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Legal Harmonization, Institutional Quality, and Countries' External Positions

A Sectoral Analysis

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Legal harmonization, institutional quality, and countries' external positions: A sectoral analysis

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Abstract

This paper analyzes links between institutional harmonization and bilateral portfolio debt and equity holdings at the sectoral level. Motivated by the action plan for the European Capital Markets Union, we examine the potential for legal harmonization and convergence in institutional quality to affect financial structures. Our analysis yields three key insights. First, legal harmonization across the EU promotes capital market integration via increased portfolio equity holdings. Second, discrepancies in institutional quality matter for cross-border portfolio positions: economic agents increase their portfolio debt investment in countries that are transparent and have efficient insolvency procedures, investor protection, and tax systems as compared to the domestic ones. Third, the relationship between external capital holdings and institutional harmonization varies significantly across sectors. The other financial corporations sector, which accounts for a large share of portfolio positions, tends to react more to institutional harmonization than do banks and the non-financial private sector.

Keywords: capital market integration, legal harmonization, sectoral effects
JEL Codes: E02, F21, G15

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1 Introduction

Regulators and policy makers are facing the challenge to promote resilient capital market structures that support macroeconomic and financial stability. The recent financial and sovereign debt crisis in Europe revealed a critical weakness: local stress was spreading across countries, such that the entire financial system became unstable. One reason for the system-wide stress is the financial market structure in Europe (Langfield and Pagano, 2016). Relative to GDP, the EU has a large, though shrinking banking sector, and rather underdeveloped bond and equity markets comparative to the other big economies (Figure 1). Therefore, when the banking system ran into trouble, credit got scarcer in many countries, which impaired investment activity and, hence, growth. Consequently, policy makers and academics increasingly stress the role of alternative, non-bank financing sources for European firms.

The EU financial system remains national and cross-border financial integration is rather limited (European Commission, 2015). Even though international portfolio equity holdings have significantly increased since the global financial crisis, they remain relatively small as compared to portfolio debt holdings (Figure 2). Previous literature shows that a larger equity share in external positions is related to better cross-country risk sharing, whereas larger external credit and debt positions matter less for consumption smoothing and can even reduce it (Kose et al., 2009; Milesi-Ferretti et al., 2011; Bremus and Buch, 2018). Related to these considerations, the key goals laid out in the action plan for the European Capital Markets Union (CMU) are the promotion of capital market integration in Europe and a further deepening of debt and equity markets.

In this paper, we analyze legal and institutional determinants of countries' external debt and equity positions for different sectors for a large sample of advanced economies, with a focus on the EU countries. Relating to the debate about the CMU, we ask how harmonization of the regulatory environment affects countries' external debt and equity positions, as well as whether cross-country differences in institutional efficiency matter for financial integration in Europe. The literature provides ample evidence that information frictions between countries due to differences in language and legal origins, along with deep-rooted preferences and habits, can explain a significant part of cross-border equity and debt holdings (Grinblatt and Keloharju, 2001; Giofre, 2013a; Roque and Cortez, 2014; Giofre, 2017). Yet, evidence on institutional and regulatory determinants of external financial structures in the EU is scarce. This paper fills this

gap and investigates which institutional and regulatory factors that appear in the CMU-debate are relevant determinants of external holdings of equity and debt.

The channels through which European policymakers plan to deepen and integrate financial markets include standardization and harmonization of rules through supervisory convergence, elimination of differences in financial regulations between the EU countries, wider access to information, increased transparency (e.g. on the creditworthiness of firms), and convergence in tax and insolvency rules (European Commission, 2015).

First, we analyze the effect of legislative harmonization in the regulation of financial services on capital market integration. For that, we extend the legal harmonization index by Kalemli-Ozcan et al. (2010), using both the EU-Lex database and national information on the transposition of the EU-Directives in the area of financial intermediation. We collect data on the transposition of the EU laws by new member states as well as include information about the regulations introduced in the post-crisis period. A more harmonized legal framework reduces information and compliance costs and, therefore, should promote cross-border portfolio investment. Second, we investigate how cross-country differences in institutional variables, such as insolvency recovery rates, strength of investor protection, coverage of credit registries, as well as the efficiency of tax systems and contract laws, are related to international portfolio debt and equity investment. We expect that economic agents prefer to invest in countries with more efficient institutions.

We use bilateral data on external asset holdings for a set of the OECD- and EU-economies from the Coordinated Portfolio Investment Survey (CPIS) by the International Monetary Fund (IMF). As stressed by Galstyan et al. (2016), the patterns evident in the aggregate portfolio investment data do not uniformly apply across the various holding sectors. Therefore, in addition to total bilateral asset holdings, we use breakdowns of these positions by institutional holder-sector in order to achieve a more granular picture about sectoral differences in the institutional and regulatory determinants of external portfolio holdings. We focus on private investors and consider three different institutional sectors, namely banks, other financial corporations (OFC), and the non-financial private sector (NF) that includes non-financial corporations and households.

Our study is the most closely related to two strands of literature. It contributes to the literature that studies the potential of legislative harmonization and convergence in institutional quality to promote international financial integration. While previous studies (Kalemli-Ozcan

et al., 2010; Houston et al., 2012) look at the effect of regulatory harmonization on cross-border credit positions, our study provides evidence for portfolio debt and equity holdings, i.e. for capital market integration. Further, the paper is related to the gravity studies that analyze drivers of international investment positions at the *sectoral* level. Most of the gravity literature in finance is based on aggregate data on cross-border positions of debt and equity (Okawa and van Wincoop, 2012; Portes and Rey, 2005). Since data availability has improved, a small but growing literature investigates sectoral patterns of international investment positions (Roque and Cortez, 2014; Giofre, 2017; Galstyan et al., 2016; Boermans and Vermeulen, 2016). In contrast to the existing studies, we provide a comprehensive overview over the determinants of investment behavior of sophisticated (banks and other financial corporations) and less-sophisticated investors (households and non-financial corporations) in both equity and debt markets, with a focus on differences in institutional quality and regulatory environment.

Our empirical analysis yields three key findings. First, legislative harmonization in the regulation of financial services across the EU helps strengthen portfolio equity investment, while the effect is statistically insignificant for portfolio debt positions in our sample. Second, differences in institutional quality matter, particularly for bilateral cross-border debt positions. Economic agents prefer to invest more in countries that are transparent and have efficient insolvency procedures, investor protection, and tax systems as compared to the domestic ones. Third, the effects of legislative harmonization and differences in institutional efficiency on bilateral portfolio investment positions vary significantly across sectors. When we consider total holdings, important sectoral developments are hidden as they may counteract each other in the aggregate. The other financial corporations sector, which accounts for a large share of both portfolio equity and debt holdings, seems to incorporate information on institutional and regulatory factors in its investment decisions the most.

The rest of the paper is organized as follows. Section 2 provides a brief review of the literature. The empirical model together with tested hypotheses and data are presented in Section 3. Section 4 describes the estimation results and provides robustness tests. Section 5 concludes and offers thoughts on further research.

2 Related literature

Several empirical studies explore the effects of differences in financial regulations and institutional quality on cross-border portfolio investment and credit stocks and flows – with different results depending on whether bank credit or portfolio investment are considered.

One strand of the literature shows that differences in the stringency and quality of regulations can distort the allocation of capital between countries. On the one hand, cross-country differences in banking regulations may encourage bank credit to flow from more restrictive to less restrictive jurisdictions. This way, banks may improve their efficiency by reducing the costs of compliance with regulations. At the same time, this regulatory arbitrage can encourage excessive leveraging and risk taking (Barth et al., 2008). Houston et al. (2012) show that banks transfer funds to markets with more lenient regulations. However, countries with lax regulations but weak institutions are less able to attract credit inflows. In a similar vein, Bremus and Fratzscher (2015) find that source countries that experienced increases in capital stringency, banking supervisory power, or overall independence of the supervisor saw larger credit outflows after the Global Financial Crisis.

On the other hand, in the case of cross-border debt and equity investments, economic agents have incentives to send capital to jurisdictions with more stringent rules on information sharing or investor protection, encouraging a "race to the top" in institutional quality (Carruthers and Lamoreaux, 2016). Based on an empirical analysis, La Porta et al. (2000) claim that the debt and equity capital markets of countries with poorer investor protections are both smaller and narrower. Mandatory disclosure and facilitation of private enforcement are positively associated with the ratio of equity market capitalization to GDP, the number of listed firms per capita, and trading volume relative to GDP (La Porta et al., 2006). Further, Gelos and Wei (2005) show that investment funds systematically invest less in less transparent countries and have a greater propensity to exit non-transparent countries during crises.

Another strand of the literature shows that countries with more similar regulations, both business and financial, face lower information barriers and lower costs of compliance, which leads to more bilateral cross-border investment (Okawa and van Wincoop, 2012). At the same time, regulatory differences impose additional costs on economic agents by making them learn, interpret, and understand different laws. For example, different accounting standards make it more difficult for investors to evaluate the financial soundness and learn about the creditworthiness

of firms they invest in. Empirically, Vlachos (2004) measures regulatory differences as the absolute difference between regulatory variables in the source and recipient countries of capital. His analysis confirms that smaller differences in financial regulations between two countries lead to higher bilateral portfolio holdings. He identifies the reduction in information costs rather than lower compliance costs as the key driving force of increased financial integration.

Kalemli-Ozcan et al. (2010) construct an index of legislative harmonization utilizing differences in the transposition of the EU-Directives of the Financial Services Action Plan (FSAP) into national laws by the EU-15. The paper presents evidence that legislative convergence led to growth in cross-border banking activities among the European countries. Ozkok (2016) collects a similar index for 25 EU countries and confirms a positive link between financial harmonization and developments in the banking and stock markets in the EU. Additionally, Christensen et al. (2016) find a positive effect of the Market Abuse Directive on market liquidity, with the effects being stronger in countries with stricter implementation and traditionally more stringent securities regulations.

3 Empirical analysis

The goal of this paper is to investigate how legal harmonization and cross-country differences in institutional quality impact cross-border investment in debt and equity markets. In the following, we present our tested hypotheses as well as describe the data and empirical methodology.

3.1 Legal harmonization and differences in institutional quality: Hypotheses

We concentrate on institutional aspects that are related to the current debate about the European Capital Markets Union, namely legal harmonization and narrowing down of differences in investor protection, insolvency procedures, contract enforcement, credit information, and efficiency of tax systems. Table 1 summarizes the expected effects of the respective variables of interest on international portfolio investment. More generally, we test the following hypotheses.

Hypothesis 1: The more harmonized is the legal framework for financial services between countries i and j, the larger are their bilateral cross-border asset holdings. A more harmonized legal framework for financial services across countries lowers the costs of investing abroad. Legal harmonization reduces both information and compliance costs. Thus, we expect larger bilateral asset holdings for country-pairs with more harmonized markets for financial services.

Hypothesis 2: Investors in country i invest more in assets issued by country j, if the quality of institutions in country j is better than in country i. In order to gauge the potential for more transparency (e.g. on the creditworthiness of firms) to foster capital market integration, we consider public and private coverage of credit registries. The better the access to information about firms' financial health is in the issuing country, the lower the information costs are and the more attractive cross-border investments become (La Porta et al., 2006). Hence, if the credit registry coverage in the issuer country j is higher than in the holder country i, investors from country i will prefer to hold more debt and equity from country j. Further, better investor protection (La Porta et al., 2000) and higher insolvency recovery rates raise the probability of receiving investments back in case of bankruptcy of the issuer. Thus, higher insolvency recovery rates in the issuer country as compared to the holder country should induce higher holdings by country i of assets issued by country j. The same reasoning applies to differences in investor protection. Finally, the larger the gap between country i and j in the costs to enforce a contract, that is, contract enforcement is less efficient in a source country than in a recipient country of capital, the higher should be the cross-border asset positions of i in j. A similar logic applies to the effect of differences in the time to prepare and pay taxes – a proxy for the efficiency of a tax system.

Given that sophisticated investors like banks and other financial corporations are more exposed to cross-country differences in legal frameworks due to larger and more internationally diversified portfolios as compared to less sophisticated investors (the non-financial private sector), we expect legal harmonization and institutional differences to matter more for the former sectors (Roque and Cortez, 2014).

Regarding asset classes, differences in the strength of insolvency recovery rates should be more important for debt than for equity investment due to the difference in liability characteristics of these two asset categories; in case of bankruptcy, creditors are generally paid first.[1] Regarding investor protection, empirical results by Giofre (2013b) reveal that a stronger protection of shareholders' rights can have opposing effects on equity and debt investments due to conflicting interests of creditors and shareholders, e.g. with respect to a firm's risk-taking. Overall, information asymmetries tend to matter more for shareholders (Eichler, 2012). Therefore, legal harmonization can be expected to play a more important role for portfolio equity

[1] According to the World Bank Doing Business Indicators 2018, debt recovery rate was about 70 cents on the dollar in high income OECD economies.

than for portfolio debt investments.

3.2 Data

Portfolio debt and equity holdings. We use bilateral sectoral cross-border portfolio equity and debt holdings as dependent variables. These variables capture security holdings by a sector s of country i that are issued by all sectors of country j. The data are available at annual frequency from the Coordinated Portfolio Investment Survey (CPIS), which collects information on the stock of cross-border portfolio equity and debt securities on a voluntary basis. We only consider holders from those OECD and EU countries that report international equity and debt holdings with a sectoral breakdown. For issuing countries, we include all OECD and EU countries for which the data are available. The full list of countries and a brief description of the key variables including the data sources can be found in Appendix A.1. In order to prevent outliers from affecting the estimation results, we trim the sectoral debt and equity holdings at the 2.5%- and 97.5%-percentiles. Summary statistics for the regression sample are presented in Table 2.

As illustrated by Figure 2, which plots the evolution of total international debt and equity holdings for our baseline sample, investors from advanced economies hold more debt than equity. Holdings of both equity and debt followed an upward trend with equity and debt almost tripling over the 2001-2015 period. Equity holdings dropped significantly in 2008, which is partially due to valuation changes. Additionally, while average annual growth in both equity and debt holdings was negative in 2008 and 2011, portfolio equity holdings picked up again in the post-crisis period (Figure 3).

As stressed by Galstyan et al. (2016), the patterns evident in the aggregate portfolio investment data do not uniformly apply across the various holding sectors and may disguise important sectoral developments. Therefore, we disaggregate portfolio investments by holder-sector, that is, into banks, other financial corporations (insurance corporations, pension funds, money market funds, and others), and the non-financial sector (private households and non-financial corporations). Monetary authorities and the public sector are excluded from the analysis.

We treat banks and other financial corporations as sophisticated investors that have greater experience in bond and equity investments and are more financially literate as compared to the less-sophisticated investors represented by non-financial corporations and households. As discussed by Roque and Cortez (2014), sophisticated investors face lower transaction and information costs and are more concerned about the profitability of their investment. Therefore, the

importance of regulations in shaping investment decision might be different for sophisticated and less-sophisticated investors. Figure 4 plots the composition of international debt and equity holdings by sector for our regression sample. It reveals that recently OFCs account for the largest part of portfolio equity and debt holdings. While banks hold a large part of external debt, their cross-border holdings of equity account for a minor share of total portfolio equity positions. The non-financial sector plays a subordinated role for portfolio investment positions in our sample.

Legislative harmonization. In order to investigate the role of legislative harmonization at the European market for financial services in promoting cross-border capital investments, we construct an index of legislative harmonization following Kalemli-Ozcan et al. (2010). These authors present a dataset that measures the degree of legislative harmonization in financial services across the EU-15 between 1999 and 2007. Their index is based on 27 EU-level Directives of the 1999 Financial Service Action Plan (FSAP), which sought to create a harmonized European market for banking, securities, and insurance. To construct the index, Kalemli-Ozcan et al. (2010) exploit the fact that the Directives passed by the European Commission are transposed into national law within a certain period of time, often with delays. As shown by Koetter et al. (2017), the transposition time takes a couple of years and the delays might occur either due to necessity of technical adaptations and modifications of national laws and institutions or because of other more general country-characteristics or political considerations. As the timing of the transposition of the EU-Directives varies across countries, the constructed index allows for capturing the harmonization of regulations across time and country-pairs. Besides measuring bilateral legal harmonization within the EU, this index could also be used as an instrument in studies evaluating the effects of financial openness as in Kalemli-Ozcan et al. (2013).

We update the index constructed by Kalemli-Ozcan et al. (2010) in two dimensions. First, we extend it to include the 13 new EU countries (Bulgaria, Czech Republic, Estonia, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Romania, Slovak Republic, Slovenia, and Poland), which transposed most of the existing Directives after their accession to the EU. Second, we collect information on the transposition dates of the financial regulations introduced post-crisis, which consist of 28 new Directives and amendments as described in Table 8. We select the Directives that are listed in the section "Financial reforms" by the European Commission.[2]

[2] https://ec.europa.eu/info/business-economy-euro/banking-and-finance/financial-reforms-and-their-progress/progress-financial-reforms_en

Only the Directives related to banking, securities, or insurance markets that were transposed into national laws before 2015 are included. To find out the transposition dates of each Directive we rely on information from EUR-Lex as well as on the national legislation.[3]

To create the bilateral financial harmonization index, for each country-pair we define 55 indicator variables (LEX_{kijt}) that are equal to one starting at the year when the Directive k was transposed into a national law by both countries, and zero otherwise. Further, we aggregate the values of the 55 indicator variables as follows: $LegHarm_{ijt} = log(1 + \sum_{k=1}^{K=55} LEX_{kijt})$. The resulting legal harmonization index takes higher values when countries i and j adopted similar regulations in the areas of banking, securities, and insurance. For example, in 2014, the (non-logarithmized) index is 34 for the country-pair Italy – Croatia, whereas it takes on a value of 50 for Netherlands – Sweden. Figure 5 illustrates that the pace of transposition of the relevant EU-Directives into national laws varies across the EU member states. While some countries implemented the Directives quickly, others did not transpose some of the Directives into national laws or did it with delays.

Differences in institutional quality. To measure various aspects of legal barriers preventing capital market integration, we concentrate on specific legal areas that were identified by the Giovannini report (Giovannini Group, 2001). That is, we focus on variables gauging the quality of investor protection, insolvency recovery, contract enforcement, coverage of credit registries, and tax systems. We use time to prepare and pay taxes to account for the sophistication of a tax system (Lawless, 2013) and credit registry coverage to measure transparency of a financial system. Information on all these variables is taken from the World Bank Doing Business Indicators.

To measure differences in institutional quality between holder- and issuer-country, for each of the variables discussed above we compute indicators as follows: $InstDiff_{ijt} = log(Inst_{it}/Inst_{jt})$. Intuitively, economic agents are expected to transfer funds to markets with better regulations and more efficient legal frameworks (Table 1, subsection 3.1).

Control variables. In addition to our main variables of interest, we include a set of control variables in the regression equations. Following Okawa and van Wincoop (2012), we add standard bilateral gravity controls, such as common language, common legal origin, distance,

[3]For each Directive, we search information on transposition dates at `https://eur-lex.europa.eu`, section "National transposition." For each country, this section presents a list of national laws that contain references to the Directive. We read the listed laws (available from the national law web-portals) and select those laws that mention transposition of the Directive into national law. The date is recorded as of entry of the law into force.

bilateral trade, and membership in the EU and the euro area (EA). The lower distance between countries reduces communication costs and increases human interaction, thus, increasing cross-border investment between countries. The common language dummy captures information barriers that arise between two countries when economic agents speak different language and/or legal documents are in a different language. Similarly, countries that have the same legal origin (British, French, German, Scandinavian, or Socialist) face lower information barriers. More trade leads to closer interactions between countries reducing information asymmetries. Moreover, countries that are members of the EA do not face exchange rate risks, while membership in the EU removes potential capital movement barriers. Following Houston et al. (2012), country-specific control variables for both holder- and issuer-economies include GDP per capita, population, and the Chinn-Ito index of financial liberalization.

3.3 Regression specifications

Our empirical model specification is based on the gravity literature in finance that links bilateral international capital positions to information frictions and country characteristics (Okawa and van Wincoop, 2012; Portes and Rey, 2005).

In a first step, we estimate how legal harmonization, that is, the applicability of the same law across different countries, affects cross-border portfolio debt and equity holdings. Our aim is to gauge the potential for institutional harmonization – one of the long-term goals of the CMU – to foster cross-border integration of debt and equity markets. For this purpose, we estimate the following panel gravity model:

$$log(A_{i_sjt}) = \alpha_{it} + \theta_{jt} + \gamma LegHarm_{ijt} + \beta X_{ijt} + \epsilon_{i_sjt} \tag{1}$$

where A_{i_sjt} are portfolio asset positions (either equity or debt) held by investors in country i, issued by all entities in country j. The index t denotes years, and s reflects the holder sector, namely banks, other financial institutions (OFC), the non-financial sector (NF), or total bilateral portfolio positions.[4] $LegHarm_{ijt}$ gauges the harmonization of laws across the EU based on the transposition of the Financial Service Action Plan (FSAP) and post-FSAP Directives into national law as described above. Additionally, we include both constant and time-varying

[4]Total bilateral positions include holdings of the public sector, which only accounts for a small part of total portfolio positions. It is not included separately in the analysis, as our focus is on the link between institutional differences and private investment behavior. Moreover, data coverage for public portfolio holdings is rather limited.

bilateral control variables from the gravity literature (X_{ijt}), such as common language, common legal origin, distance, bilateral trade, and dummy variables indicating whether both countries are members of the EU or the EA. To control for all country-specific pull and push factors, we add a full set of holder-country-and-time (α_{it}) and issuer-country-and-time fixed effects (θ_{jt}). These fixed effects absorb all banking sector and macroeconomic developments at the source- and recipient-country levels. Thus, all potential confounding factors at the country-level are controlled for in this setup.

Regarding concerns about a reverse causality between the legal harmonization index and capital market integration, we note that decisions on the transposition of Directives are made at the country-level and not at the bilateral level that our dependent variable is measured at. The transposition date of the related EU-directives is decided upon by each individual country and affects all its EU-partner countries alike. Further, Koetter et al. (2017) show that transposition delays are mainly related to the prevailing country-specific legal and regulatory frameworks rather than to financial structures. Still, more financially integrated economies may implement the Directives faster. This pattern, however, will be controlled for by the country-and-time fixed effects for holder- and issuer-countries.

In a second step, we explore how differences in the quality of institutions between holder- and issuer-countries affect the investment behavior of different sectors. The idea is that economic agents prefer to invest more in countries that are transparent and that have high quality of institutions and laws as compared to the national ones. We follow Houston et al. (2012) and regress bilateral asset holdings on the differences between several measures of institutional efficiency in countries i and j:

$$log(A_{i_sjt}) = \alpha_i + \theta_j + \eta_t + \gamma InstDiff_{ijt} + \beta X_{ijt} + \epsilon_{i_sjt} \tag{2}$$

where $InstDiff_{ijt}$ contains our variables of interest, which capture how qualitatively different institutions and laws between two countries are. We concentrate on institutional characteristics related to the CMU-debate, such as investor protection, disclosure of information, contract law, and insolvency and tax regimes. The vector X_{ijt} contains the same bilateral control variables as in equation (1). Additionally, we include a set of standard country-level control variables as in Houston et al. (2012), namely log of GDP per capita, log of population, and the Chinn-Ito index of financial liberalization for both holder- and the issuer-countries.

Overall, our baseline sample covers 33 holder- and 35 issuer-countries over the period of 2001-2015. For the models investigating the impact of differences in institutional efficiency (equation (2)), the sample covers the years 2006-2014, as the main explanatory variables measuring the quality of institutions were available from the World Bank Doing Business Indicators for this period. As we are interested in how institutional differences and legal harmonization within the EU affect capital market integration, we follow Kalemli-Ozcan et al. (2010) and only include those holder- and issuer-countries from the EU and the OECD countries that report international equity and debt holdings with a sectoral breakdown. For robustness checks, we expand our sample to all 94 issuer-economies for which the data are available.

4 Regression results

Tables 3 - 7 present estimation results for the linkages between bilateral portfolio holdings, legal harmonization, and institutional efficiency, based on equations (1) and (2). We provide detailed evidence for total bilateral debt and equity positions together with sectoral decompositions into banks, other financial corporations (OFC), and the non-financial private sector (NF).

4.1 Determinants of international debt and equity positions

Legislative harmonization. Table 3 presents the results for our baseline sample of advanced economies. It appears that harmonization of the financial market regulations within the EU is positively related to cross-border debt and equity positions. Yet, the positive effect of bilateral legal harmonization is only statistically significant for the cross-border portfolio equity holdings of the other financial corporations sector (column (7)). The result remains intact if the sample is extended to a broader set of countries (Table 4). Hence, legal harmonization seems to matter more for equity market integration, which may be due to shareholders' higher sensitivity to information frictions as compared to creditors. The non-results for the banking sector may be partly driven by comparatively small volumes of portfolio equity holdings by banks.

In order to investigate whether the estimation results are driven by certain domains of financial market regulations, we run regressions for four alternative measures, namely for bilateral harmonization in the areas of (1) banking, (2) securities, (3) insurance services, and (4) focusing on newly issued Directives, excluding amendments to the previous Directives, as shown in Table 8. All regressions include the same number of observations as well as the same control variables

as in the baseline setup in Table 3. Based on the results in Table 5, all sub-indexes (banking, securities, insurance services) are statistically significant in the regressions with portfolio equity investment of the other financial corporations as a dependent variable, with harmonization in the insurances area being particularly important.

Regarding economic significance, an increase in harmonization of financial regulations between issuer- and holder-countries by one standard deviation from the mean is associated with an increase in cross-border equity holdings of the other financial corporations by 34%.[5] As we control for membership in the EA and in the EU, the coefficients on our bilateral harmonization index show the effect of the adoption of common laws on cross-border capital market integration on top of the membership effect. When comparing this effect to the impact of changes in other structural variables, we find that, for example, an increase in bilateral trade by one standard deviation from the mean corresponds to a rise in bilateral portfolio equity holdings of the other financial corporations by about 90%. Hence, pushing forward legal harmonization can strengthen equity market integration within the EU, thereby increasing financial market depth.

For the set of standard bilateral control variables, our estimation results confirm previous evidence from the gravity literature. The less distant two countries are and the more they trade with each other, the larger are their bilateral portfolio debt and equity positions. Moreover, legal origins are an important determinant of capital market integration; bilateral portfolio positions are higher if two countries share a common legal system. These findings are broadly confirmed across assets types (debt, equity) and sectors (total, banks, OFC, NF).

For total cross-border debt assets, our results reveal that positions are higher within the euro area as compared to the rest of the sample; i.e. if both holder- and issuer-countries are members of the euro area. This finding is driven by the asset holdings of the euro area financial sector, whereas debt holdings do not significantly differ inside and outside of the euro area for the non-financial sector. Higher portfolio debt holdings within the euro area are related to comparatively large banking systems, both on the issuer- and holder-sides. As banks are closely interlinked with each other by holding other banks' bonds and they re-finance themselves through debt more than through equity, the obtained results are not surprising.

Bilateral equity positions, in contrast, do not show a consistently different pattern within the euro area as compared to the rest of the sample. Apart from a positive and significant

[5]Taking the estimated coefficient from Table 3 (column (7)) and multiplying it with a one standard deviation increase from the mean (in %) in the (non-logarithmized) index of legal harmonization yields $0.28 \cdot 100 \cdot (17.8/14.7) = 34.2\%$.

effect of euro area membership on bilateral equity positions in the banking sector, euro area membership does not seem to matter for portfolio equity investment. The regression results are in line with the fact that European economies differ in their investment patterns from a broader set of countries (Langfield and Pagano, 2016).

Differences in institutional quality. Next, we investigate how differences in the quality of institutions between holder- and issuer-countries affect bilateral debt and equity holdings (Tables 6 - 7). As expected, capital is attracted by those countries featuring the more efficient institutional frameworks, even when controlling for general bilateral information frictions like common legal origins or distance.

First, the larger is the difference between two countries in strength of investor protection, insolvency recovery, and credit registry coverage, that is, the issuer-country has less efficient institutions as compared to the holder-country, the lower are their bilateral portfolio debt positions. Second, the less time it takes to enforce a contract and to prepare and pay taxes in the issuer-country than in the holder-country, the more investors from country i invest in debt instruments of country j. The coefficients are rather similar for both the sample of advanced countries (Table 6) and the extended country sample (Table 7). Interestingly, it is again the sector of the other financial corporations that mostly drives the results, but this time with respect to its portfolio debt holdings.

The estimates indicate that a change in the ratio of institutional quality in the holder- and issuer-country by one standard deviation from the mean translates into a change in portfolio debt holdings of the other financial corporations by about 30 - 60%, depending on the type of laws being adjusted. For example, if insolvency recovery rates become more favorable in the holder- than in the issuer-country, such that the difference in institutional quality rises, cross-border debt holdings of the other financial corporations fall by nearly 30%. At the same time, differences in institutional efficiency do not seem to matter much for bilateral portfolio equity investments across sectors and in total. For insolvency recovery rates, for example, this finding is in line with the pecking order of priority creditor payments, according to which holders of securities are paid before equity shareholders in case of the liquidation of a company.

As suggested by Tables A2 - A3 in the Appendix, both institutional pull and push factors play an important role in determining investment decisions – yet, mostly in debt markets in our sample. Economic agents from countries with high quality of institutions (especially, in the areas of investors' protection and insolvency laws) invest less abroad. At the same time,

investments go to the issuer-countries with better institutional quality.

4.2 Robustness checks

Next, we explore the sensitivity of our results to sample selection, potential outliers, and changes in the model specification.[6]

First, we check how robust our regression results are to changes in the sample composition. For that goal, we test if the observed effects are driven by individual countries or groups of countries. We exclude issuer- and holder-countries one-by-one. The coefficients of interest retain their economic and statistical significance for all specifications. Further, in order to account for potentially different dynamics of equity and bond markets pre- and post-crisis, we re-run the regressions excluding years one-by-one as well as removing the global financial crisis from the sample. The results remain close to our baseline specification.

Second, to test for the robustness of our results with respect to the choice of the dependent variable, we use the log of the share of country j's assets in the total external portfolio of country i (Roque and Cortez, 2014). The results are mostly unaffected by this alternative specification. In addition, we check sensitivity of our estimates to the model specification with respect to the explanatory variables. We exclude each explanatory variable one-by-one to account for potential multicollinearity between the regressors.[7] As expected, institutional and regulatory variables are correlated and the coefficients become more statistically significant when we include only one explanatory variable at a time.

Third, we test the sensitivity of our coefficients of interest, namely the coefficients on legal harmonization, with respect to the inclusion of different combinations and sets of control variables. Given that point estimates and standard errors depend on model specification (Athey and Imbens, 2015), in addition to the aforementioned robustness checks, we take a more systematic approach. Namely, we perform an extreme bounds analysis (EBA) using the Sala-i-Martin algorithm that considers the entire distribution of the parameters (Hlavac, 2016). It estimates 2^m regressions using different combinations of m potential explanatory variables.[8] This approach allows for checking whether changes in the set of explanatory variables can fundamentally change the coefficients of interest. The results of the EBA are presented in Figures 6 - 7. They suggest

[6]The corresponding regression results are available from the authors upon request.

[7]Our baseline model is specified such that variance inflation factors are below the recommended value of 10.

[8]We use m=10 potential explanatory variables: common language, common legal origin, colonial links, common colony, common currency, contiguity, log distance, log trade, and membership in the EU and euro area. Consequently, 1024 regressions are estimated.

that the coefficients on legal harmonization are mostly positive for both total debt and equity holdings across a large range of alternative empirical models. Moreover, legal harmonization is positively associated with debt and equity holdings of the OFCs and portfolio debt investment of banks. Yet, the estimated coefficients on legal harmonization for the portfolio equity positions of the non-financial corporations and banks are varying widely and can take positive and negative values almost equally likely, depending on the set of the included control variables.

Finally, we consider various approaches for estimating the standard errors in our panel data regressions. Apart from clustering standard errors at a holder-country level, we perform clustering at both issuer-country and country-pair levels. The results become more statistically significant with alternative clustering methods.

5 Conclusion

Motivated by the debate about institutional harmonization in the realm of the action plan for the European Capital Markets Union, this paper analyzes institutional and regulatory driving factors of bilateral cross-border debt and equity holdings at the sectoral level. The goal is to examine the potential for institutional harmonization to affect longer-term structures of the financial system in Europe. To this end, based on the information from the European Commission and national sources, we extend the legal harmonization index proposed by Kalemli-Ozcan et al. (2010) by collecting data on the transposition of the 28 post-FSAP Directives as well as by including new EU member states in the sample. Besides allowing to gauge *de jure* capital market integration in Europe, this index could also be used as an instrument in studies evaluating the effects of capital market integration, similarly to the approach of Kalemli-Ozcan et al. (2013) for banking sector integration.

Our empirical analysis yields three key findings. First, based on the constructed measure of legal harmonization of financial regulations for the period 2001-2015, we present evidence that common laws in financial services facilitate cross-border capital market integration. The regression results reveal that the other financial corporations sector increases its cross-border portfolio equity investment in response to legal harmonization. In contrast, portfolio debt holdings are not significantly affected by harmonization of the regulatory environment.

Second, differences in institutional quality matter for cross-border asset holdings as economic agents prefer to invest in countries with more efficient institutions. The more efficient insolvency

procedures, investor protection, or contract enforcement are in an issuer-country as compared to a holder-country, the larger are the bilateral portfolio debt positions. Portfolio equity holdings, however, seem to be less responsive to these discrepancies.

Third, the estimation results show that the relationship between institutional and regulatory differences and bilateral portfolio investment holdings vary significantly across sectors. The other financial corporations sector reacts to a large set of the variables considered in this study as compared to banks and the non-financial private sector. Given that the sector of the OFCs accounts for a significant part of the cross-border debt and equity positions, the reduction of differences in institutional quality as well as legal harmonization of the financial regulations have the potential to increase capital market integration.

Since most of the indicators on differences in institutional quality are rather broad and reflect a large set of factors, a more detailed analysis of the most relevant regulatory and institutional drivers of the external capital market positions is needed. Further, in order to examine the potential for legal harmonization and more efficient institutions to promote equity market integration, the analysis could be extended to foreign direct investment as an important part of the equity market.

Tables

Table 1: Expected effects of legal and institutional harmonization

Variable	Effect on portfolio investment
Legal harmonization	+
Strength of investor protection, difference	-
Insolvency recovery, difference	-
Time to enforce a contract, difference	+
Credit registry coverage, difference	-
Time to pay taxes, difference	+

This Table presents the expected effects of legal harmonization and differences in institutional quality on portfolio investment positions. Differences are computed as the log of the ratio of institutional quality in the holder and in the issuer country.

Table 2: Summary statistics

	Obs.	Mean	SD	Min	Max
	Dependent variables				
log(Debt), total	11750	5.71	2.95	-1.84	11.06
log(Debt), banks	7043	5.46	2.61	-1.17	10.38
log(Debt), OFC	7868	5.37	2.82	-1.31	10.62
log(Debt), NF	6465	3.28	2.81	-3.33	9.06
log(Equity), total	11490	4.70	3.32	-3.92	10.41
log(Equity), banks	4178	3.38	2.85	-3.81	8.66
log(Equity), OFC	7992	4.77	3.03	-2.74	10.11
log(Equity), NF	6862	2.73	3.14	-4.99	8.52
	Bilateral explanatory variables				
Common language	11750	0.07	0.25	0.00	1.00
Common legal origin	11750	0.20	0.40	0.00	1.00
log(Distance)	11750	7.78	1.13	4.09	9.88
log(Trade)	11750	7.37	2.03	-1.61	13.36
Both countries in the EU	11750	0.45	0.50	0.00	1.00
Both countries in the EA	11750	0.17	0.38	0.00	1.00
Bilateral harmonization index, total	11750	1.45	1.67	0.00	3.99
	Country-specific explanatory variables				
Strength of inv. protection, diff.	6377	0.00	0.31	-1.08	1.06
Insolvency recovery, diff.	6377	-0.02	0.57	-1.59	1.59
Time to enforce a contract, diff.	6377	0.02	0.58	-1.75	1.79
Credit coverage, diff.	6377	-0.01	1.14	-3.96	3.96
Time to pay taxes, diff.	6377	0.08	0.71	-2.30	2.49
log(GDP per capita), issuer	6377	11.29	2.06	7.22	17.16
log(Population), issuer	6377	2.57	1.33	-1.19	5.77
Financial liberalization, issuer	6377	0.90	0.21	0.16	1.00
log(GDP per capita), holder	6377	11.21	2.10	7.22	17.16
log(Population), holder	6377	2.42	1.23	-1.19	4.87
Financial liberalization, holder	6377	0.91	0.17	0.16	1.00

This Table presents descriptive statistics for the baseline regressions presented in Tables 3 and 6. OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households), diff. = log of the ratio of institutional quality in the holder and in the issuer country.

Table 3: Determinants of bilateral asset holdings: Legal harmonization

	Debt				Equity			
	(1) Total	(2) Banks	(3) OFC	(4) NF	(5) Total	(6) Banks	(7) OFC	(8) NF
Common language	0.100	-0.160	0.064	0.061	-0.047	0.367	-0.162	0.035
	(0.194)	(0.178)	(0.247)	(0.179)	(0.176)	(0.288)	(0.209)	(0.216)
Common legal origin	0.696***	0.683***	0.703***	0.802***	0.851***	0.425*	0.843***	0.921***
	(0.123)	(0.136)	(0.161)	(0.140)	(0.145)	(0.243)	(0.166)	(0.166)
log(Distance)	-0.274***	-0.423**	-0.380***	-0.439***	-0.389***	-0.401**	-0.412**	-0.915***
	(0.090)	(0.154)	(0.131)	(0.095)	(0.110)	(0.180)	(0.169)	(0.119)
log(Trade)	0.341***	0.327***	0.237***	0.313***	0.452***	0.535***	0.315**	0.406***
	(0.056)	(0.087)	(0.082)	(0.069)	(0.095)	(0.173)	(0.146)	(0.098)
Both countries in the EU	0.460	-0.183	0.224	0.454	-0.260	-0.899	-0.815*	-0.457
	(0.312)	(0.697)	(0.486)	(0.574)	(0.321)	(0.950)	(0.467)	(0.508)
Both countries in the EA	0.563***	0.528**	0.466**	-0.035	0.146	0.940***	0.087	0.270
	(0.173)	(0.204)	(0.187)	(0.171)	(0.228)	(0.337)	(0.281)	(0.285)
Bilateral harmonization index	0.109	0.119	0.128	0.064	0.101	0.002	0.282**	0.043
	(0.099)	(0.209)	(0.134)	(0.145)	(0.101)	(0.276)	(0.133)	(0.107)
R-squared	0.824	0.743	0.812	0.732	0.836	0.655	0.817	0.777
Observations	11750	7043	7868	6465	11490	4178	7992	6862
Holders countries	33	31	32	32	33	31	32	31

This Table presents estimation results for log bilateral portfolio debt and portfolio equity assets as dependent variables. OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households). Holder-year and issuer-year fixed effects are included in all regression, but are not reported. Standard errors are clustered at the holder-country level. * p<0.1, ** p<0.05, *** p<0.01

Table 4: Determinants of bilateral asset holdings: Legal harmonization, all countries

	Debt				Equity			
	(1) Total	(2) Banks	(3) OFC	(4) NF	(5) Total	(6) Banks	(7) OFC	(8) NF
Common language	0.237**	-0.022	0.176	0.264*	0.005	0.548**	-0.136	0.321
	(0.116)	(0.166)	(0.162)	(0.139)	(0.156)	(0.254)	(0.172)	(0.239)
Common legal origin	0.515***	0.579***	0.564***	0.725***	0.837***	0.356	0.769***	0.876***
	(0.145)	(0.182)	(0.202)	(0.150)	(0.155)	(0.271)	(0.154)	(0.162)
log(Distance)	-0.513***	-0.717***	-0.529***	-0.607***	-0.637***	-0.595***	-0.550***	-1.186***
	(0.097)	(0.127)	(0.147)	(0.086)	(0.117)	(0.197)	(0.127)	(0.111)
log(Trade)	0.215***	0.209***	0.121*	0.159***	0.328***	0.317***	0.265***	0.200***
	(0.041)	(0.070)	(0.064)	(0.056)	(0.054)	(0.097)	(0.069)	(0.047)
Both countries in the EU	0.432	-0.258	-0.602	0.458	0.001	0.118	-0.755	0.045
	(0.453)	(0.752)	(0.528)	(0.769)	(0.408)	(0.792)	(0.470)	(0.847)
Both countries in the EA	0.896***	0.692**	0.816**	0.095	0.036	0.637*	0.082	0.199
	(0.275)	(0.279)	(0.341)	(0.196)	(0.268)	(0.359)	(0.297)	(0.318)
Bilateral harmonization index	0.019	0.081	0.251*	0.047	-0.035	-0.099	0.202*	-0.098
	(0.122)	(0.220)	(0.130)	(0.171)	(0.128)	(0.311)	(0.117)	(0.205)
R-squared	0.777	0.707	0.770	0.689	0.785	0.556	0.782	0.719
Observations	22659	11502	14971	10888	21238	6573	14635	11698
Holder countries	33	31	32	32	33	31	32	32

This Table presents estimation results for log bilateral portfolio debt and equity assets as dependent variables. OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households). Holder-year and issuer-year fixed effects are included in all regression, but are not reported. Standard errors are clustered at the holder-country level.
* p<0.1, ** p<0.05, *** p<0.01

Table 5: Determinants of bilateral asset holdings: Legal harmonization in different markets

	Debt				Equity			
	(1) Total	(2) Banks	(3) OFC	(4) NF	(5) Total	(6) Banks	(7) OFC	(8) NF
Bilateral harmonization index, total	0.109	0.119	0.128	0.064	0.101	0.002	0.282**	0.043
	(0.099)	(0.209)	(0.134)	(0.145)	(0.101)	(0.276)	(0.133)	(0.107)
Bilateral harmonization index, banking	0.135	0.157	0.167	0.067	0.112	-0.063	0.274*	0.115
	(0.114)	(0.217)	(0.139)	(0.174)	(0.114)	(0.319)	(0.135)	(0.124)
Bilateral harmonization index, securities	0.139	0.157	0.127	0.088	0.092	-0.149	0.273*	-0.013
	(0.110)	(0.227)	(0.147)	(0.171)	(0.115)	(0.278)	(0.145)	(0.127)
Bilateral harmonization index, insurance	0.129	0.167	0.117	-0.017	0.142	-0.100	0.327**	0.088
	(0.122)	(0.239)	(0.166)	(0.189)	(0.115)	(0.308)	(0.153)	(0.137)
Bilateral harmonization index, excluding amendments	0.110	0.108	0.145	0.082	0.126	0.123	0.349**	0.061
	(0.105)	(0.230)	(0.146)	(0.148)	(0.108)	(0.294)	(0.149)	(0.116)

This Table presents estimation results for log bilateral portfolio debt and equity assets as dependent variables. OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households). Holder-year and issuer-year fixed effects are included in all regression, but are not reported. All regression models include the same control variables as in Table 3, as well as the same number of observations. Standard errors are clustered at the holder-country level.
* p<0.1, ** p<0.05, *** p<0.01

Table 6: Determinants of bilateral asset holdings: Institutional differences

	Debt				Equity			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total	Banks	OFC	NF	Total	Banks	OFC	NF
Common language	-0.118	-0.266	-0.261	-0.107	-0.273	0.331	-0.414*	-0.215
	(0.235)	(0.220)	(0.263)	(0.173)	(0.187)	(0.318)	(0.217)	(0.214)
Common legal origin	0.804***	0.739***	0.841***	0.900***	0.845***	0.478**	0.849***	1.122***
	(0.126)	(0.141)	(0.184)	(0.158)	(0.154)	(0.233)	(0.169)	(0.184)
log(Distance)	-0.351***	-0.445***	-0.388***	-0.487***	-0.421***	-0.509**	-0.474***	-0.962***
	(0.093)	(0.140)	(0.127)	(0.114)	(0.111)	(0.190)	(0.158)	(0.136)
log(Trade)	0.344***	0.328***	0.287***	0.363***	0.503***	0.512**	0.331**	0.398***
	(0.057)	(0.090)	(0.066)	(0.074)	(0.096)	(0.192)	(0.146)	(0.099)
Both countries in the EU	0.724***	0.413*	0.674**	0.910***	0.055	-1.001*	0.131	-0.220
	(0.208)	(0.233)	(0.303)	(0.254)	(0.247)	(0.560)	(0.282)	(0.341)
Both countries in the EA	0.765***	0.629***	0.526***	-0.013	0.152	0.883**	0.139	0.313
	(0.188)	(0.215)	(0.181)	(0.208)	(0.198)	(0.389)	(0.243)	(0.254)
log(GDP per capita), holder	1.876	0.479	1.783	0.023	3.342***	3.718**	2.271***	2.816*
	(1.373)	(1.003)	(1.208)	(1.356)	(0.728)	(1.772)	(0.810)	(1.381)
log(GDP per capita), issuer	2.653***	3.533***	5.675***	1.591	0.620	-1.519	1.847***	-0.255
	(0.805)	(1.044)	(0.839)	(1.061)	(0.691)	(1.118)	(0.617)	(0.943)
log(Population), holder	-0.583	2.789	2.853	1.932	4.390**	-3.080	3.589**	0.670
	(2.982)	(2.020)	(2.473)	(2.718)	(2.103)	(2.953)	(1.661)	(1.906)
log(Population), issuer	2.117*	4.003***	2.516***	3.069**	0.275	1.355	0.029	0.849
	(1.053)	(1.253)	(0.831)	(1.330)	(0.864)	(2.208)	(1.143)	(1.227)
Fin. liberalization, holder	1.059	2.033	-1.096	2.307	2.394***	6.609***	1.928***	1.979
	(1.429)	(1.648)	(0.916)	(1.835)	(0.440)	(1.672)	(0.658)	(2.055)
Fin. liberalization, issuer	0.514	0.219	0.731	0.543	-0.908*	1.181	-0.975	-1.003
	(0.333)	(0.477)	(0.443)	(0.432)	(0.532)	(1.543)	(0.612)	(0.923)
Strength of inv. protection, diff.	-0.780	-0.403	-0.635	-1.368**	0.074	1.224	0.163	-0.365
	(0.465)	(0.818)	(0.452)	(0.558)	(0.276)	(0.807)	(0.327)	(0.578)
Insolvency recovery, diff.	-0.223	-0.585***	-0.474***	-0.320	-0.111	-0.601	-0.148	0.066
	(0.227)	(0.178)	(0.171)	(0.199)	(0.148)	(0.377)	(0.160)	(0.181)
Time to enforce a contract, diff.	0.895***	0.532*	0.587***	0.125	0.201	-0.311	0.085	-0.022
	(0.286)	(0.289)	(0.172)	(0.299)	(0.160)	(0.446)	(0.122)	(0.315)
Credit registry coverage, diff.	-0.031	-0.189***	-0.327***	-0.042	0.044	-0.080	-0.022	0.096
	(0.093)	(0.065)	(0.051)	(0.111)	(0.077)	(0.118)	(0.091)	(0.101)
Time to pay taxes, diff.	0.293**	0.106	0.359***	0.424*	-0.277*	-0.161	-0.211	-0.332**
	(0.133)	(0.171)	(0.128)	(0.223)	(0.140)	(0.244)	(0.136)	(0.145)
R-squared	0.806	0.727	0.811	0.702	0.825	0.669	0.804	0.771
Observations	6377	3800	4587	3850	6313	2259	4544	4094
Holder countries	32	30	31	29	32	29	31	29

This Table presents estimation results for log bilateral portfolio debt and equity assets as dependent variables. OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households), diff. = log of the ratio of institutional quality in the holder and in the issuer country. Holder-, issuer-, and year- fixed effects are included in all regression, but are not reported. Standard errors are clustered at the holder-country level.

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

Table 7: Determinants of bilateral asset holdings: Institutional differences, all countries

	Debt				Equity			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total	Banks	OFC	NF	Total	Banks	OFC	NF
Common language	0.154	-0.177	0.050	0.153	-0.065	0.716**	-0.299	0.131
	(0.156)	(0.190)	(0.186)	(0.146)	(0.196)	(0.272)	(0.182)	(0.257)
Common legal origin	0.517***	0.605***	0.632***	0.733***	0.807***	0.408*	0.741***	0.990***
	(0.152)	(0.187)	(0.197)	(0.160)	(0.142)	(0.236)	(0.164)	(0.181)
log(Distance)	-0.424***	-0.641***	-0.461***	-0.595***	-0.568***	-0.616***	-0.550***	-1.013***
	(0.097)	(0.139)	(0.153)	(0.117)	(0.132)	(0.200)	(0.127)	(0.123)
log(Trade)	0.286***	0.275***	0.197***	0.231***	0.442***	0.396**	0.323***	0.303***
	(0.043)	(0.097)	(0.062)	(0.070)	(0.071)	(0.186)	(0.090)	(0.068)
Both countries in the EU	0.433*	0.353	0.346	0.881***	-0.173	-0.265	-0.015	-0.033
	(0.231)	(0.268)	(0.346)	(0.287)	(0.308)	(0.612)	(0.333)	(0.362)
Both countries in the EA	1.069***	0.771**	0.873***	0.185	0.183	0.682*	0.240	0.315
	(0.258)	(0.285)	(0.259)	(0.227)	(0.223)	(0.369)	(0.254)	(0.296)
log(GDP per capita), holder	1.429	0.794	1.893*	0.658	2.101***	2.915**	0.953	1.989
	(1.080)	(0.827)	(1.047)	(1.072)	(0.695)	(1.404)	(1.186)	(1.275)
log(GDP per capita), issuer	1.401***	1.575*	2.624***	-0.105	0.085	-0.234	1.042*	0.171
	(0.432)	(0.843)	(0.518)	(0.820)	(0.503)	(0.686)	(0.513)	(0.680)
log(Population), holder	-0.297	3.212	2.291	0.928	4.861**	-0.891	3.511*	1.591
	(2.430)	(1.934)	(2.152)	(2.792)	(2.153)	(2.771)	(1.800)	(1.994)
log(Population), issuer	0.318	0.277	1.017	1.897*	1.462	0.481	1.412	-0.565
	(0.593)	(0.864)	(0.626)	(1.013)	(0.986)	(1.325)	(0.973)	(0.850)
Fin. liberalization, holder	0.727	1.823	-1.170*	1.988	2.841***	6.296***	1.912**	2.671
	(0.970)	(1.277)	(0.657)	(1.730)	(0.305)	(1.655)	(0.905)	(1.672)
Fin. liberalization, issuer	0.557***	0.487*	0.712***	0.680**	0.123	1.056	0.124	-0.287
	(0.160)	(0.279)	(0.197)	(0.295)	(0.245)	(0.966)	(0.254)	(0.390)
Strength of inv. protection, diff.	-0.295	0.424	-0.277	-0.564	-0.235	0.337	-0.196	-0.549
	(0.324)	(0.504)	(0.331)	(0.351)	(0.338)	(0.615)	(0.363)	(0.424)
Insolvency recovery, diff.	-0.178	-0.432*	-0.211	-0.003	-0.283***	-0.215	-0.175	0.125
	(0.177)	(0.230)	(0.139)	(0.149)	(0.098)	(0.289)	(0.104)	(0.165)
Time to enforce a contract, diff.	0.803***	0.539*	0.727***	0.099	0.214	0.021	0.272	-0.216
	(0.250)	(0.272)	(0.216)	(0.255)	(0.147)	(0.370)	(0.166)	(0.282)
Credit registry coverage, diff.	-0.027	-0.076	-0.199***	0.068	0.017	0.001	-0.066	0.127
	(0.068)	(0.060)	(0.043)	(0.104)	(0.058)	(0.107)	(0.056)	(0.095)
Time to pay taxes, diff.	0.172	-0.034	0.277**	0.331*	-0.181	0.165	-0.125	-0.167
	(0.105)	(0.162)	(0.106)	(0.187)	(0.142)	(0.264)	(0.127)	(0.129)
R-squared	0.778	0.709	0.768	0.677	0.778	0.590	0.774	0.722
Observations	11209	5647	7992	5914	10544	3229	7606	6212
Holder countries	32	30	31	29	32	29	31	29

This Table presents estimation results for log bilateral portfolio debt and equity assets as dependent variables. OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households), diff. = log of the ratio of institutional quality in the holder and in the issuer country. Holder-, issuer-, and year- fixed effects are included in all regression, but are not reported. Standard errors are clustered at the holder-country level.

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

Table 8: The FSAP and post-FSAP Directives

Directive	Title of the Directive	Sector
1998/26/EC	Implementation of the Settlement Finality Directive	Securities
2000/46/EC	Directive on the taking up, pursuit and prudential supervision of the businesses of electronic money institutions	Banking
2000/64/EC	Directive amending the insurance directives and the ISD to permit information exchange with third countries	Insurance
2001/17/EC	Directive on the reorganization and winding-up of insurance undertakings	Insurance
2001/24/EC	Directive on the reorganization and winding-up of banks	Banking
2001/65/EC	Directive amending the 4th and 7th Company Law Directives to allow fair value accounting	Securities
2001/86/EC	Directive supplementing the Statute for a European Company with regard to the involvement of employees	Securities
2001/97/EC	Directive amending the money laundering directive	Banking
2001/107/EC	1st Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	Securities
2001/108/EC	2nd Directive on UCITS (Undertakings for Collective Investments in Transferable Securities)	Securities
2002/13/EC	Directive amending the solvency margin requirements in the insurance directives	Insurance
2002/47/EC	Directive on financial collateral arrangements	Securities
2002/65/EC	Directive on the Distance of marketing of Financial Services	Insurance
2002/87/EC	Directive on the supplementary supervision of credit institutions, insurance undertakings and investment firms in a financial conglomerate	Banking
2002/83/EC	Solvency I Directive for life insurance	Insurance
2002/92/EC	Directive on insurance mediation	Insurance
2003/6/EC	Directive on insider dealing and market manipulation	Securities
2003/41/EC	Directive on the prudential supervision of pension funds	Insurance
2003/48/EC	Directive on the taxation of savings income in the form of interest payments	Banking
2003/51/EC	Directive modernizing the accounting provisions of the 4th and the 7th Company Law Directives	Securities
2003/71/EC	Directive on prospectuses	Securities
2004/25/EC	Directive on Take Over Bids	Securities
2004/109/EC	Transparency Directive	Securities
2004/39/EC	Directive on Markets in Financial Instruments (update of ISD) - MiFID	Securities
2005/56/EC	10th Company Law Directive on cross-border mergers	Securities

2006/48/EC	Directive on the relating to the taking up and pursuit of the business of credit institutions	Banking
2006/49/EC	Directive on the capital adequacy of investment firms and credit institutions	Banking

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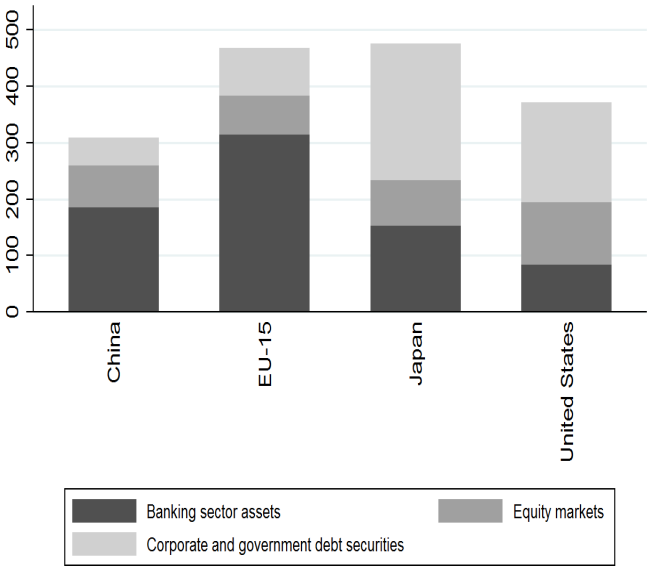
2006/43/EC	Directive on statutory audits of annual accounts and consolidated accounts (amendment)	Securities
2006/46/EC	Directive on accounting standards (amendment)	Banking, Insurance, Securities
2007/14/EC	Directive on the harmonization of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market (amendment)	Securities
2007/36/EC	Directive on the exercise of certain rights of shareholders in listed companies	Securities
2007/44/EC	Directive on procedural rules and evaluation criteria for the prudential assessment of acquisitions and increase of holdings in the financial sector (amendment)	Banking, Insurance, Securities
2007/63/EC	Directive on requirement of an independent expert's report on the occasion of merger or division of public limited liability companies (amendment)	Securities
2007/64/EC	Directive on the payment services in the internal market	Banking, Insurance
2009/14/EC	Directive on deposit-guarantee schemes (amendment)	Banking
2009/44/EC	Directive on settlement finality in payment and securities settlement systems and on financial collateral arrangements (amendment)	Securities
2009/49/EC	Directive on certain disclosure requirements for medium-sized companies and the obligation to draw up consolidated accounts (amendment)	Securities
2009/65/EC	Directive on undertakings for collective investment in transferable securities (UCITS)	Securities
2009/109/EC	Directive on reporting and documentation requirements in the case of mergers and divisions (amendment)	Securities
2009/110/EC	Directive on taking up, pursuit and prudential supervision of the business of electronic money institutions (amendment)	Banking
2009/111/EC	Directive on the capital requirements (amendment)	Banking
2009/138/EC	Directive on the taking-up and pursuit of the business of insurance and reinsurance (Solvency II)	Insurance
2010/73/EC	Directive on the prospectus (amendment)	Securities
2010/76/EC	Directive on the capital requirements (amendment)	Banking
2010/78/EC	Directive on the powers of the European Supervisory Authority (European Banking Authority, European Insurance and Occupational Pensions Authority, and European Securities and Markets Authority) (amendment)	Banking, Insurance, Securities

2011/61/EC	Directive on alternative investment fund managers (amendment)	Securities, Insurance
2011/89/EC	Directive on the supplementary supervision of financial entities in a financial conglomerate (amendment)	Banking
2012/17/EC	Directive on the interconnection of central, commercial and companies registers (amendment)	Securities
2013/14/EC	Directive on the activities and supervision of institutions for occupational retirement provision, on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) (amendment)	Insurance, Securities
2013/34/EC	Directive on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings (amendment)	Securities
2013/36/EC	Directive on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms (amendment)	Banking
2013/50/EC	Directive on the harmonization of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market (amendment)	Securities
2014/49/EC	Directive on deposit guarantee schemes	Banking
2014/51/EC	Directive on the powers of the European Supervisory Authority (European Insurance and Occupational Pensions Authority and European Securities and Markets Authority) (amendment)	Insurance, Securities
2014/59/EC	Directive on establishing a framework for the recovery and resolution of credit institutions and investment firms (amendment)	Banking, Securities

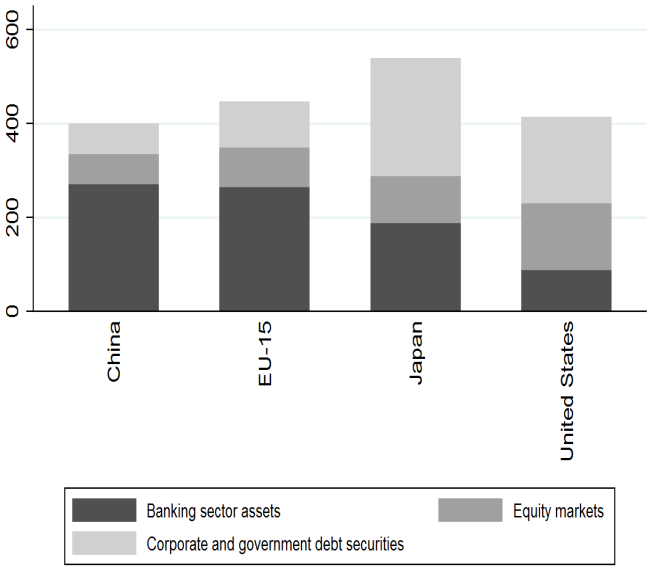
Figures

Figure 1: Size of the financial sector (% of GDP)



Source: Author's calculations based on the IMF IFS, GFDD WB, BIS Debt securities statistics, European Central Bank, Bank of Japan, China Banking Regulatory Commission, Board of Governors of the FED, Securities Industry and Financial Markets Association

(a) 2008



Source: Author's calculations based on the IMF IFS, GFDD WB, BIS Debt securities statistics, European Central Bank, Bank of Japan, China Banking Regulatory Commission, Board of Governors of the FED, Securities Industry and Financial Markets Association

(b) 2015

Figure 2: Total international portfolio debt and equity holdings

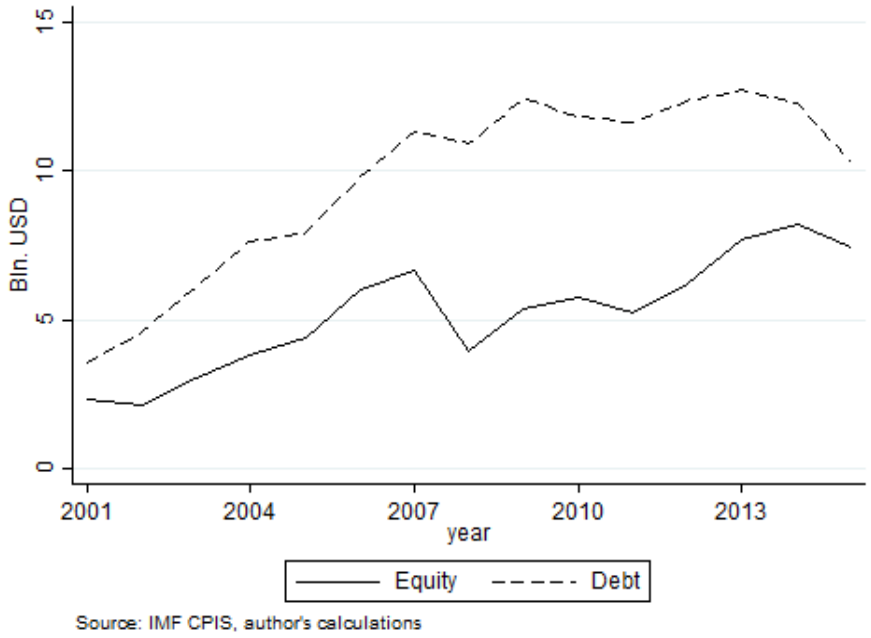


Figure 3: Mean growth rates of international portfolio debt and equity holdings

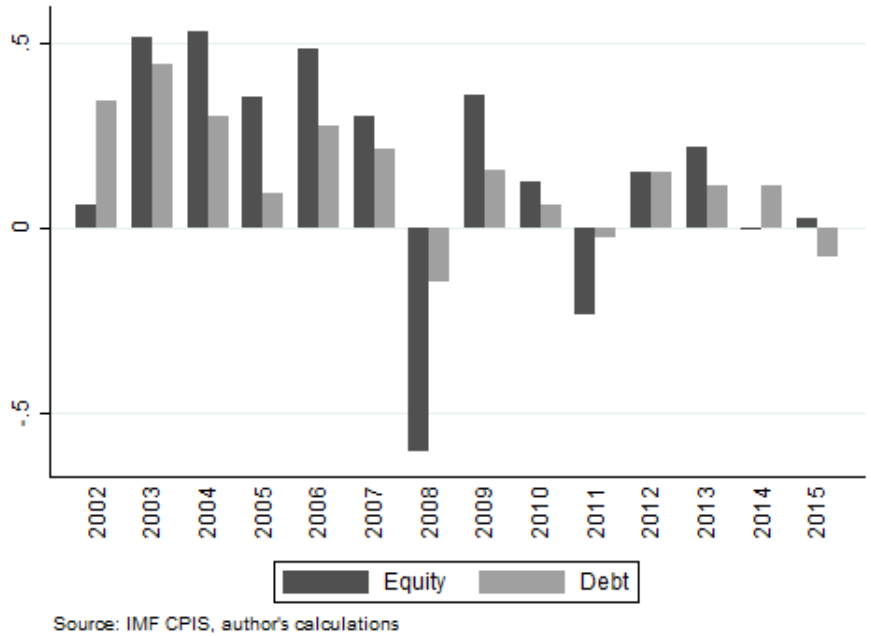
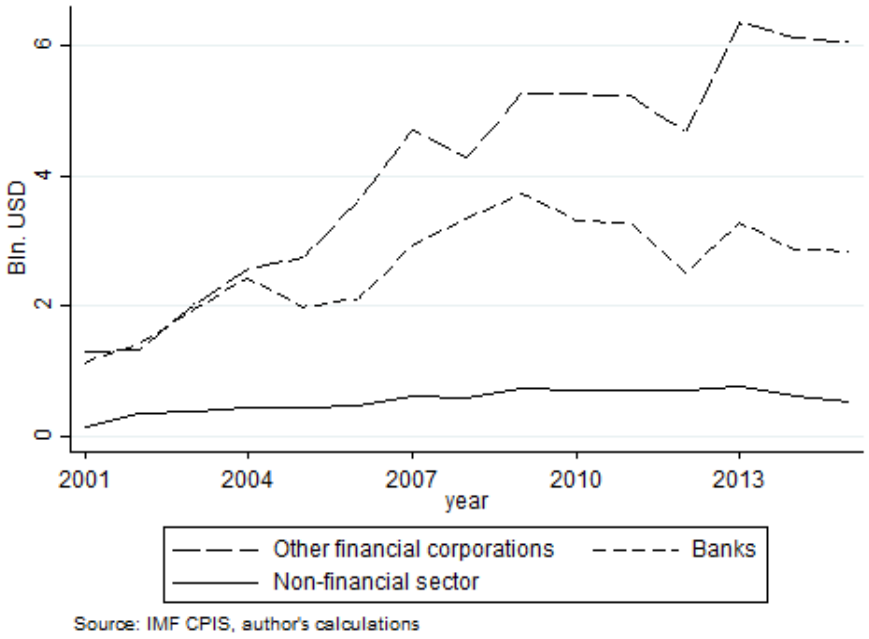
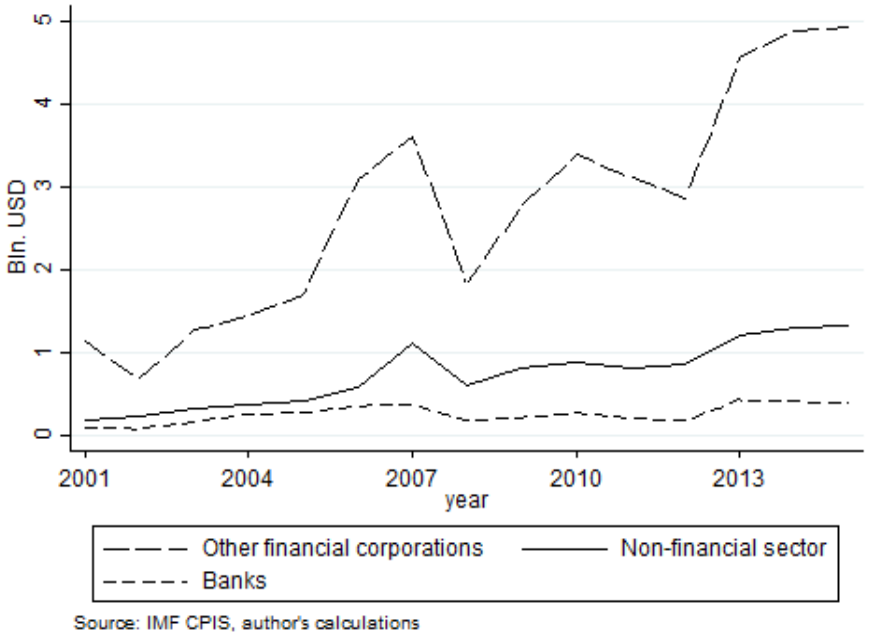


Figure 4: Cross-border portfolio positions, by sector

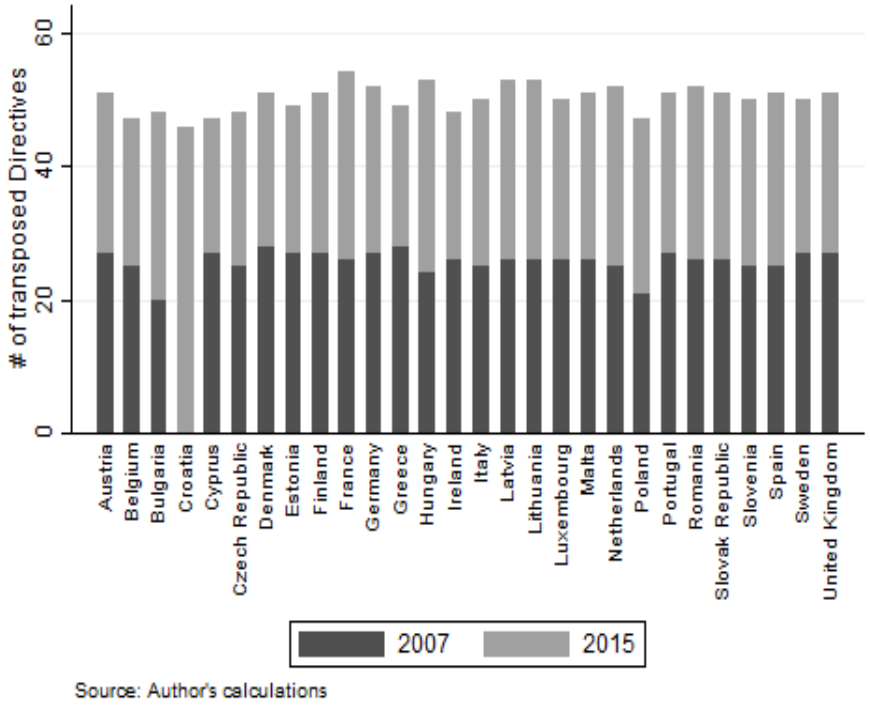


(a) Portfolio debt holdings



(b) Portfolio equity holdings

Figure 5: Number of the FSAP and post-FSAP Directives transposed into the national law, 2007 and 2015



Source: Author's calculations

Figure 6: Extreme bounds analysis: legal harmonization, debt holdings

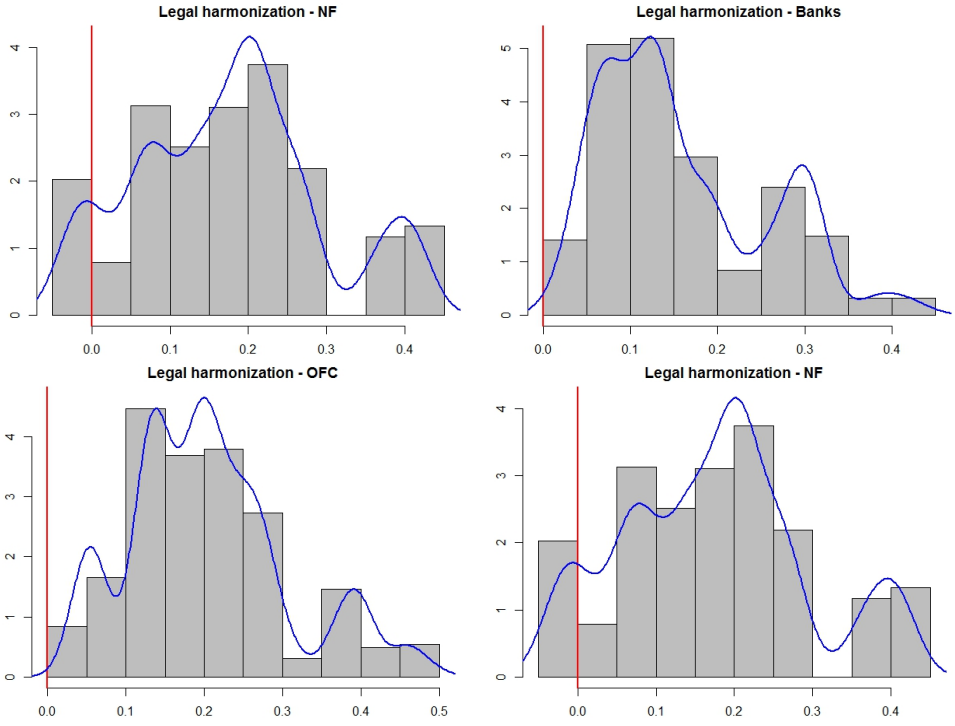
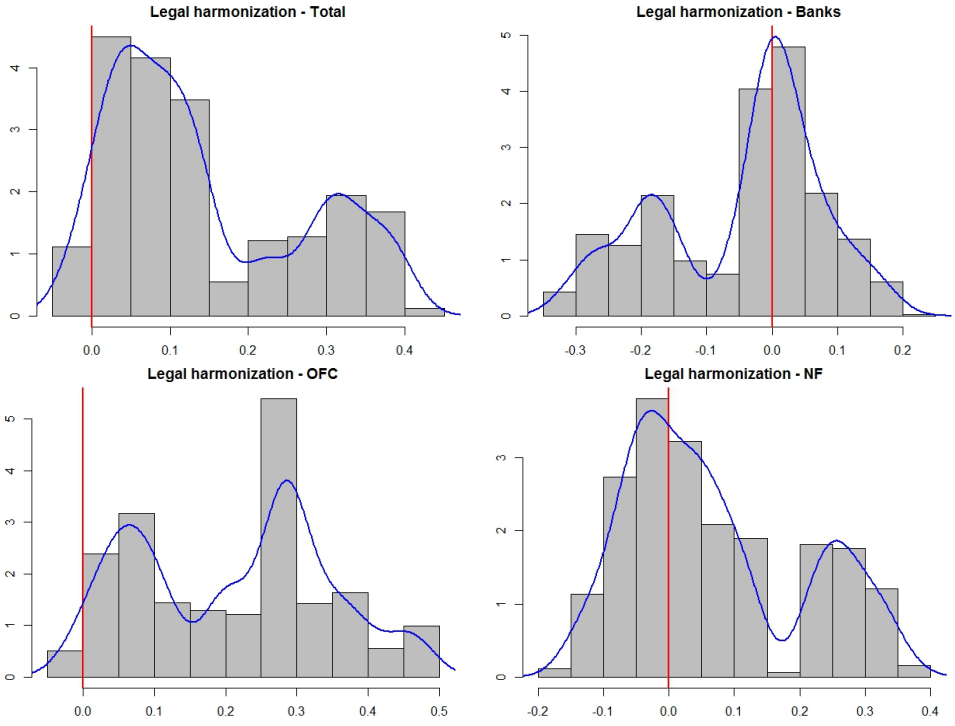


Figure 7: Extreme bounds analysis: legal harmonization, equity holdings



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A Appendix

A.1 Data Description

List of countries:

Holder countries (33 EU and/or OECD countries):

Australia, Austria, Belgium, Bulgaria, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Mexico, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Turkey, United Kingdom.

Issuer countries (35 OECD countries):

Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States.

Full sample (59 additional issuer countries):

Argentina, Bahamas, Bahrain, Barbados, Belize, Bermuda, Brazil, Bulgaria, China, Colombia, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Georgia, Ghana, Gibraltar, Guatemala, Hong Kong, India, Indonesia, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Lebanon, Liberia, Lithuania, Malaysia, Malta, Mauritius, Morocco, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Qatar, Romania, Russia, Saudi Arabia, Singapore, South Africa, Sri Lanka, Thailand, Trinidad and Tobago, Tunisia, Ukraine, United Arab Emirates, Uruguay, Venezuela, Vietnam.

Table A1: Variable definitions and data sources

Variable	Unit	Description	Source
Equity, Debt	mln. USD	Cross-border holdings of equity or debt from a country j by sectors of a country i	CPIS, IMF
Common language	0 or 1	Dummy variable that equals one if the two countries share a common language (spoken by at least 9% of the population in both countries)	CEPII
Common legal origin	0 or 1	Dummy variable that equals one if the two countries have the same legal origin (British, French, German, Scandinavian, and Socialist)	La Porta et al. (1999)
Distance	km	Simple distance between most populated cities	CEPII
Trade	mln. USD	Sum of the values of imports and exports, fob	DOTS, IMF
EU, EA	0 or 1	Dummy variables that equals one if the two countries are members of the EU and the Eurozone respectively	
GDP per capita	const. 2010 mln. USD	GDP per capita	World Development Indicators, WB
Population	mln. people	Total population that is counted as all residents regardless of legal status or citizenship (midyear estimates)	Global Financial Development, WB
Fin. liberalization	[0,1]	The Chinn-Ito index, normalized. The index takes on higher values the more open the country is to cross-border capital transactions	Chinn and Ito (2006)
Insolvency recovery	cents on the dollar	Amount recovered by secured creditors through judicial reorganization, liquidation or debt enforcement (foreclosure or receivership) proceedings	WB Doing Business
Strength of inv. protection	[0,10]	Strength of investor protection index. High values indicate better protection	WB Doing Business
Time to enforce a contract	days	Time required to enforce a contract, counted from the moment the plaintiff decides to file the lawsuit in court until payment	WB Doing Business
Time to pay taxes	hours	Time to prepare and pay taxes (per year) for a medium-size company	WB Doing Business
Credit registry coverage	%	Public and private credit registry coverage	WB Doing Business
Bilateral financial harmonization	index	Legislative harmonization in financial services based on the transposition of the Directives	EC, Kalemli-Ozcan et al. (2010), authors' calculations

Table A2: Determinants of bilateral asset holdings: Issuer-specific characteristics

	Debt				Equity			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total	Banks	OFC	NF	Total	Banks	OFC	NF
Common language	-0.075	-0.259	-0.174	-0.009	-0.232	0.260	-0.336	-0.110
	(0.235)	(0.213)	(0.264)	(0.191)	(0.186)	(0.333)	(0.213)	(0.228)
Common legal origin	0.794***	0.764***	0.793***	0.902***	0.839***	0.470*	0.831***	1.083***
	(0.122)	(0.139)	(0.180)	(0.150)	(0.156)	(0.235)	(0.177)	(0.183)
log(Distance)	-0.336***	-0.456***	-0.386***	-0.498***	-0.394***	-0.473**	-0.425***	-0.944***
	(0.094)	(0.146)	(0.118)	(0.096)	(0.107)	(0.181)	(0.150)	(0.127)
log(Trade)	0.361***	0.334***	0.295***	0.344***	0.513***	0.579***	0.361**	0.409***
	(0.060)	(0.091)	(0.067)	(0.074)	(0.093)	(0.205)	(0.139)	(0.096)
Both countries in the EU	0.740***	0.236	0.504*	0.841***	-0.015	-0.942*	0.096	-0.373
	(0.201)	(0.248)	(0.261)	(0.299)	(0.247)	(0.472)	(0.289)	(0.408)
Both countries in the EA	0.675***	0.626***	0.609***	-0.090	0.145	0.887**	0.116	0.227
	(0.160)	(0.215)	(0.186)	(0.198)	(0.202)	(0.403)	(0.235)	(0.248)
log(GDP per capita), issuer	2.595***	3.179***	5.403***	1.782	0.879	-1.401	2.345***	-0.019
	(0.739)	(1.006)	(0.759)	(1.196)	(0.649)	(1.045)	(0.671)	(0.978)
log(Population), issuer	3.153***	3.517***	3.468***	4.167***	0.907	1.747	0.234	2.636**
	(1.054)	(1.191)	(0.877)	(1.322)	(0.950)	(2.040)	(1.231)	(1.252)
Fin. liberalization, issuer	0.688*	0.545	0.717	0.562	-0.784	1.066	-0.871	-1.002
	(0.353)	(0.556)	(0.442)	(0.407)	(0.522)	(1.266)	(0.603)	(0.887)
Strength of inv. protection, issuer	-0.580	-1.278	-1.198*	0.116	-0.982***	-1.225	-0.865**	-0.286
	(0.386)	(0.809)	(0.635)	(0.777)	(0.356)	(1.369)	(0.367)	(0.548)
Insolvency recovery, issuer	0.109	0.225	0.540***	0.098	-0.018	0.473	0.032	0.108
	(0.162)	(0.212)	(0.182)	(0.267)	(0.182)	(0.511)	(0.207)	(0.311)
Time to enforce a contract, issuer	-0.633**	-0.610**	-0.397	-0.143	0.083	0.145	0.182	0.950***
	(0.252)	(0.270)	(0.234)	(0.315)	(0.190)	(0.498)	(0.172)	(0.296)
Credit registry coverage, issuer	0.234***	0.236***	0.418***	0.251**	0.045	0.069	0.018	0.065
	(0.053)	(0.070)	(0.064)	(0.109)	(0.092)	(0.205)	(0.092)	(0.111)
Time to pay taxes, issuer	-0.499***	-0.128	-0.537***	-0.693***	0.626***	0.360	0.556***	0.650***
	(0.103)	(0.213)	(0.119)	(0.189)	(0.121)	(0.309)	(0.130)	(0.152)
R-squared	0.818	0.735	0.815	0.736	0.829	0.680	0.812	0.773
Observations	6707	4035	4892	4033	6653	2346	4863	4304
Holder countries	33	31	32	30	33	30	32	30

This Table presents estimation results for log bilateral portfolio debt and equity assets as dependent variables. The following equation is estimated:

$$log(A_{i_s jt}) = \alpha_{it} + \theta_j + \eta_t + \gamma Institutions_{it} + \beta X_{ijt} + \epsilon_{i_s jt}$$

OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households). Holder-year, issuer-, and year-fixed effects are included in all regression, but are not reported. Standard errors are clustered at the holder-country level.
* p<0.1, ** p<0.05, *** p<0.01

Table A3: Determinants of bilateral asset holdings: Holder-specific characteristics

	Debt				Equity			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Total	Banks	OFC	NF	Total	Banks	OFC	NF
Common language	0.030	-0.230	-0.045	0.042	-0.172	0.433	-0.275	-0.144
	(0.220)	(0.216)	(0.273)	(0.164)	(0.186)	(0.334)	(0.206)	(0.230)
Common legal origin	0.736***	0.703***	0.745***	0.793***	0.865***	0.510*	0.861***	1.066***
	(0.135)	(0.143)	(0.175)	(0.161)	(0.144)	(0.254)	(0.163)	(0.176)
log(Distance)	-0.307***	-0.409***	-0.362**	-0.439***	-0.405***	-0.502***	-0.441**	-0.982***
	(0.094)	(0.137)	(0.148)	(0.114)	(0.129)	(0.177)	(0.181)	(0.136)
log(Trade)	0.344***	0.333***	0.279***	0.351***	0.484***	0.406**	0.344**	0.368***
	(0.053)	(0.083)	(0.071)	(0.074)	(0.101)	(0.164)	(0.153)	(0.094)
Both countries in the EU	0.753***	0.363	0.816**	0.791***	0.151	-0.936*	0.216	-0.190
	(0.250)	(0.227)	(0.302)	(0.240)	(0.274)	(0.537)	(0.305)	(0.342)
Both countries in the EA	0.618***	0.553**	0.362*	-0.105	0.097	0.831**	0.097	0.281
	(0.195)	(0.216)	(0.191)	(0.214)	(0.222)	(0.357)	(0.276)	(0.283)
log(GDP per capita), holder	1.767	0.105	1.428	0.104	2.988***	3.681*	2.225**	2.269
	(1.270)	(0.892)	(1.248)	(1.569)	(0.631)	(1.868)	(0.936)	(1.434)
log(Population), holder	-0.246	3.017	1.753	1.932	4.547**	-5.610*	2.797	2.172
	(2.411)	(2.245)	(2.663)	(2.933)	(1.820)	(2.835)	(1.792)	(2.016)
Fin. liberalization, holder	0.968	1.495	-0.836	2.076	2.596***	5.706**	2.225***	1.503
	(1.353)	(1.732)	(1.004)	(1.624)	(0.316)	(2.070)	(0.759)	(1.850)
Strength of inv. protection, holder	-1.908***	-2.217***	-1.682***	-2.045*	-1.076***	0.210	-0.615	-0.638
	(0.649)	(0.729)	(0.476)	(1.004)	(0.347)	(0.992)	(0.436)	(0.727)
Insolvency recovery, holder	-0.229	-0.913***	-0.417**	-0.515	-0.240	-0.776	-0.221	0.212
	(0.378)	(0.292)	(0.179)	(0.375)	(0.220)	(0.529)	(0.144)	(0.221)
Time to enforce a contract, holder	0.875*	0.141	0.579**	-0.247	0.458*	-0.668	0.318	0.688
	(0.457)	(0.351)	(0.240)	(0.389)	(0.239)	(0.944)	(0.193)	(0.475)
Credit registry coverage, holder	0.160	-0.009	-0.065	0.343*	0.104	-0.171	-0.042	0.315
	(0.123)	(0.153)	(0.093)	(0.182)	(0.096)	(0.187)	(0.191)	(0.213)
Time to pay taxes, holder	-0.020	0.028	0.096	0.095	0.089	-0.227	0.114	-0.134
	(0.273)	(0.259)	(0.209)	(0.550)	(0.157)	(0.469)	(0.172)	(0.242)
R-squared	0.806	0.732	0.812	0.700	0.827	0.647	0.810	0.778
Observations	7011	4197	5029	4250	6891	2565	4976	4498
Holder countries	32	30	31	29	32	30	31	30

This Table presents estimation results for log bilateral portfolio debt and equity assets as dependent variables. The following equation is estimated:

$$log(A_{i_s jt}) = \alpha_i + \theta_{jt} + \eta_t + \gamma Institutions_{jt} + \beta X_{ijt} + \epsilon_{i_s jt}$$

OFC = other financial corporations (insurances, pension funds, money market funds, others), NF = non-financial private sector (non-financial corporations and private households). Issuer-year, holder-, and year-fixed effects are included in all regression, but are not reported. Standard errors are clustered at the holder-country level.

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