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Globalization and international risk-sharing: do political and social factors matter more than economic integration?

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Keywords

International risk-sharing, globalization, social and political integration

JEL Classification

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Globalization and international risk-sharing: do political and social factors matter more than economic integration?

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1 Introduction

The globalization process is a controversial issue. For some time the economic literature has been investigating (theoretically and empirically) its consequences (in terms of risk-sharing, the composition of government expenditure, contagion effects etc.) on the global economy (and on the economy of groups of countries), reaching different results and conclusions. Our aim is to assess the effects of various aspects of globalization on international risk-sharing. The empirical literature, so far, has mainly focused on the economic and financial sides of globalization (i.e. financial and trade integration, leaving, virtually, all other aspects of integration).

The relevance of political integration has already been recognized as a determinant of growth and its volatility. If political ties can partly determine income pooling and facilitate international contracts enforcement, cultural integration may prove vital for successful cross-border mergers and acquisitions (M&A) which are one of the main components of foreign direct investments (FDI), a mean of income pooling. Moreover, politically and culturally integrated countries might reasonably share a more similar economic structure, which would enable them to pool risk among themselves. The aim of this work is to fill this gap in the literature by evaluating the impact of social and political globalization on the degree of risk-sharing on three groups of countries: Organization for Economic Cooperation and Development (OECD), European Monetary Union countries (EMU), and low and middle income (LMY) countries.[1] In fact, nothing is known about the impact of other non-economic aspects of globalization that might play a role in shaping risk-sharing opportunities, such as social and political integration, whereas economic integration has been consistently investigated. Within a strand of empirical literature, economic integration is widely recognized as having a positive effect on the degree of risk shared. In particular, in a context like the EMU, where the economic integration is high and there is a common currency, it might be the case that political and social integration exert a role as relevant as economic integration or might even be what really matters in improving risk-sharing,

[1] See the appendix for the list of countries.

since economic integration (usually measured by financial flows and measures of freedom of trade) is actually the result of political arrangements and social/cultural proximity. Thus the question is: if political and social globalization are taken into account, does economic integration still play a role or does it lose its relevance? We find that over the whole sample (1970–2010) for EMU and OECD countries, the marginal effect of economic integration on risk-sharing is not statistically different from zero, whereas social and/or political integration positively affect risk-sharing. In the globalization era (sub-sample 1990–2010), for EMU countries, this finding still holds true; for OECD countries, economic globalization recover significance, exerting a positive impact on the degree of insured risk. However, we find that the marginal effect of economic integration is of the same magnitude as that of political integration. LYM countries, in accordance with previous literature, do not seem to benefit from globalization in terms of improvements in risk-sharing. Moreover, we find consistent and robust evidence of the positive impact exerted by the degree of financial development for all groups of countries examined. The main claim of this paper is that it is not possible to investigate the consequences of globalization on international risk-sharing focusing only on the economic aspect of the integration, since it might provide misleading results and an undoubtedly incomplete picture. Globalization is a complex phenomenon that implies integration among countries in several manners and at different levels. All these aspects tell a different story about the phenomenon when analyzed and it is vital to take all of them into account. When this happens the new and very striking finding is the recognition of a more limited role of economic globalization (which so far has been at the center of economists' attention) and which might entail new policy implications.

The next section surveys the literature on globalization and risk-sharing. Section 3 discusses the role played by social and political integration on risk-sharing and the means through which their impact is exerted. Section 4 reviews the measures of economic, social and political globalization used in the empirical analyses. Data are presented in Section 5. The empirical strategy is described in Section 6 and estimation results are discussed in Section 7. Section 8 concludes the paper.

2 Literature

Recently, a growing number of contributions has argued in favor of the null (or even negative) impact of globalization on international diversification opportunities and on business cycle volatility. Stiglitz (2010) provides a general framework to analyze the optimal degree of financial integration, highlighting the undesirability of complete integration among countries. Mendoza and Quadrini (2009) attempt to uncover the contribution of increased financial integration to the surge in debt in the US and its influence on the spillover of the crisis across countries. Kose et al. (2009) conclude that only industrial countries have benefitted from improvements in risk-sharing in the recent period of globalization, arguing for the existence of a threshold level of integration, beyond which countries start enjoying a positive impact of financial globalization on consumption insurance. In addition, they warn about the influence of other country-specific characteristics that, despite the increased level of financial integration, may preclude the possibility of improvements in risk-sharing. The procyclicality of net capital inflows is a further reason singled out by the empirical literature (Kaminsky et al., 2004) as a reason behind the inability to attain the expected benefits of financial integration. Before reviewing the most influential contributions it might be helpful to stress some points. First, risk-sharing itself can work as a measure of financial integration, since measurements of the degree of risk-sharing are given by comparison with the benchmark case of fully integrated markets. Second, recent contributions have documented, at a global level, that countries have accumulated cross-border holdings and enlarged the size of their external portfolios over the last years (Lane and Milesi-Ferretti, 2007), ratifying the surge of economic/financial integration among countries. Moreover, the inception of the EMU, with the introduction of a common currency, has produced a unique case which is perfectly suitable for investigating the impact of financial integration. These issues have probably channeled the scholars' interest predominantly towards the aspect of globalization which is represented by economic and financial integration. The literature we explore next tries to understand whether the degree of risk-sharing actually tracks some of the economic and/or financial integration indices.

The empirical literature on the impact of financial and economic integration on risk-sharing is strongly divided. Part of it claims an increased degree of risk-sharing starting from the early 1990s, arguing that it has been driven by improvements in market integration due to globalization (see, *inter alia*, Giannone and Reichlin, 2006; Sørensen et al., 2007; Leibrecht and Scharler, 2008). Conversely, other empirical contributions are unable to document improvements in risk-sharing.[2] Some call for the existence of a threshold mechanism: improved financial integration *per se* does not guarantee a rise in the degree of risk-sharing or the presence of risk pooling (for instance, Bai and Zhang, 2012). Others impute this failure of detecting an augmented degree of insurance to standard regression tests that exploit data at business cycle frequency, strengthening the link between consumption and output volatility (e.g. Artis and Hoffmann, 2007). Kose et al. (2003) suggest that risk-sharing rises at an intermediate level of financial integration, but it falls at higher levels of integration. Kose et al. (2007) find very weak links between financial globalization and risk-sharing over the period 1960–2004 and for the two sub-samples 1960-1986 (pre-globalization) and 1987–2004 (globalization). However, in the shorter globalization sample, they document how only developed countries reaped some benefits from financial globalization in term of risk-sharing, whereas the sub-set of emerging economies were not affected, at least in a statistically significant way. On the other hand, Kose et al. (2003) (page 14) find that "financial openness, as measured by gross capital flows as a ratio to Gross Domestic Product (GDP), is associated with an increase in the ratio of consumption volatility to income volatility, contrary to the notions of improved international risk-sharing opportunities through financial integration". On these lines, Broner and Ventura (2011) claim that even though globalization may increase demand for insurance, we might observe a decline in the availability of insurance because globalization is also conducive to other underlying frictions, such as sovereign risk.

[2]For instance, Pierucci and Ventura (2010) using the same sample as Leibrecht and Scharler (2008) but applying a new method to isolate idiosyncratic risk (which guarantees orthogonality between aggregate and idiosyncratic income) find no clear evidence of an increase in the degree of risk shared in the long run starting from the beginning of the 1990s.

In this context, it becomes particularly interesting to study the patterns of risk-sharing channels (and measurement of the potential benefits from risk-sharing) in different regions of the world where the effects of integration might be more remarkable and distinguishable. In stark contrast with the evidence from the US states, Sørensen and Yosha (1998) find that, for OECD and European Community countries,[3] the largest fraction of risk-sharing is achieved through savings. However, Balli and Sørensen (2006), just after the beginning of the third phase of the European monetary unification process, detect that the role of capital markets increases significantly, whereas the portion of risk-sharing due to national saving decreases sharply. Volosovych (2013), investigating the case of two Eastern European countries, [4] finds a positive empirical relationship between investors' protection and international income risk-sharing through factor income, bridging the risk-sharing and financial development literatures. Demyanyk and Volosovych (2008) document substantial welfare gains[5] from risk-sharing for the enlarged European Union (EU): about 5.3% for new EU members but less than 1% for old EU members. Looking at Asia, Kim et al. (2006) find that idiosyncratic risk is largely uninsured among East Asian countries, where regional financial markets play a very limited role in smoothing shocks to income, and where the misfunctioning of capital and financial markets might have been the cause of the decrease in risk-sharing during the 1990s. Their work finds consistent evidence of how the development of financial markets has had a crucial role in shaping risk-sharing opportunities: more developed Asian countries achieve a level of risk-sharing similar to that displayed by OECD and EU countries. African Economic and Monetary unions have been analyzed by Yehoue (2011), who finds that little risk-sharing is obtained through standard income channels (capital market, credit market and remittances), while the bulk of smoothing

[3]The sample includes eight European countries: Belgium, Denmark, France, Germany, Ireland, Italy, the Netherlands and United Kingdom.

[4]Poland and Hungary are similar in many respects, such as economic policy, socio-economic indicators and geography, but are different in terms of investors' protection.

[5]Measured as a permanent increase in the level of each country's consumption. Potential welfare gains are measured comparing welfare gains under complete diversification of risk versus gains in an incomplete market economy (autarky). See, for instance, Kalemli-Ozcan et al. (2001).

is imputable to channels peculiar to the countries analyzed (for example, France's contributions). In Middle East and North African (MENA) countries,[6] between 1992 and 2009, a large part of output shocks remains uninsured. Risk-sharing achieved via saving and factor income is comparable to that achieved by OECD and EMU countries, whereas non-oil MENA countries share a certain degree of risk also via workers' remittances and international transfers. Also focusing on this region Balli et al. (2013) and Balli and Balli (2013) find positive welfare gains of about 3.88% for resource-scarce MENA countries and 3% for oil-rich MENA economies. Pacific Island Countries smooth an important portion of output shocks via net compensation of employees,[7] but the largest part of shocks is absorbed via domestic savings. Foreign aid is a strong and stable channel compared to remittances, which prove to be volatile. Potential welfare gains are estimated to be higher for PIC if they attain full risk-sharing with other countries in the region rather than with OECD countries (Balli and Balli, 2011).

3 Why should we expect different forms of globalization to affect risk-sharing?

In the previous section, we realized that financial integration can have an impact on international risk-sharing, essentially through income pooling. However, there are several other arguments that should convince us that political and social (cultural)[8] integration may also have a bearing upon the extent and the success of risk-sharing endeavors. The channels through which this is possible may or may not include income pooling, which

[6]These countries are heterogenous in terms of natural resource endowments.

[7]This is a sub-component of factor income. On the other hand, factor income smoothing among OECD countries is primarily attributable to foreign financial asset holdings.

[8]In our analyses, social integration is measured as the combination of cultural proximity, information flows and personal contacts. Therefore, cultural integration is one aspect of social integration. See Section 4 for the details of the globalization measures.

is the key factor in the case of financial integration. The importance of income pooling has been highlighted by the extant literature. One way of achieving income pooling at the international level is clearly provided by FDI. It is well known that the share of cross-border M&A over total FDI has been growing in the last two decades at an amazing pace. UNCTAD (2000) reports that the M&A share of FDI rose from 52% in 1987 to about 88% in 2000. Importantly, some authors (for example, Jin and Tian, 2007) report that about 70% of international M&A failed and that the main reason for such a high rate of failure is essentially due to a lack of cultural integration, as the integration of a firm in the new environment is key in determining a successful acquisition.[9] Since the seminal contributions by Cartwright and Cooper (1993) and Hopkins et al. (1999), the relevance of cultural integration has been stressed as one of the major factors in M&A's success, as claimed for example by Weber and Camerer (2003), Jarnagin and Slocum (2007), and Froese et al. (2008).

Political integration has also been singled out by some authors as one of the determinants of economic growth and its dynamics, although much less frequently than economic and financial integration. As notable examples, Alesina et al. (2000) and Alesina et al. (2005) claim a relationship among political integration, the dimension of the market, and economic growth: in the case of restricted market participation (for example, because of trade restrictions), political integration may increase the effective size of the market. In this sense, the less open an economy is, the more important political integration becomes. Political integration can thus be seen as a substitute for economic integration, as in Spolaore and Wacziarg (2005). Other contributions, such as that of Brou and Ruta (2011), claim that political and economic integration complement each other, when the effect of political integration on growth drives firms' incentives to innovate. Be that as it may, political integration can be counted as one of the determinants of economic growth and

[9]With respect to M&A, a failure may generally refer to several situations: the stock prices of the acquiring firm falling at the announcement of the merge, the acquired companies later being sold off, or the profitability of acquired firms becoming lower after the merger compared to similar non-merged firms (Weber and Camerer, 2003).

its volatility. Political ties may also partly determine international income pooling. Just to give an example, recall that sovereign wealth funds (i.e. government managed investment funds) have gained tremendous momentum in the last few years and are expected to continue growing in importance. According to recent estimates by IMF (2008a) and IMF (2008b), sovereign wealth funds are currently controlling 2 to 3 trillion US dollars in asset value worldwide, and are expecting to reach 10 trillion US dollars in the next few years, which exceeds the market capitalization even of large European economies. Although the managers of sovereign wealth funds strive to convey the impression that their investments are led solely by financial and economic considerations, we cannot reject the hypothesis that some of the investments are also led by political considerations (political proximity, strategic trade, etc.).

Social, cultural and political globalization may also have an impact on risk-sharing in terms of making individual economies more similar to each other, which is likely to bring about important consequences in terms of risk-sharing and consumption smoothing. For example, a few recent contributions, such as those of Ostergaard et al. (2002) and DeJuan and Luengo-Prado (2006), highlight the relevance of closed economy aggregate constraints in shaping the degree of risk-sharing and in determining the sensitivity of consumption dynamics to income dynamics, which can be regarded as a measure of (lack of) insurance opportunities. The main idea is that closed economy constraints, in the form of frictions in international credit markets or trade markets, are responsible for a low degree of risk-sharing. This concept seems to be confirmed by the fact that regions within a country are less constrained and enjoy more opportunities of risk-sharing among themselves. National boundaries therefore appear to be important in limiting risk-sharing opportunities. As a consequence, political and cultural integration might efficiently work towards a reduction of such aggregate constraints. In fact, more politically and culturally integrated countries might share rules and customs, be more open to each other in terms of trade and credit markets, and eventually converge to a similar economic structure, becoming similar in terms of their stance towards aggregate risk-taking. On the other hand, they will likely be more inclined to pool idiosyncratic risks among themselves. This, too, might signal a form

of complementarity among economic, cultural and political integration.

4 KOF index of globalization

As highlighted in Section 2, virtually all contributions dealing with risk-sharing and globalization have done so by focusing on the financial, economic and trade aspects. Nevertheless, globalization is a multifaceted phenomenon. That is why it may be inappropriate to reduce it only to its economic and financial dimensions. The main research question of this work is, therefore, whether or not other dimensions of globalization have exerted any role in shaping the risk-sharing opportunities enjoyed by countries, particularly the political and social (cultural) aspects of integration. To explore this issue, we need a more comprehensive dataset, covering all these aspects, in addition to the standard ones. A.T.Kearney (2007), Dreher (2006) and Dreher et al. (2008) provide such datasets.

A.T.Kearney (2007) was possibly the first dataset to include several dimensions of globalization (16 variables measuring economic integration, technological connectivity and political engagement, for a large set of countries). However, the scores obtained on the basis of those variables are only available for a few, and rather recent, years. On the other hand, KOF index of globalization[10] combines 23 variables related to economic, social and political integration, generating three sub-indices, which are, in turn, aggregated into an overall index (index *oi*), available for a very large number of countries and a wide time horizon: the 2013 release considers 207 countries and includes years between 1970 and 2010. The three indices (a, b, c) concern, respectively, the economic, social and political sides of globalization, which assume values from 1 to 100 (maximum globalization, which proxies complete integration).[11] Economic integration (index a) is measured both by ac-

[10]Swiss Federal Institute of Technology Zurich (ETH Zurich). See Dreher (2006) and Dreher et al. (2008).

[11]The overall index is available for 207 countries, the economic globalization sub-index for 150 countries and the social globalization sub-index for 193 countries. See Table 2 for descriptive statistics for the

tual flows (trade, foreign direct investments, portfolio investments, income payments to foreign nationals and capital employed) and by restrictions on trade and capital (measured by hidden import barriers, mean tariff rates, taxes on international trade and capital controls). Social globalization (index b), the hardest to pin down, is proxied by data on personal contacts (international tourism, internet users, number of radios, telephone calls and telephone costs, foreign population), data on information flows (telephone mainlines, internet hosts, internet users, cable television users, daily newspapers and radios) and data on cultural proximity (the number of McDonald's restaurants per capita, the number of Ikea outlets per capita and trade in books as a percentage of GDP). Political globalization (index c) is proxied by variables such as the number of embassies in a country, the number of international organizations and the number of UN peace missions participated in by the country.

The rationale for combining these 23 variables into three indices is given by their being largely collinear, which makes it virtually impossible to use all of them in isolation for regression purposes. One of the main advantages of the KOF indices (overall, economic, social and political) is that, as just described, they are composite indicators that account for different aspects of globalization. It can be assumed that they are able to better depict a multifaceted phenomenon such as the globalization process. On the other hand, standard measures of globalization account only for very few aspects of globalization (mainly economic), as in the case of measures of globalization given by financial openness or the share of trade in GDP.

Recently, Potrafke (2014) have comprehensively surveyed the recent empirical literature that deals with the effects of globalization on economic systems,[12] highlighting how the KOF indices became the most used to measure globalization. These indices follow Clark (2000)'s definition of globalization as "the process of creating networks of connections

globalization indices (by groups of countries) in the case of all variables included in the most comprehensive specification being available (see Table 5).

[12]Potrafke has extensively surveyed contributions that explore the role of globalization in macroeconomic performance; distributional consequences; regulations, industrial policies and economic reforms.

among actors at multicontinental distances, mediated through a variety of flows including people, information and ideas, capital, and goods".[13] Among the countries included in the study, the most globalized are reported to be Belgium, the Netherlands and Canada, while the lowest globalized are Equatorial Guinea, Lao PDR and Afghanistan. Even though the KOF index is an excellent measure that is applicable in econometric models to capture complex phenomena, it is worthwhile briefly recalling the drawbacks of applying these indices: they do not measure factors related to migration and religion. Moreover, some measures of cultural proximity, such as the number of McDonald's restaurants or Ikea outlets per capita, can represent measures of Westernization rather than globalization, thus excluding non-Western globalization such as Islamic globalization (see Potrafke, 2014, page 4 and references therein).

Table 1 shows that the three dimensions of globalization tell a (sometimes very) different story. This table reports the Spearman rank correlation index among the rankings obtained with respect to economic, social, political and overall globalization. A quick inspection of Table 1 reveals that the Spearman correlations among the rankings obtained by the various forms of globalization and for the three sub-groups of countries investigated are always smaller than 0.64 and 0.65 for EMU and OECD countries, respectively, and 0.73 for LMY countries. It is worthwhile highlighting how the political globalization index (c) displays a rather low correlation with economic integration (a) and with the overall index (oi). The correlation indices reported in Table 1 clearly indicate that the three indices convey different pieces of information, which could be lost if one only looked at one dimension of globalization or only at the overall summary index.

5 Data

Data on income and consumption have been taken from the World Development Indicators (the World Bank) and are expressed in real per capita values (at constant 2005 US dollars).

[13] Clark (2000), page 86.

Consumption data are given as households' final consumption expenditure. Given the relevance (recalled in Sections 2 and 3) of countries' financial development on the degree of risk-sharing, we control for the degree of financial development measured as the ratio of bank deposits to GDP (%) taken from the Global Financial Development Database (the World Bank). We also control for exposure to risk by considering the total damages caused by natural disasters in millions of US dollars (in real terms). Data on exposure to risk are taken from the International Disaster Database (Center for Research on the Epidemiology of Disaster). Lastly, we control for fluctuations of the real effective exchange rate index (2005 = 100), taken from International Financial Statistics (International Monetary Fund).

6 The empirical strategy

Under the hypothesis of complete markets, economic theory predicts full insurance (perfect consumption smoothing across time and states of nature).[14] Consider two endowment economies: a domestic and a foreign country with one homogeneous tradable good, two periods and two states of nature. Representative agents are identical and can access a complete set of Arrow–Debreu securities. Agents are risk averse and with Constant Relative Risk Aversion preferences. The solution of this simple model allows all individuals in home and foreign countries to equate their marginal rates of substitution between current consumption and state-contingent future consumption to the same state-contingent security prices. If marginal utility growth is equalized across countries, the correlation between domestic and foreign per capita consumption growth is perfect (or high), even though countries' discount factors might be different. Consumption is then internationally diversified in the sense that the only type of risk reflected by consumption is that due to aggregate uncertainty in world output (systemic risk). This means that domestic consumption growth should not be affected by idiosyncratic risk. An empirical counterpart of this

[14] See Obstfeld and Rogoff (1996) for a complete description of the model.

strong theoretical prediction is given by a simple test regression of the following type,[15] first proposed by Cochrane (1991) and Mace (1991):

$$\Delta \log c_{it} = \alpha_1 \log y_{it} + \alpha_2 \Delta \log c_{at} + \epsilon_{it} \tag{1}$$

where $\log y_{it}$ represents the idiosyncratic shock variable proxied by domestic output growth demeaned by the world output growth in order to account for common shocks to income,[16] $\Delta \log c_{it}$ is the rate of growth of domestic consumption for country i at time t and $\Delta \log C_{at}$ is the rate of growth of aggregate consumption. Under the null of perfect (idiosyncratic) risk-sharing, α_1 should equal zero, while α_2 should be equal to 1 under the assumption of identical risk-aversion coefficients among agents. The hypothesis of complete risk-sharing has been extensively tested empirically at the household level and with panels of countries. The empirical literature, with the exception of very few contributions (e.g. Mace, 1991; Lewis, 1997), has pervasively documented rejections of the null hypothesis of complete risk-sharing. However, agents seem to be able to better cope with idiosyncratic risk intra-nationally rather than internationally: this evidence might be due to the presence of income smoothing through the fiscal channel, which is almost absent among different countries[17] (e.g. Asdrubali et al., 1996; Sørensen and Yosha, 1998; Crucini, 1999). For example, Sørensen and Yosha (2000) prove that geography can affect the ability to share risk by estimating income and consumption smoothing within and between regions in the US and show that more overall risk-sharing occurs within than between regions: risk-sharing through saving seems to be more a local phenomenon. These contributions show how geographical, political and cultural proximity as well as personal contacts and information flows enable agents to insure against shocks to income.[18] Besides this, financial integration facilitates diversification of risk through access to a wider range of insurance possibilities.

[15] An alternative empirical approach studies consumption and output correlations in order to prove the economic prediction of the model in an international business cycle framework (among others, Devereux et al., 1992; Tesar, 1993; Obstfeld, 1994; Stockman and Tesar, 1995).

[16] The standard practice consists of subtracting the group average rate of growth of GDP.

[17] This point has been first outlined in a early work by Sachs and Sala-i-Martin (1992).

[18] For further details, see Section 3.

The most common specification of macroeconomic risk-sharing regression tests are those of Asdrubali et al. (1996) and Sørensen and Yosha (1998), which apply the following regression:

$$\Delta \log c_{it} = \nu_t + \beta \Delta \log y_{it} + \epsilon_{it} \tag{2}$$

where $\Delta \log c_{it}$ and $\Delta \log y_{it}$ are country i's idiosyncratic consumption and GDP growth (common shocks to income and consumption are captured by time-fixed effects). Thus β is the unsmoothed part of risk, since it represents co-movements of relative consumption and relative income, and $(1 - \beta)$ can be interpreted as the degree of insurance achieved by the internal and external channels. In fact, the theory predicts that the higher the degree of international risk-sharing, the smaller the co-movements between relative consumption and relative income. Melitz and Zumer (1999) revise Asdrubali et al. (1996)'s approach by adding some structure to β so that $\beta = \beta_0 + \beta_1 z_i$, where z_i is an interaction variable affecting the degree of international risk-sharing that a country obtains, which, according to Asdrubali et al. (1996)'s interpretation, is equal to $1 - (\beta_0 + \beta_1 z_i)$. Kose et al. (2007) interact idiosyncratic income with a measure of financial openness to understand and measure the impact of financial globalization on international risk-sharing, expecting a negative interaction term (β_1), which implies that financial openness has a positive impact on international risk-sharing or, equivalently, a negative one on co-movements between state-specific risk and domestic relative consumption. Sørensen et al. (2007) extend the empirical methodology introduced by Melitz and Zumer (1999) allowing β to change over time, including a time trend in order to control for downward trends in the interaction variable (namely, home bias and financial integration measures), which might capture changes in the trend of risk-sharing imputable to other developments in financial markets.[19] Our empirical strategy is mainly based on these contributions (Asdrubali et al., 1996; Sørensen and Yosha, 1998; Melitz and Zumer, 1999; Kose et al., 2007; Sørensen et al., 2007) and our

[19]We control for financial development by including a proxy for the level of financial development attained by countries among the set of interaction variables. See Section 5 for the details of this variable.

test equation is the following:

$$\Delta \log c_{it} = \nu_t + \beta_0 \Delta \log y_{it} + \beta_1 (Zi_{it} - \overline{Zi_t}) \Delta \log y_{it} + \epsilon_{it} \tag{3}$$

with:

$$\beta = \beta_0 + \beta_1 (Zi_{it} - \overline{Zi_t}) \tag{4}$$

where Zi_{it} is a set of interaction variables which includes the overall index (oi) or several indices for economic (index a), social (index b) and political globalization (index c);[20] the degree of financial development (FD); a measure of risk exposure (RE) and the real exchange rate index (XRATE).[21] $\overline{Zi_t}$ represents its mean. Hence, with reference to Equation 4, β_1 is expected to be negative. We followed Brambor et al. (2006) and Balli and Sørensen (2013) in including all the relevant interaction variables, so therefore we included all the constitutive terms in the regressions as well as all the possible interactions among them. Moreover, in order to interpret the results properly, we computed the conditional marginal impact (and standard errors) of the Zi-th interaction variable on the consumption growth rate (Tables 4, 6 and 8), which represents the impact of the aforementioned non-economic aspects of globalization on co-movements between domestic idiosyncratic consumption growth and idiosyncratic risk.[22]

Our panel analysis allows for heteroskedasticity by using two-step Feasible Generalized Least Squares (FGLS). Therefore, we estimate the panel at the first step by applying or-

[20] See Section 4 for the details of the globalization indices.

[21] See the details of these variables in Section 5. These variables were adjusted in order to avoid scale problems.

[22] Operationally, we estimate the following equation:

$$\Delta \log c_{it} = \nu_t + \beta_0 \Delta \log y_{it} + \beta_\alpha (Zi_{it} - \overline{Z}i_t) + \beta_1 (Zi_{it} - \overline{Zi_t}) \Delta \log y_{it} + \epsilon_{it}$$

Consequently, the average (at mean) conditional marginal effects of the (demeaned) Zi-th interaction variable on the generic dependent variable Y ($\Delta \log c_{it}$, in our case) is computed as follows:

$$\delta Y_{it} / \delta (Zi_{it} - \overline{Z}i_t) = \beta_\alpha + \beta_1 \overline{\Delta \log y_{it}}$$

dinary least squares and use the estimated residuals to calculate the Variance-Covariance matrix. We account for heteroskedasticity across panels (the estimated variances is different for each country) and autocorrelation within panels, assuming that the error term in each country follows an AR(1) process. Due to the short sample period for the pre- and post-globalization sample and the related difficulties in estimating a country-specific autocorrelation coefficient, we restrict the autocorrelation parameter to be identical across countries.[23] We do not include controls à la Levine and Renelt (1992) in Equation (3), which are usually included in cross-country growth regressions, as we do not search for linkages between average growth rates in consumption and other factors (for instance, social and institutional factors).

7 Empirical findings

Table 2 reports the descriptive statistics for all the variables employed in the most comprehensive specification (reported in Table 7). As expected, EMU and OECD countries show a remarkably higher level of globalization than LMY countries and the same is true for financial development which, as we recognize in the empirical exercise, may play an important role in facilitating risk diversification among countries. Tables 3, 5 and 7 present the results for the three groups of countries considered for whole time sample available (1970–2010) and for two sub-samples (1970–1989 and 1990–2010) in order to identify possible changes in the effects of the integration process on risk-sharing for the periods before and after globalization. Tables 4, 6 and 8 report the marginal effects of the interaction variables, thus measuring the impact of, for instance, globalization variables on the dependent variable (idiosyncratic consumption). A negative sign on the marginal effects will measure the attenuation of co-movements between idiosyncratic consumption and income brought

[23] As a robustness check, we also specified a country-specific autocorrelation coefficient, where we estimate our equation over the whole sample (1970–2010) and, even though some slight changes occur, the results are largely consistent. Therefore, we decided to keep the common autocorrelation coefficient in order to employ the same methodology for the full sample as well as for the sub-samples.

about by globalization itself or by specific aspects of it (the same holds for the other interaction variables included). We will mainly derive our results from the analysis of the marginal effects since the sign, magnitude and statistical significance of the the estimated coefficients of the constitutive terms as well as of the interacted variables might not be informative about the total impact (marginal effect) on co-movements between idiosyncratic income and consumption.

As the first step of the analysis (results reported in Table 3), we investigated the effect of globalization as synthesized by the KOF overall index of globalization which encompasses all aspects of integration (economic, social and political).[24] As mentioned above, we control for the level of financial development, for the exposure to risk and for fluctuations of real exchange rate. The literature has already highlighted the relevant impact of this variable within the regression tests of consumption insurance, which might produce tangible changes in the results.[25] Therefore, we estimate our test equation including and excluding the real exchange rate; however, given the variability that this variable introduces in the results and the lack of data for several countries which greatly reduces the number of observations, if this variable turns out not statistically significant, we will give preeminence to the estimated equations which exclude the real exchange rate. Following this approach, we will report in Tables 4, 6 and 8 the marginal effects of the specification which includes the real exchange rate only when the corresponding marginal effect is statistically significant; otherwise, we will report the marginal effects of the regression which excludes this variable. Over the full time horizon (1970–2010) and for the globalization era sub-sample (1970–1990), OECD and EMU countries have benefitted from globalization (oi), as the interaction term produces a statistically significant positive effect (i.e. it displays a negative sign, see Columns 1 and 4 in Table 3) on risk-sharing, reducing the reactions of the rate of growth of domestic consumption to idiosyncratic shocks (with marginal effects amounting to -0.22 and -0.25 for OECD and EMU countries, respectively see Columns 1 and 2 in Table 4). On the other hand, for the same time sample, LMY countries seem to be nega-

[24] See Section 4 for the details of the overall index of globalization.

[25] On this point, see a recent work by Devereux and Hnatkovska (2011).

tively affected by globalization (see Column 3, Panels a and c in Table 4), although they are not affected during the pre-globalization period of 1970–1989 (see Panel b, Column 3 in Table 4). We can see how the integration process had a positive effect on risk-sharing for OECD and EMU countries. Therefore, the benefits of the integration were enjoyed only by industrialized high-income countries; however, this integration had an insignificant (between 1970 and 1989) or even negative impact on LMY countries (over the full sample and in the globalization era). Another remarkable result is the role played by the financial development (FD), which has a positive effect on risk-sharing for industrialized countries (OECD and EMU).[26] Conversely, for LMY countries, this variable seems to have no effect on risk-sharing; this counterintuitive result might be imputable to the remarkably low average level of financial development that characterizes these countries.[27]

In Table 5 (and 6 with the relative marginal effects), we explore the impact of economic integration alone (a) as if, in line with the current literature, our focus was on the impact of economic integration on risk-sharing. A quick inspection of the results is somewhat in favor of the clear positive effect of economic integration on the degree of risk shared for OECD countries, while LMY countries, in the 1970–1989 pre-globalization sample are even negatively affected (with a positive marginal effect of 0.77). Surprisingly, EMU countries seem not to be affected by economic integration in any of the time horizons analyzed (see the marginal effects reported in Table 6). A possible explanation might be found in the long-lasting economic integration process which all EMU states undertook. The main improvements deriving from economic integration might have already been reaped, whereas the benefits derived from the second and third phase of the monetary unification might be caught by the financial development variable. In fact, the implementation of a common currency required the adhering states to carry out several actions and notable efforts to enhance and develop the financial system.

[26] Its marginal effect is always negative and highly statistically significant for the full sample (1970–2010) and for the second sub-sample (1990–2010). See Table 4.

[27] Table 2 shows that the average level of financial development for LMY countries is equal to 28.78% as opposed to 72.65% and 83.32% for OECD and EMU countries, respectively.

The main conclusions we can derive from these results so far analyzed is that, for OECD countries, globalization had a positive impact on risk-sharing and that the higher the economic integration of these countries, the higher the level of risk-sharing among them. This effect intensified in the 1990–2010 sub-sample with respect to pre-globalization sub-sample. If one concentrates its attention on this specific aspect of globalization/integration, we can obtain quite a clear picture of the fact that economic globalization has had a positive effect onto risk-sharing and that the relative benefits have been realized by industrialized countries, whereas LMY countries seem not to be affected by the potential benefits deriving from economic integration, both in the whole sample and during the globalization era (which is consistent with the findings of several works on the topic).[28]

The third step of our analysis consisted in taking into account the role played by other non-economic aspects of globalization in shaping risk-sharing opportunities. In Table 5, we report the estimation results of Equation 3 taking into account the three globalization sub-indices, which measure economic, social and political integration.[29] A cursory inspection of this table, especially in comparison with the previous ones, reveals that the magnitude of the marginal effects of the three globalization indices is lower than that of the overall index (compare Tables 4 and 8), as if complementarities across types of globalization were indeed relevant. The most striking result is that, *ceteris paribus*, economic globalization becomes totally irrelevant when social and political factors are considered (i.e. its impact turns out not to be statistically significant; see Table 8), with the exception of OECD countries during the globalization era. On the contrary, social and political integration become positively relevant (negative sign) in improving risk-sharing. Specifically, over the whole sample (1970–2010), social integration plays a role for OECD countries (see Table 8, Panel a, Column 1); for EMU countries, both social and political integration positively affect risk-sharing (see Table 8, Panel a, Column 3). Even more interesting are the results related to the globalization era, which shed light on how the degree of social and political integration of each EMU country with all countries in the world improves risk-sharing

[28] See Section 2 for a brief review of the literature.

[29] Indices a, b and c, respectively; see Section 4 for the details of these sub-indices.

among the group of EMU countries (see Table 8, Panel c, Column 2).

With respect to the EMU case, the issue of political integration is of a great momentum in terms of potential policy implications. Since the start of the third phase of the EMU in 1999, and increasingly after the 2008 global economic crisis, the issue of political integration among member states and with respect of the rest to the world have come to the fore. There are two main issues in this regard. The first is the political integration among member states who share the same currency and monetary policy, but lack complete political integration and do not share a common fiscal policy as is in the case of the US states (which have always been taken as the benchmark case for currency unions). The absence of a common fiscal policy in the EMU,[30] which can follow only from wider political integration among member states, hampers the absorption of state-specific shocks through the fiscal system. Beside this, member states adhering to the currency union could not rely on some policy instruments such as the exchange rate any more. Therefore, they lost some policy instruments without having a common (or at least coordinated) fiscal policy system, which helps to absorb asymmetric shocks. Moreover, the absence of a common fiscal policy for EMU member states in times of increasing global integration and of the global value chain, might produce situations of fiscal dumping. Some member states have a fiscal regime on firms, which is much more convenient with respect to other countries in the EMU (for instance, Ireland, the Netherlands and Germany), thus attracting investors from outside as well as from other member states within the EMU. As a consequence, companies located in those member states with higher fiscal pressure on firms are incentivized to move their legal head office to those member states which offer better fiscal conditions, producing a contraction in tax returns in the countries of origin, who see their public budget balance worsening and have to face increasing difficulties in meeting European stability criteria.[31]

[30] Characterized by heterogeneous countries in terms of economic structure.

[31] See, for instance, the recent case of the Italian automobile company FIAT Group, which, after the merger with the American company Chrysler into a new company called FIAT Chrysler Automobiles, has moved its legal head office to the Netherlands through the merger of the FIAT Group with Fiat Investments N.V., which is constituted in the Netherlands, thus giving birth to Fiat Chrysler Automobiles N.V. (FCA).

The second issue is strictly related to the first and concerns the political role of the EMU with respect to the rest of the world, and its impact in terms of economic and political consequences. The absence of complete political integration among member states prevented the rise of a common foreign politics in international and economic affairs. This absence has produced a lack of recognition of the EMU as having political credibility.[32] From our analysis, we find that political integration of each single EMU member state with other member states and with the rest of the world would improve risk-sharing among EMU states. This is a clear indication about how internal as well as external political integration of EMU member states has become of outmost importance for the attenuation of idiosyncratic economic fluctuation, particularly in the era of globalization, while pure economic integration, measured by actual flows and restrictions on trade and capital, has become irrelevant. This result is of interest particularly for the policy implications which one might derive: for EMU and OECD countries, in an increasing globalized world, political integration should be more than a concern. Moreover, social integration among OECD countries might prove even more important than political integration. On the other hand, except for economic globalization between 1970 and 1989, LMY countries do not benefit from any form of globalization and even the degree of financial development seems to have a negative effect on risk-sharing. This finding concerning LMY countries might be imputable to an inadequate level of integration and financial development, which prevent these countries from reaping any benefit from globalization (in line with Kose et al., 2007).

8 Concluding remarks

The effects of globalization on international risk-sharing are far from clear. There is mixed evidence in the empirical literature as to whether we should expect an increase in risk-

[32]There are many examples of international politics which regard conflicts around the world or situations of crisis (such as the recent case of Crimea), for which the European Union often struggled to find a credible and unified position in foreign affairs.

sharing and in consumption insurance due to the recent surge in financial integration. This might be partly due, in our opinion, to the fact that only the economic dimensions of globalization have been taken into account. This work was meant to contribute to the literature in the field by investigating the impact of economic integration (measured by indices on actual flows and restrictions on trade), along with other aspects of globalization, such as social and political integration on the degree of risk-sharing achieved by industrialized (OECD and EMU) and LMY countries (results from Tables 3–8). In these respects, our work integrated the extant empirical literature, which has mainly focused on economic integration (such as financial openness) and produced fragmented evidence on the impact of several economic measures of globalization on risk-sharing. As discussed in Section 3, the social/cultural and political aspects of globalization should also be considered to get a clearer and more realistic picture of insurance opportunities shared by economies. Our main findings highlight how the focus on economic integration might be misleading, and that social and political globalization do have a role in determining countries' sensitivity to idiosyncratic risks. This an unprecedented result entails new policy implications which should focus attention on the issue of social and political integration, while economic integration should no longer be a concern since the start of the 1990s, as it plays no role in reducing the idiosyncratic fluctuations of income for the EMU and it has a comparable impact to political integration for OECD countries. These new results of course call for more empirical research to obtain further insights into the non-economic channels of risk-sharing.

9 Appendix. List of countries

Definitions of the groups of countries are taken from the World Bank.

European Monetary Union countries (EMU)

Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Malta, the Netherlands, Portugal, Slovak Republic, Slovenia, Spain. Latvia and Estonia joined the third phase of the EMU in 2011 and 2014, however the

process of integration into the currency union is a long process which started in the past, therefore we decided to include these two countries in our sample of EMU countries.

Organization for Economic Co-operation and Development countries (OECD)

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

Low and Middle Income economies (LMY)

Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameron, Central Africa, Chad, China, Colombia, Comoros, Congo Dem. Rep, Congo Rep., Costa Rica, Ivory Coast, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Eritrea, Ethiopia, Fiji, Gabon, Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Guinea Bissau, Guyana, Kenya, Haiti, Honduras, Hungary, India, Indonesia, Iran Islamic Rep., Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyz Rep., Lao PDR, Lebanon, Lesotho, Libya, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Nepal, Nicaragua, Niger, Nigeria, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Rwanda, Samoa, Sao Tomé and Principe, Senegal, Serbia, Seychelles, Sierra Leone, Solomon Islands, Somalia, South Africa, Sri Lanka, St. Lucia, St. Vincente and the Grenadine, Sudan, Suriname, Swaziland, Syrian Arab Republic,Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen Rep., Zambia, Zimbabwe.

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Table 1: Spearman correlation indices

OECD

		a	b	c	oi
a	ρ	1			
	Observations	865			
b	ρ	0.6481	1		
	Observations	865	865		
	Significance lev.	0.0000			
c	ρ	0.2934	0.5228	1	
	Observations	865	865	865	
	Significance lev.	0.0000	0.0000		
oi	ρ	0.8482	0.8941	0.6346	1
	Observations	865	865	865	865
	Significance lev.	0.0000	0.0000	0.0000	

EMU

		a	b	c	oi
a	ρ	1			
	Observations	484			
b	ρ	0.6403	1		
	Observations	484	484		
	Significance lev.	0.0000			
c	ρ	0.1825	0.4908	1	
	Observations	484	484	484	
	Significance lev.	0.0001	0.0000		
oi	ρ	0.7925	0.8994	0.631	1
	Observations	484	484	484	484
	Significance lev.	0.0000	0.0000	0.0000	

LMY

		a	b	c	oi
a	ρ	1			
	Observations	889			
b	ρ	0.7312	1		
	Observations	889	889		
	Significance lev.	0.0000			
c	ρ	0.3004	0.3523	1	
	Observations	889	889	889	
	Significance lev.	0.0000	0.0000		
oi	ρ	0.8348	0.8561	0.6872	1
	Observations	889	889	889	889
	Significance lev.	0.0000	0.0000	0.0000	

oi is the overall index of globalization given by the combination of the economic, social and political globalization indices (a, b and c, respectively).

Table 2: Descriptive statistics

OECD

Variable	Obs	Mean	Std. Dev.	Min	Max
Real per capita consumption	864	15250.73	6599.21	2749.29	34255.27
Real per capita GDP	864	27876.81	13714.85	4379.57	87716.73
Economic globalization index (a)	864	70.51	15.48	21.44	98.88
Social globalization index (b)	864	70.32	14.25	29.08	91.25
Political globalization index (c)	864	83.56	12.56	39.82	98.43
Overall index of globalization (oi)	864	73.87	11.80	39.53	92.72
Financial development index (FD)	864	72.65	51.21	9.13	394.60
Risk exposure index (RE)	864	2532485	17200000	0	395000000
Real exchange rate	864	96.64	16.35	47.40	152.79

EMU

Variable	Obs	Mean	Std. Dev.	Min	Max
Real per capita consumption	484	13514.96	5352.63	3221.05	30361.93
Real per capita GDP	484	25081.03	12854.88	4431.99	87716.73
Economic globalization index (a)	484	73.47	14.55	43.07	98.88
Social globalization index (b)	484	68.94	13.71	37.58	92.58
Political globalization index (c)	484	79.72	17.54	29.01	98.43
Overall index of globalization (oi)	484	73.42	11.81	48.41	92.72
Financial development index (FD)	484	83.32	58.09	31.31	394.60
Risk exposure index (RE)	484	814782	4338028	0	82700000
Real exchange rate	484	95.65	12.76	47.40	138.75

LMY

Variable	Obs	Mean	Std. Dev.	Min	Max
Real per capita consumption	889	1540.57	1262.76	119.85	6180.28
Real per capita GDP	889	2510.63	2237.83	143.78	11533.82
Economic globalization index (a)	889	47.63	13.74	14.72	90.01
Social globalization index (b)	889	36.59	14.13	7.79	81.47
Political globalization index (c)	889	60.38	17.99	11.44	92.43
Overall index of globalization (oi)	889	46.86	12.19	19.98	87.25
Financial development index (FD)	889	28.78	19.78	1.16	122.19
Risk exposure index (RE)	889	877	18338	0	460193
Real exchange rate	889	111.78	54.41	9.75	516.83

Financial development (FD) is given by the ratio between bank deposits to GDP (%). Exposure to risk (RE) is expressed as total damages caused by natural disasters in millions of US dollars (in real terms, base year 2005). The number of observations reflects data availability with respect to inclusion of all globalization sub-indices (see the estimated equation in Table 7).

Table 3: International risk-sharing and overall index of globalization

	(1)	(2)	(3)	(4)	(5)	(6)
Panel a			**1970-2010**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.7908***	0.7871***	0.6547***	0.7066***	0.8141***	0.8454***
	(0.027)	(0.023)	(0.041)	(0.039)	(0.042)	(0.023)
$(oi_{it}-\overline{oi_t})\Delta\log(y_{it})$	−5.4735***	−1.7165	1.0164	−7.3367*	6.4899*	−0.9881
	(1.984)	(1.517)	(4.518)	(3.752)	(3.585)	(2.186)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−1.1353***	−1.0872***	0.1165	−0.7848	0.8513	2.4908***
	(0.371)	(0.357)	(0.494)	(0.488)	(1.642)	(0.934)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0001**	0.0001***	0.0005	−0.0004	0.0000	−0.0000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	0.5815		−2.6347		0.0022	
	(1.028)		(2.588)		(0.003)	
Observations	864	1,063	484	575	895	2,146
Number of id	28	32	15	17	39	87
Panel b			**1970-1989**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.9487***	0.8475***	0.6545***	0.6762***	0.8928***	0.9202***
	(0.048)	(0.034)	(0.068)	(0.059)	(0.090)	(0.039)
$(oi_{it}-\overline{oi_t})\Delta\log(y_{it})$	0.5074	7.0840***	2.5334	−4.1180	10.4045	−18.9329***
	(2.933)	(1.990)	(6.142)	(4.880)	(8.490)	(4.612)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−3.6756***	−3.2885***	−2.8409**	−3.2131***	1.9373	5.3061**
	(0.794)	(0.819)	(1.168)	(1.186)	(3.595)	(2.434)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0002***	0.0002***	0.0006	−0.0002	0.0000	−0.0000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	2.3370*		−3.1013		0.0026	
	(1.411)		(4.418)		(0.003)	
Observations	323	444	185	242	220	694
Number of id	23	25	13	13	24	48
Panel c			**1990-2010**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.7277***	0.7401***	0.6821***	0.8015***	0.8256***	0.8510***
	(0.034)	(0.030)	(0.057)	(0.050)	(0.052)	(0.029)
$(oi_{it}-\overline{oi_t})\Delta\log(y_{it})$	−9.9733***	−10.5525***	−0.5009	−18.3512***	6.9238	4.7251*
	(2.941)	(2.309)	(6.561)	(5.109)	(4.295)	(2.514)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−0.3879	−0.5914	0.8761	−0.0014	−0.5000	1.3615
	(0.483)	(0.467)	(0.623)	(0.595)	(2.006)	(0.919)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0005	−0.0002	0.0002	−0.0026	0.0009***	−0.0001
	(0.000)	(0.000)	(0.003)	(0.003)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	0.7652		−4.0192		2.6509	
	(1.709)		(3.301)		(1.912)	
Observations	519	595	286	320	652	1,405
Number of id	28	32	15	17	39	87

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in brackets. Test equation: $\Delta\log c_{it} = \nu_t + \beta_0\Delta\log y_{it} + \beta_1(Zi_{it}-\overline{Zi_t})\Delta\log y_{it} + \epsilon_{it}$. Zi is a vector of interaction variables which includes the overall index of economic globalization (oi) given by the combination of economic, social and political globalization indices; the degree of financial development (FD) is given as the ratio between bank deposits to GDP (%); exposure to risk (RE) is expressed as total damages caused by natural disasters in millions of US dollars (in real terms, 2005 dollars). Interacted variables are adjusted to avoid scale problems. Following Brambor et al. (2006) and Balli and Sørensen (2013), we included in the estimated equations all the constitutive terms in the regressions, as well as all the possible interactions among them. However, we reported only the estimated coefficients of the interactions.

Table 4: Marginal effects of the overall index of globalization on international risk-sharing

	(1)	(2)	(3)
Panel a		**1970-2010**	
	OECD	**EMU**	**LMY**
	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$
Overall globalization index	−0.2210***	−0.2513***	0.1503*
	(0.0500)	(0.0953)	(0.0858)
Financial development	−0.0424***	−0.0481**	−0.0355
	(0.0116)	(0.0191)	(0.0406)
Risk exposure	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
Exchange rate	0.0993***		
	(0.0294)		
Panel b		**1970-1989**	
	OECD	**EMU**	**LMY**
	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$
Overall globalization index	−0.2164***	−0.3452**	0.1048
	(0.0690)	(0.1549)	(0.2035)
Financial development	−0.0023	−0.0027	−0.0386
	(0.0250)	(0.0422)	(0.1066)
Risk exposure	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
Exchange rate	0.1003**	0.2366**	
	(0.0381)	0.0978	
Panel c		**1990-2010**	
	OECD	**EMU**	**LMY**
	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	$\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$
Overall globalization index	−0.1823***	−0.2288*	0.1546*
	0.0674	(0.1282)	(0.0920)
Financial development	−0.0408***	−0.0548**	−0.0087
	0.0153	(0.0226)	(0.0383)
Risk exposure	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in brackets. The marginal effect of the (demeaned) Zi-th interaction variable is given by $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t) = \beta_\alpha + \beta_1 \overline{\Delta \log y_{it}}$. The marginal effects of the specifications, which include the real exchange rate, are reported only when the corresponding marginal effect is statistically significant; otherwise, we report the marginal effects of the regression which excludes this variable. See Sections 6 and 7 for details.

Table 5: International risk-sharing and Economic Globalization

	(1)	(2)	(3)	(4)	(5)	(6)
Panel a			**1970-2010**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.7886***	0.7872***	0.6543***	0.7313***	0.8568***	0.8397***
	(0.027)	(0.023)	(0.041)	(0.038)	(0.038)	(0.022)
$(a_{it}-\overline{a_t})\Delta\log(y_{it})$	−2.3566*	−2.2273*	−3.1861	−4.6320*	−0.8361	−2.8737
	(1.421)	(1.189)	(3.125)	(2.506)	(2.793)	(1.780)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−0.9284**	−1.0509***	0.3926	−0.5665	2.7027*	2.3243**
	(0.374)	(0.354)	(0.544)	(0.518)	(1.518)	(1.098)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0001***	0.0001***	0.0001	−0.0007	0.0000	−0.0000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	0.5893		−2.1314		0.0021	
	(1.035)		(2.516)		(0.003)	
Observations	864	1,063	484	575	889	2,106
Number of id	28	32	15	17	38	81
Panel b			**1970-1989**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.9523***	0.8034***	0.6580***	0.6702***	0.9733***	0.8681***
	(0.049)	(0.034)	(0.067)	(0.054)	(0.080)	(0.036)
$(a_{it}-\overline{a_t})\Delta\log(y_{it})$	−0.9764	−3.2518*	0.1818	−8.5569***	4.0906	−12.9767***
	(2.604)	(1.823)	(4.678)	(3.108)	(6.186)	(2.854)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−3.4430***	−2.2761***	−3.0570**	−1.9031	2.1620	4.7574**
	(0.862)	(0.744)	(1.406)	(1.261)	(3.892)	(2.391)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0002***	0.0001***	0.0007	−0.0007	0.0000	−0.0000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	2.6560*		−1.8307		0.0029	
	(1.444)		(4.212)		(0.002)	
Observations	323	444	185	242	220	694
Number of id	23	25	13	13	24	48
Panel c			**1990-2010**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.7210***	0.7625***	0.6858***	0.8265***	0.8858***	0.8598***
	(0.034)	(0.030)	(0.058)	(0.054)	(0.044)	(0.027)
$(a_{it}-\overline{a_t})\Delta\log(y_{it})$	−1.7515	−1.7175	−2.6155	−4.8614	−2.8107	0.3123
	(1.855)	(1.574)	(4.282)	(3.975)	(3.459)	(2.256)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−0.4878	−1.1434***	1.0704	−0.3614	1.6497	1.4674
	(0.475)	(0.435)	(0.663)	(0.625)	(1.747)	(1.118)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0006*	−0.0001	−0.0003	−0.0035	0.0008**	−0.0001
	(0.000)	(0.000)	(0.003)	(0.003)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	0.4046		−3.9007		2.1984	
	(1.745)		(3.234)		(1.926)	
Observations	519	595	286	320	646	1,365
Number of id	28	32	15	17	38	81

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in brackets.Test equation: $\Delta\log c_{it} = \nu_t + \beta_0\Delta\log y_{it} + \beta_1(Zi_{it}-\overline{Zi_t})\Delta\log y_{it} + \epsilon_{it}$. Zi is a vector of interaction variables which includes the index of economic globalization (a); the degree of financial development (FD) is given as the ratio between bank deposits to GDP (%); exposure to risk (RE) is expressed as total damages caused by natural disasters in millions of US dollars (in real terms, 2005 dollars). Interacted variables are adjusted to avoid scale problems. Following Brambor et al. (2006) and Balli and Sørensen (2013), we included in the estimated equations all the constitutive terms in the regressions, as well as all the possible interactions among them. However, we reported only the estimated coefficients of the interactions.

Table 6: Marginal effects of economic globalization on international risk-sharing

	(1)	(2)	(3)
Panel a		**1970-2010**	
	OECD $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	**EMU** $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	**LMY** $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$
Economic	−0.1354***	−0.0346	0.1000
	(0.0356)	(0.0631)	(0.0677)
Financial development	−0.0344***	−0.0439**	−0.0431
	(0.0116)	(0.0201)	(0.0446)
Risk exposure	0.0000	0.0256*	0.0000
	(0.0000)	(0.0000)	(0.0000)
Exchange rate	0.088***		
	(0.0298)		
Panel b		**1970-1989**	
	OECD $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	**EMU** $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	**LMY** $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$
Economic	−0.1165**	−0.0869	0.7747**
	(0.0524)	(0.1095)	(0.3078)
Financial development	0.0073	0.0165	−0.4668***
	(0.0256)	(0.0476)	(0.1539)
Risk exposure	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
Exchange rate	0.0848**	0.1820*	0.0542**
	(0.0392)	(0.0953)	(0.0312)
Panel c		**1990-2010**	
	OECD $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	**EMU** $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$	**LMY** $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t)$
Economic	−0.1261***	−0.0778	0.0792
	(0.0461)	(0.0954)	(0.0727)
Financial development	−0.0428***	−0.0522**	−0.0113
	(0.0142)	(0.0245)	(0.0443)
Risk exposure	0.0000	0.0000	0.0000
	(0.0000)	(0.0001)	(0.0000)

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in brackets. The marginal effect of the (demeaned) Zi-th interaction variable is given by $\delta Y_{it}/\delta(Zi_{it} - \overline{Z}i_t) = \beta_\alpha + \beta_1 \overline{\Delta \log y_{it}}$. The marginal effects of the specifications, which include the real exchange rate, are reported only when the corresponding marginal effect is statistically significant; otherwise, we report the marginal effects of the regression which excludes this variable. See Sections 6 and 7 for details.

Table 7: International risk-sharing and economic, social and political globalization

	(1)	(2)	(3)	(4)	(5)	(6)
Panel a			**1970-2010**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.7900***	0.7815***	0.6451***	0.6938***	0.8086***	0.8038***
	(0.028)	(0.023)	(0.041)	(0.040)	(0.042)	(0.027)
$(a_{it}-\overline{a_t})\Delta\log(y_{it})$	−0.1938	−1.4888	−3.7116	−3.9608	3.5513	−3.8516*
	(1.743)	(1.542)	(3.273)	(2.650)	(3.740)	(2.272)
$(b_{it}-\overline{b_t})\Delta\log(y_{it})$	−4.5610**	−2.1223	1.2280	−1.2388	−4.7319	1.6075
	(1.977)	(1.666)	(4.125)	(4.032)	(3.958)	(2.317)
$(c_{it}-\overline{c_t})\Delta\log(y_{it})$	0.0684	3.2790**	3.1687	−2.5732	10.0109***	4.2416***
	(2.029)	(1.490)	(2.407)	(1.919)	(1.970)	(1.309)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−1.0862***	−0.8929**	0.5670	−0.7768	0.0190	1.1215
	(0.384)	(0.361)	(0.576)	(0.520)	(1.637)	(1.141)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0001**	0.0001***	0.0002	−0.0005	0.0000	−0.0000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	0.3016		−2.5469		0.0031	
	(1.059)		(2.553)		(0.003)	
Observations	864	1,063	484	575	889	2,106
Number of id	28	32	15	17	38	81
Panel b			**1970-1989**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.9320***	0.8218***	0.6268***	0.6881***	0.9095***	0.8509***
	(0.049)	(0.033)	(0.069)	(0.058)	(0.103)	(0.047)
$(a_{it}-\overline{a_t})\Delta\log(y_{it})$	−2.0126	−8.3929***	0.1599	−12.0302***	2.4497	−7.9758**
	(3.107)	(2.030)	(5.047)	(3.371)	(8.458)	(3.962)
$(b_{it}-\overline{b_t})\Delta\log(y_{it})$	2.0550	6.3272***	4.0139	11.1040**	1.6097	−8.4946
	(2.444)	(2.214)	(5.984)	(5.288)	(12.567)	(5.739)
$(c_{it}-\overline{c_t})\Delta\log(y_{it})$	−2.3597	4.6252**	0.1503	1.3463	8.3614	2.6387
	(2.718)	(1.856)	(3.465)	(2.659)	(5.628)	(2.393)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−4.0294***	−2.4757***	−2.6184*	−0.9719	3.6809	6.4293***
	(0.962)	(0.700)	(1.565)	(1.315)	(3.983)	(2.444)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0002***	0.0001***	0.0006	−0.0002	0.0000*	−0.0000
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	2.5567*		−4.5628		0.0028	
	(1.424)		(4.541)		(0.003)	
Observations	323	444	185	242	220	694
Number of id	23	25	13	13	24	48
Panel c			**1990-2010**			
VARIABLES	OECD $\Delta\log(c_{it})$	OECD $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	EMU $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$	LMY $\Delta\log(c_{it})$
$\Delta\log(y_{it})$	0.7295***	0.7232***	0.6324***	0.7480***	0.8080***	0.8087***
	(0.034)	(0.030)	(0.061)	(0.056)	(0.053)	(0.032)
$(a_{it}-\overline{a_t})\Delta\log(y_{it})$	4.8907**	5.6007***	−1.9452	1.0898	2.6597	−2.2732
	(2.383)	(2.106)	(4.778)	(4.095)	(4.832)	(2.839)
$(b_{it}-\overline{b_t})\Delta\log(y_{it})$	−13.4134***	−12.5702***	−3.3576	−9.2463	−2.9773	4.0375
	(3.517)	(2.476)	(7.241)	(6.885)	(4.611)	(2.537)
$(c_{it}-\overline{c_t})\Delta\log(y_{it})$	−0.5977	−2.2785	4.9075	−7.1501**	10.0385***	5.7314***
	(3.202)	(2.270)	(4.194)	(3.203)	(2.252)	(1.509)
$(FD_{it}-\overline{FD_t})\Delta\log(y_{it})$	−0.8043*	−0.9985**	1.1531	−0.3621	−2.2454	−0.5349
	(0.462)	(0.424)	(0.710)	(0.607)	(1.938)	(1.101)
$(RE_{it}-\overline{RE_t})\Delta\log(y_{it})$	0.0007**	−0.0003	−0.0008	−0.0001	0.0007**	−0.0001
	(0.000)	(0.000)	(0.003)	(0.003)	(0.000)	(0.000)
$(XRATE_{it}-\overline{XRATE_t})\Delta\log(y_{it})$	−1.1844		−4.1603		1.8449	
	(1.746)		(3.427)		(1.856)	
Observations	519	595	286	320	646	1,365
Number of id	28	32	15	17	38	81

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in brackets. Test equation: $\Delta\log c_{it} = \nu_t + \beta_0\Delta\log y_{it} + \beta_1(Zi_{it}-\overline{Zi_t})\Delta\log y_{it} + \epsilon_{it}$. Zi is a vector of interaction variables which includes economic globalization (a), social globalization (b) and political globalization (c); the degree of financial development (FD) is given as the ratio between bank deposits to GDP (%); exposure to risk (RE) is expressed as total damages caused by natural disasters in millions of US dollars (in real

Table 8: Marginal effects of economic, social and political globalization on international risk-sharing

	(1)	(2)	(3)
Panel a		**1970-2010**	
	OECD $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$	**EMU** $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$	**LMY** $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$
Economic	−0.0719	−0.0082	0.0100
	(0.0452)	(0.0749)	(0.0937)
Social	−0.1117**	−0.1661*	0.1817*
	(0.0542)	(0.1009)	(0.0984)
Political	−0.0231	−0.1691*	−0.0149
	(0.0549)	(0.0867)	(0.0565)
Financial development	−0.0410***	−0.0662***	−0.0762
	0.0120	(0.0225)	(0.0467)
Risk exposure	0.000	0.0000	0.0000
	(0.000)	(0.0000)	(0.0000)
Exchange rate	0.0899***	0.1191*	
	(0.0318)	(0.0663)	
Panel b		**1970-1989**	
	OECD $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$	**EMU** $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$	**LMY** $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$
Economic	−0.0126	0.0237	0.0322
	(0.0638)	(0.1148)	(0.1824)
Social	−0.1781***	−0.2840**	0.1046
	(0.0654)	(0.1450)	(0.2198)
Political	0.0464	−0.1221	0.0499
	(0.0737)	(0.1168)	(0.1153)
Financial development	0.0165	−0.0486	−0.0755
	(0.0284)	(0.0528)	(0.1042)
Risk exposure	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
Exchange rate	0.0783*	0.2572**	
	0.0403	(0.1023)	
Panel c		**1990-2010**	
	OECD $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$	**EMU** $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$	**LMY** $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t)$
Economic	−0.1911***	0.0004	−0.0209
	(0.0670)	(0.1067)	(0.1001)
Social	0.1424*	0.0502	0.1917*
	(0.0846)	(0.1805)	(0.1006)
Political	−0.2025**	−0.2547**	0.0207
	(0.0790)	(0.1139)	(0.0585)
Financial development	−0.0517***	−0.0780***	−0.0475
	(0.0137)	(0.0260)	(0.0446)
Risk exposure	0.0000	0.0000	0.0000
	(0.0000)	(0.0001)	(0.0000)

*** p<0.01, ** p<0.05, * p<0.1. Standard errors are reported in brackets. The marginal effect of the (demeaned) Zi-th interaction variable is given by $\delta Y_{it}/\delta(Zi_{it}-\overline{Z}i_t) = \beta_\alpha + \beta_1\overline{\Delta \log y_{it}}$. The marginal effects of the specifications, which include the real exchange rate, are reported only when the corresponding marginal effect is statistically significant; otherwise, we report the marginal effects of the regression which excludes this variable. See Sections 6 and 7 for details.