

Let them eat cake: does financial and social fragmentation matter for International Business?

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ABSTRACT

In this paper, we aim to better understand how social and financial fragmentation impact capital flows now that businesses are encouraged to achieve sustainable growth objectives. We introduce financial and social fragmentation in gravity models of European capital flows. We use data from 19 Eurozone countries from 2000 to 2021 and show how fragmentation impact capital flows, namely foreign direct investment, cross-border loans as well as equity and bond flows. Since capital is, in principle, free to flow in the Eurozone, our analysis directly identifies the roles of potential sources of fragmentation: social inequalities, market openness, and domestic regulations such as macroprudential controls. Our results show that financial fragmentation and domestic inequalities matter for capital flows in Europe, although the impact varies across capital flow types, which emphasizes the importance of disaggregating the data. Domestic inequalities have a strong positive impact on financial assets flows used to finance local projects such as cross-border loans. On the contrary, FDIs are negatively affected by inequalities which, in the context of the Eurozone, cannot be associated with traditional determinants such as political or foreign exchange risk. Finally, inequality spreads across countries deter capital flows.

Introduction

“Let them eat cake.” Although the authenticity of this remark by Marie-Antoinette has been disputed, it has long been used as a reference for the disconnection between the fate of the leaders and that of the mass population. Nowadays, a large amount of international leadership is exercised by the corporate sector. The scientific literature has not paid much attention as to whether businesses are sensitive to issues fragmenting society in general nor more specifically in the context of sustainable development (Kavadis et al, 2024). For example, there has been much debate in the international business (IB) literature regarding the role of multinational firms (MNE)s in generating economic growth and increasing inequalities (George and Schillebeeckx, 2022 and Van Der Straaten et al., 2023). While this question is of interest for governments to foster fairer economic policies, it provides limited guidance for managers who need to assess how social unrest, social fragmentation and financial segmentation influence their investment decisions nor to investors who want to find options that enlarge their opportunity set.

On the global scene, this point is largely in agreement with the societal challenges stated in the UN Sustainable Development Goals (UN, 2021) which include the challenge raised by inequalities across the world. In that context, we concentrate on the role of inequalities on capital flows. Studying inequalities within and across countries of the Eurozone, we show how inequalities and financial fragmentation impact capital flows and lead to a change in the cost of financing impacting the value creation process. The literature has not yet widely documented how to adapt firms’ and investors’ strategies to such issues since they are complex and difficult to quantify. Assessing how firms make their choices in the presence of inequalities gives insights to better our understanding of their importance. Our approach reconciles the practices of international businesses with potential policies and strategies to address the role of inequalities in the value creation process of firms. In a first step, this paper aims to reveal whether firms’ and investors’ decisions take income and wealth inequalities into account together with financial fragmentation. In a second step, we analyze the role of fragmentation resulting from inequalities on capital flows across Europe. We define social fragmentation as the domestic measures of inequalities as well as European dispersion in these domestic measures. To

achieve these objectives, we assess whether inequalities are determinants of capital flows and whether social and financial fragmentation drive firms and investors' financing and investment decisions. We concentrate on the Eurozone to control for the traditional determinants of capital flows as explained below.

Perhaps surprisingly, financial, banking, and social fragmentation should matter from a managerial perspective in Europe. In terms of financial and banking fragmentation, in principle, the adoption of a monetary union between countries should entail free capital movements (Ingram, 1969) helping to compensate external and internal imbalances among members. In the Eurozone, this phenomenon took place during the first decade that followed the adoption of the euro. Free capital mobility and the easing of credit conditions generated by the monetary union during the 2000-2007 period entailed a well-documented increase in cross-border banking and financial flows within the Eurozone (Cerutti, Claessens and Ratnovski, 2017). However, the lack of a macroprudential framework has created conditions favorable to a financial crisis (Agénor, Jackson and Pereira da Silva, 2019). As an example, the lack of cycle synchronicity (Merler, 2015) and asymmetry between home and host regulations are the main determinants of the low cross-border flows observed in the Eurozone since the 2008 crisis. In particular, the drop in cross-border loans in the Eurozone was substantial after the 2008 financial crisis compared with the rest of the world (European Central Bank, 2013 and 2019 annual reports). While the 2008 liquidity crisis was mitigated by an intervention of the European Central Bank (ECB), these interventions exacerbate overborrowing in financially stressed economies (Fagan and McNelis, 2020). Consequently, risk premiums, as well as the cost of borrowing increased in these economies, which accentuated financial fragmentation (Cartapanis, Gagnon and Gimet, 2023). Finally, as recently as June 2022, the ECB Governing Council highlighted the importance of fragmentation in the European financial system in a context where monetary policy should be as symmetric as possible across its members.

Social inequalities should also matter in Europe (Van Der Straaten et al., 2023). The World Bank (2020)⁴ documents heterogeneity in the evolution of income in Europe between 2004 and 2018. For example, inequalities decreased or remained constant in countries like Belgium or Finland, while they increased in Italy and Spain. It is also well-established that wealth inequalities are higher than income inequalities and that wealth is concentrated at the top of the distribution in a set of European countries including Germany and Austria, suggesting noteworthy disparities in the rates of return on wealth, the growth rate of average income, and the saving rate within and across the Eurozone economies (Chancel, 2019), with global inequality dynamics resulting from powerful and sometimes contradictory forces. In countries that have reached comparable technological and globalization levels, the disparities in wealth and income distributions are mainly linked to differences in taxes and redistribution policies in the labor market, and in access to education and health services, which put the role of the governments at the core of the problem (Blanchard and Rodrik, 2021).

Given the importance of such sources of fragmentation and their potential influence on investors and firms' investment decisions, we study the role of social fragmentation measured by income and wealth inequalities as well as the role of financial fragmentation on different types of capital flows across countries of the Eurozone, namely portfolio flows, equity flows, bonds flows, foreign direct investments (FDI) and cross-border loans (CBL) from 2000 to 2021. Building on the gravity model (Portes and Rey, 2005 and Gyawali, 2024) to identify the determinants of bilateral flows across countries inside the zone, we show how these sources of fragmentation influence firms' and investors' decisions. Understanding the influence of fragmentation on bilateral flows across countries of the Eurozone reveals where firms and investors distribute their capital. The originality of Portes and Rey (2005) is to provide a model of capital flows that incorporate elements of the finance literature and of the international macroeconomics and asset trade literature. Their gravity model sheds light on the main determinants of capital and trade

⁴ The World Bank (2020), the World Bank database, <https://data.worldbank.org/indicator/SI.POV.GINI>.

flows⁵. In its classical form, it includes variables of distance across trading countries, as well as country size, to explain capital flows.

In this paper, further to the Eurozone context given above, we specifically study financial and social fragmentation in the zone because its rules make it possible to eliminate or control for potential explanations empirically identified for fragmentation. *First*, the Eurozone provides an environment that is exempt from currency risk and the monetary union eliminates most of the political risk. While the absence of currency risk is obvious, euro countries that experience financial difficulties are backed by the ECB, mitigating political risk and associated expropriations through union rules. The case of Greece in the 2008 financial crisis is an illustration of how the potential default of a country and the resulting expropriation risk is mitigated. This is important since currency (Han and Rey, 2006) and political risks (Beaulieu, Cosset and Essaddam, 2005 and Kayakawa, Kimura and Lee, 2013) are two important drivers of investments decisions. Getting empirical evidence in an environment free of those risks results in important insight on where capital flows in the presence of fragmentation given that the remaining source of uncertainty are productivity shocks that affect capital flows equally, yet not necessarily uniformly. Furthermore, the legal system in place in each country provides different levels of property protection, for which we control in our empirical analysis. *Second*, the Eurozone also provides an environment where all reporting rules are the same, which prevents results from differentiating themselves on that basis. *Third*, it is also the case that many economic factors that differ across countries such as liquidity risks are mitigated by the presence of the ECB or do not motivate FDI or other capital flows. *Finally*, given that our sample only considers flows circulating across countries of the Eurozone, it implies that heterogeneous corporate governance rules and or standards across countries cannot explain flows. In this context, the Eurozone is one of the best environments to study the impact of financial and social fragmentation on capital flows because it controls for the factors usually associated with capital flows.

⁵ Note that the use of the gravity model is not exclusive to capital and trade flows since, for example, De Ménéil (1999) finds that a gravity model accounts well for FDI flows among European countries.

One strong point of our approach is the different disaggregated inequality measures we use. These measures – that cover the right and left tails of wealth and income distributions within each country of the Eurozone as well as inequality measures across countries of the zone – add to the understanding of the role of inequalities within a country and across countries of the Eurozone. They reveal the impact of inequalities and financial fragmentation on capital flows. They show that inequalities are detrimental to the value creation process given that they lead to fragmentation which implies an increase in the cost of financing faced by firms in the Eurozone.

We study five European types of capital flows: portfolio flows, equity and debt flows, cross-border loans and foreign direct investments. We argue that studying several types of flows is important to assess the impact of financial and social fragmentation in the IB firms' and investors' investment decision since the comparison reveals a disparity among flow types, and therefore different impacts of the disparities of different types of investment decisions. Indeed, the literature on these different flow types provide motivation for such a disaggregated analysis. For example, portfolio flows are affected by the cost of capital. For debt, when the cost of capital increases due to financial crises, financial inflows and financing opportunities are reduced, and increasingly so for domestic credit of low-wealth households. Financial crises further generate higher inequalities: on the one hand high-income households and firms choose to invest abroad ahead of the crash, and when on the other hand the crisis increases bankruptcies and lay-offs, it results in impacting more importantly the most vulnerable households (Honohan, 2005).

In terms of equity markets subject to a trend towards financial integration, firms and investors face lower discount rates and additional financing sources in the real sector, all of which promote higher investment levels and improved average income distribution by transferring wealth from creditors to debtors (Aghion and Bolton, 1997). All in all, it is nonetheless possible that valuation changes have an asymmetric impact depending on which income level we focus on, if equity market participation is not homogeneous across income groups. Lower discount rates may also result in an increase in inequalities if operating cash flows are not reinvested in the real economy because they result in dividend payments (Das and Mohapatra, 2003). It is a well-recognized fact that more advanced economies have large firms

that profit importantly from the stock market tending to enlarge inequalities (Aggarwal and Goodell, 2009).

Furthermore, the literature on financial fragmentation in Europe highlights the importance of increasing the quantity of CBLs, as banks in Europe mostly do business in their home country (Gagnon and Gimet, 2023). CBLs are therefore a relevant measure to study the impact of inequalities since they are an indicator of whether capital is uniformly accessible across the zone. Access to capital is likely to play a role in inequality reductions in Europe and to better the understanding of the role of social and financial fragmentation on capital flows. It is important to extend the empirical literature to the banking sector since credit market imperfections imply distortions in access to credit between risky and less-risky households and firms, and may be responsible for persistent inequalities (Acemoglu, 2001).

Finally, FDIs are a key element in international economic integration because they create linkages between economies due to the physical nature of their investments. Our focus on the Eurozone implies that we are mainly dealing with horizontal FDIs, substituting production in foreign countries to exports in economies with similar production specialization (Helpman, 1984; Markusen, 1984, Coeurdacier et al. 2009). Given that our analysis focuses on Eurozone countries, corporate governance outside the scope of the legal system and macroeconomic stability does not significantly influence FDI flows in our sample and the Eurozone provides an interesting ground to test our hypotheses. While multinationals allow for capital flows across countries, there is an unanswered question that is still very much up for debate: what is the relationship between fragmentation in the zone and FDIs?

Our results reveal that European flows are affected by both financial and social fragmentation, which measure different underlying factors and are not substitute for one another. First, financial integration in Europe entails more capital flows of any type. This is a straightforward result. On the inequality front, our evidence on domestic inequalities and contextual variables varies importantly across the types of flows considered. In fact, while the analysis on portfolio flows only partially supports augmenting the gravity model with social, financial and contextual determinants, the effects of these variables vary importantly from other flow types. Indeed, domestic inequalities is found to have two distinct effects on flows. For financial markets (stock and bonds), increasing domestic inequalities increases flows. This is

what we call a *diversification effect of social fragmentation* that can be attributed to the fact that domestic inequalities are associated with an increase in wealth of the richest decile of the population who seeks to diversify his/her wealth increase in other markets. On the other hand, domestic inequalities entail a diminution of FDI inflows in European countries. This is what we call the *demand effect of social fragmentation*. Given that we deal principally with horizontal FDIs in Europe, the decrease in these flows coupled with social fragmentation increases, can be interpreted as a diminution of the potential supply demand of MNEs in the Eurozone. Therefore, domestic inequalities are a deterrent to these investments contrarily to the other type of flows we study. In all the flows considered except debt, where the holder has a higher liquidation value, the legal system in the receiving country is paramount to encourage multinational capital flows. This is especially relevant for FDIs and CBLs and consistent with the presence of cross-border centers (Pogliani, von Peter and Wooldridge, 2022), The authors document FDI assets and liabilities in specific centers, largely set in common law, that are important and of comparable size. They interpret their presence as evidence of pass-through FDIs. Finally, our analysis presents evidence on social fragmentation as we study the importance of wealth and income spreads across countries on capital flows. Our results show clearly that social fragmentation across European countries is detrimental to capital flows, no matter which type. This is strong evidence of the importance of social fragmentation in the Eurozone on the distribution of capital.

This paper is organized as follows. We first review the state of the literature on capital flows, FDIs and cross-border loans in the Eurozone, as well as on the presence of potential inequalities. We then discuss the extension of the gravity model introducing fragmentation and several national measures in order to capture the home bias. The empirical analysis follows with portfolio, equity and bond flows for an initial general picture, followed by foreign direct investments and cross-border loans. The final section concludes.

2. Literature Review

While the literature has considered the impact of capital flows through financial market integration on social fragmentation (Erauskin and Turnosky, 2019 and 2022), the reverse causal relationship remains an open question.

2.1 Social Fragmentation

As recognized by Erauskin and Turnosky (2019 and 2022), social inequalities such as wealth and/or income inequalities in a country can be affected by capital and banking flows across countries and play a role in banking and financial market fragmentation. *Ceteris paribus*, with liquid assets such as shares, inequalities might also represent investment opportunities for which the marginal product of capital is higher than for more illiquid assets such as CBLs. If this is the case, in terms of portfolio management, it means that countries with larger inequalities enlarge/enhance investors' and lenders' investment opportunity sets, bringing diversification benefits. This argument aligns with Portes and Rey (2005) since they use it to motivate their model. On the other hand, diversification benefits might be lowered or disappear if the legal environment does not offer the same level of protection of foreign investments or private property across countries. The same argument can hold in terms of arbitrage opportunities. If inequalities exist, there might be a claim to arbitrage. Capital should flow where the risk return relation is the lowest.

In the context of Europe, Herzer and Nunnenkamp (2013) focus on the effects of inward and outward FDIs on income inequality. Their main result centers on the long-run effect of FDIs on inequality which is shown to be negative. Our objective is to complement their evidence with structured empirical results from the gravity models and a broader set of capital flows to characterize the set of opportunities for firms and investors.

2.2 Financial Market Integration

The literature has mainly focused on equity to measure the state of financial market fragmentation (Bekaert et al, 2013, among others). Studying a larger set of asset classes and capital flows is an important research question given that fragmented markets imply different investment opportunities between countries, households, and firms with the same relevant characteristics, limiting cross-border financial links and risk-sharing (Baele et al., 2014). Carrieri, Chaieb and Errunza (2022) establish that barriers to investment exist across emerging countries as well as between them and developed countries. We claim that barriers to investment exist in developed countries for smaller investors and that their presence is difficult to document empirically in asset flows given their relative size compared to that of institutional and larger players involved in global financial markets.

2.3 The Interaction Between Inequalities and Financial Market Integration

While the interaction of international trade and financial market integration has been studied in the literature, the impact of capital flows and financial integration on inequalities has received less attention. In addition, the issue has been mainly driven by developing markets than developed ones, such as the Eurozone. For example, Bumann and Lensink (2016) study international financial liberalization (as measured by financial depth through capital account liberalization) with a five-year panel of 106 countries from 1973 to 2008. Their results show that the financial liberalization movement reduces inequality. Using worldwide panel data, Furceri, Loungani and Ostry (2018) find that capital account liberalization increases inequality. Of the existing literature, the paper most related to ours is Jaumotte, Lall and Papageorgiou (2013), who also measure financial international openness in terms of asset movements. They find a limited overall impact of globalization on inequalities. Their results show two offsetting tendencies which help explain why the aggregate effect is small. Trade globalization is associated with a reduction in inequality, while financial globalization - and foreign direct investment in particular - is associated with an increase.

3. Methodology

Gravity models provide a sound theoretical background to test our hypotheses relative to financial and social fragmentation. Classic gravity models (e.g. Leamer and Levinsohn, 1995; Evenett and Keller, 1998) study the relationships between trade, size, and distance (Head and Mayer, 2014). The literature identifies a positive relationship between the size of two trading partners and a negative influence of distance on trade on capital flows. We enlarge the gravity model of Portes and Rey (2005) that first included financial variables in their modeling. In that context, we first estimate the following traditional gravity model on each type of flows using the Poisson regression by pseudo maximum likelihood (PPML). Our estimation method is based on Santos Silva and Teneyro (2006)⁶ and the code provided in Santos Silva and Teneyro (2015), as they show that the gravity model with the OLS estimator is not consistent in the presence of heteroskedasticity, and the logarithmic form of the gravity equation is not appropriate given it does not consider the absence of bilateral flows.⁷ We use the recommended two-way clustered standard errors and a pseudo R-squared measure corresponding to the square of the correlation between the fitted values and the observed values. Finally, we follow the literature and treat outflows and inflows separately, instead of averaging the reciprocal flows (Anderson, 2011). Let us first define $i = 1, \dots, 19$, the euro area reporting countries and $j=1, \dots, 18$, the euro area economic partners, $flows_{i,j,t}$ are a specific type of financial flows (portfolios, stocks, bonds, Foreign direct investments and cross border loans from country i to country j at time t , $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{i,t})$ is the market value of financial markets (stocks and/or

⁶ They demonstrate several empirical shortfalls to the OLS method applied to the log gravity model, especially in the presence of heteroscedasticity and dependent variables equal to zero in some periods. They show that the Poisson pseudo-maximum likelihood estimation (PPML) circumvents these issues and perform significantly better than the traditional approach of applying OLS to log values.

⁷ While the results presented in the paper rely on the Poisson Pseudo maximum Likelihood, we perform robustness checks regarding the estimation methods used to estimate the gravity models. Following Portes and Rey (2005), Head, Mayer and Ries (2010), and Head and Mayer (2014), the equation is also estimated with Ordinary Least Squares (OLS) using $\ln(PT_{ij})$, $\ln(EQUITY_{ij})$, $\ln(DEBT_{ij})$ or $\ln(FDI_{ij})$ and $\ln(CBL_{ij})$, as dependent variables and the gamma pseudo maximum likelihood estimator, as a robustness check. Results are omitted for brevity. The main results carry over the robustness check.

bonds according to the type of flows) of country i at time t , $\ln(SIZE_{j,t})$ is the market value of financial markets (stocks and/or bonds according to the type of flows) of country j at time t :

$$Flows_{i,j,t} = \exp[\beta_0 + \beta_{CT}CONTIG_{ij} + \beta_D \ln(DIST_{ij}) + \beta_{Si} \ln(SIZE_{i,t}) + \beta_{Sj} \ln(SIZE_{j,t}) + \varepsilon_{ij,t}]. \quad (1)$$

Then, we expand the classic gravity model of financial assets trades with a set of indicators to consider the economic profile of each country and its partners to identify the main determinants of financial and banking fragmentation. More precisely, in addition to the traditional gravity model variables, we consider macroeconomics, as well as financial and social factors that could enhance or hinder bilateral banking and financial flows. Social integration is accounted for first with INE_{it} is a measure of inequality in country i at time t , INE_{jt} is a measure of inequalities in country j at time t and $\varepsilon_{ij,t}$ the error term.

We therefore estimate the following model for each type of flows:

$$flows_{i,j,t} = \exp[\beta_0 + \beta_{CT}CONTIG_{ij} + \beta_D \ln(DIST_{ij}) + \beta_{Si} \ln(SIZE_{i,t}) + \beta_{Sj} \ln(SIZE_{j,t}) + \beta_{INEi}INE_{it} + \beta_{INEj}INE_{jt}]. \varepsilon_{ij,t} \cdot \quad (2)$$

Finally, we estimate the unconstrained version of the model with baseline, contextual, social and financial variables where $CC_{i,t}$ is a variable of returns on financial markets that approximates the cost of capital in country i at time t , $CC_{j,t}$ is a variable of returns on financial markets that approximates the cost of capital (weighted average of stock and bond markets returns) in country j at time t , $IFI_{i,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_CL_{j,t}$ equals one if the partner countries j has common law for legal system,:

$$PT_{i,j,t} = \exp[\beta_0 + \beta_{CT}CONTIG_{ij} + \beta_D \ln(DIST_{ij}) + \beta_{Si} \ln(SIZE_{i,t}) + \beta_{Sj} \ln(SIZE_{j,t}) + \beta_{CCi}CC_{i,t} + \beta_{CCj}CC_{j,t} + \beta_{LEG}LEG_CL_{j,t} + \beta_{IFIi}IFI_{i,t} + \beta_{IFIj}IFI_{j,t} + \beta_{INEi}INE_{it} + \beta_{INEj}INE_{jt}]. \varepsilon_{ij,t} \cdot \quad (3)$$

Eq. (3) presents the estimation equation for the full unconstrained models with for portfolios flows ($PT_{i,j,t}$) as a reference case. We now present the differences in modelling for different types of flows.

3.1 Specifications of Gravity Models for Equity Flows

We estimate the same model specifications for equity with the indicator of financial openness specific to equity flows: $GEQ_{i,t}$ is the Lane and Milesi-Ferretti (2007) indicator of financial openness for equity markets in country i , $GEQ_{j,t}$ is the Lane and Milesi-Ferretti (2007) indicator of financial openness for equity in country j . The cost of capital and size variables measure respectively the returns and size of the stock market in country j .

3.2 Specifications for Gravity Models for Debt Flows

The models estimated for debt flows are essentially the same as those for portfolio flows, except that the size and return variables represent the bond market in the country of interest.

3.3 Specifications for Gravity Models for Foreign Direct Investments

Gravity models for FDI have been introduced by Buch, Kokta and Piazzolo (2003) Egger and Pfaffermayr (2004) and Bevan and Estrin (2004) to assess the impact of the Eurozone creation and country insertion in the zone on FDIs. We estimate the same models for FDIs as presented for equity flows. We note that in this case, among the economic factors that are found in the literature as sound determinants of FDIs (see e.g. Nguyen and Cieřlik, 2021, among others), we control for market size (proxied by stock market size) and market fragmentation directly in the exogenous variables of the gravity model.

3.4 Specification for Cross-Border Loan Flows

The financial variables for cross-border loans are specific as they include borrower-based macroprudential measures, as highlighted by the literature (Gagnon and Gimet, 2020). We estimate the following gravity model for cross-border loans given by

$$\begin{aligned} CBL_{i,j,t} = \exp[\beta_0 + \beta_{CT}CONTIG_{ij} + \beta_D \ln(DIST_{ij}) + \beta_{Si} \ln(SIZE_{i,t}) + \beta_{Sj} \ln(SIZE_{j,t}) + \\ \beta_{IFIi}IFI_{i,t} + \beta_{IFIj}IFI_{j,t} + \beta_{LEG}LEG_CL_{j,t} + \beta_{LCR}LCR_{ij,t} + \beta_{NPLi}NPL_{i,t} + \beta_{NPLj}NPL_{j,t} + \\ \beta_{INEi}INE_{it} + \beta_{INEj}INE_{jt}] \cdot \varepsilon_{ij,t}, \end{aligned} \quad (4)$$

where $CBL_{i,j,t}$ are cross-border loans from country i to country j at time t , $IFI_{i,t}$ is the Lane and Milesi-Ferretti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferretti (2007) indicator of financial openness in country j , $LEG_CL_{j,t}$ equals one if the partner countries j has the common law as a legal system, $LCR_{ij,t}$ is a dummy variable that represent common lender-based financial regulation for countries i and j at time t , $NPL_{i,t}$ is a variable that reflects the presence of borrower-based macroprudential measures in the country i at time t approximated by the ratio of non-performing loans, $NPL_{j,t}$ is a variable that reflects the presence of borrower-based macroprudential measures in the country j at time t approximate by the ratio of non-performing loans, $INE_{j,t}$ is a measure of wealth and income inequalities in country j at time t and $\varepsilon_{ij,t}$ the error term.

Regarding the role of domestic regulations measured by macroprudential controls, the asset-based and capital-based measures have, in principle, different effects on inequalities. Theoretically, the strict borrower-based measures generate a higher selection on credit acquisition that exclude low-wealth households. Low-wealth borrowers with mortgages are also impacted by a tightening of LTV ratios. They experience an increase in their risk evaluation and higher mortgage repayments (Rabitsch and Punzi, 2017). Moreover, even if higher collateral requirements impact entrepreneurs' investment, they also limit landowners' gains of wealthy agents (Stiglitz, 2015). The total effect on welfare depends on

the level required (Mendicino et al., 2018), but the empirical literature is still in its infancy and has not settled on this question (Colciago, Samarina and de Haan, 2019). However, Arregui et al. (2013) postulate that an asymmetry in the macroprudential measures between countries encourages financial arbitrage and cross-border lending for high-income agents, increasing inequalities within and between countries. Consequently, to benefit from the positive impact of these measures that create financial stability to decrease international shock vulnerability (Rey, 2013) and reduce the risk of crisis and harmful social consequences, macroprudential measures must be implemented at a euro area level.

3.5 Multilateral Resistances for the Reporting Country

In this section, we present a complementary analysis to the previous section to account for multilateral resistances in reporting countries. Anderson and Van Wincoop (2003) underscore the importance of controlling for potential bias relative to unobservable factors named multilateral resistance in the original model. We follow the approach undertaken in Aviat and Coeurdacier (2007) and add reporting countries and time dummies to the model. The estimated equation for each flow type becomes:

$$flows_{i,j,t} = \exp \left[\beta_0 + \sigma_{i,t} + \beta_{CT} CONTIG_{ij} + \beta_D \ln(DIST_{ij}) + \beta_{Sj} \ln(SIZE_{j,t}) + \beta_{CCj} CC_{j,t} + \beta_{LEG} LEG_CL_{j,t} + \beta_{IFIj} IFI_{j,t} + \beta_{INEj} INE_{jt} \right] \cdot \varepsilon_{i,j,t}. \quad (5)$$

The specification accounts for the reporting country and time fixed-effect ($\sigma_{i,t}$) while allowing to investigate and test the effects of financial and social fragmentation.

3.6 Eurozone Fragmentation

In this section, we introduce multilateral resistances in both the reporting and partner countries (Anderson and VanWincoop, 2003 and Fally, 2015). In this context, all the country specific variables in the model are absorbed by the fixed effects. However, this approach documents social fragmentation since it measures the effects of inequalities *between countries* of the Eurozone rather than *within* a given country. To that end, we introduce spreads between inequality measures in the partner and reporting countries. We use two specifications to capture this effect. We first use a dummy variable that equals

one when the partner country has a higher measure of the given inequality measure than the reporting country. In the second approach, we use the magnitude of the spread of the inequality measure of each country between the partner and reporting country in absolute value. The equation estimated is:

$$flows_{i,j,t} = \exp \left[\beta_0 + \sigma_{i,t} + \rho_{j,t} + \beta_{CT} CONTIG_{ij} + \beta_D \ln(DIST_{ij}) + \beta_{LEG} LEG_{ij,t} + \beta_{SPINEij} SPREADINEG_{ijt} \right] \cdot \varepsilon_{ij,t}, \quad (6)$$

Where $\sigma_{i,t}$ and $\rho_{j,t}$ are the reporting country-time and partner country-time fixed effects.

3.7 Testable Hypotheses

Considering the literature review presented in Section 2, we summarize in this section the hypotheses that we test in this paper within the gravity model framework. We test, for different categories of capital flows, the following hypotheses:

- **H_{soc}**: Social integration has no impact on capital flows

Against the bilateral alternative that social fragmentation is important. Empirically, this is tested in eq. (2) with $\beta_{INEi} = 0$ and/or $\beta_{INEj} = 0$ against bilateral alternatives $\beta_{INEi} \neq 0$ and $\beta_{INEj} \neq 0$.

If the impact is significantly positive, we associate it with what we call the *diversification effect of social fragmentation*, that is, a larger gap between the highest and the lowest decile of inequalities can lead the richer investors to invest abroad to diversify their wealth or income. Conversely if the impact is negative, it implies that when the gap shrinks between the highest and the lowest deciles, investors invest less abroad. We call this effect the *demand effect of inequalities* since it implies that domestic markets are more appealing for investors to spend their capital.

We also consider a third hypothesis in which financial and social fragmentation interact as complements or substitutes for one another. This implies that both financial and social fragmentation should not remain significant when added jointly to gravity models,

- **H_{Fs}**: social integration is not a proxy from financial integration;

Against the alternative hypothesis that coefficients on both social and financial fragmentations are significant when present together in the model. Empirically, this is tested in Eq. (3) with $\beta_{INEi} = 0$ and/or $\beta_{INEj} = 0$ against bilateral alternatives $\beta_{INEi} \neq 0$ and $\beta_{INEj} \neq 0$.

Finally, the hypotheses up to now are linked to inequality measures within one country. The following hypothesis relates to inequality measures across countries of the Eurozone and informs on the importance of capital flows due to variations in inequality measures across countries.

- **H_{Frag}**: Social fragmentation across countries of the Eurozone has no impact on capital flows ;
Against the bilateral alternative hypothesis that social fragmentation across countries is important for capital flows. Empirically, this is tested in eq. (5) with $\beta_{SPINEG} = 0$ against bilateral alternatives $\beta_{SPINEG} \neq 0$.

4. Data

The paper relies on a euro area yearly dataset for the 2000 – 2021 period. The countries included in our analysis are: Austria, Belgium, Cyprus, Germany, Spain, Estonia, Finland, France, Greece, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, The Netherlands, Portugal, Slovakia and Slovenia. Our objective is to underscore how financial and social fragmentation impact capital movements in the Eurozone. Claessens (2017) puts forwards four different determinants of financial fragmentation: natural barriers, market forces, policy intervention, and regulatory policies. Our choice of variables also mirrors these considerations with the addition of social fragmentation variables. Table 1 details the variables, their sources, and their nomenclature.

Dependent variables. We evaluate our augmented gravity models on five types of bilateral capital movements in order to test several hypotheses regarding the importance of fragmentation on different types of capital movements related to different economic contexts. We first look at (i) aggregate bilateral financial stock movements. We then decompose further using both (ii) equity and (iii) debt bilateral

stocks. We next look at specific categories relevant to Europe and provide insight on how different kinds of investors (small to medium businesses or multinationals) may be exposed to social and financial fragmentation (cross-border loans and foreign direct investment). In fact, natural barriers or financial frictions can be linked to information asymmetry (Claessens, 2017) and help to explain the choice of investors to prefer local rather than cross-border assets, which creates a home bias, which motivates our choice of enlarging our set of flows to (iv) FDI and (v) CBLs.

Baseline models independent variables. These variables are at the root of gravity models (Portes and Rey, 2005 and Head and Mayer, 2014) and constitute a benchmark in explanatory power. They are the (i) size for both markets and (ii) distance between the two capital).

Contextual variables. (i) contingent border, (ii) legal system and (iii) cost of capital: Contingent border control for proximity and to potentially reduce barriers to capital movements associated with similar culture or lower cost of acquirement of information in neighborhood countries (CEPII website). The legal system in place might influence where flows land given that different legal systems offer different investors protection (La Porta et al, 1997; La Porta, 1998). We consider that context, as well as that of financial centers serving as cross-border hubs for FDI and CBL. Pogliani, Peter and Woolridge (2022) study such financial centers which cater predominantly to non-residents and serve as large intermediaries of cross-border financial flows. Such centers in the Eurozone are Cyprus, Ireland, Luxembourg, Malta, and the Netherlands. Finally, the cost of capital measures control for the economic and financial environment of a given country by being a proxy for the level of systematic risk incurred.

Fragmentation variables. (i) financial integration indexes and (ii) national macroprudential regulations. We measure international financial liberalization using the de facto measure asset positions proposed by Lane and Milesi-Ferretti (2007) for several reasons. First, changes in these measures better capture the significant and rapid change in the degree of international financial integration recently experienced. Conversely, the index suggested by Chinn and Ito (2008) changes slowly, as it captures “the extent and intensity of capital controls” from a *de jure* perspective. Second, although the growth in cross-border financial assets is undoubtedly driven by underlying changes in regulations, by basing our empirical analysis on an extension of the traditional stochastic portfolio framework, it is more convenient to focus

on the flow of assets as a reflection of international financial integration. Finally, one of our objectives is to highlight the contrast between liberalization with respect to foreign investment costs versus liberalization with respect to foreign borrowing costs. Since these differences are most directly reflected in the flow of financial assets and are likely to be obscured by some composite index, there is further reason for measuring the impact of international financial integration in terms of portfolio shares.

Furthermore, regulatory policies, when asymmetric between home and host regulations, could impact small investors differently than large ones. Given the financial stability trilemma (Schoenmaker, 2011) in a regionally integrated financial system, financial stability (defined as a low level of systemic risk) is incompatible with national financial policy. Thus, regulations are encouraged to be formulated at the regional level (Fernandez and Garcia-Herrero, 2009). In the case of the euro area, the macro-prudential policy borne by both lenders and borrowers should account for country heterogeneity. On the lenders' side, it can take the form of common capital requirements and leverage ratios and measures based on the Capital Requirement Regulation (CRR)/Capital Requirement Directive (CRD IV). However, borrower-based instruments that can be characterized by loan-to-value ratios or debt-to-income ratios differ from one country to another. The national bank regulation generates an asymmetry between countries creating a potential bias in investment opportunities (Merler, 2015).

Social fragmentation. Inequality Measures of dispersion in wealth and income are frequently used in the scientific literature. Income represents household revenue constituted by labor earning, transfers, and financial asset holdings. Wealth characterizes people's saving abilities and is calculated by assets (financial or real estate) minus debt (mortgage and loans) (Piketty et al., 2018). Income inequality is defined as the difference in household revenue constituted by labor earning, transfers and financial assets holdings, while wealth inequality is the gap between people's saving abilities (Alvaredo et al. 2017 and Piketty, Saez and Zucman, 2018). The World Bank (2020)⁸ documents heterogeneity in the evolution of income inequality in Europe. Wealth inequalities tend to be higher than income inequalities and wealth is extremely concentrated at the top in a set of European countries like Germany or Austria,

⁸ The World Bank (2020), the World Bank database, <https://data.worldbank.org/indicator/SI.POV.GINI>.

suggesting noteworthy disparities in the rates of return on wealth, in the growth rate of average income, and in the savings rates within and across euro area economies (Chancel, 2019). We also introduce inequality spread between European countries in order to appreciate how social fragmentation evolves, on top of considering inequality measures that depend on the highest level or lowest level of the wealth and income distributions, we have developed wealth and income spread measures that inform on how the richest and the poorest deciles of a population compare to one another over time. We use two measures of fragmentation spreads either a dummy equals to one when the partner country has a higher measure than the reporting country or the absolute value of the spread.

5. Results

The models are first estimated with a baseline set of variables (distance, size for both countries and contingent border). In sections 5.1 to 5.6, we focus on domestic measures of inequality and produce results on inequality measures across European countries in Section 5.7. We present our evidence for portfolio flows followed by equity and debt flows to cover the type of capital most liquid and most studied first. We then present results for FDIs followed by CBLs.

5.1 Portfolio Flow Gravity Models

First, we present results associated with the estimation of gravity models with aggregate portfolio flows as the dependent variable. Results are reported in Table 2. In the second column of Table 2, the baseline results are reported. As expected, portfolio flows are proportional to market size and inversely proportional to distance, with p-values close to zero. This evidence draws a similar picture as that of Portes and Rey (2005) in a related context. In terms of inequalities, several measures are significant when added to the baseline model. In particular, the top decile of the wealth distribution as well as the spread between the top decile and the bottom decile of the wealth distribution are significant and positive in both countries: the top decile of the income distribution as well as the income spread are also positive and p-values are around 0.01. Thus, when the top of the wealth distribution become wealthier, it increases European cross-border portfolio flows. However, the evidence is mixed once we add financial

fragmentation measures to the model. Then, the main determinant of portfolio flows is Lane and Milesi-Ferreti's measure of financial openness and cost of capital measures. In this case, the signs are positive and p-value are around 0.01 for both countries in all specifications, as expected. Measures of R squared increase importantly when financial variables are taken into account. The legal system of the partner country often reveals a p-value lower than 0.05. From this evidence, the case to augment the traditional baseline gravity model appears to be limited, especially for social inequalities as only the top decile of the income distribution (and corresponding spread) remains significant for the reporting country. We now look at more specific measures of flows and show that our variables of interest (contextual, social and financial) are relevant for those flows categories.

5.2 Equity Flow Gravity Models

Table 3 presents the results for the estimation of the gravity models with equity flows as the dependent variable. First, the results show that the traditional gravity variables are significant at a 5% level significance and of expected signs, even when financial and social fragmentation are introduced in the model. Second, we find that financial controls are highly relevant in addition to the traditional gravity model, regardless of the social inequality measures introduced. Higher returns in both countries lead to an increase in equity flows as well as a greater openness as measured by the Lane and Milesi-Ferreti index. For equity, the distance coefficient is not significantly different from zero when the contingent border is significant and vice versa which is revealed by p-values that alternate at around 0.02 for these coefficients. The legal system in the partner country is often significant and positive (increasing inflows of equity in a common law country) with p-values close to zero.

In terms of inequalities, the wealth spread and the right tail of the distribution always has a positive and significant impact on equity flows within both countries, even after controlling for the financial context. In other words, when the individuals in the wealthiest part of the distribution become wealthier, it increases both outflows and inflows of capital. In terms of income, the spread measure as well as the

right tail of the distribution are also highly significant and positive in both countries (although with coefficients of smaller magnitude than wealth).

5.3 Debt Flow Gravity Models

Table 4 presents the results for the extended gravity model estimated on European debt flows. First, the dummy variable indicating a shared border is never significant for debt, contrary to what is presented above for equity. This result aligns with the evidence in the bond literature: in the absence of foreign exchange risk, which applies to the Eurozone, there is no home bias (Burger et al, 2018). The sign and significance of the distance (significantly negative with p-values all below 0.02) and size of the bond markets (significantly positive with p-values all very close to zero) coefficients are as expected. The inequality measures for the reporting country are significant at 5%, even once we control for the size of the financial sector. The right tail of the wealth distribution as well as the wealth spread for the reporting country are positive and significant with p-value close to zero. This finding implies that when the wealthy gets wealthier in the reporting country, they invest this increasing share of their wealth more intensely into European debts outside of their national borders. Also, the income of the right tail of the distribution for the reporting country matters significantly and positively in the gravity model. Finally, in terms of financial variables, we find that the return on the bond market in the reporting country is not important (p-values larger than 0.10) to explain debt flows when income measures are introduced and increasing yields on debt in the partner country does not explain debt flows. As expected, measures of financial openness have p-values close to zero and positive coefficients for the reporting countries. However, they are not important for the partner countries. In terms of inequalities, the measure of right tail of the income and wealth distributions are positive and often significant at the 5% level. Finally, the legal system of the partner country being the common law does not seem to matter for debt movements in Europe. This is not surprising since Laporta et al (2004) document that the legal system mostly mattered for equity holders, who are the last claimants.

5.4 FDI Flow Gravity Models

Table 5 presents the results for FDI's determinants. The classic gravity model presents the expected sign and close to zero p-values for distance (negative) and size (positive). The common border variable never reveals a p-value below 0.05. The financial openness measures are always positive for both partner and reporting countries and present p-values close to zero. No specification of the model leads to an insignificant distance coefficient with p-values across models for this variable very close to zero. This shows that in the case of FDI's despite the overall fit of the gravity model, other factors would explain why distance is a deterrent to this type of investment. The common law system in the partner country has a positive impact on the inflows of FDI's in this country. The returns obtained on the stock market in both reporting and partner country do not have a significant impact on FDI flows, except for three cases for the reporting countries with small and positive coefficients and associated p-value between 0.05 and 0.10. We find a negative and significant at 5% impact for FDI when the right tail of the wealth and income distributions in the partner country increases as well as the spread. Increasing income inequalities (*income_90R* and *spread_R*) also has the same effect. In the case of FDI, our results on the right tail of the income distribution and the spread also show a significant negative impact in the reporting country. This result combined with our previous evidence on stocks and bonds for the reporting country suggest that when the individual with the higher decile of the distribution gets richer, this individual invests mainly in stock and bonds and not in FDI's. This is coherent with what was witnessed during the COVID crisis. Thus, this result suggests that inequalities within a given country will deter FDI's in Europe. Since foreign direct investors are looking for a greater market base when they invest in the Eurozone due to their horizontal nature, when the rich become richer, it suggests a smaller proportion of the population has disposable income and wealth decreases the overall demand for goods. The FDI's measured in Europe are mostly horizontal and are not dependent on salary levels in the partner countries, as in vertical FDI's. If that were the case, we would get a negative and significant sign to *income_10P*. One interesting result with FDI's that distinguishes them from other capital flows is that inequalities are a deterrent for this type of investment. Given the nature of direct investment, which is largely an investment in physical assets, combined with the horizontal nature of FDI's in Europe, it appears normal

that inequalities in income or wealth would reduce FDI flows rather than increase them as it is the case for other types of capital flows.

5.5 Cross-Border Loan Gravity Models

The coefficients for distance between capital (*Ldistcap*), common border (*cont*) and size (*Size_R* and *Size_P*) have associated p-values very close to zero, as expected. For the size coefficients, both reporting and partner countries have a positive coefficient, ranging between .378 and .982 and a p-value very close to zero. While the significance and sign of the coefficients are comparable to the existing literature, the exact magnitude of these coefficients can vary given the differences in model specifications. These results extend the existing evidence regarding the baseline model on capital flows, as well as those found previously on the specific case of bank loans (Martin and Rey, 2003; Portes and Rey, 2005; Head, Mayer and Ries, 2010; De Benedictis and Taglioni, 2011).

Inequality variables are introduced next. Results show that wealth measures are especially relevant for CBLs. In particular, the right tail of the distribution coefficient revealing p-values close to zero for both countries. As before, when the rich get richer in both countries, cross-border loans increase. The same result is found for the positive coefficient associated with wealth spread. When financial variables are introduced however, only the wealth indicators in the reporting country remain significantly positive. As for the income measures, they are not significant in general. One exception is the lower tail of the income distribution in the partner country which is found to have a negative sign. This result is not robust, however, to the introduction of the financial variables and controls which we discuss next.

The measure of financial fragmentation consists of regulation variables in addition to the baseline gravity model. The first indicator introduced is the liquidity coverage ratio (*lcr*), a time indicator variable depicting the evolution in the requirements made by the ECB. It is a lender-based measure common to all euro countries. It is found not to be very important with p-values larger than 0.10 in all specifications. The second measure of fragmentation highlights the difference in European country risk profiles related to nonperforming loans (*npl*). Our result shows that increasing the nonperforming loans ratio in the

reporting country decreases cross-border flows to the partner countries. The partner countries' nonperforming loans measure has p-values larger than 0.20 in most specifications. These findings suggest that loans tend to leave from countries with slacker regulations regarding nonperforming loans and therefore higher nonperforming loan ratios. The legal system of the partner is positive and significant, often at a 5% level. Finally, it is important to note that the distance coefficient is often no longer significant when all variables are included with different measures of wealth and income which is good news for the model.

5.6 Fixed Effects for the Reporting Country Resistance

We now present results for robustness checks accounting for time and fixed effects in the reporting country. The results are presented in the Appendix and show that in essence, our main results are unchanged. Table A.1 presents the results for the portfolio flows. The results are the same as before, namely that for aggregate portfolio flows, measure of social inequalities are no longer significant once financial integration measures are taken into account. Table A.2 presents the results for equity flows that are the same as before, except that the coefficient for left tail of the income of the distribution is negative and significant at 5%, even after controlling for financial integration. A similar observation can be made from debt flows results presented in Table A.3. However, we find that the left tail of the income distribution is now significant and positive at 5%. Combined with the results on stocks, we find that fluctuations on the left tail of the income distribution of the partner country reveals a substitution effect from stocks to bonds. This can be explained by the fact that when a larger proportion of the population becomes poorer as it is the case here, the net inflows of debt increase since risk aversion leads investors to buy bonds in larger proportion than shares. These results underscore the importance of testing several measures of social inequalities. The left and right tails of the income and wealth distribution are indeed related differently to flows. Finally, Table A.4 and A.5 show that results are unchanged for FDIs and CBLs respectively. We conclude that the addition of one fixed effect for one country in our gravity models does not, in general, change our conclusions on the sign and significance of the variables in our models. Given that the presence of multiple dummy variables, the question of reduced power might

explain why in a few cases we lose the significance of explanatory variables linked to distance and financial measures.

5.7 European Fragmentation

We present the results for the analysis accounting for both countries fixed effects. We introduce measures of spreads to investigate the effects of social fragmentation across the Eurozone. Results are presented for the two specifications (either the absolute value of the spread or a dummy variable for when the measure is higher in the partner country) in Table 7-12. In Table 7, we find that portfolio flows increase when the spread between the right tail of the wealth distribution increases at a 10% level while they decrease when the spread in the lower income increases (*inc10_sprd*) and when wealth inequalities (*wealth_sprd*) are higher in the partner country at a 10% level. Table 8 shows that social fragmentation matters importantly for stock markets flows. When the spread increases in the left tail of the wealth distribution (*wealth10_sprd*), equity flows decrease. Equity flows also decrease when the spread increases for the right tail of the income distribution (*inc90_sprd*) and the within country inequalities (*inc_sprd*). We note that when the partner country left tail of the income distribution (*inc_10_sprd*, dummy) increases more than the reporting country's, equity flows increase. Finally, equity flows decrease when the spread of the income distribution (*inc_sprd*) increases and when the higher decile in income is higher (*inc90_sprd*) in the partner country than the reporting country. This shows that larger inequalities reduce flows. For debt flows, presented in Table 9, we also find negative effects of social fragmentation for several measures of inequalities across the eurozone, when the spread increases in the lower wealth decile (*wealth10_sprd*), as well as when the spread increases in the higher end of the income distribution (*inc90_sprd*). When the partner country has higher measures of revenue in the lower end of the distribution than the reporting country (dummy for *inc10_sprd*), debt flows decrease. When the rich have a larger part of the wealth distribution in the partner country and when wealth inequalities are higher (spread of spread) debt flows decrease. FDIs in Table 10 are also impacted by social fragmentation but in a smaller magnitude: only the absolute value of the spread of the lower end of the wealth distribution impacts negatively FDIs flows at a 5% level. The higher tail of the income

distribution also impacts FDIs negatively but only at a 10% significance level. Finally, our analysis reveals that both wealth and income spreads are important and contribute to reduce flows but also that spreads of the left side of the income distribution are important for flows and the scope of our empirical analysis allows to shed light on this fact. Taken collectively, our results show an important result across all categories of flows: when inequality spreads and social fragmentation increase, flows are reduced. This is another way of showing that inequalities are detrimental to flows and that governmental policies should aim at reducing inequalities to let capital flows easily. Inequalities appear to be an important source of fragmentation in the Eurozone. One exception worth mentioning is the evidence from the use of the dummy variable that takes on the value of one when the spread of the given variable is larger for the partner country than for the reporting one and zero otherwise. In the case of CBL, when the income spread of the 90th percentile across both countries get larger, CBL flows increase. This result is not robust to the evidence from the absolute value of the spread and we consider it as marginal.

5.8 Discussion of Results

While the results obtained with the baseline models are in line with the existing gravity literature, we find that a greater level of financial market integration in both the reporting and the partner country increases all flows. This effect – all flows increasing with a greater level of financial market integration - is measured for all models and dependent variables. When we do not control for fixed effects, it is interesting to note that controlling for the regulatory context as well as financial and social fragmentation does not render distance insignificant for most specifications and types of flows, but that often the contingent border appears unimportant. We also note that the distance coefficient is reduced once financial and social fragmentation are present in the model. Thus, we conclude that our proposed model accounting for financial and social fragmentation captures some but not all of the home bias traditionally depicted in the distance and common border variables. When we control for two fixed effects, depending on the nature of the flows, there are occurrences in which, even after controlling for social fragmentation, distance and a common border remain important, mainly for bonds, FDI and CBL.

This paper shows that inequalities matter and cannot be proxied by financial fragmentation. Furthermore, our evidence regarding H_{SO} and H_{FS} underscores the importance of decomposing capital flows into categories. In fact, controlling for financial fragmentation absorbs most of the effect of inequalities on portfolio flows, but it is no longer the case when the dependent variable is disaggregated. Thus, social fragmentation plays a different role according to the nature of the flows under study. For debt flows, equity flows and CBLs, social fragmentation matters, especially when measured by the wealth and income differential between the richest and the poorest decile. In general, increasing wealth inequalities (measured by *wealth_spread*) in both the reporting and the partner countries implies more flows. This is a *diversification effect*, as wealthier fringes of the distribution aim to diversify internationally in liquid assets. For FDIs, the same wealth spread measure is found to be significant and negative, but only for the partner countries. This *demand effect* of inequalities suggests that the physical investment entailed in FDIs is deterred by the decrease in purchasing power of the population when inequalities increase, given the horizontal nature of FDI in the Eurozone. In fact, the horizontal FDI in Europe are typically motivated by an enlargement of the market for the international businesses. Our evidence suggests that growing inequalities decrease the potential for market growth in a given country and therefore deter direct investments. This is interesting given that this negative relationship would typically be associated with foreign exchange and political risk. Given that these risks are mitigated in the Eurozone, this is an important contribution of our paper, as our effect can be associated directly to the effects of social fragmentation on consumption demand.

Contextual variables accounting for the national cost of capital and the legal system in the partner country are statistically significant, but their effect is often mitigated. In fact, a higher cost of capital implies more portfolio and equity flows, but the magnitude of the effect is more modest than with traditional gravity model variables. The common law legal system in the partner country is an attractive feature for portfolios flows. For debt flows, when inequalities are important, the legal system variable loses its significance. Since debt owner are more protected than equity owners, it is not surprising that the legal system matters less for more protected markets. The common law legal system attracts more FDIs, possibly again reflecting the further mobility constraint placed on that type of investment and the

role of financial hubs for FDIs and CBL. In that latter case, a common border is important for CBL flows given that these types of loans concern mainly small investors and corporations; it makes sense that a shared border would increase flow.

Our fixed effect analysis complements the appreciation of these results in showing that not all flows are influenced in the same way by changes in inequalities. For example, when the 10th percentile spread is enlarged, equity flows increase while when the 90th spread grows, equity flows diminish. Our most important results in this analysis remains that when inequality spread grow in the Eurozone, it is detrimental to capital flows, illustrating the importance and relevance of social fragmentation.

6. Conclusion

In this paper, we use gravity models augmented with social and financial fragmentation measures to document their impacts on capital movement in Europe. Our rationale for using European data is twofold: first, the European case presents an interesting natural experiment where many factors such as exchange rates, political risk and monetary policies are held constant. Therefore, any remaining sources of fragmentation measured in our model are not proxies for these important factors. Second, the existing literature on social fragmentation measured as wealth and income inequalities document global markets, with a focus on emerging markets. We argue that, even in countries that have already achieved a high degree of social and financial convergence, our measures of inequalities and fragmentation remain relevant. In fact, we test three hypotheses regarding financial and social fragmentation. We concluded that financial fragmentation has a significant impact on capital movements, along with social inequality measures. We further find that both financial and social fragmentation remain significant when added jointly to gravity models. We therefore conclude that they measure different phenomena relevant to capital movements.

We further document how different types of capital movements lead to different reactions to variations in fragmentation. Larger wealth inequalities imply more capital movements for equity, bonds and CBLs (a diversification effect of inequalities), but not for FDIs (a demand effect of inequalities). For FDIs,

our results show that the physical investment entailed in FDIs is deterred by greater inequalities in the host country. These findings underscore economic implications for both the International Business managers and portfolio managers as well as in terms of regulatory implications in the Eurozone. European international businesses, particularly those using direct investments to increase their market share, will be deterred by rising inequalities. Finally, the European Central Bank would do well to diversify their objective to account for inequalities with the goal of reducing fragmentation in European capital movements.

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Table 1. Description of the data

<i>Dependent Variables</i>		
Portfolio flows	PT	Total Portfolio held by the reporting country in the partner country /JRC-ECFIN database from the ECB (in euros) (outflows from country <i>i</i> to country <i>j</i>)
Equity flows	EQUITY	Assets, Equity held by the reporting country in the partner country/ Coordinated Portfolio Investment Survey (CPIS) (outflows from country <i>i</i> to country <i>j</i>)
Debt flows	DEBT	Assets, Debt Securities held by the reporting country in the partner country/ Coordinated Portfolio Investment Survey (CPIS) (outflows from country <i>i</i> to country <i>j</i>)
Cross-Border Loans	CBL	MFI to non-MFI loans end of period /ECB database from country <i>i</i> to country <i>j</i> . All currencies combined, reported in euros.
Foreign Direct Investment	FDI	FDI directional principle held by the reporting country in the partner country/ JRC-ECFIN database from the ECB (in euros) (outflows from country <i>i</i> to country <i>j</i>)
<i>Independent variables</i>		
<i>Geographic variables</i>		
Common frontier	Contig	= 1 if both countries have common frontier (CEPII gravity database)
Distance	Distcap	Log distance in km between capitals / (CEPII gravity database)
<i>Regulatory variables / common variables / banking model</i>		
Common macroprudential measure on liquidity	lcr	1= Effective October 1, 2015, the LCR is set at 60%. 2 =Effective January 1, 2016, the LCR is increased to 70% 3 =Effective January 1, 2017, the LCR is increased to 80% (iMaPP database and ECB lender-based measures)
<i>Regulation variables / common variables / financial and banking models</i>		
Common law Legal system	leg_cl	= 1 if the receiving country has the common law as a judicial system. From Raphael Laporta's website based on La Porta et al. (1997) and following contributions.
<i>Banking Variables / National variables / banking model</i>		

Banking sector size	totCredit	Lagged log of the total credit to non-financial corporations, households and non-profit institutions serving households (ECB)
Risk	npl	Non-performing loans ratio – (Supervisory Banking Statistics ECB)
<i>Financial Variables / National variables / financial model</i>		
Financial markets size	MarketSize	Lagged log of capitalisation (in Euros) for a given market: (stock, bonds and financial market as a whole). ECB database.
Cost of capital	Returns	For stocks: national index returns (Standard and Poor's and World Bank Bonds: FTSE fixed income index (Refinitiv) For financial markets: weighted average returns on financial markets (stock + bonds).
volume-based measure of financial integration in flows	ifi	$ifi_{it} = \frac{FA_{it} + FL_{it}}{GDP_{it}}$ where <i>FA</i> and <i>FL</i> refer to the stocks of aggregate foreign assets and liabilities, respectively. Milesi-Ferreti and Lane (2007 and 2022)
volume-based measure of financial integration in equity	geq	$Geq_{it} = \frac{(PEQA_{it} + FDIA_{it} + PEQL_{it} + FDIL_{it})}{GDP_{it}}$ where <i>PEQA (L)</i> and <i>FDIA (L)</i> are the stocks of portfolio equity and FDI assets (liabilities) Lane and Milesi-Ferreti (2007 and 2022)
<i>Social inequalities variables / national variables</i>		
Income inequality	income10 income90 income_spread	the income decile repartition (10 and 90 deciles) (pre tax)(WID database). The poorest (P10) and richest (P90) decile are used as well as the spread between the richest and poorest (P90- P10).
Wealth inequality	wealth10 wealth90 wealth_spread	Measured with the decile (10 and 90) of wealth decile repartition (WID database) The poorest (P10) and richest (P90) decile are used as well as the spread between the richest and poorest (P90- P10).
<i>European social fragmentation</i>		
Income fragmentation	inc10_sprd inc90_sprd inc_sprd_sprd	Defined as either the absolute value of the spread between the income measures of the partner and reporting country or a dummy variable equals to when the partner has a higher measure than the reporting country.
Wealth fragmentation	wlth10_sprd wlth90_sprd wlth_sprd_sprd	Defined as either the absolute value of the spread between the wealth measures of the partner and reporting country or a dummy variable equals to when the partner has a higher measure than the reporting country.

Table 2. Results for portfolio flows

<i>CONTIG</i>	0.164	0.218	0.251	0.140	0.261*	0.208	0.270*	0.162	0.269*	-0.100	0.080	-0.099	0.082
	[0.210]	[0.218]	[0.159]	[0.199]	[0.137]	[0.211]	[0.145]	[0.221]	[0.159]	[0.202]	[0.160]	[0.202]	[0.160]
$\ln(DIST_{ij})$	-0.625***	-0.616***	-0.214**	-0.668***	-0.261***	-0.654***	-0.241**	-0.628***	-0.206*	-0.793***	-0.366***	-0.795***	-0.366***
	[0.115]	[0.116]	[0.107]	[0.098]	[0.098]	[0.103]	[0.108]	[0.129]	[0.114]	[0.126]	[0.122]	[0.127]	[0.122]
Size_R	0.661***	0.642***	0.736***	0.656***	0.764***	0.656***	0.759***	0.639***	0.745***	0.655***	0.740***	0.655***	0.740***
	[0.074]	[0.095]	[0.062]	[0.073]	[0.054]	[0.077]	[0.057]	[0.083]	[0.060]	[0.068]	[0.055]	[0.068]	[0.055]
Size_P	0.617***	0.611***	0.757***	0.597***	0.743***	0.598***	0.741***	0.599***	0.735***	0.628***	0.748***	0.628***	0.748***
	[0.072]	[0.095]	[0.065]	[0.070]	[0.047]	[0.073]	[0.052]	[0.082]	[0.055]	[0.073]	[0.051]	[0.073]	[0.051]
Returns_R			0.007**		0.006**		0.006**		0.007**		0.008**		0.008**
			[0.003]		[0.003]		[0.003]		[0.003]		[0.003]		[0.003]
Returns_P			0.009***		0.009***		0.009***		0.008***		0.009***		0.009***
			[0.003]		[0.002]		[0.002]		[0.003]		[0.003]		[0.003]
ifi_R			0.004***		0.004***		0.004***		0.004***		0.004***		0.004***
			[0.000]		[0.000]		[0.000]		[0.000]		[0.000]		[0.000]
ifi_P			0.005***		0.005***		0.005***		0.005***		0.005***		0.005***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
leg_cl_P			0.190		0.419**		0.425**		0.269**		0.221		0.222
			[0.131]		[0.183]		[0.215]		[0.127]		[0.138]		[0.138]
wealth10_R		-0.167	0.254										
		[0.384]	[0.371]										
wealth10_P		-0.409	-0.181										
		[0.390]	[0.349]										
wealth90_R				0.463***	0.175								
				[0.149]	[0.127]								
wealth90_P				0.339**	-0.089								
				[0.136]	[0.086]								
wlth_sprd_R						0.375***	0.129						
						[0.113]	[0.102]						
wlth_sprd_P						0.296***	-0.077						
						[0.107]	[0.089]						
inc10_R								-2.629	-0.552				
								[1.627]	[1.085]				
inc10_P								-1.178	1.251				
								[1.197]	[0.910]				
inc90_R										0.118***	0.072***		
										[0.029]	[0.020]		
inc90_P										0.081***	0.028		
										[0.031]	[0.023]		
inc_sprd_R												0.117***	0.071***
												[0.029]	[0.020]
inc_sprd_P												0.080***	0.027
												[0.031]	[0.022]
Constant	-3.107**	-2.888*	-9.401***	-6.992***	-9.798***	-6.441***	-9.655***	-1.138	-9.538***	-8.533***	-11.56***	-8.379***	-11.47***
	[1.378]	[1.488]	[1.151]	[1.584]	[1.161]	[1.567]	[1.192]	[1.981]	[1.619]	[1.601]	[1.009]	[1.579]	[1.002]
Obs	4,053	2,842	1,902	3,183	2,184	2,842	1,902	2,614	1,709	2,614	1,709	2,614	1,709
R-squared	0.565	0.544	0.750	0.598	0.756	0.592	0.753	0.560	0.750	0.592	0.778	0.592	0.778

Table 2 presents the estimated coefficients from the estimation of eq. (1) eq. (2) and eq (3) the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in round brackets P-values are reported in brackets []. The dependent variable $PT_{i,j,t}$ are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the

value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{i,t})$ is the market value size of the financial markets (stocks and bonds) of country i at time t , $\ln(SIZE_{j,t})$ is the market value size of the financial markets (stocks and bonds) of country j at time t , $Return_{i,t}$ is a variable of returns on financial markets that approximates the cost of capital in the country i at time t , $Return_{j,t}$ is a variable of returns on financial markets that approximates the cost of capital in the country j at time t , $IFI_{i,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_CL_{j,t}$ equals one if the partner countries j has the common law as a legal system, INE_{it} is a measure of inequality in country i at time t , INE_{jt} is a measure of wealth and income inequalities in country j at time t .

Table 3. Results for equity flows

contig	1.069*	1.134**	1.001***	1.068	0.863***	1.176*	0.887***	0.974*	0.909***	0.732	0.449**	0.729	0.449**
	[0.566]	[0.549]	[0.347]	[0.662]	[0.301]	[0.680]	[0.309]	[0.560]	[0.293]	[0.460]	[0.203]	[0.459]	[0.203]
Ldistcap	-0.810**	-0.837**	-0.181	-0.890***	-0.252	-0.908***	-0.243	-0.915***	-0.211	-0.914***	-0.491***	-0.917***	-0.493***
	[0.328]	[0.352]	[0.167]	[0.336]	[0.188]	[0.339]	[0.189]	[0.296]	[0.160]	[0.277]	[0.130]	[0.275]	[0.130]
Size_R	0.348***	0.295**	0.535***	0.362***	0.506***	0.388***	0.537***	0.383***	0.504***	0.405***	0.527***	0.406***	0.527***
	[0.102]	[0.137]	[0.099]	[0.089]	[0.074]	[0.104]	[0.082]	[0.123]	[0.064]	[0.103]	[0.059]	[0.103]	[0.059]
Size_P	0.366**	0.428**	0.600***	0.326**	0.580***	0.370**	0.572***	0.353**	0.602***	0.365***	0.617***	0.365***	0.617***
	[0.155]	[0.204]	[0.129]	[0.157]	[0.118]	[0.164]	[0.118]	[0.153]	[0.122]	[0.139]	[0.098]	[0.138]	[0.098]
Returns_R			0.005***		0.004***		0.005***		0.005***		0.004***		0.004***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
Returns_P			0.003**		0.003***		0.003***		0.003***		0.003**		0.003**
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
geq_R			0.008***		0.007***		0.007***		0.007***		0.007***		0.007***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
geq_P			0.012***		0.011***		0.011***		0.012***		0.011***		0.011***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
leg_cl_P			1.002***		0.608*		0.396		1.128***		0.937***		0.939***
			[0.264]		[0.317]		[0.369]		[0.179]		[0.193]		[0.194]
wealth10_R		0.672	-0.500										
		[1.116]	[0.753]										
wealth10_P		-1.951*	-0.364										
		[1.014]	[0.462]										
wealth90_R				0.783*	0.559**								
				[0.401]	[0.240]								
wealth90_P				1.306***	0.411**								
				[0.286]	[0.208]								
wlth_sprd_R						0.572*	0.448**						
						[0.342]	[0.200]						
wlth_sprd_P						1.086***	0.422**						
						[0.234]	[0.192]						
inc10_R								-4.928	-1.744				
								[3.716]	[1.855]				
inc10_P								-6.237***	-0.254				
								[2.327]	[1.469]				
inc90_R										0.096	0.113***		
										[0.088]	[0.031]		
inc90_P										0.147***	0.111***		
										[0.038]	[0.031]		
inc_sprd_R												0.096	0.112***
												[0.087]	[0.031]
inc_sprd_P												0.146***	0.110***
												[0.038]	[0.031]
Constant	19.380***	19.260***	8.817***	8.146*	4.587*	9.601**	4.711*	23.755***	10.273***	11.368**	3.613**	11.488**	3.789***
	[1.628]	[1.916]	[1.484]	[4.513]	[2.597]	[4.308]	[2.480]	[2.080]	[1.960]	[4.754]	[1.483]	[4.688]	[1.454]
Obs	2,121	1,665	1,394	1,803	1,527	1,665	1,394	1,582	1,458	1,582	1,458	1,582	1,458
R-squared	0.218	0.220	0.678	0.394	0.681	0.364	0.688	0.246	0.705	0.264	0.769	0.265	0.769

Robust standard errors in brackets *** p<0.01, ** p<0.05, * p<0.1

Table 3 presents the estimated coefficients from the estimation of eq. (1) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways

clusters and are reported below each coefficient in round brackets. P-values are reported in brackets []. The dependent variable, $STOCKS_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{i,t})$ is the size of the stock markets of country i at time t , $\ln(SIZE_{j,t})$ is the size of the stock markets of country j at time t , $Return_{i,t}$ is a variable of returns on the stock markets that approximates the cost of capital in the country i at time t , $return_{j,t}$ is a variable of returns on stock markets that approximates the cost of capital in the country j at time t , $GEQ_{i,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $GEQ_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_CL_{j,t}$ equals one if the partner countries j has the common law as a legal system, INE_{it} is a measure of inequality in country i at time t , INE_{jt} is a measure of wealth and income inequalities in country j at time t .

Table 4. Results for debt flows

contig	0.172	0.091	0.136	0.173	0.234	0.188	0.255	0.167	0.226	-0.000	0.090	0.002	0.093
	[0.193]	[0.177]	[0.158]	[0.176]	[0.168]	[0.186]	[0.174]	[0.197]	[0.188]	[0.236]	[0.242]	[0.236]	[0.242]
Ldistcap	-0.524***	-0.455***	-0.305***	-0.493***	-0.357***	-0.517***	-0.348***	-0.537***	-0.321**	-0.674***	-0.458**	-0.674***	-0.458**
	[0.122]	[0.121]	[0.118]	[0.107]	[0.118]	[0.118]	[0.128]	[0.134]	[0.136]	[0.177]	[0.198]	[0.178]	[0.198]
Size_R	0.621***	0.521***	0.558***	0.627***	0.667***	0.643***	0.675***	0.596***	0.627***	0.591***	0.624***	0.591***	0.624***
	[0.077]	[0.092]	[0.093]	[0.084]	[0.086]	[0.088]	[0.090]	[0.088]	[0.096]	[0.074]	[0.079]	[0.074]	[0.080]
Size_P	0.790***	0.804***	0.757***	0.742***	0.713***	0.761***	0.722***	0.827***	0.760***	0.843***	0.780***	0.843***	0.780***
	[0.046]	[0.062]	[0.053]	[0.038]	[0.038]	[0.047]	[0.046]	[0.048]	[0.049]	[0.049]	[0.047]	[0.049]	[0.047]
Returns_R			-0.002		0.001		0.001		0.001		0.010***		0.010***
			[0.004]		[0.004]		[0.004]		[0.004]		[0.004]		[0.004]
Returns_P			0.003		-0.001		-0.001		0.001		-0.004		-0.004
			[0.005]		[0.004]		[0.004]		[0.004]		[0.004]		[0.004]
ifi_R			0.002***		0.002***		0.002***		0.002***		0.002***		0.002***
			[0.000]		[0.000]		[0.000]		[0.001]		[0.000]		[0.000]
ifi_P			0.000		0.000		0.001		0.001		0.000		0.000
			[0.000]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
leg_cl_P			-0.244		0.060		0.159		-0.151		-0.062		-0.063
			[0.149]		[0.184]		[0.227]		[0.162]		[0.120]		[0.120]
wealth10_R		1.265**	1.324**										
		[0.606]	[0.672]										
wealth10_P		0.223	0.061										
		[0.374]	[0.395]										
wealth90_R				0.507***	0.374***								
				[0.078]	[0.060]								
wealth90_P				-0.085	-0.163								
				[0.102]	[0.102]								
wlth_sprd_R						0.317***	0.211***						
						[0.066]	[0.061]						
wlth_sprd_P						-0.088	-0.185*						
						[0.098]	[0.110]						
inc10_R								0.084	1.084				
								[1.287]	[1.291]				
inc10_P								2.321	3.290**				
								[1.794]	[1.425]				
inc90_R										0.107***	0.103***		
										[0.032]	[0.030]		
inc90_P										-0.005	-0.021		
										[0.033]	[0.029]		
inc_sprd_R												0.105***	0.101***
												[0.032]	[0.030]
inc_sprd_P												-0.005	-0.021
												[0.033]	[0.028]
Constant	8.316***	9.298***	8.308***	6.205***	6.221***	6.964***	6.957***	7.351***	5.588***	5.538***	4.970***	5.655***	5.091***
	[1.302]	[1.409]	[1.476]	[1.333]	[1.524]	[1.406]	[1.606]	[1.930]	[2.009]	[1.476]	[1.249]	[1.446]	[1.227]
Obs	2,251	1,656	1,491	1,788	1,623	1,656	1,491	1,641	1,218	1,641	1,218	1,641	1,218
R-squared	0.772	0.766	0.782	0.783	0.792	0.774	0.782	0.795	0.780	0.801	0.808	0.801	0.807

Table 4 presents the estimated coefficients from the estimation of eq. (1) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways

clusters and reported below each coefficient in round brackets. P-values are reported in brackets []. The dependent variable, $BONDS_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{i,t})$ is the size of the bond markets of country i at time t , $\ln(SIZE_{j,t})$ is the size of the bond markets of country j at time t , $Return_{i,t}$ is a variable of returns on bond markets that approximates the cost of capital in the country i at time t , $Return_{j,t}$ is a variable of returns on bond markets that approximates the cost of capital in the country j at time t , $IFI_{i,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_CL_{j,t}$ equals one if the partner countries j has the common law as a legal system, INE_{it} is a measure of inequality in country i at time t , INE_{jt} is a measure of wealth and income inequalities in country j at time t .

Table 5. Results for FDI flows

contig	-0.600	-0.588	-0.382	-0.693*	-0.335	-0.643*	-0.356	-0.625	-0.398	-0.491	-0.087	-0.492	-0.088
	[0.369]	[0.394]	[0.279]	[0.381]	[0.270]	[0.378]	[0.266]	[0.399]	[0.282]	[0.398]	[0.275]	[0.398]	[0.275]
Ldistcap	-1.256***	-1.359***	-1.121***	-1.412***	-0.978***	-1.399***	-0.980***	-1.285***	-0.993***	-1.141***	-0.755***	-1.142***	-0.755***
	[0.199]	[0.229]	[0.165]	[0.230]	[0.146]	[0.235]	[0.154]	[0.232]	[0.165]	[0.204]	[0.141]	[0.205]	[0.142]
Size_R	0.496***	0.514***	0.695***	0.475***	0.602***	0.479***	0.586***	0.473***	0.601***	0.455***	0.602***	0.455***	0.601***
	[0.061]	[0.095]	[0.076]	[0.066]	[0.062]	[0.067]	[0.061]	[0.063]	[0.064]	[0.066]	[0.065]	[0.066]	[0.065]
Size_P	0.460***	0.492***	0.465***	0.446***	0.513***	0.462***	0.513***	0.465***	0.495***	0.442***	0.490***	0.442***	0.490***
	[0.067]	[0.104]	[0.080]	[0.075]	[0.059]	[0.078]	[0.060]	[0.079]	[0.065]	[0.076]	[0.064]	[0.076]	[0.064]
Returns_R			0.003*		0.002		0.002		0.003*		0.003*		0.003*
			[0.002]		[0.002]		[0.002]		[0.002]		[0.002]		[0.002]
Returns_P			0.000		0.001		0.001		0.000		-0.000		-0.000
			[0.002]		[0.002]		[0.002]		[0.002]		[0.002]		[0.002]
geq_R			0.009***		0.009***		0.008***		0.009***		0.009***		0.009***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
geq_P			0.006***		0.008***		0.008***		0.006***		0.007***		0.007***
			[0.001]		[0.002]		[0.002]		[0.002]		[0.002]		[0.002]
leg_cl_P			1.091**		1.473***		1.664***		0.845**		1.013***		1.011***
			[0.486]		[0.473]		[0.549]		[0.381]		[0.335]		[0.335]
wealth10_R		-1.029	-1.413*										
		[0.961]	[0.789]										
wealth10_P		-0.899	0.314										
		[1.040]	[0.789]										
wealth90_R				0.384	-0.085								
				[0.270]	[0.319]								
wealth90_P				0.387	-0.421**								
				[0.239]	[0.205]								
wth_sprd_R						0.355	0.030						
						[0.233]	[0.284]						
wth_sprd_P						0.345	-0.421**						
						[0.217]	[0.212]						
inc10_R								-1.434	2.386				
								[2.176]	[2.856]				
inc10_P								-2.939*	-0.653				
								[1.674]	[2.267]				
inc90_R										-0.042	-0.112**		
										[0.044]	[0.047]		
inc90_P										-0.018	-0.088**		
										[0.044]	[0.042]		
inc_sprd_R												-0.041	-0.111**
												[0.043]	[0.047]
inc_sprd_P												-0.017	-0.086**
												[0.044]	[0.042]
Constant	6.586***	6.379***	2.278	3.752*	4.841**	3.711*	4.487*	8.592***	1.846	8.557***	7.352***	8.472***	7.199***
	[1.452]	[1.867]	[1.679]	[2.100]	[2.267]	[2.167]	[2.310]	[2.140]	[1.976]	[2.189]	[1.891]	[2.156]	[1.875]
Obs	4,195	2,937	2,259	3,289	2,559	2,937	2,259	2,725	2,483	2,725	2,483	2,725	2,483
R-squared	0.261	0.261	0.504	0.267	0.516	0.266	0.508	0.264	0.492	0.253	0.506	0.253	0.505

Table 5 presents the estimated coefficients from the estimation of eq. (1) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in round brackets. P-values are reported in brackets []. The dependent variable, $FDI_{i,j,t}$, are

portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{i,t})$ is the market value size of the financial markets of country i at time t , $\ln(SIZE_{j,t})$ is the market value size of the financial markets of country j at time t , $Return_{i,t}$ is a variable of returns on financial markets that approximates the cost of capital in the country i at time t , $Return_{j,t}$ is a variable of returns on financial markets that approximates the cost of capital in the country j at time t , $GEQ_{i,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $GEQ_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_CL_{j,t}$ equals one if the partner countries j has the common law as a legal system, $INE_{i,t}$ is a measure of inequality in country i at time t , $INE_{j,t}$ is a measure of wealth and income inequalities in country j at time t .

Table 6. Results for cross-border loans

contig	0.599*	0.713**	0.866***	0.420	0.778***	0.532*	0.740***	0.696*	0.883***	0.550	0.905***	0.550	0.903***
	[0.327]	[0.343]	[0.249]	[0.286]	[0.240]	[0.278]	[0.221]	[0.381]	[0.305]	[0.353]	[0.337]	[0.354]	[0.337]
Ldistcap	-0.660***	-0.658***	-0.429***	-0.839***	-0.477***	-0.804***	-0.494***	-0.615***	-0.451**	-0.655***	-0.395	-0.657***	-0.396
	[0.165]	[0.171]	[0.163]	[0.195]	[0.165]	[0.187]	[0.152]	[0.200]	[0.215]	[0.200]	[0.274]	[0.200]	[0.275]
TotCredit_R	0.982***	1.028***	1.086***	0.956***	0.846***	0.980***	0.878***	0.967***	0.842***	0.931***	0.820***	0.931***	0.820***
	[0.132]	[0.132]	[0.130]	[0.119]	[0.125]	[0.106]	[0.106]	[0.137]	[0.123]	[0.124]	[0.126]	[0.124]	[0.126]
TotCredit_P	0.378***	0.385***	0.563***	0.373***	0.555***	0.382***	0.538***	0.336***	0.516***	0.358***	0.521***	0.358***	0.521***
	[0.069]	[0.096]	[0.076]	[0.073]	[0.072]	[0.074]	[0.071]	[0.077]	[0.076]	[0.076]	[0.079]	[0.076]	[0.079]
ifi_R			0.007		0.026**		0.028***		0.005		0.025		0.025
			[0.016]		[0.011]		[0.011]		[0.020]		[0.017]		[0.017]
ifi_P			0.005***		0.005***		0.004***		0.004***		0.005***		0.005***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
leg_cl_P			0.764**		1.047*		0.837		1.053***		0.993**		0.990**
			[0.354]		[0.562]		[0.605]		[0.271]		[0.392]		[0.391]
lcr			-0.025		-0.064		-0.049		-0.071		-0.058		-0.058
			[0.041]		[0.043]		[0.043]		[0.050]		[0.053]		[0.053]
nplR			-0.111***		-0.057***		-0.052***		-0.076***		-0.058**		-0.058**
			[0.029]		[0.021]		[0.017]		[0.025]		[0.024]		[0.025]
nplP			0.015		0.016		0.017		0.011		0.021		0.021
			[0.011]		[0.021]		[0.018]		[0.012]		[0.018]		[0.018]
wealth10_R		-0.434	-3.184***										
		[0.726]	[0.959]										
wealth10_P		-1.118*	-0.704										
		[0.588]	[0.602]										
wealth90_R				0.644***	0.589**								
				[0.225]	[0.239]								
wealth90_P				0.553**	-0.100								
				[0.220]	[0.275]								
wlth_sprd_R						0.648***	0.709***						
						[0.214]	[0.212]						
wlth_spad_P						0.513***	0.032						
						[0.153]	[0.249]						
inc10_R								-2.132	-2.336				
								[2.531]	[2.997]				
inc10_P								-4.318**	-3.333				
								[2.022]	[2.936]				
inc90_R									0.078*	0.057			
									[0.042]	[0.052]			
inc90_P									0.056	-0.018			
									[0.040]	[0.065]			
inc_sprd_R												0.077*	0.056
												[0.041]	[0.051]
inc_sprd_P												0.057	-0.017
												[0.040]	[0.064]
Constant	-6.666***	-7.642***	-12.65***	-11.62***	-11.37***	-12.28***	-12.93***	-3.886	-5.938*	-9.986***	-9.692***	-9.929***	-9.681***
	[1.958]	[2.099]	[2.152]	[1.735]	[1.797]	[2.009]	[1.977]	[2.749]	[3.602]	[2.064]	[2.110]	[2.049]	[2.073]
Obs	2,556	1,734	1,298	1,877	1,415	1,734	1,298	1,587	1,211	1,587	1,211	1,587	1,211
R-squared	0.458	0.474	0.597	0.458	0.567	0.478	0.567	0.474	0.574	0.477	0.589	0.476	0.589

Table 6 presents the estimated coefficients from the estimation of eq. (2) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneyro (2006). Robust standard error are calculated using two-ways clusters and are reported under each coefficient. P-values are reported in brackets []. The dependent variable, $CBL_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j , $\ln(TotCredit_{i,t})$ is total credit to non-financial corporations, households and non-profit institutions serving households of country i at time t , $\ln(TotCredit_{j,t})$ is total credit to non-financial corporations, households and non-profit institutions serving households of country j at time t , $IFI_{i,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_CL_{j,t}$ equals one if the partner countries j has the common law as a legal system, lcr is a dummy that represents the common macroprudential measure on liquidity at a European level, $npl_{i,t}$ is the non-performing loans ratio in the country i at time t , $npl_{j,t}$ is the non-performing loans ratio in the country j at time t , INE_{it} is a measure of inequality in country i at time t , INE_{jt} is a measure of wealth and income inequalities in country j at time t .

Table 7 Results for portfolio flows for a model with both country-years fixed effects

	AV	D	AV	D	AV	D	AV	D	AV	D	AV	D	
contig	0.176 [0.123]	0.152 [0.129]	0.179 [0.122]	0.195 [0.120]	0.173 [0.120]	0.188 [0.124]	0.174 [0.118]	0.205 [0.139]	0.175 [0.122]	0.151 [0.144]	0.174 [0.122]	0.150 [0.144]	0.175 [0.122]
Ldistcap	-0.254** [0.118]	-0.238* [0.132]	-0.256** [0.118]	-0.206 [0.127]	-0.258** [0.114]	-0.180 [0.148]	-0.259** [0.114]	-0.197 [0.141]	-0.255** [0.117]	-0.211 [0.143]	-0.253** [0.117]	-0.211 [0.143]	-0.254** [0.118]
wealth10_sprd		-0.506 [0.367]	0.056 [0.108]										
wealth90_sprd				0.201* [0.114]	-0.217 [0.141]								
wealth_sprd						0.131 [0.116]	-0.247* [0.142]						
inc10_sprd								-3.629*** [1.229]	0.016 [0.081]				
ince90_sprd										-0.004 [0.022]	-0.045 [0.093]		
inc_sprd												-0.005 [0.022]	-0.033 [0.094]
Constant	13.004*** [0.810]	13.060*** [0.889]	12.986*** [0.816]	12.547*** [0.904]	13.135*** [0.775]	12.470*** [1.041]	13.162*** [0.770]	12.867*** [0.947]	13.001*** [0.812]	12.853*** [0.974]	13.025*** [0.797]	12.860*** [0.973]	13.019*** [0.798]
Obs	5,264	3,439	5,264	3,849	5,264	3,439	5,264	3,393	5,264	3,393	5,264	3,393	5,264
r2_p	0.957	0.948	0.957	0.948	0.958	0.949	0.958	0.956	0.957	0.955	0.957	0.955	0.957

Table 7 presents the results for the gravity model estimation from eq.(6) where the dependent variables are $PT_{i,j,t}$. The first column represents the baseline model without any social fragmentation variables. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in round brackets. The dependent variable, $PT_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j . From column 2 to 13, the model is estimated with a measure of segmentation ranging from: the spread in the first decile of the wealth distribution between the partner and the reporting country (wealth10_sprd), the spread in the last decile of the wealth distribution between the partner and the reporting country (wealth90_sprd), the spread between the difference between the richest and poorest wealth deciles between the partner and the reporting country (wealth_sprd), the spread in the first decile of the income distribution between the partner and the reporting country (income10_sprd), the spread in the last decile of the income distribution between the partner and the reporting country (income90_sprd), the spread between the difference between the richest and poorest income deciles between the partner and the reporting country (income_sprd). To avoid perfect multicollinearity, for each measure, the first column reports the results using the absolute value of the spread (AV) and the second column represents a dummy variable equals to 1 when the spread is positive, that is when the measure for the partner is higher than for the reporting country.

Table 8 Results for equity flows for a model with both country-years fixed effects

	AV	D	AV	D	AV	D	AV	D	AV	D	AV	D	
contig	0.417*	0.335	0.407*	0.407	0.418*	0.384	0.418*	0.393*	0.431*	0.325	0.405**	0.325	0.409**
	[0.235]	[0.243]	[0.233]	[0.250]	[0.241]	[0.248]	[0.238]	[0.228]	[0.229]	[0.234]	[0.202]	[0.234]	[0.202]
Ldistcap	0.020	-0.078	0.010	0.031	0.019	-0.025	0.019	-0.001	0.021	-0.018	0.016	-0.020	0.017
	[0.183]	[0.202]	[0.181]	[0.189]	[0.182]	[0.192]	[0.183]	[0.195]	[0.178]	[0.185]	[0.172]	[0.185]	[0.171]
wealth10_sprd	-1.343**	-0.233											
	[0.565]	[0.162]											
wealth90_sprd			-0.032	0.007									
			[0.229]	[0.179]									
wealth_sprd					-0.209	0.014							
					[0.230]	[0.168]							
inc10_sprd							-3.904	0.286**					
							[3.028]	[0.126]					
inc90_sprd									-0.099**	-0.497***			
									[0.041]	[0.147]			
inc_sprd											-0.099**	-0.508***	
											[0.041]	[0.145]	
Constant	24.472***	25.385***	24.632***	24.440***	24.472***	24.951***	24.471***	24.852***	24.308***	25.177***	24.744***	25.189***	24.742***
	[1.229]	[1.383]	[1.235]	[1.322]	[1.227]	[1.365]	[1.229]	[1.318]	[1.201]	[1.243]	[1.139]	[1.243]	[1.129]
Observations	2,310	1,720	2,310	1,863	2,310	1,720	2,310	1,726	2,310	1,726	2,310	1,726	2,310
r2_p	0.977	0.976	0.978	0.975	0.977	0.975	0.977	0.976	0.978	0.977	0.979	0.977	0.979

Table 8 presents the results for the gravity model estimation from eq.(6) where the dependent variables are . The first column represents the baseline model without any social fragmentation variables. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in round brackets []. The dependent variable, $EQUITY_{i,j,t}$, are equity stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j . From column 2 to 13, the model is estimated with a measure of segmentation ranging from: the spread in the first decile of the wealth distribution between the partner and the reporting country (wealth10_sprd), the spread in the last decile of the wealth distribution between the partner and the reporting country (wealth90_sprd), the spread between the difference between the richest and poorest wealth deciles between the partner and the reporting country (wealth_sprd), the spread in the first decile of the income distribution between the partner and the reporting country (income10_sprd), the spread between the difference between the richest and poorest income deciles between the partner and the reporting country (income_sprd). To avoid perfect multicollinearity, for each measure, the first column reports the results using the absolute value of the spread (AV) and the second column represents a dummy variable equals to 1 when the spread is positive, that is when the measure for the partner is higher than for the reporting country.

Table 9 Results for debt flows for a model with both country-years fixed effects

	AV	D	AV	D	AV	D	AV	D	AV	D	AV	D	
contig	0.106 [0.080]	0.092 [0.085]	0.109 [0.078]	0.115 [0.082]	0.091 [0.070]	0.103 [0.080]	0.083 [0.065]	0.163** [0.077]	0.103 [0.069]	0.129* [0.071]	0.104 [0.079]	0.129* [0.071]	0.105 [0.080]
Ldistcap	-0.334*** [0.100]	-0.326*** [0.103]	-0.339*** [0.099]	-0.325*** [0.101]	-0.338*** [0.097]	-0.323*** [0.102]	-0.339*** [0.091]	-0.309*** [0.100]	-0.352*** [0.095]	-0.314*** [0.098]	-0.330*** [0.100]	-0.314*** [0.098]	-0.333*** [0.101]
wealth10_sprd	-0.494** [0.233]	0.079 [0.090]											
wealth90_sprd			0.104 [0.083]	-0.319*** [0.114]									
wealth_sprd					-0.105 [0.113]	-0.515*** [0.113]							
inc10_sprd							-1.306 [1.351]	-0.196*** [0.069]					
inc90_sprd									-0.041*** [0.016]	-0.032 [0.057]			
inc_sprd												-0.041*** [0.016]	-0.008 [0.056]
Constant	27.236*** [0.680]	27.311*** [0.718]	27.234*** [0.673]	27.113*** [0.700]	27.355*** [0.666]	27.283*** [0.701]	27.417*** [0.619]	27.103*** [0.682]	27.473*** [0.651]	27.242*** [0.668]	27.227*** [0.680]	27.245*** [0.667]	27.234*** [0.682]
Obs	2,450	1,815	2,450	1,919	2,450	1,815	2,450	1,800	2,450	1,800	2,450	1,800	2,450
r2_p	0.973	0.968	0.974	0.968	0.975	0.968	0.977	0.973	0.974	0.974	0.973	0.974	0.973

Table 9 presents the results for the gravity model estimation from eq.(6) where the dependent variables are $Bonds_{i,j,t}$. The first column represents the baseline model without any social fragmentation variables. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in round brackets []. The dependent variable, $Bonds_{i,j,t}$, are bonds stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j . From column 2 to 13, the model is estimated with a measure of segmentation ranging from: the spread in the first decile of the wealth distribution between the partner and the reporting country (wealth10_sprd), the spread in the last decile of the wealth distribution between the partner and the reporting country (wealth90_sprd), the spread between the difference between the richest and poorest wealth deciles between the partner and the reporting country (wealth_sprd), the spread in the first decile of the income distribution between the partner and the reporting country (income10_sprd), the spread in the last decile of the income distribution between the partner and the reporting country (income90_sprd), the spread between the difference between the richest and poorest income deciles between the partner and the reporting country (income_sprd). To avoid perfect multicollinearity, for each measure, the first column reports the results using the absolute value of the spread (AV) and the second column represents a dummy variable equals to 1 when the spread is positive, that is when the measure for the partner is higher than for the reporting country.

Table 10 Results for FDI for a model with both country-years fixed effects

	AV	D	AV	D	AV	D	AV	D	AV	D	AV	D	
contig	0.459***	0.433***	0.467***	0.452***	0.457***	0.409**	0.456***	0.471**	0.449***	0.474**	0.450***	0.474**	0.452***
	[0.160]	[0.166]	[0.165]	[0.156]	[0.161]	[0.165]	[0.161]	[0.202]	[0.159]	[0.192]	[0.158]	[0.192]	[0.158]
Ldistcap	-0.405*	-0.216	-0.407**	-0.376*	-0.405*	-0.260	-0.405*	-0.302	-0.416**	-0.300	-0.403**	-0.300	-0.403**
	[0.212]	[0.251]	[0.207]	[0.216]	[0.213]	[0.229]	[0.212]	[0.266]	[0.212]	[0.263]	[0.198]	[0.263]	[0.198]
wealth10_sprd	-1.979***	0.136											
	[0.701]	[0.264]											
wealth90_sprd			-0.176	-0.054									
			[0.205]	[0.267]									
wealth_sprd					-0.268	-0.088							
					[0.179]	[0.281]							
inc10_sprd							0.253	0.104					
							[2.717]	[0.150]					
inc90_sprd									0.013	-0.412*			
									[0.033]	[0.215]			
inc_sprd											0.011	-0.413*	
											[0.033]	[0.215]	
Constant	13.524***	12.741***	13.461***	13.529***	13.553***	12.951***	13.575***	12.980***	13.548***	12.932***	13.752***	12.939***	13.751***
	[1.371]	[1.588]	[1.370]	[1.386]	[1.339]	[1.473]	[1.339]	[1.676]	[1.366]	[1.662]	[1.283]	[1.662]	[1.279]
Obs	4,731	3,106	4,731	3,478	4,731	3,106	4,731	3,075	4,731	3,075	4,731	3,075	4,731
r2_p	0.892	0.887	0.892	0.883	0.892	0.885	0.892	0.891	0.892	0.891	0.894	0.891	0.894

Table 10 presents the results for the gravity model estimation from eq.(6) where the dependent variables are . The first column represents the baseline model without any social fragmentation variables. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in round brackets []. The dependent variable, $FDI_{i,j,t}$, are the foreign direct investment stocks from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j . From column 2 to 13, the model is estimated with a measure of segmentation ranging from: the spread in the first decile of the wealth distribution between the partner and the reporting country (wealth10_sprd), the spread in the last decile of the wealth distribution between the partner and the reporting country (wealth90_sprd), the spread between the difference between the richest and poorest wealth deciles between the partner and the reporting country (wealth_sprd), the spread in the first decile of the income distribution between the partner and the reporting country (income10_sprd), the spread in the last decile of the income distribution between the partner and the reporting country (income90_sprd), the spread between the difference between the richest and poorest income deciles between the partner and the reporting country (income_sprd). To avoid perfect multicollinearity, for each measure, the first column reports the results using the absolute value of the spread (AV) and the second column represents a dummy variable equals to 1 when the spread is positive, that is when the measure for the partner is higher than for the reporting country.

Table 11 Results for cross-border loans flows for a model with both country-years fixed effects

	AV	D	AV	D	AV	D	AV	D	AV	D	AV	D	
contig	0.609***	0.669***	0.617***	0.610***	0.650***	0.609***	0.666***	0.840***	0.677***	0.727***	0.602***	0.729***	0.603***
	[0.195]	[0.206]	[0.193]	[0.201]	[0.190]	[0.201]	[0.191]	[0.237]	[0.200]	[0.219]	[0.185]	[0.218]	[0.186]
Ldistcap	-0.980***	-0.943***	-0.971***	-0.963***	-0.961***	-0.954***	-0.939***	-1.085***	-0.937***	-1.119***	-0.985***	-1.119***	-0.984***
	[0.172]	[0.184]	[0.166]	[0.196]	[0.152]	[0.218]	[0.154]	[0.232]	[0.176]	[0.213]	[0.160]	[0.212]	[0.161]
wealth10_sprd	1.735**	0.415**											
	[0.845]	[0.206]											
wealth90_sprd			0.082	-0.517***									
			[0.157]	[0.184]									
wealth_sprd					0.117	-0.522***							
					[0.154]	[0.189]							
inc10_sprd							-4.703	-0.417**					
							[2.924]	[0.205]					
inc90_sprd									-0.045	0.375**			
									[0.034]	[0.170]			
inc_sprd											-0.048	0.345*	
											[0.034]	[0.178]	
Constant	15.200***	14.722***	14.95***	15.091***	15.33***	15.031***	15.18***	16.084***	15.1***	16.289***	15.02***	16.298***	15.03***
	[1.206]	[1.267]	[1.181]	[1.411]	[1.073]	[1.546]	[1.082]	[1.571]	[1.190]	[1.476]	[1.128]	[1.471]	[1.135]
Obs	2,691	1,809	2,691	1,959	2,691	1,809	2,691	1,656	2,691	1,656	2,691	1,656	2,691
r2_p	0.910	0.902	0.912	0.901	0.913	0.899	0.913	0.916	0.911	0.915	0.911	0.915	0.911

Table 11 presents the results for the gravity model estimation from eq.(6) where the dependent variables are $CBL_{i,j,t}$. The first column represents the baseline model without any social fragmentation variables. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in round brackets []. The dependent variable, $CBL_{i,j,t}$, are the cross border loans from country i to country j at time t . The explanatory variables are: $CONTIG_{ij}$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{ij})$ the logarithm of the distance between the capitals of country i and country j . From column 2 to 13, the model is estimated with a measure of segmentation ranging from: the spread in the first decile of the wealth distribution between the partner and the reporting country (wealth10_sprd), the spread in the last decile of the wealth distribution between the partner and the reporting country (wealth90_sprd), the spread between the difference between the richest and poorest wealth deciles between the partner and the reporting country (wealth_sprd), the spread in the first decile of the income distribution between the partner and the reporting country (income10_sprd), the spread in the last decile of the income distribution between the partner and the reporting country (income90_sprd), the spread between the difference between the richest and poorest income deciles between the partner and the reporting country (income_sprd). To avoid perfect multicollinearity, for each measure, the first column reports the results using the absolute value of the spread (AV) and the second column represents a dummy variable equals to 1 when the spread is positive, that is when the measure for the partner is higher than for the reporting country.

Table A.1. Results for portfolio flows with reporting country fixed effects

Contig	0.104	0.139	0.105	0.043	0.127	0.082	0.116	0.085	0.107	-0.061	0.062	-0.060	0.062
	[0.152]	[0.159]	[0.122]	[0.162]	[0.123]	[0.162]	[0.124]	[0.163]	[0.121]	[0.186]	[0.134]	[0.186]	[0.134]
$\ln(DIST)$	-0.491***	-0.491***	-0.241***	-0.537***	-0.203**	-0.527***	-0.195**	-0.530***	-0.181**	-0.632***	-0.229**	-0.633***	-0.228**
	[0.105]	[0.097]	[0.089]	[0.124]	[0.080]	[0.120]	[0.086]	[0.134]	[0.090]	[0.167]	[0.103]	[0.167]	[0.103]
$\ln(SIZE_{P,t})$	0.628***	0.619***	0.835***	0.624***	0.805***	0.627***	0.810***	0.604***	0.804***	0.615***	0.807***	0.615***	0.807***
	[0.070]	[0.087]	[0.049]	[0.070]	[0.038]	[0.072]	[0.042]	[0.073]	[0.044]	[0.066]	[0.043]	[0.066]	[0.043]
$Return_{P,t}$			0.010***		0.009***		0.010***		0.010***		0.009***		0.009***
			[0.002]		[0.002]		[0.002]		[0.002]		[0.002]		[0.002]
IFI_P			0.005***		0.006***		0.006***		0.005***		0.005***		0.005***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.000]		[0.000]
leg			0.231**		0.454***		0.450***		0.335***		0.321***		0.322***
			[0.111]		[0.147]		[0.173]		[0.095]		[0.102]		[0.102]
wealth10_P		-0.379	-0.370										
		[0.271]	[0.245]										
wealth90_P				0.375***	-0.071								
				[0.130]	[0.079]								
wlth_sprd_P						0.317***	-0.056						
						[0.096]	[0.079]						
inc10_P								-1.168	0.490				
								[1.041]	[0.764]				
inc90_P										0.071**	0.014		
										[0.032]	[0.019]		
inc_sprd_P												0.070**	0.014
												[0.031]	[0.019]
Constant	5.504***	5.569***	0.517	3.780***	1.126	3.947***	0.921	6.518***	0.438	4.361***	0.439	4.419***	0.453
	[1.570]	[1.708]	[0.833]	[1.260]	[0.788]	[1.361]	[0.810]	[1.975]	[0.889]	[1.246]	[0.830]	[1.254]	[0.828]
Obs	4,415	3,722	3,038	3,969	3,285	3,722	3,038	3,540	2,852	3,540	2,852	3,540	2,852
r2_p	0.849	0.839	0.933	0.853	0.932	0.852	0.933	0.836	0.930	0.845	0.930	0.845	0.930

Table A.1 presents the estimated coefficients from the estimation of eq. (5) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in brackets []. Statistical significance is denoted with one two or three stars to denote significance at 10, 5 and 1% respectively. The dependent variable, $PT_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST)$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{P,t})$ is the market value size of the financial markets (stocks and bonds) of the partner country at time t , $Return_{P,t}$ returns on financial markets that approximates the cost of capital in the reporting country at time t , $IFI_{P,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_{-j,t}$ equals one if both reporting and partner countries share the same legal system, INE_{it} is a measure of inequality in the reporting country at time t .

Table A.2. Results for equity flows with reporting country fixed effects

Contig	1.082**	1.195**	0.701***	0.964*	0.595**	1.112**	0.586**	0.949*	0.594***	0.511	0.269	0.509	0.269
	[0.531]	[0.477]	[0.245]	[0.508]	[0.254]	[0.527]	[0.249]	[0.492]	[0.229]	[0.489]	[0.265]	[0.488]	[0.265]
$\ln(DIST)$	-0.505**	-0.544**	0.010	-0.719***	-0.049	-0.655***	-0.041	-0.608***	-0.094	-0.833***	-0.264	-0.836***	-0.266
	[0.215]	[0.239]	[0.137]	[0.240]	[0.147]	[0.231]	[0.149]	[0.207]	[0.122]	[0.197]	[0.169]	[0.197]	[0.169]
$\ln(SIZE_{p,t})$	0.284*	0.306*	0.767***	0.297**	0.767***	0.313**	0.756***	0.282*	0.776***	0.331***	0.784***	0.331***	0.784***
	[0.161]	[0.186]	[0.085]	[0.133]	[0.090]	[0.132]	[0.089]	[0.147]	[0.085]	[0.116]	[0.076]	[0.116]	[0.076]
$Return_{p,t}$			0.010***		0.009***		0.009***		0.010***		0.008***		0.008***
			[0.002]		[0.001]		[0.001]		[0.002]		[0.001]		[0.001]
IFI_p			0.016***		0.015***		0.015***		0.016***		0.015***		0.015***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
leg			1.160***		0.879***		0.695**		1.211***		1.000***		1.002***
			[0.205]		[0.275]		[0.326]		[0.153]		[0.164]		[0.164]
wealth10_P		-1.726**	-0.132										
		[0.837]	[0.434]										
wealth90_P				1.287***	0.254								
				[0.332]	[0.178]								
wth_sprd_P						1.044***	0.279*						
						[0.263]	[0.167]						
inc10_P								-6.041**	-2.790**				
								[2.613]	[1.305]				
inc90_P										0.198***	0.109***		
										[0.045]	[0.032]		
inc_sprd_P												0.196***	0.108***
												[0.044]	[0.032]
Constant	23.20***	22.90***	12.96***	17.10***	12.03***	17.67***	11.98***	26.14***	14.58***	18.51***	11.23***	18.65***	11.31***
	[2.079]	[2.177]	[1.272]	[2.085]	[1.255]	[1.939]	[1.208]	[2.815]	[1.446]	[1.700]	[1.001]	[1.689]	[0.997]
Obs	2,173	1,867	1,650	1,967	1,750	1,867	1,650	1,801	1,719	1,801	1,719	1,801	1,719
r2_p	0.664	0.665	0.935	0.761	0.937	0.752	0.937	0.663	0.938	0.706	0.946	0.706	0.946

Table A.2 presents the estimated coefficients from the estimation of eq. (5) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneyro (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in brackets []. Statistical significance is denoted with one two or three stars to denote significance at 10, 5 and 1% respectively. The dependent variable, $equity_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST)$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{p,t})$ is the market value size of the financial markets (stocks and bonds) of the partner country at time t , $Return_{p,t}$ returns on financial markets that approximates the cost of capital in the reporting country at time t , $IFI_{p,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_{-j,t}$ equals one if both reporting and partner countries share the same legal system, INE_{it} is a measure of inequality in the reporting country at time t .

Table A.3. Results for debt flows with reporting country fixed effects

Contig	-0.004	-0.004	-0.021	0.013	0.007	0.015	0.012	0.023	0.011	0.053	0.049	0.054	0.049
	[0.108]	[0.110]	[0.112]	[0.102]	[0.104]	[0.105]	[0.106]	[0.102]	[0.104]	[0.097]	[0.100]	[0.097]	[0.100]
$\ln(DIST)$	-0.278***	-0.261***	-0.220**	-0.267***	-0.223***	-0.260***	-0.213***	-0.280***	-0.212**	-0.286***	-0.231***	-0.285***	-0.230***
	[0.075]	[0.082]	[0.086]	[0.070]	[0.072]	[0.074]	[0.076]	[0.083]	[0.085]	[0.076]	[0.077]	[0.076]	[0.077]
$\ln(SIZE_{p,t})$	0.824***	0.808***	0.819***	0.810***	0.820***	0.808***	0.818***	0.819***	0.825***	0.818***	0.829***	0.818***	0.829***
	[0.037]	[0.044]	[0.046]	[0.041]	[0.043]	[0.043]	[0.044]	[0.038]	[0.041]	[0.038]	[0.041]	[0.038]	[0.041]
$Return_{p,t}$			-0.000		-0.001		-0.001		-0.003		-0.003		-0.003
			[0.004]		[0.003]		[0.004]		[0.004]		[0.003]		[0.003]
IFI_p			0.001**		0.001**		0.001**		0.001***		0.001***		0.001***
			[0.000]		[0.000]		[0.000]		[0.000]		[0.000]		[0.000]
leg			-0.122		-0.034		0.005		-0.107		-0.043		-0.044
			[0.110]		[0.131]		[0.161]		[0.078]		[0.078]		[0.078]
wealth10_P		0.128	0.096										
		[0.217]	[0.279]										
wealth90_P				-0.046	-0.076								
				[0.057]	[0.078]								
wth_sprd_P						-0.048	-0.085						
						[0.050]	[0.081]						
inc10_P								1.554*	1.996**				
								[0.864]	[0.889]				
inc90_P										-0.024	-0.029*		
										[0.016]	[0.016]		
inc_sprd_P												-0.024	-0.029*
												[0.016]	[0.016]
Constant	15.200**	15.312**	14.898**	15.566**	15.285**	15.558**	15.305**	14.667**	13.983**	16.031**	15.674**	16.018**	15.658**
	*	*	*	*	*	*	*	*	*	*	*	*	*
	[0.786]	[0.811]	[0.860]	[0.964]	[1.047]	[0.940]	[1.036]	[0.751]	[0.783]	[0.943]	[0.985]	[0.936]	[0.978]
Obs	2,277	1,928	1,807	2,026	1,905	1,928	1,807	1,825	1,543	1,825	1,543	1,825	1,543
r2_p	0.956	0.953	0.954	0.952	0.953	0.953	0.954	0.961	0.960	0.961	0.960	0.961	0.960

Table A.3 presents the estimated coefficients from the estimation of eq. (5) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in brackets []. Statistical significance is denoted with one two or three stars to denote significance at 10, 5 and 1% respectively. The dependent variable, $Bonds_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST)$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{p,t})$ is the market value size of the financial markets (stocks and bonds) of the partner country at time t , $Return_{p,t}$ returns on financial markets that approximates the cost of capital in the reporting country at time t , $IFI_{p,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_{-j,t}$ equals one if both reporting and partner countries share the same legal system, INE_{it} is a measure of inequality in the reporting country at time t .

Table A.4. Results for FDI flows with reporting country fixed effects

Contig	-0.283	-0.257	-0.108	-0.288	0.107	-0.283	0.052	-0.354	-0.103	-0.274	0.169	-0.275	0.167
	[0.300]	[0.299]	[0.359]	[0.317]	[0.300]	[0.316]	[0.307]	[0.314]	[0.362]	[0.319]	[0.308]	[0.319]	[0.309]
$\ln(DIST)$	-0.927***	-0.947***	-0.885***	-0.973***	-0.766***	-0.960***	-0.743***	-1.014***	-0.903***	-0.935***	-0.683***	-0.936***	-0.683***
	[0.184]	[0.206]	[0.229]	[0.198]	[0.182]	[0.205]	[0.185]	[0.202]	[0.210]	[0.184]	[0.173]	[0.184]	[0.173]
$\ln(SIZE_{p,t})$	0.392***	0.396***	0.478***	0.368***	0.549***	0.375***	0.561***	0.374***	0.486***	0.367***	0.500***	0.367***	0.500***
	[0.064]	[0.087]	[0.083]	[0.076]	[0.065]	[0.077]	[0.066]	[0.069]	[0.068]	[0.070]	[0.071]	[0.070]	[0.071]
$Return_{p,t}$			0.002		0.004*		0.005**		0.002		0.002		0.002
			[0.003]		[0.003]		[0.002]		[0.003]		[0.004]		[0.004]
IFI_p			0.006***		0.009***		0.009***		0.006***		0.007***		0.007***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
leg			1.008***		1.987***		2.280***		0.950***		1.123***		1.121***
			[0.368]		[0.364]		[0.415]		[0.265]		[0.233]		[0.234]
wealth10_P		-0.578	0.187										
		[0.727]	[0.811]										
wealth90_P				0.239	-0.713***								
				[0.187]	[0.184]								
wth_sprd_P						0.214	-0.723***						
						[0.161]	[0.184]						
inc10_P								-1.470	-0.121				
								[1.447]	[1.830]				
inc90_P										-0.014	-0.100***		
										[0.033]	[0.036]		
inc_sprd_P												-0.014	-0.099***
												[0.032]	[0.035]
Constant	11.96***	11.97***	10.25***	11.21***	12.31***	11.17***	12.14***	13.29***	10.29***	12.79***	11.78***	12.77***	11.70***
	[1.369]	[1.509]	[1.571]	[1.663]	[1.764]	[1.634]	[1.801]	[1.731]	[1.753]	[1.692]	[1.917]	[1.678]	[1.900]
Obs	4,387	3,688	3,253	3,927	3,492	3,688	3,253	3,543	3,374	3,543	3,374	3,543	3,374
r2_p	0.756	0.751	0.813	0.755	0.830	0.754	0.831	0.753	0.816	0.752	0.826	0.752	0.826

Table A.4 presents the estimated coefficients from the estimation of eq. (5) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in brackets []. Statistical significance is denoted with one two or three stars to denote significance at 10, 5 and 1% respectively. The dependent variable, $FDI_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST)$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{p,t})$ is the market value size of the financial markets (stocks and bonds) of the partner country at time t , $Return_{p,t}$ returns on financial markets that approximates the cost of capital in the reporting country at time t , $IFI_{p,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_{-j,t}$ equals one if both reporting and partner countries share the same legal system, INE_{it} is a measure of inequality in the reporting country at time t .

Table A.5. Results for cross-border loans with reporting country fixed effects

Contig	0.556*	0.668**	0.718***	0.481	0.682**	0.565*	0.664**	0.544*	0.654**	0.522	0.720**	0.520	0.718**
	[0.299]	[0.304]	[0.257]	[0.308]	[0.289]	[0.291]	[0.264]	[0.325]	[0.293]	[0.335]	[0.322]	[0.335]	[0.322]
$\ln(DIST_{i,j,t})$	-0.530***	-0.458**	-0.551***	-0.667***	-0.600***	-0.611***	-0.586***	-0.571***	-0.706***	-0.507**	-0.583**	-0.510**	-0.585**
	[0.176]	[0.179]	[0.177]	[0.246]	[0.216]	[0.228]	[0.197]	[0.195]	[0.239]	[0.222]	[0.266]	[0.222]	[0.267]
$\ln(SIZE_{p,t})$	0.375***	0.360***	0.588***	0.356***	0.591***	0.361***	0.574***	0.361***	0.590***	0.350***	0.586***	0.350***	0.586***
	[0.063]	[0.085]	[0.067]	[0.068]	[0.064]	[0.070]	[0.065]	[0.069]	[0.066]	[0.069]	[0.067]	[0.069]	[0.067]
$Return_{p,t}$			0.005***		0.005***		0.005***		0.005***		0.005***		0.005***
			[0.001]		[0.001]		[0.001]		[0.001]		[0.001]		[0.001]
IFI_p			0.865**		1.047**		0.907*		1.137***		1.026***		1.023***
			[0.386]		[0.512]		[0.545]		[0.290]		[0.382]		[0.382]
leg			0.017		0.022		0.022		0.010		0.023		0.023
			[0.012]		[0.020]		[0.018]		[0.013]		[0.020]		[0.020]
wealth10_P		-0.891*	-0.543										
		[0.466]	[0.589]										
wealth90_P				0.574***	-0.024								
				[0.221]	[0.281]								
wlth_sprd_P						0.506***	0.048						
						[0.153]	[0.240]						
inc10_P								-3.921***	-4.170*				
								[1.455]	[2.399]				
inc90_P										0.042	-0.007		
										[0.035]	[0.049]		
inc_sprd_P												0.042	-0.006
												[0.035]	[0.048]
Constant	6.905***	6.493***	3.630***	4.893***	4.093***	4.750***	3.868***	8.774***	6.196***	5.794***	4.125***	5.802***	4.099***
	[1.351]	[1.582]	[1.314]	[1.163]	[1.046]	[1.249]	[1.121]	[1.561]	[1.999]	[1.483]	[1.355]	[1.477]	[1.342]
Obs	2,555	2,141	1,800	2,247	1,890	2,141	1,800	2,112	1,753	2,112	1,753	2,112	1,753
r2_p	0.764	0.772	0.848	0.790	0.848	0.795	0.847	0.770	0.854	0.763	0.848	0.763	0.848

Table A.5 presents the estimated coefficients from the estimation of eq. (5) on the euro area economic partners. The model is estimated with the pseudo-maximum likelihood method presented in Santos Silva and Teneryo (2006). Robust standard errors are calculated using two-ways clusters and are reported below each coefficient in brackets []. Statistical significance is denoted with one two or three stars to denote significance at 10, 5 and 1% respectively. The dependent variable, $CBL_{i,j,t}$, are portfolio stocks from country i to country j at time t . The explanatory variables are: $CONTIG$ is a dummy variable that takes the value 1 if countries i and j share a common border, $\ln(DIST_{i,j,t})$ the logarithm of the distance between the capitals of country i and country j , $\ln(SIZE_{p,t})$ is the market value size of the financial markets (stocks and bonds) of the partner country at time t , $Return_{p,t}$ returns on financial markets that approximates the cost of capital in the reporting country at time t , $IFI_{p,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country i , $IFI_{j,t}$ is the Lane and Milesi-Ferreti (2007) indicator of financial openness in country j , $LEG_{-j,t}$ equals one if both reporting and partner countries share the same legal system, INE_{it} is a measure of inequality in the reporting country at time t .