

# Financial Systems and Economic Crises: Vulnerabilities, Effects and Dynamics

## Alt title: Institutional dynamics in EU financial Systems

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### Abstract

This paper argues that the traditional dichotomous and static conceptualisations of financial systems fail explain how financial systems have changed as a result of transformative events (the 2007-2008 financial crisis in particular) and trends in recent decades. To shed light on developments in contemporary financial systems in the EU, this paper presents and analyses an index that seeks to capture the extent to which funding structures in non-financial companies subject them to financial pressures.

The index reveals that the EU as a whole is distinctly “bank-based”, in the sense of private equity and bank credit matter more for funding of non-financial companies than listed equity or market-based credit. However, the EU and its Member States have become more market-based over the last decade. While this trend generally holds true, there is also increasing divergence between European financial systems. Developments in individual countries appears to be determined by competitive advantage specialization as well as how strong the country was hit by the 2007-2008 financial crisis.

The paper thereby contributes to the comparative political economy literature on comparative financial systems, as well as the much neglected questions if, how and why institutional transformation in financial systems occur. It also contributes to the literature on how different national financial systems respond to economic shocks.

**Key words:** Financial systems; varieties of capitalism; institutional transformation; financial crisis, corporate funding

# Financial Systems and Economic Crises: Vulnerabilities, Effects and Dynamics

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### 1 introduction

This paper contributes to the debate on whether financial systems (FSs) are essentially stable over time, or whether, how and why they evolve.<sup>i</sup> The former perspective characterizes the bulk of the comparative political economy (CPE) literature, which sees the institutional system within and around FSs as self-sustaining historical choices. In this perspective, the variety of FSs across countries – in terms of how and by whom intermediation between deficit and surplus agents is accomplished – can be explained by the degree to which the institutional system supports or discourages particular forms of intermediation. And since institutions are stable or at least “sticky”, such FSs can also explain the presence of distinct FSs even in an era of global trade and competition across product, service and capital markets.

The CPE literature on FSs often focuses on the relationships between non-financial companies (NFCs), investors and intermediaries, and contrasts between bank- and market-based FSs.<sup>ii</sup> In the former, banks play a particularly important role in intermediation, and bank credit is a core source of funding of NFCs. Other forms of patient capital also characterize the funding structures in these FSs, such as concentrated equity ownership by owner-families, or other NFCs (including through cross-holdings). NFCs in market-based FSs, on the other hand, rely on more short-term oriented investors in both the equity and capital space; listed equity and market-based credit (such as corporate bonds) play more prominent roles (Gabor 2012). Sometimes, the CPE literature also recognizes hybrid-type FSs that combine the features of the bank- and market-based systems to various extents (Boyer 2001; Hancke 2001; Howarth 2013 Quaglia & Royo 2015).

Different types of FS appear to produce equally satisfactory levels of welfare over longer time periods (Gambacorta et al. 2014; Cournède & Denk 2015). One reason is that FSs allow for NFCs (on the aggregate level) to embark on somewhat different strategies or specialization, with different types of employee skills required or innovation (Hall & Soskice 2001). The CPE literature also claims that NFCs across different FSs maintain their competitiveness over time by reverting to their sources of competitive advantage in periods of transformation or when experiencing economic shocks (Hancke et al. 2007). FSs will therefore respond differently to common challenges or shocks.

Even studies following the global financial crisis of 2007-2008 – arguably the most severe economic shock experienced in many contemporary capitalist societies – suggest that the distinct characteristics of FSs were preserved or that any transition or convergence between them is unlikely (Hancke et al. 2007; Iversen & Soskice 2012). Such downplaying of institutional dynamics and transformations of FS is a frequent critique of the mainstream CPE literature. Although exceptions exist – such as the documentation of convergence through global policy reactions after the crisis through new banking regulation, “neoliberal” austerity policies etc. (Peters 2012; Hermann 2014; Bengtsson 2013) – much of the CPE literature has misjudged the power of exogenous shocks and supranational institutions in leading to institutional transformation (Hermann 2014).

This absence of social transformation does not chime with the vast and growing literature on *financialization*. This literature claims that financial actors, markets, practices, measurements, and narratives are increasingly shaping our societies (Aalbers 2016; Thomson & Dutta 2016). While this is partly related to policy choices following the crisis, it is also related to other secular trends that characterize many capitalist societies. These are the rapid growth in financially managed assets in search of yield and financial innovation in the shape of new intermediaries, assets and markets (such as shadow banking, securitization etc. (Bengtsson 2014; 2017). Moreover, financial integration and deregulation/liberalization open up markets for cross-border intermediation and provisioning of other financial services. This is a particularly important development in the EU, where common laws and supplementary institutions (ECB, ECJ etc.) facilitate specialization across Member states for particular financial services or market segments (Bengtsson & Delbecq 2011; Bengtsson 2019).

This paper argues that the traditional dichotomous and static conceptualizations of FSs fail to take into account the changes that have followed from transformative events (the financial crisis of 2007-2008 in particular) and trends in recent decades. To address this shortcoming, this paper presents an index – the

*market-based index* (MBI) – that seeks to capture the extent to which funding structures in NFCs subject them to financial pressures. The MBI is presented on a cross-country basis (and for the EU as a whole) to allow for a discussion on whether European countries can be categorized in different archetype FSs. Moreover, annual changes in MBIs for individual countries and the EU are presented and analysed in order to gauge the direction in which FSs have evolved in the recent decade. Finally, the MBI is also used to estimate the role and magnitude of the 2007-2008 financial crisis as a catalyst for institutional change.

The paper shows that the EU as a whole is “bank-based” in the sense of privately held equity and bank credit matter more for funding of NFCs than listed equity or market-based credit. However, the EU and its Member States have become more market-based over the last decade. While this trend generally holds true, there is also increasing divergence between European FSs. Developments in individual countries appears to be determined by competitive advantage specialization as well as how strong the country was hit by the 2007-2008 financial crisis.

The paper thereby contributes to the CPE literature on comparative financial systems, as well as the much neglected questions on if, how and why institutional transformation in FSs occur. It also contributes to the literature on how different FSs respond to economics shocks. This literature has studied the frequency, depth and recovery from crises across different types of FSs (IMF 2006; Kalemli-Ozcan et al. 2012; Langfield & Pagano 2016; Allard & Blavy 2011), and institutional change in particular countries or certain reforms areas (social policies, collective bargaining, labour legislation, impact on women, etc.) (Farnsworth & Irving 2011; Karamessini & Rubery 2013; Hermann 2014). However, less is known on how the actual FSs themselves transform. And while there are excellent overviews on the latter topic (see for instance Hardie & Howarth 2013), they often focus on particular countries (thus fails to capture the comparative dimension) or cover too short periods after the crisis to sufficiently capture institutional transformation that occurs gradually and slowly over time. By seeking to fill this void, this paper also contributes to the financialization discussion, which from a theoretical viewpoint is precisely a question of institutional change.

The remainder of this article is organized as follows: Section 2 covers the relevant literature. Section 3 outlines the data and methodology. In Section 4, the empirical results are presented and contrasted with the literature on FSs. Section 5 provides a concluding discussion and suggests topics for future research.

## **2 Literature review**

Combining earlier work on varieties of capitalism (VoC) with more contemporary perspectives on financialization and market based banking, this section discusses perspectives on cross-country divergence and convergence in FSs. The focus is on financial structures NFCs, and whether the monitoring and interaction between corporations and investors are increasingly subject to financial market pressures. The framework thus appreciates how such pressures can have a potential impact across the range of elements that differentiate FS in the VoC literature. However, unlike important contributions in this field that tend to implicitly or explicitly focus on providers of capital (c.f. Hardie et al. 2013; Howarth 2013 etc.), the framework adopted in this paper explicitly focuses on the NFCs themselves.<sup>iii</sup>

There are several reasons for this. One is the considerable variety *within* banking systems, and how banks in different jurisdictions operate in different market segments. For instance, UK and SE banks tend to operate their mortgage portfolios using similar business models, whereas their corporate banking practices differ considerably (Ayadi et al. 2011).<sup>iv</sup> Another is the secular trends that characterise developments across most developed economies in recent decades, such as financialization and economic integration. These trends, and associated developments in cross-border provisioning of financial services and non-bank credit intermediation, increasingly make country level aggregates on credit and market capitalisation less appropriate to understand the nature of NFCs’ financial structures.

This section provides the background for the subsequent analysis of NFC financial structures across the EU by covering the following issues: Financial systems and institutional stability (Section 2.1); Institutional transformation in European Financial Systems (Section 2.2); and European Financial Systems: Contemporary and post-crisis perspectives (Section 2.3).

### **2.1 Financial systems & institutional stability**

A focus on non-financial corporations as nexus of stakeholder relations, and that path-dependent institutions structure such relations across distinct FS, is a core assumption in VoC camp of the CPE literature (Hall & Soskice 2001). One core relationship is that between firms and their providers of capital. In this relation, the latter seek access to funding whereas investors seek assurances of returns on their investments. The characteristics and terms of the resulting financial structures are, in turn, dependent on the monitoring capacities present in the FS.

In cases where institutional structures in FSs promote long-term relations that facilitate monitoring and reputational sanctioning, the willingness of investors supply capital will depend less on market-based measures such as key financial ratios, implied equity returns etc. In turn, this enables firms to embark on strategies that pursue delayed returns, instead of short-term maximization of shareholder value. High aggregate bank lending and long term concentrated equity ownership characterize NFC finance (Beyer & Höpner 2003; Vitols 2004; Deeg 2010). In contrast, in FSs where capital providers have limited access to proprietary information about firms, access to capital will depend on publicly available criteria about the performance of firm (such as financial accounting or market prices). In these FSs, firms turn to equity and bond markets to raise capital. Banks play less a role in NFC funding, or primarily provide such firms with short-term/working capital financing.

The CPE literature often rely on these concepts to arrive at a dichotomous framing of FS as either 'bank- or 'market-based' (Culpepper 2005).<sup>v</sup> In the VoC literature, the bank- or market-based relations between firms and their providers of capital is one of the social dimensions that tend to characterize different types of market economies. In this literature, such economies are typically categorized as either liberal or coordinated market economies (LMEs and CMEs) respectively. Typically, countries in continental Europe are seen as a bank-based CMEs, whereas Anglo-Saxon UK and IE are labelled market-based LMEs. A growing body of literature is recognizing the considerable varieties of market economies and FSs, and rely on various other types of categorizations, particularly across Europe. These include recognizing hybrid models (Boyer 2001; Hancke 2001) or explicitly using more categories to classify economies and FSs, such as social-democratic, Nordic and Mediterranean. (Amable 2003; Hall 2007; Hancké et al. 2007). Others distinguish between northern and southern countries (Rajan & Zingales 2003), or between old and new member states (Allen et al. 2005).

Regardless of the number of market economy categories used to classify countries, the CPE and VoC literatures assume that stakeholder relations in different types of economies are structured by institutional elements such as law, regulation, practices, norms, organisational forms etc. Since these institutions are reinforcing and complementary, they promote stability in how any particular economy and its various constituting stakeholders organize. It is also argued that similar types of market economies tend to respond to changing conditions in similar ways – regardless of they are caused by exogenous or endogenous pressures or shocks (Hancke et al. 2007). In essence, the reactions of political and economic stakeholders' across types of FSs will reflect existing institutional complementarities, which will shape their assessment of the situation and devised responses. Eventually, this will reinforce existing elements of their market economies and FSs (Hall & Soskice 2001; Hermann 2014). For instance, Royo (2013) shows that Spain reinforced its particular model of FS in the period leading up the global financial pressure, bucking the generic trend towards financialization.

## **2.2 Institutional transformation in European financial systems**

Despite partial recognition (cf. Hackethal et al. 2006; Jackson & Moerke 2005; Hall & Soskice 2001), the literature on VoC has offered insufficient attention or explanations to causes and patterns of evolution in market economies and FSs. In particular, the influence of exogenous shocks has largely been ignored or misjudged (Hermann 2014). This said, the literature mentions that transmissions from relation-oriented systems (CMEs or bank-based) towards transaction-oriented ones is more likely, since the former depend on embedded knowledge and experience in relation-oriented strategic interaction (Hancke et al. 2007). Ample empirical evidence also demonstrate that bank-based financial systems experience deeper recessions and recover more slowly after economic shocks than market-based FSs (Langfield & Pagano 2016; Allard & Blavy 2011; Darvas 2013). The literature suggests that these differences are probably not only determined by financial elements (such as the pace of recognizing losses, industrial transformation or reallocation of capital within the economy), but also to political economy effects, related to the willingness and speed of adjusting institutional systems (Claessens et al. 2012).

In addition, the literature has somewhat underestimated role of supranational and secular trends on institutional system (Hermann 2014). A dominant, and perhaps accelerating secular trend in recent decades, is that of financialization and the corresponding surge in financial capitalism (Engelen & Konings 2010). The underlying causes are many and range from technological developments, financial innovation, changing demographics, retrenched welfare system, trade imbalances etc. This has led to tremendous growth in financial assets and changes in the nature of financial intermediaries. One such change is the altered business models of traditional financial intermediaries, where a move towards market-based banking characterize many FSs in the last two decades. Howarth and Hardies' (2013) concept of market-based banking emphasises the changing nature of banks' assets and liabilities and how market prices and principles are becoming increasingly prominent, Also, the roles of market-priced derivatives and collateral are gaining increasing prominence through securitizations, repos and securities lending. As a consequence, banks are increasingly deriving their income from non-traditional activities Erturk and Solari (2007), through a move from the 'originate and distribute' business model towards deal-based banking (Deeg 2010).

Another shift is represented by the various types of intermediaries that are new or increasingly found in the contemporary financial system, such as private equity funds, hedge funds, and sovereign wealth funds) (Bengtsson 2011; 2014). Moreover, there has been a secular (and cyclical) move towards an increasing role of non-bank financial credit intermediation (or so-called 'shadow banking' (see Bengtsson 2013; 2017) for economies in general, as well as for NFCs. All these developments exposes NFCs to more market pressure than when their funding remained as loans on the banks' balance sheets and was valued at cost. And the extent to which this happens across space and time depend on various institutional elements relating to financial regulation, tax law, accounting practices, corporate governance, social and political norms etc. (Deeg & Hardie 2016; Bengtsson 2019).

In the European context, such institutional elements are also influenced by the process of regulatory and economic integration. Yet, VoC scholars have often underestimated the impact of European integration (Hermann 2014; Johnson & Regan 2017). In the context of NFC financial structures, European integration matters since it provides the foundations for large-scale exports of cross-border financial services. This involves traditional credit provision where large pan-European intermediaries offer credit in several jurisdictions, either through exports or local presence. Is also includes the emergence of financial centres that provide other types of services on a European scale (Fuller 2017). For instance, the UK provide capital market services for NFCs across the continent. This has important implications for the understanding of FSs and corresponding financial structures of NFCs. First, it implies that FS not easily observed by looking at domestic data on credit stocks or equity market valuation, since part of these aggregates may reside outside the jurisdiction. Second, it means that the average country is less market-based than the EU as a whole (Claessens 2017).

### **2.3 European financial systems: Contemporary & post-crisis perspectives**

More recent literature yields a number of noteworthy claims on EU countries' FSs and institutional change. One is that distinct models still characterise FSs across Europe. Bijlsma and Zwart (2013) identify four clusters of FSs. Bank-based FS prevail across much of the continent (Austria, Denmark, Germany, Greece, Italy, Portugal, and Spain), whereas the Netherland, United Kingdom, Belgium, France, Finland, and Sweden are more market-based and resemble the US. In addition, there is the cluster of more recent Member States in the East, with smaller and less developed FSs. In contrast, financial centres for particular market segments or services are found in Ireland, Malta, Cyprus and Luxembourg (Bengtsson & Delbecque 2011). Other studies (Howarth 2013; Quaglia & Royo 2015) highlight the hybrid forms of FSs in the Netherland and France, and the moderately market-based FSs in Italy and Spain. Hardie and Howarth (2013) identify a spectrum of market-based banking, where Greece, Italy and Spain are found at the lower end; France, Germany and Belgium in the middle terrain; and the Netherland and the UK at the high end of the spectrum.

Related to the claim of persistent and distinct FSs in Europe, is the claim that there is no clear shift towards market-based funding in the EU (Claessens 2017). However, Howarth (2013) shows that the French FS has increasingly transformed from state dirigisme to become more financialized. Moreover, at the same time, non-bank credit provision has continued to increase following the crisis, spurred among other factors by higher capital requirements and other regulatory requirements on the traditional banking sector. For instance, bonds

issued by NFCs are significant (Gabor 2012), and NFC securities are increasingly used as collateral in Europe's growing market for securities financing.

There is also a strand of literature that explicitly consider the impact of the crisis on FSs. The VoC framework suggests that country-specific weaknesses, available institutions and comparative advantages would determine national crisis responses. As a consequence, the crisis was not expected to lead to fundamental changes in FSs (Iversen & Soskice 2012). Indeed, Hall (2013) discovered a reinforcement of institutional differences among European FSs rather than convergence through weakening of differences (see Hermann 2014 for a discussion).

However, some research suggests that economies with more market-based financial systems were more severely hit by the crisis; at least in the earlier stages before it evolved into a European sovereign and currency crisis (Hardie & Howarth 2013). These results contradict earlier results where bank-based economies tend to be more often and worse affected by crisis (see Section 2.1). However, it was suggested that this was a result from the crisis having its roots in market-based financing and securitizations (Quaglia & Royo 2015). Additional studies that consider the different effects from the crisis depending on nature of national financial system include Quaglia and Royo (2015) and Howarth (2013). These studies also highlight the role of market-based banking. For instance, in Spain, banks (the *Cajas* in particular) had built up leverage through short-term wholesale funding from international markets. This was coupled with the associated property bubble, which made the Spanish FS more vulnerable than its more bank-oriented Italian counterpart (Quaglia & Royo 2015). Similarly, French banks suffered less compared to more market-based banks in the UK, but also compared to banks in traditionally more bank-based Germany, where banks had embarked on substantial trading activities and built up exposures to securitized assets (Howarth 2013). On the other hand, France suffered more than less market-based systems in South Europe in the initial stages.

### 3 Methodology

#### 3.1 A market-based index on NFC funding

The nature of FSs is often proxied by aggregate macro-variables such as the size of stock markets, bank assets or credit in relation to GDP (Hall & Soskice 2001; Hardie et al. 2013; Allen & Gale 2001). Such measures are fraught with certain shortcomings. One is that GDP fluctuates over time which makes the measures indicate changes in the FS which in fact are unrelated to institutional change. This problem is even more pronounced when market values, such as market capitalization, enter the measures. Another problem relates to the nature of banks. Hardie et al. (2013), Howarth (2013), Lagoarde-Segot (2017), Gabor & Ban (2016) argue that one should focus on the degree of market-based banking or financial markets to understand the nature of financialization of FSs.

While this improves understanding to FSs differences and developments compared to more aggregate measures, it still omits important dimensions. One is that banks in particular FS may differ along different sectors or market segments. For instance, the UK banking system is largely "traditional" (i.e. non market-based) for their mortgage portfolios but more market-based for corporate banking. In Sweden, for example, it is the other way around. Secondly, banking is increasingly provided cross-border. This means that banks in one country may provide credit or market services for NFCs in other countries. This is particularly the case within the EU's Single Market (although some disintegration characterise post-crisis developments), which has also led to considerable geographical specialization. In the EU, financial service centres have emerged for particular market segments that serve clients on a pan-European basis (Bengtsson & Delbecque 2011). One should also differentiate between banks and banking (Ansidei et al. 2011) in the sense that both banks and other financial intermediaries may provide credit to NFCs. This is particularly important following the introduction of the post-crisis regulatory reform package, which has consciously and unconsciously promoted non-bank credit (Bengtsson 2016).

Since these dimensions reduce the usefulness of aggregates or bank-focused measures to understand FS and the nature of the relations between NFCs and their capital providers, this paper uses a *Market-Based Index* (MBI) that is based on the actual balance sheets of NFCs. The MBI is calculated for the EU as a whole and for 26 Member States between 2010 and 2018.<sup>vi</sup> It measures the combined unweighted percentage of market-based credit and publicly listed equity in NFCs. Market-based credit covers credit securities issued by the NFCs, which

are assumed to be more prone to market pressures through higher extents of market trading, frequent pricing and transactions compared to bank credit. Publicly listed equity is similarly assumed to be more sensitive to market factors compared to equity that is privately held. Due to data shortcomings, the MBI does not differentiate between different owners or lenders, although this would improve the MBI (for a discussion on these dimensions see Deeg and Hardie 2016).<sup>vii</sup> The MBI is significantly positively correlated with traditional aggregate measures, such as stock market capitalization to GDP, which suggests that increases in the MBI is associated with FS growth.<sup>viii</sup>

The MBI is based on book values. This reduces the volatility in the measure, and disregards price fluctuations that are unrelated to the nature of FSs. Since bank credit is typically reported at historical costs, using book values also implies that all sources of funding are values based on similar principles. The MBI is calculated on an aggregate and annual basis (one can think of the MBI as an aggregate national balance sheet of all NFCs), which in turn allows for relative and absolute rankings of countries and the EU as a whole across both time and cross-country dimensions. The balance sheet approach of the MBI implies that cross-listings or cross-border borrowing are covered in the measure, in contrast to most other measures on FSs.

### **3.2 Variables & data**

In order to shed light on the determinants of change in FSs, the first order difference in the MBI is calculated for each year and country ( $\Delta$  NFC MBI). This is used as dependent variable in the subsequent regressions, and allows for gauging the lag by which particular factors influence FSs. Thereby it could be regarded as a proxy for the pace of institutional change within FSs. As independent variables, this paper uses the position of FS in terms of the MBI in 2010, since this is the first year when comprehensive comparative data is available. This choice should also relatively well reflect the position of NFC when the market volatility of the crisis had dropped.

Additional independent variables relate to the magnitude of the effects from the 2007-2008 financial crisis. Several indicators were included that estimates the effects on a national basis. Some of these indicators represent “purer” measures of the effects, such as the length of the crisis in months; output losses; and peak non-performing loans (NPLs). Other measures of crisis effects are more “policy oriented” in that they also reflect conscious decisions by policy makers to counter the consequences of the crisis: Net Fiscal Costs; Fiscal cost to financial assets; Peak liquidity; and Public debt increase.

The dataset puts together 10 years of annual data between 2009 and 2018 for 26 EU Member States. Missing data was omitted and no winsorizing was applied. All measures are unweighted except when calculating the MBI for the EU as a whole, when both an unweighted and a weighted MBI were calculated and analysed. The dataset draws on a number of data sources: European Central Bank SDW, ORBIS Corporate Database, and Bank for International Settlement (BIS) debt securities database; ESRB’s crisis database and Laeven & Valencia 2013. Table 1 provides descriptive data for all variables, and Table 2 provides detailed information on data sources for the variables or their components.

### **3.3 Analytical methods**

This paper uses both less rigorous clustering and more formal regression analysis to shed light on European FSs. In order to identify groups of countries with similar FS and similar developments over time, the paper uses a simple clustering method to categorize countries. For changes over time, it uses a difference of means test for the EU MBI as a whole over the period. Changes in MBI standard deviations from 2010 to 2018 are used as a proxy for convergence/divergence.

Multivariate OLS regressions were used to: a) gauge the influence and lag by which the effects of the 2007-2008 financial crisis influence changes in FSs; b) determine whether countries’ transition during the period depend on the character of their FSs at the beginning of the period (MBI 2010). These regressions thus consider the joint effects from an exogenous shock and the conditions at the time this shock hit the FSs. Tests shows healthy model characteristics, and suggests no heteroscedasticity (apart from for Peak NPLs prior to 2012 which are henceforth omitted from the analysis) or multicollinearity. For a variable correlation matrix, see Annex A.

Table 1 Descriptive data

| Variables                      | Mean  | Median | Minimum | Maximum | Std. dev. | C.V.  | Skewness | Ex. kurtosis | 5% Percentile | 95% Percent. | Obs. |
|--------------------------------|-------|--------|---------|---------|-----------|-------|----------|--------------|---------------|--------------|------|
| MBI 2010                       | 0.14  | 0.13   | 0.01    | 0.34    | 0.08      | 0.57  | 0.61     | -0.13        | 0.02          | 0.32         | 26   |
| Δ MBI 2011                     | 0.02  | 0.02   | -0.04   | 0.08    | 0.02      | 0.89  | -0.45    | 1.96         | -0.03         | 0.07         | 26   |
| Δ MBI 2012                     | 0.00  | 0.00   | -0.03   | 0.05    | 0.02      | 8.01  | 0.88     | 1.74         | -0.03         | 0.05         | 26   |
| Δ MBI 2013                     | 0.01  | 0.00   | -0.02   | 0.14    | 0.03      | 3.67  | 3.25     | 11.14        | -0.02         | 0.12         | 26   |
| Δ MBI 2014                     | 0.01  | 0.01   | -0.02   | 0.19    | 0.04      | 3.48  | 3.84     | 14.83        | -0.02         | 0.15         | 26   |
| Δ MBI 2015                     | 0.00  | 0.00   | -0.02   | 0.09    | 0.02      | 9.53  | 3.07     | 10.61        | -0.02         | 0.07         | 26   |
| Δ MBI 2016                     | 0.00  | 0.00   | -0.13   | 0.03    | 0.03      | 36.97 | -3.78    | 14.92        | -0.10         | 0.03         | 26   |
| Δ MBI 2017                     | 0.00  | 0.00   | -0.03   | 0.04    | 0.02      | 17.63 | 0.55     | 1.52         | -0.03         | 0.04         | 26   |
| Δ MBI 2018                     | 0.01  | 0.01   | -0.05   | 0.04    | 0.02      | 2.74  | -0.90    | 1.71         | -0.04         | 0.04         | 26   |
| Months                         | 36    | 29     | 0       | 100     | 31        | 1     | 0        | -1           | 0             | 95           | 26   |
| Output loss                    | 41.73 | 34.99  | 12.26   | 107.72  | 26.80     | 0.64  | 1.29     | 0.61         | 23.93         | 8.00         | 26   |
| Peak NPLs                      | 12.39 | 5.95   | 0.00    | 47.75   | 12.90     | 1.04  | 1.44     | 1.35         | 14.27         | 7.00         | 26   |
| Net Fiscal Costs               | 5.66  | 3.78   | -0.01   | 26.76   | 7.33      | 1.30  | 1.69     | 1.96         | 6.98          | 7.00         | 26   |
| Fiscal cost (financial assets) | 3.78  | 2.57   | 0.00    | 17.06   | 4.33      | 1.15  | 1.78     | 2.86         | 4.12          | 7.00         | 26   |
| Peak liquidity                 | 15.19 | 12.94  | 0.00    | 61.74   | 14.15     | 0.93  | 1.96     | 4.25         | 13.86         | 7.00         | 26   |
| Public debt increase           | 24.06 | 21.26  | 0.00    | 76.54   | 16.95     | 0.70  | 1.48     | 2.97         | 19.08         | 7.00         | 26   |

Table 2 Variables: Units & data sources

| Variables   | Unit (before conversion)   | Source                            | Data availability |
|---|--|-----------------------------------|-------------------|
| Aggregate book value of equity - all NFCs         | EUR mn   | EUROSTAT                          | 2006-2018         |
| Aggregate book value of equity - listed NFCs      | EUR mn   | Orbis                             | 2010-2018         |
| NFC Debt securities - CY EE IT LT LV MT SI SK     | EUR mn   | ECB SDW                           | 2010 - 2018       |
| NFC Debt securities - remaining countries         | USD mn   | BIS Credit statistics             | 2006-2018         |
| Aggregate loans to NFCs - CY EE IT LT LV MT SI SK | EUR mn   | ECB SDW                           | 2010 - 2018       |
| Aggregate loans to NFCs - Remaining countries     | USD mn   | BIS Credit statistics             | 2006-2018         |
| Exchange rates - USD to EUR                       | USD mn   | ECB SDW                           | 2000-2018         |
| Gross domestic product                            | USD mn   | World Bank                        | 2006-2018         |
| Stock market capitalization                       | USD mn   | World Bank                        | 2010 - 2018       |
| Stock market turnover                             | EUR mn   | ECB SDW                           | 2006-2018         |
| Length of crises                                  |  | ESRB Crisis database              | 2006-2018         |
| Type of crises                                    |  |                                   |                   |
| Output loss <sup>1/</sup>                         | % GDP  | World Bank/Laeven & Valencia 2019 | 2006-2019         |
| Fiscal Costs <sup>2/</sup> (% of GDP)             | % GDP  |                                   |                   |
| Fiscal Costs, net <sup>2/</sup> (% of GDP)        | % GDP  |                                   |                   |
| Fiscal cost(% of financial sector assets)         | % Financial sector assets  |                                   |                   |
| Peak liquidity <sup>3/</sup>                      | Ratio of central bank claims on deposit money banks (line 12 in IFS) and liquidity support from the Treasury to total deposits and liabilities to non-residents. |                                   | 2006-2019         |
| Liquidity support <sup>3/</sup>                   |  |                                   |                   |
| Peak NPLs <sup>4/</sup>                           | % Total loans  |                                   | 2006-2019         |
| Increase in public debt <sup>5/</sup>             | % GDP  |                                   |                   |

Notes: 1) In percent of GDP. Output losses are computed as the cumulative sum of the differences between actual and trend real GDP over the period [T, T+3], expressed in percent of trend real GDP, with T denoting the starting year of the crisis. The trend is computed by applying an HP filter ( $\lambda=100$ ) to the GDP series over [T-20, T-1]; 2) Fiscal costs refer to outlays directly related to the restructuring of the financial sector; 3) Liquidity is measured as the ratio of central bank claims on deposit money banks and liquidity support from the Treasury to total deposits and liabilities to non-residents; 4) In percent of total loans; 5) In percent of GDP. The increase in public debt is measured as the change in debt projections, over [T-1, T+3], relative to the pre-crisis debt projections, where T is the starting year of the crisis.

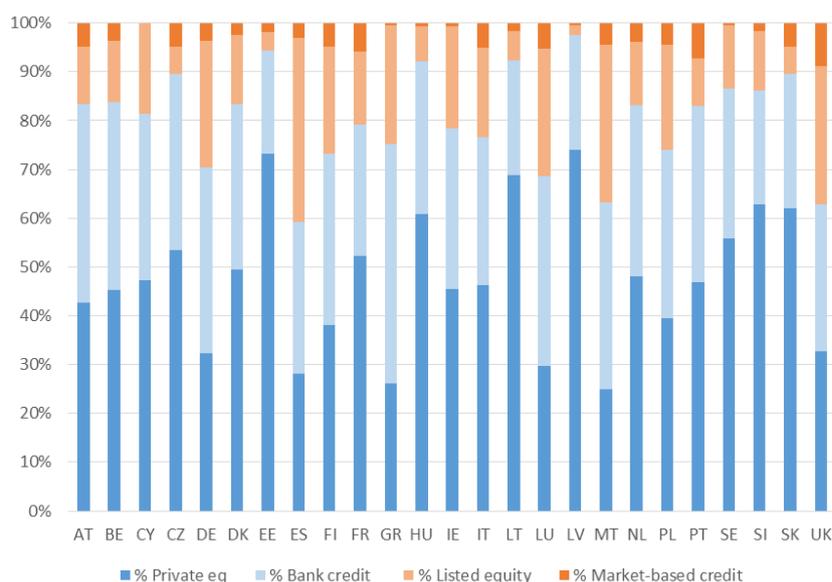
## 4 Varieties and trends in EU financial systems

This section begins by presenting cross-country data (and for the EU as a whole) and discusses whether European countries can be categorized into different clusters (Section 4.1). Thereafter, it considers the changes FSs have undergone in the recent decade (Section 4.2). Finally, Section 4.3 estimates the role and magnitude of various predictors as catalysts for institutional change.

### 4.1 Financial systems - Country differences & clusters 2018

Figure 1 depicts the composition of NFCs aggregate balance sheets across the EU's 26 Member States. It demonstrates the considerable variation in the relative importance of the various sources of capital for NFCs. At the same time, many distinctions between Member States are gradual. Seeking generalizable patterns are therefore difficult, but a few notable observations emerge. One is that bank credit plays a relatively similar role across the Member States. Another is that the largest drivers of differences across countries is the role of equity in both its private and public form.

**Figure 1** Funding structures of NFCs across EU Member States (end 2018)



NFCs in former communist East European countries (LT, LV, EE, CZ, HU, SK and SI) are all characterized by very high levels of privately held equity. Publicly traded equity in these countries plays a very limited role. PL is an exception to this, and seems rather to form part of a group of countries with moderate levels of market-based finance. This group contains the large continental countries such as FR, DE and IT. A range of medium-sized countries form another group with lower rates of market-based funding (NL, PT, AT and BE). This group also contains a number of Nordic countries, with FI being the exception and rather belonging to the moderately market-based group. Listed equity is the driving factor that leads to commonality for the more market-based European FSs. These include the Anglo-Saxon economies of UK and IE, as well as a number of additional and typically small Member States (LU, MT and CY). They also tend to share the characteristic of their roles as financial centres for particular financial services market segments in the European single financial market.

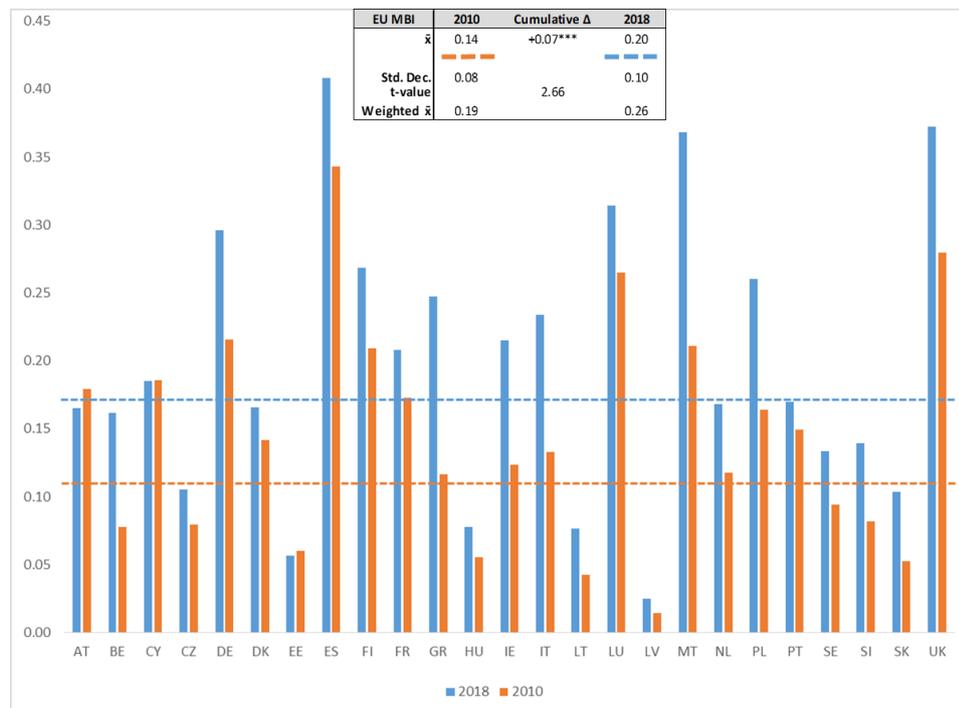
Perhaps these two features are related to institutional systems that are accommodating to market-based activities and structures more generally. While market-based credit generally plays a bigger role for NFCs in this group of countries, its role varies considerably and remains muted even for many countries that are relatively more market-based oriented FSs. Based on the data, ES would also form part of this group. However, the large informal sector in ES (c.f. Royo 2013) and relatively important public equity markets, skew the MBI towards market-based funding.

This cross-country variation, and grouping or clustering of countries, suggests a more complex picture of EU FSs than those suggested by most VoC and CPE. Firstly, the cross-country variation shows that a dichotomous framing of FS as either ‘bank- or ‘market-based’ (Culpepper 2005) appear to be less appropriate to understand contemporary structures in NFCs funding across the EU. There are some similarities to the clusters of countries identified by Bijlsma and Zwart (2013) and the hybrid models suggested by Boyer (2001), Hancke (2001), Hardie and Howarth (2013) and others, but the focus on NFCs funding and the distinction between types of financial instruments provides additional insights on FSs across the EU. In particular, some countries appear very different when looking through the lenses of NFC funding, such as Spain where listed equity is particularly important. Another example are Eastern Member States, that in the literature are typically characterized by their relatively small financial systems, whereas this paper suggests that NFCs in these countries are characterised by privately held equity funding. In addition, this perspective does not support clustering countries based on their FSs into social-democratic, Nordic and Mediterranean (Amable 2003; Hall 2007; Hancké et al. 2007) or Northern and Southern Europe (Rajan and Zingales 2003).

The perspective of NFC funding also casts doubts on the categorization of bank- and market-based that are characterized by bank lending and market-based credit respectively (Beyer & Höpner 2003; Vitols 2004; Deeg 2010). At least in the European NFC context, these differences appear to be limited, whereas variations in the different types of equity matter more. Differences among the investors behind these “forms” of equity, who are likely vary in their investment time horizons and monitoring preferences/capacities, could thereby be the main source of variation in the extent to which corporations across the EU are subject to financial market pressures.

Figure 2 shows the market-based index for the 26 EU Member States for which data is available for 2010 and 2018. It also contains the simple mean for the EU as whole for both years. Figure 2 suggests that the EU as a whole is “bank-based” in the sense that privately held equity and bank credit (which is relatively stable across MSs) are the main funding sources for NFCs in most countries. The embedded table also reveals a higher weighted average for the EU, which result from the relatively higher market-based index among many of the Member States with the largest NFC sectors (in addition to those smaller financial centre type of FSs discussed above). This data thus supports the claim that the average country is less market-based than the EU as a whole (Claessens 2017).

Figure 2 European market-based index 2010 and 2018



## 4.2 Financial system dynamics 2010-2018

Figure 2 demonstrates that the change in the simple averages from 2010 to 2018 amount to 0.07 for the EU as a whole. This change is significant at the 1%-level. It clearly demonstrates that while the EU as whole can still be characterised as bank-based, it has become considerably more market-based in recent years. This supports the notion that it is more likely that countries transmit from relation-oriented systems (“bank-based”) towards transaction-oriented (“market-based”) (Hancke et al. 2007). This development is even more striking when considering changes in the weighted mean, which increased from 0.19 to 0.26, suggesting that these developments are more common in Member States with larger NFC sectors. The changes in the standard deviation over time - which rises from 0.08 to 0.10 over the period - also provide insights on the nature and dynamics of European FSs. This shows that while the EU is getting more market-based over time, this change is unevenly distributed across Member States, which in turn leads to increased divergence between FSs. This suggests that the influence of economic integration on FSs may be substantial, but promoting divergence through specialization rather than convergence; a phenomenon not well covered in the literature on VoC (see Hermann 2014; Johnson & Regan 2017 for a discussion)

Turning to developments in individual Member States, it is clear that many countries only displayed muted developments. In particular, this include many Member States in Eastern and Nordic parts of Europe. Estonia even maintained their FS completely unchanged during the period, whereas NFCs in AT become less reliant on market-based funding sources from 2010 to 2018. But exceptions in these regions exists, such as PL or FI, which reduced the value of explanations grounded in geographical proximity. A second very diverse group of countries that include DK, FI, FR, PT, NL, SE experienced modest increases in their market-based indexes, to end up around the average EU level by 2018.

Two groups appear to cover those countries that are characterised by substantial leaps towards more market-based FS during the period. One group include many countries where market-based index levels were already high in 2010, such as Malta or UK. But not all such countries display these changes, and exceptions include LU and CY. Taken together, this divergence in both levels and developments may suggest that economic integration in the EU promotes specialisation in terms of company strategies that are more feasible with particular funding structures (through institutional complementarities) (Hall & Soskice 2001). This corroborates other research, such as Royo (2013) that demonstrates NFC specialization rather than convergence. It is important to bear in mind that the data indicates “specialization” at the NFC company level, and that it should not be confused with specialization in different segments of financial services (c.f. Fuller 2017). This said, the correlation appears to be positive between market-based indicator levels and (predominantly small) financial centres such as the UK, IE, CY or MT. This could suggest a wider institutional system in support of, or fostering, financialization (through market-based funding, substantial financial sectors, financial services exports etc.).

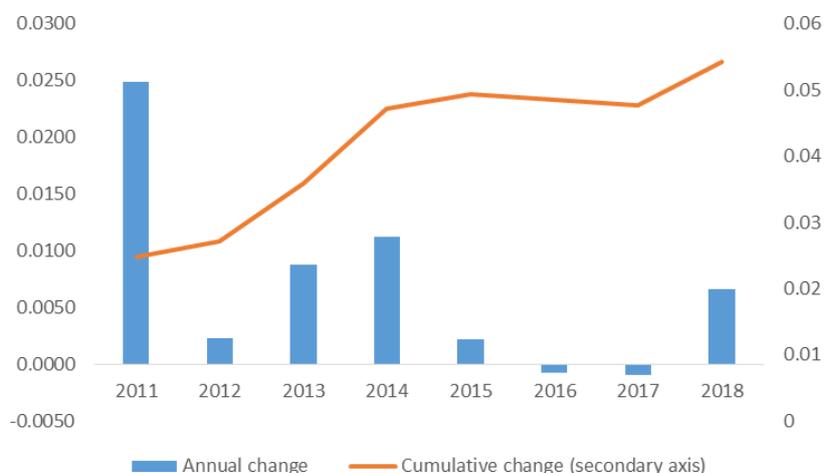
Another characterised by considerable transition towards more market-based FS include a number of MSs that are typically not considered as being market-based in the literature (e.g. Bijlsma & Zwart 2013). Nor are they considered particularly likely candidates to make a transition towards such FSs. These include DE, GR, ES, IT and DE. One common factor between these countries is that they experienced relatively strong impacts from the 2007-2008 financial crisis. For the latter three, this also applies to the European sovereign debt crisis. Their transition towards more market-based funding could be a sign of deleveraging in the banking sector (Erturk & Gabor 2016), and corresponding use of alternative sources of funding for NFCs as a consequence.

## 4.3 Predictors of institutional change

In general, it appears that the magnitude of transition towards more market-based FS was high for countries that were a) more market-based in beginning 2010; and b) heavily influenced by the 2007-2008 financial crisis. On the other hand, many countries that were also heavily exposed to the crisis display muted developments towards more market-based funding structures. In addition, a number of countries fit less well with the clusters and their common trends as discussed above. For instance, PL bucked the common trend of muted transition towards market-based FSs in Eastern Europe, and CY did not follow the pattern of increased market-based funding in other crisis struck and relatively more market-based FSs. Moreover, when observing the aggregate adjustment pattern in the EU over the period (see Figure 3), it becomes clear that adjustments are

not linear. Taken together, this raises questions on the influence of underlying determinants of stability and change.

Figure 3 European market-based index (2011-2018)



In order to test for the predictive ability of these factors, table 4 provide results from multivariate regressions on how the degree of market-based FS and impact of the crisis explain changes towards more market-based FSs from 2011 to 2018.

Table 4 Regression: MBI and crisis impact as predictor of FS developments

|                           | $\Delta$ MBI 2011 | $\Delta$ MBI 2012 | $\Delta$ MBI 2013 | $\Delta$ MBI 2014 | $\Delta$ MBI 2015 | $\Delta$ MBI 2016 | $\Delta$ MBI 2017 | $\Delta$ MBI 2018 |
|---------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| MBI 2010                  | -0.033            | 0.067             | -0.092            | 0.149             | 0.060             | -0.078            | 0.059             | 0.044             |
| <i>p-value</i>            | 0.581             | 0.123             | 0.278             | 0.141             | 0.269             | 0.291             | 0.157             | 0.353             |
| Months                    | 0.000             | 0.000             | **                | 0.000             | 0.000             | 0.000             | 0.000             | 0.000             |
| <i>p-value</i>            | 0.977             | 0.010             | 0.421             | 0.248             | 0.192             | 0.118             | 0.277             | 0.312             |
| R-squared                 | 0.015             | 0.293             | 0.069             | 0.126             | 0.107             | 0.130             | 0.116             | 0.099             |
| MBI 2010                  | -0.128            | **                | 0.039             | -0.071            | 0.073             | 0.005             | 0.005             | 0.047             |
| <i>p-value</i>            | 0.029             | 0.470             | 0.521             | 0.117             | 0.885             | 0.879             | 0.282             | 0.101             |
| Outputloss                | 0.000             | **                | 0.000             | 0.001             | 0.000             | 0.000             | 0.000             | 0.000             |
| <i>p-value</i>            | 0.015             | 0.875             | 0.138             | 0.832             | 0.708             | 0.527             | 0.647             | 0.420             |
| R-squared                 | 0.421             | 0.042             | 0.189             | 0.157             | 0.013             | 0.027             | 0.106             | 0.179             |
| MBI 2010                  | -0.082            | 0.034             | -0.061            | 0.072             | *                 | 0.008             | 0.009             | 0.038             |
| <i>p-value</i>            | 0.202             | 0.487             | 0.505             | 0.092             | 0.809             | 0.771             | 0.311             | 0.110             |
| PeakNPLs                  | 0.000             | 0.000             | 0.002             | **                | 0.000             | 0.000             | 0.000             | 0.000             |
| <i>p-value</i>            | 0.378             | 0.583             | 0.016             | 0.931             | 0.677             | 0.417             | 0.105             | 0.318             |
| R-squared                 | 0.126             | 0.056             | 0.346             | 0.225             | 0.013             | 0.043             | 0.225             | 0.219             |
| MBI 2010                  | -0.078            | 0.036             | -0.081            | 0.074             | *                 | 0.007             | 0.007             | 0.043             |
| <i>p-value</i>            | 0.207             | 0.453             | 0.293             | 0.074             | 0.829             | 0.805             | 0.216             | 0.093             |
| Net fiscal costs          | -0.001            | 0.000             | 0.003             | ***               | 0.000             | 0.000             | 0.000             | -0.001            |
| <i>p-value</i>            | 0.181             | 0.341             | 0.001             | 0.359             | 0.499             | 0.174             | 0.027             | 0.853             |
| MBI 2010                  | -0.086            | 0.021             | 0.001             | 0.085             | **                | 0.028             | 0.008             | 0.023             |
| <i>p-value</i>            | 0.202             | 0.673             | 0.988             | 0.050             | 0.351             | 0.818             | 0.509             | 0.177             |
| Fiscal cost (Fin. assets) | -0.001            | -0.001            | 0.007             | ***               | 0.001             | 0.002             | **                | 0.000             |
| <i>p-value</i>            | 0.529             | 0.200             | 0.000             | 0.281             | 0.016             | 0.824             | 0.031             | 0.126             |
| R-squared                 | 0.104             | 0.134             | 0.623             | 0.231             | 0.312             | 0.005             | 0.320             | 0.284             |
| MBI 2010                  | -0.069            | 0.044             | -0.154            | **                | 0.059             | -0.006            | 0.010             | *                 |
| <i>p-value</i>            | 0.292             | 0.382             | 0.025             | 0.110             | 0.832             | 0.757             | 0.081             | 0.012             |
| Peak liquidity            | 0.000             | 0.000             | 0.002             | ***               | 0.000             | **                | 0.000             | **                |
| <i>p-value</i>            | 0.595             | 0.520             | 0.000             | 0.031             | 0.019             | 0.431             | 0.017             | 0.005             |
| R-squared                 | 0.097             | 0.063             | 0.687             | 0.387             | 0.300             | 0.041             | 0.365             | 0.498             |
| MBI 2010                  | -0.067            | 0.040             | -0.118            | 0.065             | *                 | 0.006             | 0.002             | 0.054             |
| <i>p-value</i>            | 0.283             | 0.418             | 0.205             | 0.085             | 0.866             | 0.943             | 0.124             | 0.096             |
| Increase public debt      | 0.000             | 0.000             | 0.001             | **                | 0.000             | *                 | 0.884             | ***               |
| <i>p-value</i>            | 0.241             | 0.678             | 0.017             | 0.055             | 0.004             | 0.280             | 0.029             | 0.860             |
| R-squared                 | 0.159             | 0.048             | 0.338             | 0.347             | 0.266             | 0.074             | 0.326             | 0.169             |

Note: \*/\*\*/\*\* denote significance at 10%/5%/1% levels

Table 4 demonstrate that MBI 2010 influences differently between sub-periods. In the 2011-2013, when many European countries were still in acute crises (Lo Duca et al. 2017), more market-based FSs tend to become more bank-based, whereas bank-based FSs transit towards becoming more market-based. Only two of these coefficients are statistically significant (although the cumulative impact in 2018 comes near). However, given the small number of observation, this still indicates that more bank-based countries display larger development in the market-based direction during the early years. This lends support to the suggestion that more market-based financial systems were more severely hit by the crisis due to its roots in market-based financing and securitizations (Quaglia & Royo 2015); at least in the earlier stages before it evolved into a European sovereign and currency crisis (Hardie & Howarth 2013). If so, this could indicate that the impact on market-based elements in the FSs was particularly strong, which therefore had larger impacts in countries where these elements mattered more.

From 2014 and onwards, the character of the MBI 2010 coefficient changes. In this period, countries with higher levels of market-based funding in 2010 tend to display larger changes towards more market-based funding. Many of these coefficients are significant, both for particular years and after taking crisis impacts into account. These results suggest that, after the initial crisis period, more market-based FSs tend to return to their original type of FS and even continue to evolve towards becoming increasingly market-based. Conversely, the opposite holds for more bank-based FSs, which display less transition toward market-based financial systems in 2014-2018.

Such divergence in more or less market-based FSs could indicate that they specialise in terms of company strategies that are more feasible with particular funding structures in the context of EU economic integration (Hall & Soskice 2001). It also supports the notion that country-specific weaknesses, available institutions and comparative advantages would determine national crisis responses (Iversen & Soskice 2012). However, the results does not necessarily support that institutional differences among European FSs have been reinforced by the crisis (Hall 2017). Taken together with the increases in the mean and variance from 2010 to 2018 (see Figure 2), this rather suggest that the pace of the general transition towards more market-based FS differed between countries with different FS. This, in turn, has resulted in more European divergence. Probably, these patterns relate to pure economic factors (such as changes in demands and supply) but also to political economy aspects of adjusting institutional systems ((Claessens et al. 2012). They also show that the institutions buttressing FSs can change but tend to be sticky.

Table 4 also demonstrates that stronger crisis impact drives transitions towards more market-based FS. This effect is significant for many of the ways of measuring the effects of the crisis, and is independent of the nature of FSs in 2010. The “purer” crisis magnitude measures (months of crisis, output loss and peak NPLs) tend to be positive for most years in the period, suggesting that the more impacts drive transition towards more market-based FSs. However, the effect is small and only significant for the initial years in the period.

For crisis magnitude measures that also capture policy responses, higher fiscal costs (both net and in relation financial assets) are associated with more transition towards market-based FSs. Perhaps this is the empirical manifestation of adopting neoliberal fiscal policies (Peters 2012; Hermann 2011). In the latter part of the period is the coefficients often positive and significant (with 2016 being an exception). This also characterises the coefficient for increases in public debt for the period as a whole, with significant effects for five out of eight years. Peak liquidity is also positive and significant from 2013 to 2015, but turns negative from 2017. Liquidity injections drive down market prices by lowering interest rates, thus lowering NFCs cost of debt. The effect tend to be less for traditional bank credit, and stronger for market-based debt.

In general, Table 4 provides considerable explanatory power for the changes in FS observed during the period. The regressions generally achieve high levels of R-squared, especially from 2013 onwards (with 2016 being an exception).<sup>x</sup> By 2013, most European countries left the acute crisis phase, and although the financial systems were not functioning normally (Lo Duca et al. 2017) this may have allowed FSs to embark on more conscious transition paths. This also when most policy related crisis measures appear to have their greatest impact. Thus, institutional change within FSs is occurs gradually and with some time lag.<sup>x</sup> The degree of change is determined by countries FSs in the beginning of the period together with the impact of the crisis.<sup>xi</sup> These findings thereby the existing VoC and CPE literatures on effects of crisis on FS, which downplays the causes and patterns of evolution in market economies and FS (Hackethal et al. 2006; Jackson & Moerke 2005; Hall &

Soskice 2001), underestimates the importance of exogenous shocks (Hermann 2014), or tend to focus on how crises have different economic effects across types of FSs (Quaglia & Royo 2015; Howarth 2013).

## 5 Discussion

This paper argues that the traditional dichotomous and static conceptualisations of financial systems fail explain how financial systems have changed as a result of transformative events (the 2007-2008 financial crisis in particular) and trends in recent decades. To shed light on developments in contemporary financial systems in the EU, this paper presents and analyses an index that seeks to capture the extent to which funding structures in non-financial companies subject them to financial pressures.

Observing cross-country differences and developments in the index reveals that the EU as a whole is “bank-based” in the sense of private equity and bank credit matter more for funding of NFCs than listed equity or market-based credit. Differences among the investors behind these “forms” of capital, who are likely vary in their investment time horizons and monitoring preferences/capacities, could thereby be the main source of variation in the extent to which corporations across the EU are subject to financial market pressure.

At the same time, the EU and its Member States have become more market-based over the last decade. While this trend generally holds true, there is also increasing divergence between European FSs. Cross-country variations in the EU are primarily driven by differences in the importance and type of equity funding. For Eastern Europe, privately held equity dominates NFCs funding. Some Continental and Northern Europe are characterised by moderate levels of market-based funding of NFCs. In Anglo-Saxon economies and some smaller financial centres, NFCs rely on market-based funding – and public equity in particular – at much higher levels than their European peers.

These patterns are partially attributable to specialization. In countries with high levels of market-based funding in 2010, such funding structures tend to have become increasingly important in 2018. Developments in individual countries also appears to be determined by how strong the country was hit by the 2007-2008 financial crisis. Both these factors influence changes in FSs with some lags, suggesting that institutional transformation is a lengthy and gradual process. Changes towards becoming more market-based were particularly related to crisis magnitude measures that capture policy responses (such as higher fiscal costs). This suggest that both magnitudes of exogenous shocks, and how policy makers respond, drive institutional change. Taken together, these findings thereby contribute to the existing CPE literature, which tends to downplay the causes and patterns of evolution in market economies and FSs. But specialization and crises effects does not explain all the transition towards more market-based FSs in Europe. The ongoing financialization of European NFCs is probably related to other secular trends with transformative capacity, such as integration, liberalisation, growth in financially managed assets in search of yield and financial innovation.

The findings and the methodology of this paper can also be used as inspiration for further research. The granularity of the market-based index also make it useful as an independent variable. For instance, one could study how other aspects of corporate behaviour (innovation, capital investments, pay out patterns etc.) or key stakeholder relationships (such as employee relations, corporate governance practices etc.) relate and evolve in tandem with the index. Another suggestion is to use the market-based index as a predictor of the frequency and magnitude of exogenous shocks. The market-based index could also be refined, subject to availability of appropriate data, to more fully reflect the nature of the underlying investors of the different types of capital used in NFCs. For instance, there are good reasons to assume that a private equity fund would exert different types of pressures on NFCs compared to, say, a cross-holding company within the NFCs value chain.

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## ANNEX A VARIABLE CORRELATION MATRIX

| Output loss | Net fiscal costs | Peak liquidity | Fiscal cost (Fin. assets) | Peak NPLs | Increase public debt | MBI 2010 |                           |
|-------------|------------------|----------------|---------------------------|-----------|----------------------|----------|---------------------------|
| 1           | 0.7878           | 0.2247         | 0.4937                    | 0.6902    | 0.6309               | -0.2191  | Output loss               |
|             | 1                | 0.4983         | 0.4577                    | 0.7582    | 0.7934               | 0.0222   | Net fiscal costs          |
|             |                  | 1              | 0.5436                    | 0.5643    | 0.4853               | 0.1673   | Peak liquidity            |
|             |                  |                | 1                         | 0.5235    | 0.4493               | -0.2766  | Fiscal cost (Fin. assets) |
|             |                  |                |                           | 1         | 0.3847               | -0.1389  | Peak NPLs                 |
|             |                  |                |                           |           | 1                    | 0.0998   | Increase public debt      |
|             |                  |                |                           |           |                      | 1        | MBI 2010                  |

<sup>i</sup> Similar terms include the corporate governance sphere of national financial systems (Hall & Soskice 2011), corporate governance systems (Lazonick & O’Sullivan 2001) financial system structures (Bijlsma & Zwart 2013) or political economies (Deeg & Hardie 2016).

<sup>ii</sup> Other recent studies focus on the differences in financial structure between countries within the EU, and in particular between northern and southern countries (Zingales & Rajan 2003) and between old and new member states (Allen and Gale 2005).

<sup>iii</sup> “Providers of capital” or “capital providers” is a preferred term to “investors”, which often connotes to equity and portfolio investors and less so credit intermediaries or banks.

<sup>iv</sup> Obviously variety is also to various degrees present *between* banks in any particular FS (Bengtsson et al. 2013).

<sup>v</sup> This conceptualization overlaps to some degree with the distinction relationship vs. arms-length intermediation (Allen 1993) and the distinction between universal banking and specialized banking (Claessens 2017). Also, it overlaps the classification of financial systems based on the importance of bank intermediated funds and capital markets, where the latter typically covers equity and sometimes also bond markets.

<sup>vi</sup> The total sample was 26 countries since data for Croatia and Bulgaria is missing.

<sup>vii</sup> Hardie et al. (2013) look at NFC funding but does not differentiate between listed and privately held equity.

<sup>viii</sup> The correlation for the two measures for the period 2010-2018 was 0.40828598 with  $t(223) = 6.67906$ , with two-tailed p-value 0.000.

<sup>ix</sup> Adjusted R-squared display similar patterns as the R-squared.

<sup>x</sup> Obviously, the alteration of funding structures in FSs and development of new product offerings or pricing models by financial intermediaries take time.

<sup>xi</sup> However, the period covered in Table 4 coincide with a period of regulatory tightening (such as CRD IV/CR) in European bank regulation (Bengtsson 2013; Bengtsson 2020) and expansionary monetary policy, which may have further penalized bank lending in relation to market-based credit.