some recent contributions have used Minsky's analytical tools for studying sovereign debt (Argitis & Nikolaidi, 2014; Ferrari-Filho et al., 2010). Others have employed Minsky's tools for studying household and international debt (Brown, 2007; Wolfson, 2002; Wray, 2006). With the exception of Kirkpatrick (2016) no one has considered Minsky in the context of sub-sovereign debt.

Next to Minsky's analysis of economic behaviour there is his taxonomy of debt-income positions into hedge, speculative and Ponzi positions. Described briefly, hedge is the position where a borrower has enough net income to pay both the principal and interest of her debt; speculative the position in which net income suffices for interest payments only; while Ponzi is the state where the borrower needs continuous borrowing for covering both principal and interest of her past debt. The enduring need for new borrowing in the speculative and Ponzi states of indebtedness means that such positions are fragile, in the sense of being dependent upon market conditions at any point in time.

While there is a unity in Minsky's theory of economic behaviour and his hedge/speculative/Ponzi (HSP) taxonomy, it is also possible to isolate the latter and treat it as a 'map', on the presumption that an economic unit can find itself in a speculative or Ponzi position, even if not guided by Minsky's behavioural dynamics. Conceptualized in abstract terms, the map would be flat at the hedge state, becoming 'slippery' as one moves towards the speculative and the Ponzi states.

The analytical separation between Minsky's theory and his HSP taxonomy is valuable for present purposes. First, the HSP taxonomy allows one to make sense of the debt-income positions of the localities for which data are available, by providing the meaningful thresholds, and thus enabling analytical perspective. Side-to-side with such empirical mapping, it is also possible to discuss the extent to which recorded experiences of financialization match the behavioural insights of Minsky, the latter interpreted broadly.

As discussed in the previous section, financialization of local governance relates not just to increased indebtedness, but also with the use of financial derivatives, such as interest rate swaps, by local governments. Per se, the use of such products goes beyond the debt profiles originally described by Minsky, though in practice they are closely related. All else the same, any given locality is more likely to engage with debt-related derivatives if its level of debt starts mounting. Additionally, the increase in the need to use derivatives can often become self-enforcing and unsustainable, as with rising levels of indebtedness. Just like a speculative or Ponzi borrower requires new debt in order to pay back previous debt, Singla and Luby (2018) find that declining financial health and prior use of interest rate swaps are two of the most important determinants in the use of such swaps.

In this spirit, Kirkpatrick (2016) identifies the increased use of debt and high-risk derivatives by US municipalities over the last 40 years as transition towards Ponzi finance, in a behavioural manner similar to Minsky's financial instability cycle. According to the author, financial euphoria at the terrain of municipal governance is inherently intertwined with entrepreneurial governance:

> [Minsky's Financial Instability Hypothesis] takes note of the competitive context of the cycle. … In the case of municipalities, this pressure takes the form of intense interurban competition for mobile investment capital. Cities jockey for position within the urban hierarchy by deploying

> subsidies and incentives to attract business and industry – an 'initiatory' and 'entrepreneurial' mode of urban governance. In this context, municipal issuers are often compelled to pursue growth through speculative infrastructure development, which is increasingly financed by way of debt leverage.
>
> (p. 55)

On the basis of such interpretation, it is possible to differentiate between different types of economic behaviour in the case of European local governments. As with the discussion of the previous section, the hypothesis is that while some localities in financial distress might have been driven by either a euphoric and entrepreneurial urge, others might have used debt and financial derivatives for covering their ordinary expenditures. It is particularly interesting to explore whether the distinction between different types of behaviour translates into different ex-post debt-income profiles, as mapped within the boundaries of the HSP taxonomy.

EMPIRICAL COVERAGE

Country background

The present paper concentrates on a group of regional and municipal governments from eight Eurozone economies for the period 2004–17. The design of the sample is driven by economic intuition and data availability. Given the documented lack of data for the derivatives transactions of local governments (Hendrikse & Sidaway, 2014; Möller, 2015), the analysis concentrates on debt as means for capturing financialization. Data availability also shapes the temporal coverage of the analysis.

The aim is to include countries with a notable presence in the sub-sovereign debt market, while also at the epicentre of the 2010 crisis. To this end, the sample includes Austria, Belgium, Germany, Spain, Italy, France (with gaps), Portugal and Greece. The first four of these countries have a federal governance.

The eight countries vary in their degree of autonomy of subnational governance, often despite their de jure status. In Austria, the level of autonomy of subnational governments is relatively low, despite the federal status of the country. With the exception of Vienna, which is a municipality and a federal province, Austrian municipalities have very limited capacity to levy taxes. Belgium, on the other hand, is one of the EU countries with the highest levels of fiscal decentralization (European Committee of the Regions (ECR), 2019). Regional governments have autonomy from the central government for their spending policies and can borrow from financial markets. Their main sources of revenue are federal grants and own-source tax revenues.

Germany has traditionally been the largest issuer of sub-sovereign debt in Europe, with a heavy reliance on bond financing. Regional governments in Germany (*Länder*) enjoy budgetary independence according to the Constitution of the country, but are de facto restricted due to their limited capacity to make individual decisions regarding taxation, despite their collective influence over tax legislation. Hence, regional governments only have debt as their discretionary source of financing (Jochimsen & Nuscheler, 2011; Vetter & Zipfel, 2014). About 40% of the German sub-sovereign debt is estimated to correspond to bonds with domestic placement (Bellot et al., 2017). Three cities form their own states, namely Berlin, Bremen and Hamburg.

Spain also provides its regional governments (*Comunidades Autónomas*) with a high degree of fiscal and political independence. For historical reasons, Navarre and the Basque Country enjoy an even more extended fiscal autonomy compared with all other regional governments (ECR, 2019). Regional governments have been increasingly active in the bond market in recent years (Bellot et al., 2017).

Traditionally, Italian regions have also enjoyed a relative high degree of autonomy over spending and revenue, despite Italy not being a federal country (ECR, 2019).

France is a relatively centralized state, with very strong control on local government borrowing, primarily allowed for financing capital expenditure (ECR, 2019). Except for Ile-de-France and a handful of other regions, most local borrowing is via bank loans (Bellot et al., 2017). Nevertheless, an upward trend in bond borrowing has been observed since the European crisis (Vetter & Zipfel, 2014). The region of Ile-de-France has also been characterized as a regular issuer of green and sustainable bonds (Moody's, 2017).

Portugal is made up of 308 municipalities and has no regional administration, except for the purposes of EU regional planning (ECR, 2019). Two exceptions are the ultra-peripheral autonomous regions of Madeira and the Azores, both vested with augmented fiscal and financial responsibilities.

Greece also has a highly centralized system of governance, and sub-sovereign debt has remained relatively limited so far. Greek local governments can raise debt, but only for the financing of investment and under specific constraints relative to their regular annual revenues (ECR, 2019).

Dataset

For its empirical analysis the paper uses data from Moody's statistical handbook on regional and municipal governments (Moody's, 2005). To the best of the author's knowledge, this is the richest source of standardized cross-country economic and financial data that exists for regional and municipal governments outside the United States.[5] The dataset matches the eight Eurozone countries with 58 localities, all listed in Appendix A in the supplemental data online. In their vast majority, these localities are either from countries with relatively autonomous regional governance or special cases of enhanced autonomy in countries otherwise characterized by centralized regional administration. This is, for example, the case of Vienna in Austria, or the Azores and Madeira in Portugal, largely in line with the preceding discussion. Germany, Spain and Italy are the countries with the richest coverage.

One limitation of the dataset is that it only includes the regional and municipal governments rated by Moody's. It is clear that this creates a bias of representation because it omits European localities receiving their rating from other rating agencies, like Fitch or Standard and Poor's. Another limitation is that all data are supplied in a ready-made ratio form. Although this is suboptimal, given that it does not allow one to manipulate the data at will, the ratios provided are informative and adequate for present purposes (see the discussion below).

Tables 1 and 2 display the definitions and summary statistics of all the variables used in the analysis.

EMPIRICAL ANALYSIS AND RESULTS

The analysis and results are separated into two parts. First an overview of the broad economic conditions in which European local governments have been operating is provided. Following this, a financial analysis is conducted, with particular attention being paid to the ways in which the available data match Minsky's taxonomy of hedge, speculative and Ponzi borrowing states. The discussion also delves into the behavioural dynamics of different localities. Following this, the analysis is matched with the overarching economic conditions registered at the national level in each of these countries.

The analysis distinguishes between two time periods: one covering the pre-crisis years of 2004–09 and the other for the period 2010–17. Each graph uses a 45° diagonal line to separate the two periods (except for Figure 3b). Any observation above the diagonal indicates an increase of the corresponding variable in the transition from the one period to the other, and vice versa. All variables are expressed as averages of the corresponding time periods. In the presentation format chosen here, locations are separated by country, and are adjusted by population size. The detailed dataset of the material presented in Figures 1–3 is provided in Appendix A in the supplemental data online.

The broad economic conditions

Figure 1 maps the changes in average economic growth and unemployment. Given the availability of the data by Moody's, local developments are also contrasted with the developments taking place at the national level (shown in large hollow circles).

Both graphs reveal a mixed transmission of the core–periphery dichotomy from the national to the local level. On the one hand, it is easy to observe a sizeable correlation between national and local economic conditions. Athens, for example, has recorded the steepest decline in economic growth since 2010, as with the national aggregate. Its rate of unemployment has also increased in a parallel way. Likewise, Spanish and Portuguese localities have moved in tandem with their country aggregates. At the opposite end, all German *Länder* have followed the country in recording an increase in economic growth and a fall in unemployment.

Having said this, there are also significant discrepancies within each country.[6] Italy is noteworthy in this respect. While, for example, Italian growth as a whole has remained relatively stagnant throughout the period examined, the regions of Sicily and Molise have recorded an average annual economic decline of about 2.1 and 2.7 percentage points, respectively, since 2010. Similarly, whereas all Spanish localities have experienced increases in unemployment since 2010, the actual change varies substantially across them, while also appearing to be path dependent. Extremadura and Andalucía, for example, not only recorded the highest unemployment rates in the 2004–09 period, but were also the ones to record the steepest rise since the crisis, by 13 and 14 percentage points, respectively (north-east observations in red in Figure 1b). The Basque Country, on the other hand, recorded an increase of about 5 percentage points, remaining at the bottom end of the Spanish unemployment ranking throughout the whole period. Such discrepancies appear to be independent of size.

Financial analysis and a Minskyan map

As a starting point, this section examines the total debt-to-GDP positions of the localities of the sample. As shown in Figure 2a, one of the most evident post-crisis developments has been the surge in the debt-to-GDP ratios of Spanish subnational governments. German *Länder* have slightly reduced or maintained their levels of debt, although their starting levels were already amongst the highest. Local governments in Portugal have also increased their debt, as have Belgian ones. Italian entities exhibit a mixed picture. While some of the Italian localities with the highest debt prior to the crisis have seen their debt-to-GDP increasing further (e.g., Campania; Lazio), others have remained at low debt levels (e.g., Liguria).

Figure 2b and c map the financial profiles of the local governments of the sample according to Minsky's HSP taxonomy. While such mapping in its own right does not capture any behavioural dynamics, it is nevertheless informative for flagging the localities that would, in theory, appear to be the most vulnerable to market conditions for servicing their debts.

The main part of the analysis uses the net and gross operating balances, each divided by operating revenue (includes tax revenue and income from intergovernmental grants). As calculated by Moody's, the net operating balance captures the difference between current revenues and expenditures, with all debt payments (interest and principal) also incorporated in the expenditure side. Gross operating balance considers the difference between current revenues and expenditures, but only incorporates interest payments on the expenditure side. In alignment with Minsky's taxonomy, localities are identified for which net operating balance is positive as in a hedge state. On the contrary, a negative net operating balance denotes a speculative state. Localities in a Ponzi state are those for which not just the net but also the gross operating balance is negative.

Minsky's actual taxonomy considers capital revenues and expenditures too. These are not part of the above

Table 1. Summary statistics, variable definitions and credit rating scale.

Variable	Source	Additional notes	Observations	Mean	SD	Minimum	Maximum
National level real GDP growth (%)	World Economic Outlook, IMF		112	0.81	2.55	−9.13	5.65
National rate of unemployment (%)	Moody's statistics		111	10.34	5.63	3.80	27.50
Sub-national real GDP growth (%)	Moody's statistics		606	0.59	2.41	−9.20	7.00
Sub-national rate of unemployment (%)	Moody's statistics		652	11.06	6.54	0.00	36.30
Sovereign credit ratings (1–21 scale; 21 for Aaa)	Moody's website	End-of-year ratings	112	17.31	4.99	1.00	21.00
Sub-sovereign credit ratings (1–21 scale; 21 for Aaa)	Moody's website	End-of-year ratings	604	16.18	4.03	1.00	21.00
Population (in 000s)	Moody's statistics	Reported only for the subnational localities of the sample	691	11,354	94,302	51	1,126,938
Total debt to GDP (%)	Moody's statistics	Includes all long- and short-term debt instruments associated with the operations of a subnational government and with state-owned enterprises for which the subnational government is responsible, either by means of ownership or by guarantees; local gross domestic product (GDP) is used as the denominator	653	20.40	77.71	0.10	1001.41
Net Operating Balance (%)	Moody's statistics	Equals gross operating balance minus principal debt payments, divided by operating revenue	692	−2.81	17.05	−79.90	35.90
Gross Operating Balance (%)	Moody's statistics	Equals primary operating balance minus interest payments, divided by operating revenue	693	5.44	10.75	−44.00	36.40
Self-financing ratio (%)	Moody's statistics	Equals the gross operating balance plus capital revenue, divided by total capital expenditure	481	0.80	1.00	−6.60	12.10

Note: Moody's statistics refer to Moody's (2005). All sums are converted to US dollars. One extreme outlier is removed for the city of Milan in the debt-to-gross domestic product (GDP) series.

Table 2. Rating scale and numerical conversion.

Alpha-numerical ratings	Numerical conversion	Alpha-numerical ratings	Numerical conversion	Alpha-numerical ratings	Numerical conversion
Aaa	21	Baa1	14	B2	7
Aa1	20	Baa2	13	B3	6
Aa2	19	Baa3	12	Caa1	5
Aa3	18	Ba1	11	Caa2	4
A1	17	Ba2	10	Caa3	3
A2	16	Ba3	9	Ca	2
A3	15	B1	8	C	1

Note: Ratings Aaa to Baa3 are classified as investment grade by Moody's. All other ratings are classified as non-investment grade.
Source: Moody's website.

series, and hence one needs to consider them in a separate way. This is done in Figure 2d by plotting a separate series provided by Moody's, labelled as 'self-financing ratio'. The self-financing ratio equals the sum of the gross operating balance and capital revenue divided by capital expenditure. As described by Moody's, a ratio less than 1 implies the need to borrow in order to meet capital budget requirements (Moody's, 2005, p. 7).

Similar to earlier studies (Vammalle & Hulbert, 2013), it can be observed that the operating deficit positions of Spanish localities are in a highly precarious state. Examining Figures 2b and c together, it can be seen that in their vast majority Spanish local governments are in a Ponzi state of indebtedness, while also exhibiting a notable deterioration in the post-crisis period. The main exception to this trend is the city of Barcelona. Italian localities are split relatively evenly between hedge and speculative, with relatively moderate imbalances. The three localities with the most significant surplus positions are Bolzano, Trento and Valle d'Aosta, all from the northern part of Italy. Portuguese localities are either in speculative or Ponzi territory. In their vast majority, German *Länder* are also in speculative territory. Saxony-Anhalt is the state with the most extreme deficit position (south-west end in Figure 2b). Most of the Belgian and Austrian localities are in a mild speculative position. The Greek capital, on the other hand, is in a moderate hedge position. Figure 2d complements the overall picture by displaying the balance between capital revenues and expenditures for those locations for which data are available.

Excess economic euphoria is at the epicentre of Minsky's behavioural analysis. However, this does not mean that all local governments at a speculative or Ponzi state are necessarily driven by a euphoric behaviour. The evidence reveals a mixed picture in that respect.

On the one hand, Spain as a country was characterized by excess euphoria in the years before the crisis, with the most concrete manifestations being the ballooning of house prices and private sector debt (Benito et al., 2015; Lapavitsas et al., 2010). In large part, such euphoria was also related to the unprecedentedly low borrowing costs due to the country's admission to the Eurozone in 1999. As with the rest of the country, local governments in Spain experienced comfortable access to financial markets, holding double- to triple-A ratings up until the crisis and bond yields similar to these of Germany (Organisation for Economic Co-operation and Development (OECD), 2013; Vammalle & Hulbert, 2013).[7] Contrary to the private sector, however, local governments' deficits and debts ballooned after the crisis, rather than before.

To a large extent this development can be explained by the collapse of revenues associated with real estate activity in 2007. As pointed out by Benito et al. (2015) and Roca (2018), amongst others, the vast majority of Spanish municipalities and regions were heavily reliant on such sources of income throughout the 2000s. Some examples were taxes on real estate construction and transactions, revenues from sales of land, as well as funds from granting use rights of municipally owned property assets to private developers (Benito et al., 2015). Another factor was the decline in support from the central Spanish government. In the case of the Catalan region, for example, intergovernmental transfers declined from 41% of operating revenue in 2009 to 19% in 2017 (Moody's, 2005). Similarly, intergovernmental grant revenue went from 60% to 38% in the case of Castilla-La Mancha, another Spanish locality with a ballooning debt-to-GDP ratio. Additionally, the steep downgrading of local Spanish governments in the period 2010–12, reflective of loss of trust by international financial markets and increasing borrowing costs, significantly deteriorated the debt-servicing conditions of these governments. While the data do not allow one to draw a precise distinction between the explanatory power of each of these factors, they could be expected to have played out in a complementary rather than contesting manner.

Local governments do not operate in vacuum, and hence it could make sense to expect pre-crisis economic euphoria to have penetrated local governance in Spain. Considered in a counterfactual and speculative way, it is likely that Spanish localities would have registered notable surpluses before the crisis, were they to have viewed the real estate boom as unsustainable before its burst. From this point of view, these localities stood at the receiving end of the euphoria that had prevailed throughout the country.

While only partial, there is also some evidence of local governments exhibiting agency in acting in a Minskyan

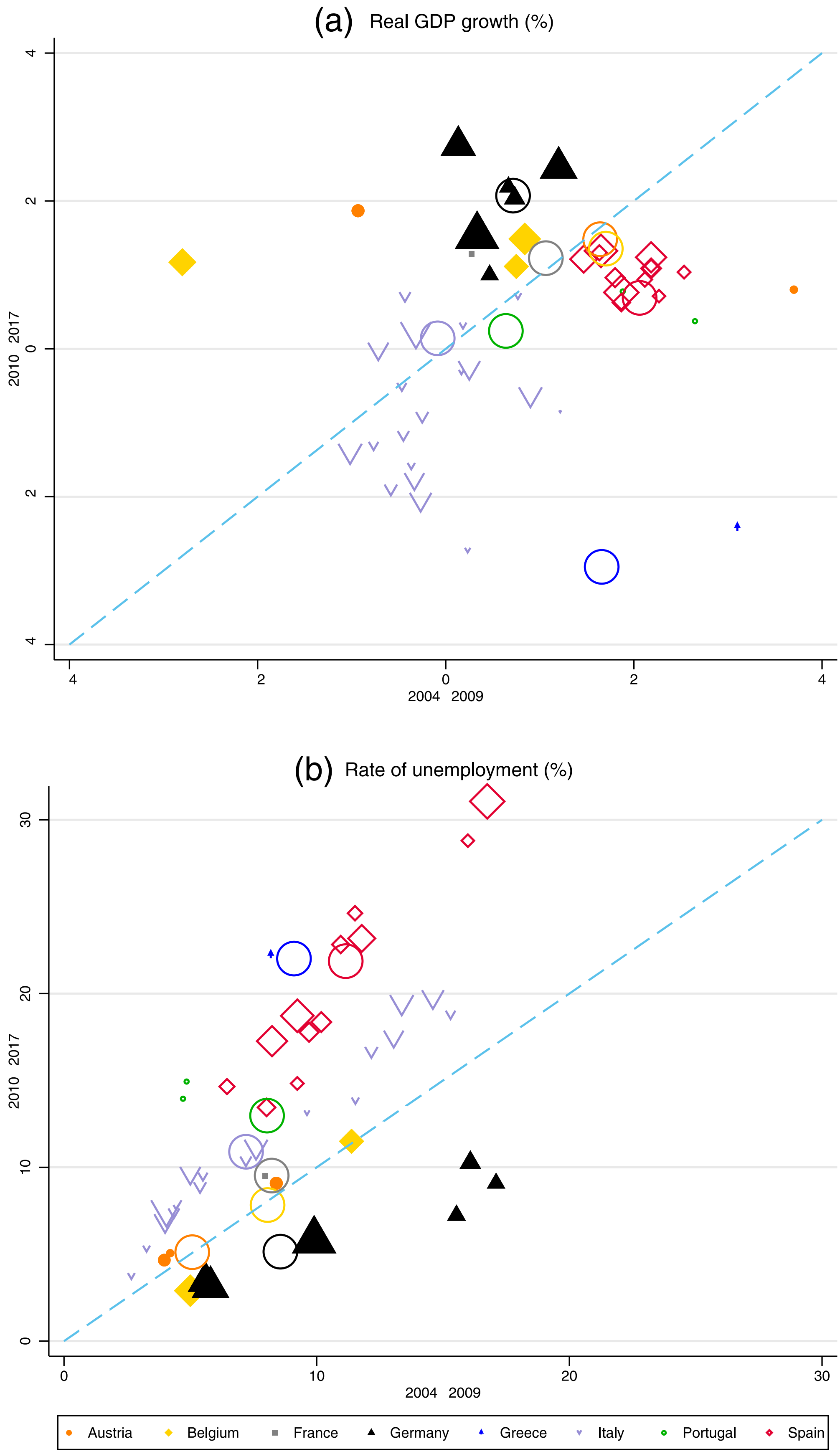

Figure 1. Overview of real gross domestic product (GDP) growth and unemployment for the 58 regions and cities of the sample.
Note: All graphs depict averages of annual values and include a 45° diagonal; country data in large hollow circles; data are adjusted by population size. For detailed data elaboration, see Appendix A in the supplemental data online.
Sources: World Economic Outlook; Moody's statistics; and author's elaboration.

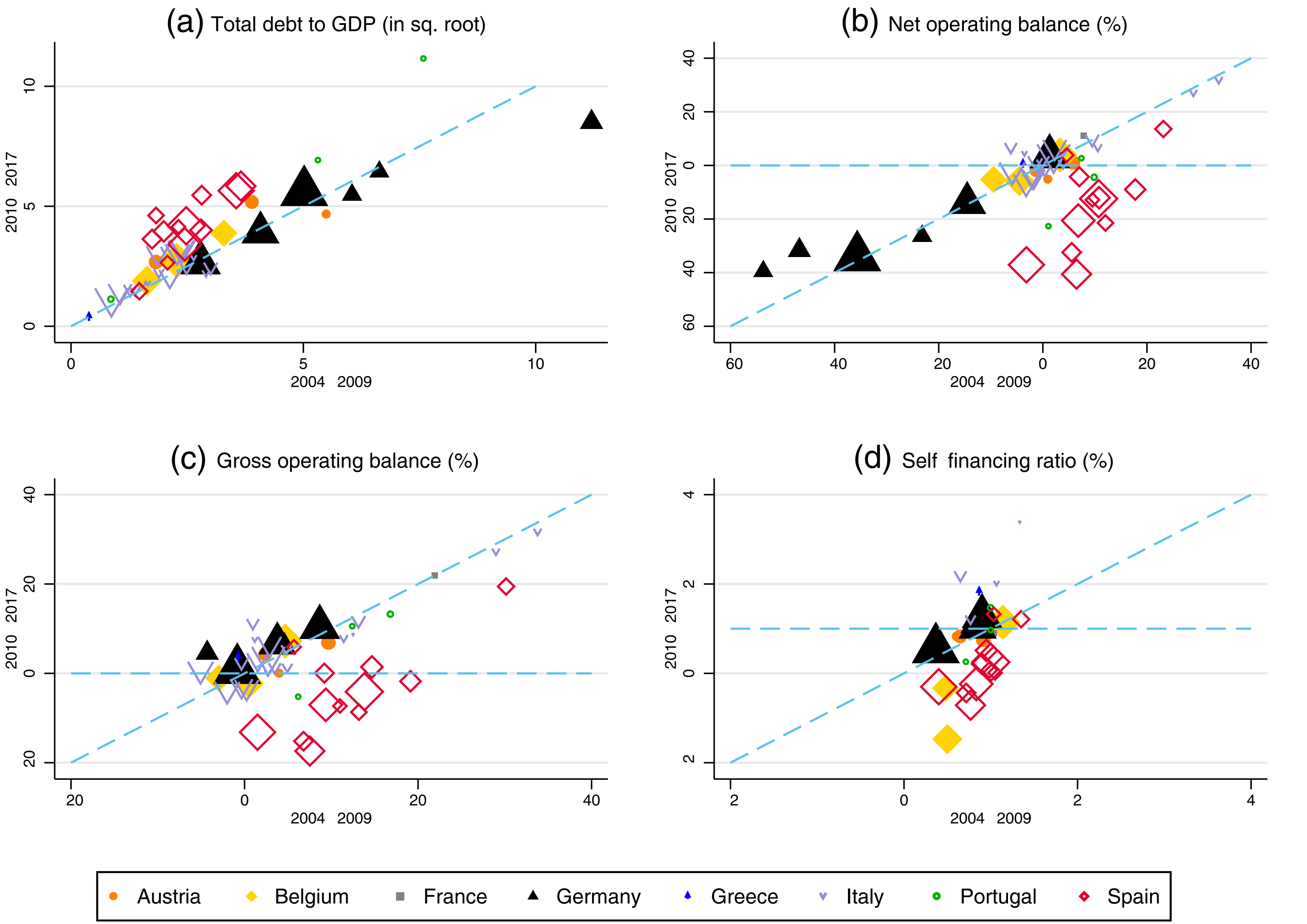

Figure 2. Financial analysis for 58 regional and municipal governments in the Eurozone.
Note: All graphs depict averages of annual values and include a 45° diagonal; data are adjusted by population size. For the definition of all variables, see Table 1. For detailed data elaboration, see Appendix A in the supplemental data online.
Sources: Moody's statistics; and author's elaboration.

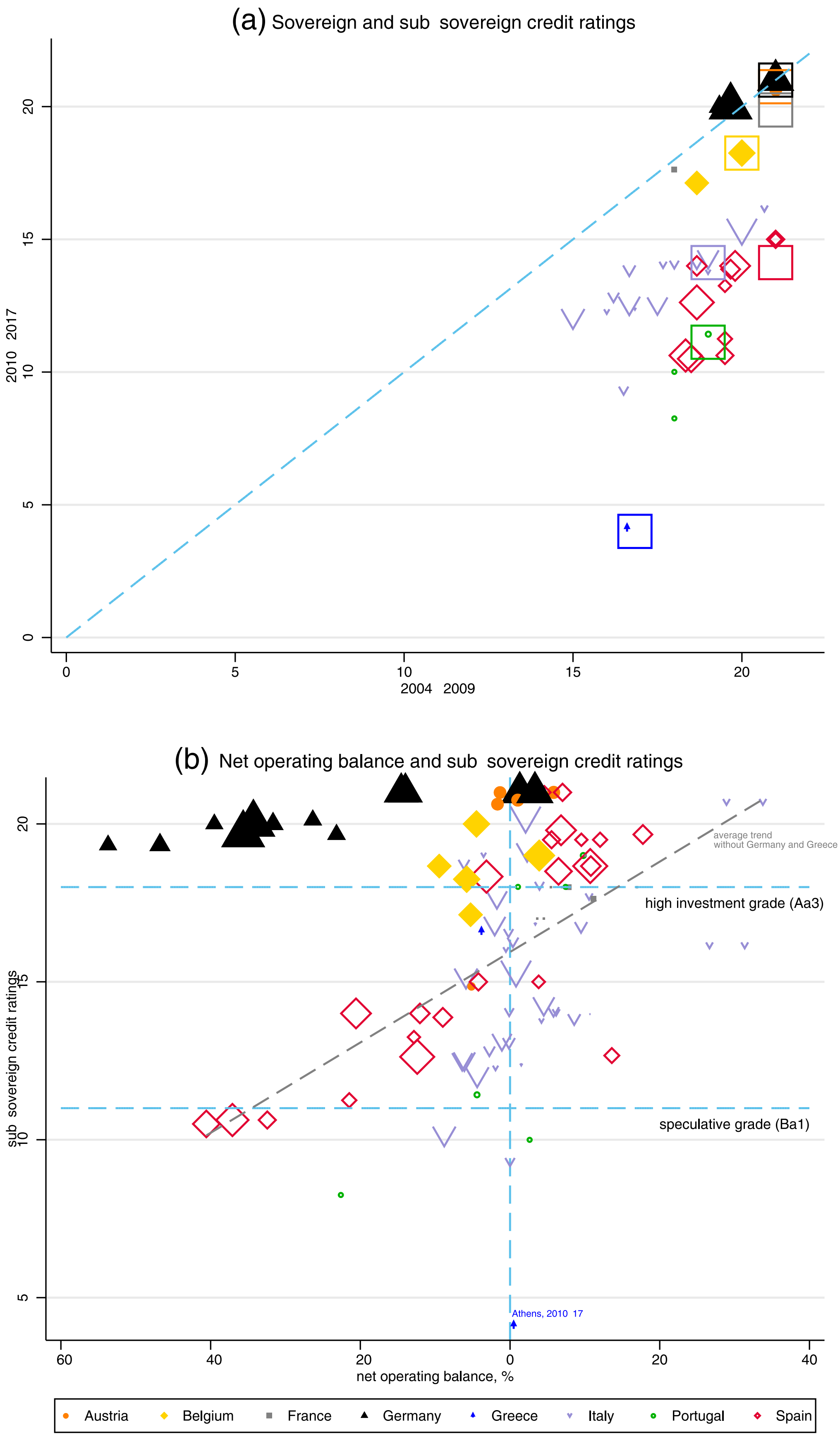

Figure 3. Significance of national economic conditions.
Note: Data correspond to regional and municipal governments, separated by country and adjusted by population size: (a) includes a 45° diagonal and country-level data in large hollow squares; (b) combines pre- and post-crisis observations, considered in averages for 2004-09 and 2010-17, respectively; the average trend in grey does not consider Germany and Greece and is based on size-unadjusted averages. For definitions of all variables, see Tables 1 and 2. For a detailed data elaboration, see Appendix A in the supplemental data online.
Sources: Moody's statistics; and author's elaboration.

manner, the latter conceptualized as in Kirkpatrick (2016). This is, for example, the case of Valencia, the locality with the most extreme net operating deficit in Figure 2a. Rius-Ulldemolins and Gisbert (2019) claim that in Valencia one can see entrepreneurial governance fused with corruption. As suggested by them, faced with post-industrial economic decline, the regional authorities in Valencia aimed at 'putting the region back on the map' by means of mega-projects, such as the Formula 1 circuit and the City of Arts and Sciences.

Another interesting example of local agency is the region of Madeira in Portugal. As reported by Moody's, Madeira's debt position was aggravated substantially in 2011 when 'grave irregularities' came to the surface due to failure to report €1.2 billion in commercial liabilities (Moody's, 2011). According to the news of the time, '[w]hile doing much to improve the average lot of the island's citizens … Jardim [Madeira's then president] has been severely criticized for the profligate spending of mainland taxes on white elephant projects' (Graeme, 2011, n.p.).

Other countries, however, provide accounts that deviate from the Minskyan behavioural prototype. A notable example is the state of Carinthia in Austria. Carinthia came under financial distress in 2015 due to the resolution of a local failed bank (Heta, itself the wound-down entity of the former Hupo-Alpe-Adria Bank), whose senior debt was guaranteed by the local government (Atkins, 2015; Atkins & Hale, 2016). The total guaranteed debt (about €11 billion) amounted to five times the government's operating revenue for 2014 (Moody's, 2015), making financial survival impossible without debt restructuring and intermediation from the central government. Besides serving as an example of non-Minskyan behaviour, this example is also useful for showing that 'too-big-to-fail' banking is not only concerned with megabanks operating at the global and national scales, as often discussed in the literature (e.g., Ioannou et al., 2019), but also penetrates the local level.

A more prominent example of deviation are the local governments of German *Länder*. While at speculative territory in terms of stand-alone indebtedness, these governments have historically been some of the largest issuers of sub-sovereign debt globally already before the crisis (Canuto & Liu, 2010). Rather than being driven by financial euphoria, however, their sustained indebtedness is a result of two factors. First, the fact that they are constitutionally limited in taxation decisions, therefore having debt as their only discretionary source of revenue (Jochimsen & Nuscheler, 2011). Second, and most importantly, the enduring triple-A status of the federal government of Germany, and thus the implicit guarantee of their debt by the federal government.

Figure 3a confirms the decisive influence of sovereign creditworthiness upon sub-sovereign creditworthiness. Both before and after the crisis of 2010, sovereign credit ratings have persistently functioned as a cap for all sub-sovereign rating scores, only with a few, very specific exceptions in the Italian and Spanish north, most notably Lombardy and the Basque Country (to see this best, read the graph both horizontally and vertically). To be sure, sovereign rating ceilings do not remove the substantial dispersion of sub-sovereign ratings recorded within countries, as evidenced, for example, in Italy. What they do is to show the limits within which such dispersion is recorded.

Figure 3b highlights the influence of sovereign economic positions further, with a particular focus on the two most extreme cases of the sample: Germany and Greece. The graph puts together sub-sovereign credit ratings and net operating balances, that is, the series used for differentiating between hedge and speculative localities earlier on, and jointly considers the pre- and post-crisis data, taken as averages for the 2004–09 and 2010–17 periods, respectively. All else the same, one would expect a positive association, wherein a greater net operating surplus would correspond to a higher credit rating, given the affirmation of the ability to service debt that such surplus would reflect. Such a hypothesis is indeed confirmed for all countries of the sample, except for Germany and Greece, the latter two conspicuously diverging from this trend, but in opposite ways. On the one side, thanks to the implicit guarantee of their debts by the German federal government, governments of German *Länder* find themselves in what could be identifies as a 'pseudo-speculative state', that is, in a speculative state of indebtedness in terms of Minsky's HSP taxonomy, albeit with top investment-grade credit ratings. At the opposite end, post-crisis Athens combines a balanced net operating budget with a C-class credit rating, a finding reflective of the steep downgrading and verge with bankruptcy of Greece's national government post-2010.

CONCLUSIONS

Economic data from 58 European regional and municipal governments are used to study the development of their debt-to-income positions for the period 2004–17. The analysis reveals a number of interesting insights. First, the distinction established at the national level between the Eurozone's core and periphery appears to be significantly diluted when moving to the terrain of sub-sovereign governance. Despite its protagonist role at the sovereign debt level, Greece, for example, is largely absent from the sub-sovereign debt market. German state governments, on the other hand, have long stood out as the second largest issuer of sub-sovereign debt in the world, after the United States (Canuto & Liu, 2010). In numerous cases these debts are disproportionate compared with the revenues of these governments. In Italy, and other cases, there appears to be a significant domestic variegation in the economic and financial conditions registered by different localities. Furthermore, although economic euphoria is often relevant for understanding the drive of local governments towards high debt-to-income positions, particularly in Spain, it is of more limited explanatory power in other contexts, as in Germany. The analysis also confirms the overarching significance of the fiscal and financial power of the national government within each country.

Various implications stem from this analysis. First, the diluted diffusion of the core–periphery dichotomy at the sub-sovereign level, together with the observed domestic variegation of economic conditions across different localities, serves as a warning against macroeconomic oversimplification. Although macroeconomic analyses are invaluable in capturing the broader picture, they remain incomplete as long as they fail to consider the subnational differentiation of the patterns observed nationally. The observed domestic heterogeneity also corroborates earlier warnings against simplistic examination of subnational aggregates (OECD, 2013; Vammalle & Hulbert, 2013).

At the same time, the overshadowing of local economic and financial conditions by the conditions prevailing at the national level – explicitly manifested by the capping of sub-sovereign ratings by sovereign ratings – also echoes earlier calls for attention to be paid to the macroeconomic and macrostructural environment within which localities operate (Christophers, 2019; Peck et al., 2013). As much as regional and urban studies are needed to capture local contexts, experiences and processes, completeness and accuracy also requires a consideration of the boundaries, pressures and influences recorded nationally and internationally. Together with the previous point, the paper thus highlights the deep complementarity between macroeconomic and regional/urban studies.

There are various ways in which this research can be expanded. First, a promising path would be to study in more detail the experiences recorded in selected localities of the current sample. There is naturally a trade-off between the panoramic view offered in this paper and the in-depth elaboration of the dynamics involved in each locality, and this is, of course, a limitation of the current study. Second, subject to data availability, one could use the methodological framework developed in the paper to study the finances of regional and municipal governments in other parts of the world, as well as globally. Such an examination and comparison with the results of the current study could also aid the identification of the degree in which aspects related to the Eurozone's institutional structure, such as the lack of monetary independence for member states, impact the finances of local governments independently from other factors.

An additional extension, once data allow, would be to study the impact of the Covid-19 pandemic on municipal and regional financial stability in Europe. To deal with the crisis, European national governments have had to provide vast support to their economies, and correspondingly register steep increases in their deficit and debt positions, even in comparison with the European crisis of 2010. Greece's sovereign debt-to-GDP ratio, for example, reached 206% in 2020, from 180% the year before, while Germany's debt exceeded the (temporarily suspended) Stability and Growth Pact ceiling of 60%, reaching 70% for the same year.[8] It remains to be seen whether the experience of the pandemic will once again lead to policies of fiscal discipline, with adverse repercussions to financial stability; or enable us to think of policies able to overcome economic divides, both within and across borders.

ACKNOWLEDGEMENTS

The author is grateful to three anonymous reviewers for their fruitful comments on an earlier draft of the paper; as well as Professor Gary Dymski and Professor Dariusz Wójcik for their valuable feedback during the writing and revision of the paper.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

FUNDING

The paper benefited from funding received from the European Research Council (European Union's Horizon 2020 Research and Innovation Programme) [grant agreement number 681337]. The article reflects only the author's views, and the European Research Council is not responsible for any use that may be made of the information it contains.

NOTES

1. Source: Eurostat.
2. Austria, Belgium, Germany, Spain, Italy, France (with gaps), Portugal and Greece.
3. While this statement holds from the economics point of view, it omits the distribution of political power among member states.
4. See Hendrikse and Sidaway (2014) for discussion of Pforzheim in the German *Länder* Baden-Württemberg; and Möller (2015) for a similar account for the Austrian city of Linz.
5. Other rating agencies, such as Standard and Poor's, provide snapshots of their analyses, but not detailed spreadsheets, as in the case of Moody's. Moody's dataset is proprietary and, in principle, available upon payment, but free access can be granted on request for using the data for academic purposes.
6. In the cases of Austria and Belgium, the discrepancies are mostly due to the disproportionate lack of data for the period before 2009.
7. Source: Moody's.
8. Source: Eurostat.

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