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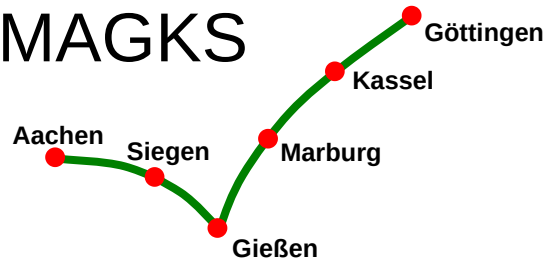

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Barbara Pfeffer

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Coordination: Bernd Hayo • Philipps-University Marburg
Faculty of Business Administration and Economics • Universitätsstraße 24, D-35032 Marburg
Tel: +49-6421-2823091, Fax: +49-6421-2823088, e-mail: hayo@wiwi.uni-marburg.de

Do regional Trade and Specialization drive intra-regional Risk-Sharing?

Barbara Pfeffer
University of Siegen*

August 25, 2008

Abstract

The goal of the present paper is two-fold. First, I explore the impact of different trade patterns on industrial specialisation and consequently on business cycle co-movements between and within different regions. Especially, I emphasize industrial specialisation as a result of intra- or inter-industry trade. Furthermore, I justify the predictions of different theoretical trade models on the basis of my results . Second, I analyse the degree of risk-sharing between and within the regions in dependence of the previous step. In particular, the purpose is to clarify direct and indirect channels between trade, specialisation, business cycle co-movements and risk sharing.

The expectations are that countries within a region with homogeneous specialisations show intra-industry trade. Hence regional business-cycles converge. Consequently, risk-sharing within these regions is not possible. These countries tend to be more internationally financially integrated than regionally. Inter-industry trade arises in countries within regions with heterogeneous specialisation. As a result regional business-cycles diverge. Now, countries can share risk within the region. Regional financial integration is stronger for these countries than international financial integration. One further question is: do the same patterns create risk sharing also in the means of consumption co-movements between or within a region?

JEL: F15, F36

Keywords: Trade, Specialization, Risk Sharing

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Do regional Trade und Specialization drive intra-regional Risk-Sharing?

Barbara Pfeffer[1]

1 Introduction

Does increasing trade drives convergence or divergence of business cycles? This question has been examined by various approaches. The most prominent ones are the empirical analysis of Frankel and Rose (1998) and the theoretical study by Krugman (1993). The former conclude that increasing trade leads to business cycle convergence between the trading partners. By contrast, Krugman (1993) derives that increasing trade implies higher specialization. Consequently, business cycles of trading partners diverge. Both results have entered the discussions of future possible currency unions or the choice of exchange rate regimes in different regions.[2] Either way, trade and in particular trade patterns within a region and between regions appear to influence the industrial shape of regions. Furthermore, business cycle co-movements depend on the industrial specialization and involve different degrees of intra and inter-regional risk sharing. In turn, risk sharing affects shock transmission between countries and, therefore, impacts for example monetary policy decisions as well as exchange rate choices.[3]

The goal of the present paper is two-fold. First, we explore the impact of different trade patterns on industrial specialization and consequently on business cycle co-movements between and within different regions. We especially emphasize industrial specialization as a result of intra- or inter-industry trade. Second, we analyse the degree of risk-sharing between and within the regions. In particular, the purpose is to clarify direct and indirect channels between trade, specialization, business cycle co-movements and risk sharing.

The empirical analysis is conducted for Europe, Asia and Latin America. We select Europe due to its high level of integration with its one single market in goods and services. Asia and Latin America are chosen as these economies rapidly increase their shares on the world economy.[4] Moreover, between these

[1] University of Siegen, Department of Economics, Hölderlinstraße 3, 57068 Siegen, Tel: +49 271 740 4044, pfeffer@vwl.wiwi.uni-siegen.de

[2] For example Reisen and van Trotsenburg (1988) discuss a possible peg of Hong Kong, Korea, Singapore and Taiwan to the Yen. Among others they claim insufficient integration between these countries and Japan as an argument against the peg. Busse, Hefeker and Koopmann (2004) analyse the implications of the exchange rate choice on trade integration and appeal of foreign investment flows. They argue in favour of a dual currency board for Mercusor. In particular, the domestic currencies should be pegged to the US-dollar and the Euro i.e. the two main trading partners.

[3] For a detailed discussion of risk sharing and shock transmission among U.S. states see Del Negro (2002). Labhard and Sawicki (2006) provide empirical evidence of higher risk sharing within the United Kingdom than between the United Kingdom and other OECD countries. Additionally, they analyse different channels of risk sharing and their varying relevance over time.

[4] See IMF (2007).

three country groupings the process of international integration has taken different forms and different speed. Fishlow and Haggard (1992) state that the European integration is driven by an intrinsic political motivation. This development is said to have happened due to the common institutions of the EU. In contrast, the authors explain that the integration process in Asia or Latin America is mostly driven by economic aspects, for example to constitute a counterweight to an international hegemony. Superior institutions to monitor this integration are rather lacking in Asia or Latin America.[5] The various origins of trade as well as financial integration may have caused the different manifestation of the present integration within the various regions. This may result in different degrees of specialization and risk-sharing within these regions.[6]

Following Imbs (2004), we implement a simultaneous-equation approach to examine the importance of inter and intra-industry trade. The application of 1 digit industry trade data and total trade data allows for analysing different trade patterns between regions and within regions. According to the literature, the business cycle convergence or divergence mainly depends on the specialization pattern within the examined region. Hence, we distinguish between similar specialization and asymmetric specialization within a country group. It is to be expected that countries within a region with homogeneous specializations show intra-industry trade. Hence, regional business-cycles converge. Consequently, risk-sharing within these regions is not possible. These countries tend to be more internationally financially integrated than regionally. Inter-industry trade arises in countries within regions with heterogeneous specialization. As a result regional business-cycles diverge and countries can share risk within the region. Regional financial integration is stronger for these countries than international financial integration. Additionally, we study whether the same patterns create risk sharing also in the means of consumption co-movements between or within a region.

We follow the recent literature by combining financial, industry trade data and business cycles as the simultaneous explaining variables. In contrast to other studies our empirical analysis also controls for different levels of risk sharing within a simultaneous equation model of trade, industrial specialization, financial integration and business cycle co-movements. The direct and indirect channels of inter- or intra-regional risk sharing with simultaneous trade and financial integration as well as industrial specialization and business cycle co-movements are widely unexplored yet. Moreover, we compare not only two but three large regions exhibiting different motivations and stages of financial and economic integration. As the following literature shows, different country groups like OECD or non-OECD countries not only react differently to variations in trade structure, specialization and financial integration but also show differing sensitivity to industry or country shocks. Thus, with the comparison of three different country groupings we emphasize the varying impact of trade,

[5] For a detailed discussion on this subject see also Mukhametdinov (2007) or Eichengreen and Park (2003).

[6] See also Eichengreen and Park (2003) for a detailed discussion of the different factors causing dissimilar degrees of financial integration for Europe and Asia.

specialization, business cycles and financial integration. This in turn might shed some light on the different transmission channels for economic shocks between these dissimilar country groupings.

The remainder of paper is organised as follows. Section 2 links the issue to the recent literature and derives two hypotheses. Then we describe the methodology and the data in section 3. The discussion of the results and their robustness follow in section 4 and 5. Finally, section 6 summarizes and concludes.

2 Theoretical Foundation

The increasing international integration has lead to an increased importance of business cycle co-movements. The transmission channels especially of shocks between countries and regions are a feature of the business cycle mechanisms that needs to be considered. Exploring the impact of trade and specialization on business cycle co-movements between countries and regions might help to understand how policy makers should react to economic shocks in neighbouring countries. Frankel and Rose (1998) suggest in an empirical approach of twenty-one countries from 1959 - 1993 that under the assumption of dominant demand shocks and a high share of intra-industry trade business cycles converge with increasing trade and financial integration between trading countries. Heathcote and Perry (2003, 2004) argument the other way around. The authors state that from 1960 - 2002 the U.S. business cycle has become less correlated with the business cycles in the rest of the industrialized world.[7] They refer this change in business cycle co-movement to increasing financial integration and less correlated shocks. Furthermore, the authors disentangle two opposed effects of financial integration on consumption co-movement between countries. Firstly, financial integration increases consumption correlation if financial markets are used to smooth the optimal consumption path through time. Secondly, financial integration decreases consumption correlation if financial markets are used to adjust the optimal composition of foreign and domestic goods in the consumption bundle. The present analysis considers these different aspects. Additionally, we analyse the impact of financial market variables on consumption risk sharing as well as on business cycle co-movements.

Campa and Fernandes (2006) analyse the development of country and industry shocks as impact factors on portfolio returns for 48 countries from 1990 - 2000. The impact of both factors on portfolio returns depends strongly on the international integration of the respective country or industry. Their main result is that the driving force behind the rise of global industry shocks is the financial market integration. On the country level, they find a higher correlation between the country's business cycle and the world's business cycle with higher economic integration. Precisely, for poor countries the importance of country factors decreases with the degree of international financial integration. Yet, in general, the impact of country factors rises with a high degree of specialization

[7] "The rest of the world" in the analysis of Heathcote and Perry (2003, 2004) consists of 15 European Union countries and Japan.

and active financial markets. Furthermore, with increasing economic integration and trade the magnitude of industry shocks increases and of country shocks decreases. Rose and Spiegel (2007) state a positive correlation between remoteness from financial activity, proxied by the distance to major international financial centres, and macroeconomic volatility. Even though their results are sensitive to changes in the country selection, they conclude that financial integration as well as geography matter for business cycle behaviour. This again indicates that identical factors cause different developments in dependence of the country characteristics. Therefore, the major country groups in the present sample Europe and Latin America are each subdivided in two smaller parts: Europe Core and Europe CEEC; Latin America Central and Latin America South. This approach is supposed to clarify the different reactions of the different country groups to the impact of trade, specialization and financial integration.

The impact of business cycle co-movements on financial risk-sharing as well as on consumption risk-sharing between countries might serve as an explanation how shocks may be absorbed through these channels, since risk-sharing can substitute for missing mechanisms like exchange rate volatility or labour mobility. Labhard and Sawicki (2006) analyse the degree and channels of risk sharing within the United Kingdom and between the United Kingdom and OECD from 1970 - 2001. They indicate that risk sharing within the United Kingdome is higher than between the United Kingdom and OECD. Additionally, they find that at the regional level the main fraction of risk is shared through cross-regional asset holdings. At the international level, risk sharing takes place via borrowing and lending. One further result of their study is that even though the role of capital markets for risk sharing has increased, the overall degree of risk sharing has declined over time. Kim and Sheen (2006) examine the risk sharing channels within Australia and between Australia and New Zealand from 1960 - 2002. They explicitly distinguish between the different possible channels like risk sharing via market mechanisms, fiscal policy or labour mobility. One result of their study is that capital and credit markets are the main risk sharing channel. Direct fiscal policy amplifies idiosyncratic shocks across Australian states only to relatively low degree. However, the increasing importance of capital and especially credit markets since 1992 might be interpreted as a result of financial market deregulations of the Australian government. Shin and Sohn (2005) evaluate the effects of financial and trade integration on business cycle co-movements in East Asia over the years 1971 - 2003. They compare the integration impact on consumption co-movement in comparison to the impact on output co-movements. The authors conclude that trade integration enforces output co-movement but financial integration does not. Furthermore, they state that increasing trade does not enhance consumption co-movement or risk-sharing. One of their assumptions is that trade liberalization tends to take place at the regional level more intensively. In contrast, financial integration is supposed not to be regionally boosted, because financial assets are weightless.

One important factor for business cycle co-movement between different countries is the degree of specialization as a consequence of bilateral trade flows. Rodriguez-Pose and Gill (2006) distinguish different trade patterns of manufac-

tured and agricultural goods. Their sample consists of four developing and four developed countries over the period 1980 - 2000. They explore how changes of manufactured to agricultural trade flows increase regional disparities (increasing trade in manufacturing goods, agricultural trade unchanged).[8] For six of seven countries the authors exhibit that regional disparities increase as agricultural exports became less important than manufacturing exports. According to this study, regional disparities decreased with increasing manufacturing exports and unchanged agricultural exports. Another important factor is the degree of financial development. In this context Svaleryd and Vlachos (2002) examine the impact of financial markets and their development on industrial specialization for 27 OECD countries. Their results indicate that financial development among the OECD countries has had greater impact on specialization than human or physical capital. According to their results, specialization of trading countries is driven by the financial sector. Hence, industry specific shocks affect the trading countries according to their industrial specialization. Finally, Imbs (2004) examines whether specialization patterns have had a direct impact on business-cycle co-movements of trading countries. He covers 24 countries over different time periods but mainly 1980 - 2000. The cycles converged with increasing similarity between the countries. Financial integration within a region has boosted the convergence even more.

All these discussed results indicate that the impact of trade, specialization, business cycle-co-movements and financial integration is very sensitive to the chosen country or region. Thus in the present study, three different country groups are examined and two of these country groups are additionally subdivided. Consequently, the estimated hypotheses should reflect the impact of different country groupings. Furthermore, the literature on risk sharing itself does not come to a consentaneous conclusion either, even with considering different characteristics of the respective countries and regions. The missing link for different directions of risk sharing might be industrial specialization within one region or country group respectively. According to the standard trade literature, trade might drive specialization in different industries and inter-industry trade arises as a consequence of specialization. Furthermore, there might be specialization in similar industries within one country group and intra-industry trade is the consequence within this country group. These considerations will be combined with the risk-sharing literature.

There are two strands of literature arguing in favour of two different directions of risk sharing within a region: The first is represented for example by Asdrubali et al. (1996), Crucini (1999) or Bayoumi and Klein (1997). They all conclude that risk sharing is higher for regions within a country than between different countries. This suggests that a country group with synchronized business cycles is supposed to share more risk within the group than members of a country group with diverging business cycles. Athanasoulis and van Wincoop (2001) examine risk sharing behaviour among the states of the USA

[8] Their study includes the countries: Brazil, China, Germany, India, Italy, Mexico, Spain and USA. The time period covers the years 1970 - 2000.

for the years 1963 - 1990. The authors state that regions of a country share more risk among each other if there are no capital controls, language barriers. Additionally, a common regulatory framework, common accounting standards and a shared currency enhance the risk sharing between these regions. These results are supported by the studies of for example Bayoumi and Klein (1997) and Crucini (1999). Bayoumi and Klein examine the integration process within Canada and between Canada and the rest of the world. The authors analyse the years 1971 - 1992. Bayoumi and Klein state that national borders matter significantly for integration of trade, financial markets and risk sharing. Crucini covers the years 1970 - 1990. His results indicate that during this time the Canadian provinces and the U. S. states shared more risk among each other than the G-7 countries between each other. Generalising these results, may lead to the assumption that with successive trade and financial liberalization risk sharing increases between countries. Furthermore, if the countries are endowed with different factors then the trading countries specialize in different industries and goods, respectively. These countries may then be more vulnerable to idiosyncratic industry shocks. As a result business cycles of the trading partners become less correlated and risk-sharing becomes possible between the trading countries. From these considerations, hypothesis 1 can be derived:

Hypothesis 1 *A group of a countries with dissimilar factor endowments specialize in the production of dissimilar goods. Trade arises between industries and drives specialization. Business cycles of these countries will diverge and risk-sharing is possible within the respective country group.*

In contrast to these approaches, there are others suggesting that regions within a country do not share a high amount of risk among each other. Regions within a country are supposed to exhibit a low degree of risk sharing. Hess and Shin (1998) analyse risk sharing behaviour of U.S. states. They state that the states within the US share less risk among each other than internationally. Hess and Shin (2000) test USA household data from 1981 - 1987. They conclude that during this period risk sharing among states and industries of the USA is rather low. Equally, van Wincoop (1995) states that in the years 1970 - 1989 there is no difference in risk sharing among the Japanese prefectures and among the OECD countries. More recently Kim and Sheen (2006) examine the degree of risk sharing between Australia and New Zealand. For reasons of comparison, they also study the risk sharing behaviour between Australia and the USA. Even though the business cycles are more synchronized between Australia and the USA the degree of risk sharing is significantly lower than between Australia and New Zealand. Hence, it is not mandatory that similar countries share risk. Again, generalising the results for regions of a country, allows for the consideration that countries within a country group specialise in similar industries. Thus, with proceeding trade integration industries will concentrate and intra-industry trade arises. This in turn leads to convergence of business cycles between the trading partners and vulnerability for the same shocks for one country group. Consequently, only a low degree of risk sharing

among these countries is possible. Hence, the second hypothesis accounts for the specialization of a country group in similar industries and it's consequences:

Hypothesis 2 *Countries within one region specialize in similar industries. The main share of trade is intra-industry and trade does not drive specialization within the country group. Business cycles for this country group tend to converge and risk-sharing can not take place within the country group.*

It is important to note that the confirmation of the hypotheses might be valid for a region as a whole but vary within the region. For example, the European core countries may display different specialization patterns to the peripheral countries or the new accession countries. Therefore, we do not only focus on the three major regions Asia, Europe and Latin America but we regroup Europe and Latin America into two subgroups: Europe Core, Europe CEEC, Latin America Central, Latin America South.

3 Methodology and Data

According to the two hypotheses we construct four equations. These equations reproduce the simultaneous impact of trade, specialization and business-cycle-correlations.

$$risk_{ij} = \alpha_0 + \alpha_1 trade_{ij} + \alpha_2 spec_{ij} + \alpha_3 bc_{ij} + a_4 C_1 + \varepsilon_{1,ij} \quad (1)$$

$$trade_{ij} = \beta_0 + \beta_1 spec_{ij} + \beta_2 C_2 + \varepsilon_{2,ij} \quad (2)$$

$$spec_{ij} = \gamma_0 + \gamma_1 trade_{ij} + \gamma_2 C_3 + \varepsilon_{3,ij} \quad (3)$$

$$bc_{ij} = \delta_0 + \delta_1 trade_{ij} + \delta_2 spec\ ij + \delta_3 C_4 + \varepsilon_{4,ij}. \quad (4)$$

To evaluate the simultaneous impact of trade, specialization and business-cycle-correlation on cross-country risk sharing, we estimate the above equation system. The indices i and j mark the country and the trading partner respectively. The endogenous variables are risk sharing $\equiv risk$, bilateral trade intensity $\equiv trade$, bilateral specialization $\equiv spec$ and bilateral movement of business-cycles $\equiv bc$. Each estimation equation contains a vector of exogenous determinants $C_1, C_{2,} C_{3,} C_4$. These vectors are specific for every endogenous variable. In order to identify the system differences between these vectors are required.

Risk sharing is the dependent variable in equation (1). In view of the proceeding economic integration it has gained particularly importance. Increased risk sharing can reduce vulnerability of countries and industries from shocks in neighbouring countries and regions. Additionally, risk sharing via credit and financial markets can substitute for missing governmental adjustment mechanisms.[9] Trade is directly included as estimator in this equation because trade

[9] See for example Labhard and Sawicke (2006), Asdrubali, Sorensen and Yosha (1996), Athanasoulis and van Wincoop (2001). They all show the importance of risk sharing and the increasing vulnerability to shocks through increasing economic integration. Furthermore, the relevance of different risk sharing channels changes and hence they can only partly substitute for each other. This is an important fact to be considered for fiscal policy settings.

might work as a transmission channel for productivity shocks between trading partners. The expected effect of trade on risk sharing depends on the underlying theory: Hypotheses 1 suggests a negative or insignificant impact of trade on risk sharing, $\alpha_1$would be negative. Trade transfers shocks only between different industries and in this case not to the trading partner's industry. Thus, increasing trade does not increase vulnerability of the trading partner's economy. With regard to hypothesis 2 the sign of α_1 is expected to be positive as with increasing trade between countries their dependence on each others economies increases and thus their need for risk sharing. Equation (2) measures whether trade is driven by specialization or not. Specialization, *spec*, is a estimator in the trade equation and *Spec* is high for countries with very different specialization patterns. A negative β_1 indicates that trade increases with a decreasing level of dissimilarity. Trading partners with related industrial characteristics combine a positive $\alpha_1$with a negative β_1. Even though shocks are transferred more easily from one country to another country through increased trade, due to similar industry structure between the countries risk sharing is reduced. In contrast, trading partners with dissimilar industries combine a negative α_1 with a positive β_1. Shock transmission is hindered by increasing inter-industry trade and additionally risk sharing is possible through the varying specialization patterns between the trading partners. Moreover, β_2 impacts risk sharing via $trade_{ij}$. In C_2 various gravity variables and home and foreign *gdp* data are included. Thus, the complete effect of trade on risk sharing consists of $\alpha_1\beta_1 + \alpha_1\beta_2$.

The second estimator in the risk sharing equation (1) is specialization. The direct impact of specialization on risk sharing is expected to be positive. Higher specialization is accompanied by increasing possibilities to share country and industry specific risk. However, there are also two indirect effects to consider. The first factor is trade. In dependence of the underlying theory, trade can boost specialization in various directions between trading partners as well as drive specialization in similar industries. Consequently, with hypothesis 1 the effect of $\alpha_2\gamma_1$ is supposed to be positive. A negative effect of $\alpha_2\gamma_1$ is expected with hypothesis 2. C_3 includes specific variables for specialization like differences in the development of financial markets and in country size of the trading partners. The entire impact of specialization is $\alpha_2\gamma_1 + \alpha_2\gamma_2$.

Business-cycle co-movement is the third estimator for risk-sharing in equation (1). The isolated direct effect of business cycle co-movement α_3 is expected to be negative. Convergence of business cycles hinders risk sharing between the respective countries. The entire impact on risk sharing consists of three components: $\alpha_3\delta_1 + \alpha_3\delta_2 + \alpha_3\delta_3$. Trade can impact business cycle co-movements in either direction. According to hypothesis 1 the assumed influence of trade is negative as with increasing trade business cycles diverge. Reversely, with hypothesis 2 business cycles between countries converge with increasing trade. The sign of δ_1 depends on the underlying hypotheses. Specialization always drives co-movements. However, δ_2 is not unambiguously determined. Increasing specialization in varying industries leads to diverging and synchronous specialization to converging business-cycles between countries. Finally, there are industry and country specific variables included in C_4.

The last estimator α_4 in the risk sharing equation (1) encompasses in C_1 financial variables to control for differences in financial development. These include proxy variables for the size and activity of the stock market and measures for financial development, financial depth and activity of financial intermediaries of a country and of his trading partner.

The discussion of the estimators clarifies the simultaneous influence of trade, specialization and business cycles. To allow for this two-way endogeneity we apply a simultaneous estimation method analogue to Imbs (2004). Three-stage least squares estimates the system in three steps and considers the endogeneity between the dependent variables of equation (2) - (4): trade, specialization and business cycle co-movements. In the first step, instrumented values for all endogenous variables are developed. In a second step the covariance matrix of the estimation disturbances is estimated. Finally, in the third step by using this covariance matrix a GLS estimation of (1) is implemented. Here, the instrumented values are placed instead of the right-hand-side endogenous variables.[10]

The analysis includes 60 countries from Asia, Europe and Latin America from 1980 - 2005.[11] To account for different stages of integration within a country group we split the European and the Latin American countries in two different country groups: for Europe, CEEC and Core, and for Latin America, Central and South. Hence, the results can be categorized in differences between the three continents Asia, Europe and Latin America and regional differences within continents Europe Core and CEEC and Latin America Central and South. Within every continental country group, we arrange country pairs for each country with each other country. The results will be presented by comparing all country groups: Asia, Europe CEEC, Europe Core, Latin America Central and Latin America South

Imbs (2004) constructs a measure of risk sharing for country-pairs using the data from Lane and Milesi-Ferretti (2001). This measure depends on the net foreign asset positions of the country-pairs. He arguments that countries with different external positions are more likely to share risk with each other than countries with similar net foreign asset positions. Analogue to this measure we use data from the World Bank World Development Indicators (WDI) to create a similar index for financial risk sharing between country pairs in the period 1980 - 2005[12]

$$risk_{ij}^{1} = \left| \frac{nfa_i}{gdp_i} - \frac{nfa_j}{gdp_j} \right|.$$

The measure indicates the difference of the countries net foreign asset position (nfa) as a share of the respective country GDP. According to Imbs (2004), $risk_{ij}^{1}$ will be higher the more diverse the net foreign positions of a country-pair are. It will be low for countries with similar positions. This indicates that these countries do not tend to borrow or lend very much from each other. As a second

[10] For a detailed discussion of simultaneous estimation see Wooldridge (2002) and 3SLS Zellner and Theil (1962).

[11] A list of the included countries can be found in appendix A.

[12] For sensitivity analysis, we also generate this measure using data from the Penn World Tables.

measure of risk sharing we use the consumption correlation between the country pairs. Generally, consumption correlation tends to synchronize for countries that pool their risks. These countries are not restricted to their domestic output and cross-country consumption correlation is higher. The development and activity of the financial markets also play a major role for risk sharing between two countries. Thus, the extent of risk sharing and the corresponding consumption correlation depends on the chosen country group and their bilateral financial integration. This justifies the divers country groupings between the continents and within a continent. There is no definite consensus about the effects of risk sharing on the dimension of consumption correlation. Particularly, the impact of financial market integration on consumption correlation is twofold. Feeney and Jones (1994) suggest a differentiated view on consumption. Agents respond differently to aggregate consumption risk or composite consumption risk. The model of Pakko (1997) suggests that even with complete asset markets a low cross-country consumption correlation is possible. This contradicts the findings of Baxter and Crucini (1995). They suggest that asset market incompleteness accounts for low cross-country consumption correlation. Restrained risk-sharing opportunities tie consumption more closely to domestic output than to world output and hence the cross-country correlation is lower. In line with these findings Heathcote and Perry (2003) conclude for the US that financial integration can have two different impacts on consumption correlation. First, increasing financial integration boosts cross-country consumption correlation because agents use financial markets to smooth their total consumption over time. Second, financial integration decreases consumption correlation between countries, because consumers use financial markets to reduce deviations in their bundle from the optimal composition of home and foreign goods. Hence, consumption correlation as a measure of risk sharing between different country groupings can be used as confirmation of the financial risk sharing measure. Additionally, it is important to control for financial integration and development as well. This is done by the equation specific control variables $C_1 - C_4$. The consumption data is obtained from the WDI base.

We use total trade data from the IMF database total direction of trade and 1 digit industry trade data from the UN Comtrade database. Both datasets include the 60 countries from 1980 - 2005. To measure trade intensity we use a standard measure for trade intensity according to Frankel and Rose (1998). The first trade measure relates bilateral trade flows to the total international trade activity of the respective countries:

$$trade^1 = \frac{1}{T}\sum_{t=1}^{T}\frac{x_{ijt} + m_{ijt}}{x_{i.t} + x_{j.t} + m_{i.t} + m_{j.t}}. \tag{5}$$

x_{ijt} denotes the total export of country i to country j at time t. Imports between the countries at the time t are defined by m_{ijt}. The higher $trade^1$ the higher is the trade intensity between the countries i and j. The second measure relates trade activity between the trading partners to their GDP. Trade intensity is

connected to country size

$$trade^2 = \frac{1}{T}\sum_{t=1}^{T}\frac{x_{ijt} + m_{ijt}}{gdp_{i.t} + gdp_{j.t}}. \tag{6}$$

This measure shows the share of trade between the countries divided by their total output. For all countries the GDP data is taken from the Penn World Tables and for a sensitivity check we use data from the Worldbank World Development Indicators.

We use a third measure of trade intensity analogue to the one used by Deardorff (1998). In contrast to the index in (6) the trade activities of this third measure are weighted with world GDP.[13]

$$trade^3 = 0,5\frac{1}{T}\sum_{t=1}^{T}\frac{(x_{ijt} + m_{ijt})\, gdp_{wt}}{gdp_{i.t} \times gdp_{j.t}}. \tag{7}$$

Size effects are eliminated and trade intensity only depends on trade barriers. In particular, this third trade measure (7) takes the value 1 if there are no trade barriers and preferences are homothetic.[14]

Specialization is measured by two different indices. Whereas the measure from Imbs (2003) is the basis for both indices

$$spec_{ij} = \frac{1}{T}\sum_{t=1}^{T}\sum_{k=1}^{K}|s_{ki} - s_{kj}|. \tag{8}$$

where s_{ki} is the share of industry k in country i. This share is measured by industry output relative to total country GDP or industry value added relative to total country GDP. Industry data is obtained from the Unido Industrial Database. According to (8) the more countries specialize in simultaneous industries the lower is $spec_{ij}$. Country pairs with no similar specialization display a high $spec_{ij}$.

Business cycle co-movements are measured by cross-country correlation of GDP. The data for the macroeconomic variable is taken from the WDI database. In order to isolate the cyclical component of the data we use the Christiano Fitzgerald Random Walk Band Pass filter described in Christiano and Fitzgerald (2003). This filter is a generalization of the Baxter King Band Pass Fitler.

The data for the financial control variables in equation (1) are taken from the WDI database. Additional gravity data in equation (2) is obtained from the CIA World Factbook. Distances between capital cities are provided by John Byers' Website "Chemical Ecology of Insects".

[13] This measure is constructed with the WDI data only.
[14] See Deardorff (1998) for a derivation of these results.

4 Results

4.1 Estimations with Total Trade Data

Financial Risk Sharing Table (1) contains the results of the simultaneous estimation of equation (1) with the total trade data. The results indicate a significant negative impact of trade on financial risk sharing only for the European CEEC and the central Latin American countries.[15]

	Asia	**Europe CEEC**	**Europe Core**	**Latin America Central**	**Latin America South**
Trade	-0.2226	-0.2660***	-0.0082	-0.0321***	-0.2227
	(-1.33)	(-5.90)	(-1.57)	(-4.05)	(-0.46)
Spec	0.0181	-0.1381***	0.0008***	-0.0029	-0.2182
	(1.34)	(-7.59)	(5.45)	(-1.59)	(-1.25)
BC	0.3285	0.0073***	0.0012*	0.0017*	-0.2415**
	(1.70)	(6.81)	(2.48)	(2.27)	(-3.01)
N	2040	1070	202	134	1030
R^2	0.41	-0.78	-1.31	0.55	-0.56

t statistics in parentheses

$^*p < 0.05,\ ^{**}p < 0.01,\ ^{***}p < 0.001$

Table 1: Direct impact on risk diversification separated by country groups. Data is total trade data. Risk sharing is measured by net foreign asset positions.

Hence, trade is not necessarily a channel for productivity shocks which turn into bilateral financial risk sharing between the trading countries. Even though trade might increase a country's vulnerability to its neighbours shocks, these shocks may not be damped by financial risk sharing between these countries or the respective country group. For the CEEC and the central Latin American countries bilateral financial risk sharing actually decreases with higher bilateral trade. For these country groups trade transfers additional shocks from one country to another but this additional risk is not damped within the group. The significant negative trade impact on risk sharing might be interpreted as a stronger risk sharing of the countries within the group with countries outside the respective country group.

Regarding specialization the results exhibit a significant impact on risk sharing within a country group only for the European countries. Interestingly, the

[15] The gravity variables show the expected signs. Only for the European CEEC and the Central American countries distance is positive but not significant.

direction of the impact differs for CEEC compared to the European Core countries. For the European core countries the results suggest that with higher specialization in different industries the countries increase their financial risk sharing among each other. They exploit the various shock vulnerability to dampen possible shocks on their respective main industry. In contrast, for the CEEC countries risk sharing decreases with higher specialization. Analogue to the significant negative trade impact on financial risk sharing, this effect might be caused by stronger linkages to countries outside than within the CEEC-group. The insignificant influence of distance on bilateral trade for the CEEC supports the assumption of a less regional linkage of these countries and stronger relations to countries outside this country group.[16] The same holds for the Central American countries. The results also exhibit a negative impact of bilateral trade on risk sharing. The European CEEC countries as well as the Central American countries display no significant impact of distance on bilateral trade within their country group. This supports the assumption that external relations are stronger than the linkages within the respective country group. This also impacts the effect of specialization on risk sharing: With increasing specialization these countries decrease their "regional" risk sharing and might increase their international links.

Surprisingly business cycle correlations affect risk sharing positive in every country group except Asia, where the coefficient is not significant and the southern Latin American countries, where the coefficient is significantly negative. The insignificant coefficient of business cycle co-movements for the Asian countries is in line with the results of Kim et al. (2006). The authors conclude that the Asian countries do not use financial channels as main risk sharing instrument to smooth cross-country variances of the GDP. Kim and Sheen (2007) study the risk sharing behaviour between Australia and New Zealand. Their results indicate that Australia and New Zealand mainly use credit markets to smooth their income shocks between each other. As in the current analysis the East Asian Countries are grouped with Australia and New Zealand, the insignificant impact of business cycle co-movements is not surprising. The significance of business cycle correlations for the European core countries is also in line with the existing literature. The results of Sorensen and Yosha (1998) suggest that until 1990 borrowing and lending between the European countries was not the main channel to smooth risk between them. Thess results hold also for the OECD countries. The previous intuition that a country group will pool its risk within the country only if the countries are dissimilar seems not definitely supported. The disaggregation of the total impact might help to clarify some of these effects.

These results might support the second strand of risk sharing literature by indicating that diverging business cycles between the members of a country group open additional opportunities for risk sharing within the respective group.

[16] Results of the trade control variables are presented in Table 2 in the Appendix.

Decomposition of Effects To disentangle the above effects, we turn to the analysis of the direct and indirect channels through which risk sharing is effected by the three main variables trade, specialization and business cycle comovements. Table (2) presents the results from equations (2) - (4).

	Asia	**Europe CEEC**	**Europe Core**	**Latin America Central**	**Latin America South**
Trade					
Spec	-0.0004***	-0.0001	-0.0013***	-0.0150***	0.0041***
	(-18.96)	(-0.04)	(-5.15)	(-3.69)	(9.55)
GDP_i	0.0265	-0.0178	0.4210***	-0.5900**	0.0785***
	(1.88)	(-0.56)	(3.96)	(-2.64)	(5.83)
GDP_j	-0.0154***	-0.0261***	-0.2130**	-0.5760**	0.1420***
	(-3.57)	(-3.71)	(-2.66)	(-2.95)	(10.49)
Spec					
Trade	-0.5329***	-0.0073*	-0.1408***	-0.0258***	0.0304***
	(-9.32)	(-2.28)	(-3.41)	(-6.94)	(3.88)
Size	-0.0049**	0.0001*	-0.0003	0.0001	0.0001
	(-3.20)	(2.27)	(-0.18)	(0.21)	(0.50)
Finance	-0.0005**	0.0001	-0.0022*	-0.0001	0.0001
	(-3.25)	(1.85)	(-2.42)	(-0.64)	(1.44)
BC					
Trade	0.0271***	0.2139***	0.0493***	-0.0141	0.0005
	(6.62)	(10.32)	(5.81)	(-1.29)	(0.09)
Spec	-0.0034***	0.5020***	-0.0026	-0.0435	-0.0671***
	(-11.94)	(7.73)	(-0.99)	(-1.65)	(-11.16)
Finance	-0.0415***	-0.1880***	-0.7500***	-0.0156	0.0521
	(-3.84)	(-5.89)	(-3.92)	(-0.18)	(1.64)
N	2040	1070	202	134	1030
R^2 Trade	0.01	0.35	0.41	0.47	-0.09
R^2 Spec	0.23	0.11	0.17	0.18	0.01
R^2 BC	0.26	-0.44	0.30	-0.01	-1.28

t statistics in parentheses
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 2: Indirect impact on risk diversification separated by country groups. Data is total trade data. Risk sharing is measured by net foreign asset positions.

The total trade impact on risk sharing can be decomposed in two direct effects: intra-industry ($\alpha_1\beta_1$) and geographical ($\alpha_1\beta_2$) trade. There are also two indirect channels, through which trade affects risk sharing, namely through specialization ($\alpha_2\gamma_1$) and business cycle co-movements ($\alpha_3\delta_1$).

In comparison to the other country groups, for Asia the negative impact of trade on risk sharing is driven by a high share of intra-industry trade as the results for Asia indicate that specialization impacts trade significant negatively. A high share of the trade impact on risk sharing can be attributed to trade between countries with similar specialization patterns. This increases the vulnerability to similar shocks within the country group and thus the need for risk sharing. However, the opportunities of risk sharing decrease within this group. This is reflected by the negative sign of the indirect channel of the trade impact via specialization. Yet these results for the Asian country group should be interpreted with caution as the explanatory power for trade is very weak within this country group.

In contrast to the Asian countries, the trade coefficient in (2) for the European CEEC countries suggests no significant impact of intra-industry trade. Additionally, the geographical trade variables indicate a rather weak trade and risk sharing link between the CEEC countries. As a consequence, increasing bilateral trade does not boost financial risk sharing between the CEEC countries. Intra-industry trade seems not to be a major link between the European core countries either. Yet, according to Table (7) in the Appendix within this country group the coefficients of the geographical variables are significantly positive (except the distance variable). Hence, trade appears to arise between close countries and similar countries. Even though the trade link within in this country group is strong, the impact on risk sharing is not significant.

Similar to the Asian countries Central America indicates a high impact of intra-industry trade on risk sharing in comparison to rest of the country groups. Intra-industry trade appears to enhance the sensitivity within the Central American country group for similar industry shocks and thus to raise the need for risk sharing. The geographical trade variables indicate a weak "regional" link for Central America. Hence, increasing bilateral trade does not seem to increase the possibilities for bilateral risk sharing within this country group. The only countries with a negative impact of intra-industry trade on risk sharing are the Latin American southern countries. Within these countries, trade appears to transfer barely similar productivity shocks. Furthermore, the coefficients of the geographical variables display a weak link between these countries. Thus, through bilateral trade the need for risk sharing does not seem to increase very much. The weak regional connection implies low risk sharing within the group.

One further effect should be noted: all country groups- expect the southern Latin American countries - show negative trade impact on specialization and vice versa. Intra-industry trade is definitely present within these respective country groups and only the degree varies and its impact on intra-group risk sharing. Unlike the direct trade or specialization impact, these indirect channels are all significant. South Latin America is the only country group that has no obvious appearance of intra-industry trade at all.

The control variables for the financial activity, depth and development have the most impact on risk sharing for Asia.[17] For Latin America south, none of the respective coefficients is significant for the risk sharing activity within this group. Again, this supports the weak linkage within and a stronger connection outside this country grouping. The European CEEC group shows higher sensitivity to the financial development and activity of the partner country than to its own financial market. For the European core countries as well as the Central Latin America countries the development of their own financial market and the financial status of the partner country indicate similar impact on risk-sharing within the respective country group. Generally, the significance of the financial variables for both groups is low.

Overall, the results indicate that intra-industry trade is very dominant among the analysed country groups. This result is supported by the estimation results of equation (2) - (4). Business cycle co-movements significantly converge with trade except for the Latin American countries. Yet, no clear-cut picture emerges for the effects of specialization on business cycle co-movements. For the Asian and southern Latin American countries specialization is supposed to lead to diverging business cycles and for the CEEC to converging business cycles. For the two remaining country groups, the European Core and Latin American central countries no significant impact of specialization on business cycle co-movements is found. Consequently, the ambiguous influence of business cycle co-movements on financial risk-sharing is likely to be caused by diverse indirect effects that vary between the country groups.

The results for financial risk sharing are not always as expected. Yet, that the measure of risk sharing used in this estimation is just one possible channel of financial risk sharing, namely for risk sharing via credit markets. Even though the importance of this channel increased in the various regions, it is ambiguous. In order to check the robustness of the results the analysis is repeated for consumption risk sharing within the various country groups.

Consumption Risk Sharing According to different approaches in the literature, like for example Crucini (1999), consumption is supposed to converge for regions that pool their risk. Following from this, consumption correlation is used as a proxy variable for risk sharing. This general assumption can be split in two parts. Risk sharing via financial markets reduces variations in the total consumption over time. Hence, risk sharing or financial integration should increase consumption correlation within one of the country group. The countereffect is that financial risk sharing reduces deviations from the optimal consumption composition. As a consequence, consumption correlation within a country group diverges with increasing risk sharing. Table (3) contains the respective estimation results of equation (1) - (4)with consumption correlation as proxy for risk sharing.

[17] Table 5 in Appendix B presents these results.

	Asia	Europe CEEC	Europe Core	Latin America Central	Latin America South
Trade	0.0668***	-0.0876**	0.1329***	-0.0081	0.0776***
	(10.59)	(-3.09)	(7.26)	(-1.11)	(8.48)
Spec	0.0059***	-0.6000***	0.0075	-0.0386*	-0.0082
	(11.95)	(-4.67)	(1.40)	(-2.28)	(-0.31)
BC	0.0392***	0.0334***	-0.0092	0.0210**	0.130***
	(5.55)	(3.99)	(-0.53)	(3.15)	(9.50)
N	2040	1070	202	134	1030
R^2	0.01	-0.19	0.43	0.55	-0.56

t statistics in parentheses

$^{*}p < 0.05,\ ^{**}p < 0.01,\ ^{***}p < 0.001$

Table 3: Direct impact on risk diversification separated by country groups. Data is total trade data. Risk sharing is measured by consumption correlation.

There are three obvious differences compared to the estimation results of financial risk sharing: Trade has a significant and positive impact on consumption correlation for the Asian, European core and southern Latin America countries. The significant negative trade effect for the European CEEC is confirmed whereas for the central Latin America the coefficient drops to insignificant. In view of the previous findings, the change of the trade coefficient with respect to the significance level and ist magnitude does not surprise: according to the first estimation, the Latin America southern grouping is the country group with the lowest, rather not existing, intra-industry trade link. Hence, increasing consumption correlation induced by rising bilateral trade confirms this result. If trade is not intra-industry then the main trading goods are consumption goods of the respective industries in the trading countries. Consequently, the trading countries assimilate their consumption behaviour by exchanging the available goods. The change of the trade impact for the European core group can be partially referred to a similar trading behaviour as for the southern American countries. The amount of intra-industry trade on total trade of the European core group is not very high in the first estimation for financial risk sharing. Hence, a reasonable part of bilateral trade within this country group consists of final goods. In turn, increasing trade of consumption goods of differing industries in the respective countries enhances the convergence of consumption between these countries. Even though the financial risk-sharing estimation indicates a higher amount of intra-industry trade for the Asian countries, the now positive trade impact might be based on similar arguments. More precisely, the positive impact of trade on consumption correlation is positive and highly significant but at a very low level. In general, with increasing trade the respective

countries are not tied to their domestic production anymore and the composition of their consumption bundles synchronize among their trading partners.

Decomposition of Effects In comparison to financial risk sharing the effect of specialization on consumption risk sharing never changes its sign. The effect of specialization on risk sharing anymore between the European core countries drops to insignificant. Within the European CEEC grouping the impact of specialization does not change at all. Business cycle co-movements is now positive for Asia, Europe CEEC and Central Latin America. The impact of business cycle co-movements changes its sign for the European core and the southern Latin American group. For the former the negative effect is not significant, whereas for the latter business cycle co-movements affect consumption correlation significantly positively. The positive relation between business cycle co-movements and consumption correlation for countries within one group is not surprising at all. With increasing correlation of their business cycles these countries have the possibility to synchronize the composition of their consumption bundle. The business cycle co-movements are partly driven by increasing trade between the respective countries. The only significant exception for this explanation is again the southern Latin American country group. Their trade share in the business cycle co-movement is negative and significant. Hence, there is need for another explanation of the positive impact of business cycle co-movements and consumption correlation. A further explanation for a positive impact of business cycle co-movements and consumption correlation might be the income correlation. With increasing business cycle convergence the income in the country group converges as well. This in turn is a strong driver for consumption convergence within this group.[18]

[18] Crucini (1999) shows very clearly how cross-regional consumption correlation follows cross-regional income growth correlation for the USA, the Canadian Provinces and the OECD countries.

	Asia	Europe CEEC	Europe Core	Latin America Central	Latin America South
Trade					
Spec	-0.0044***	0.0000	-0.0141***	-0.1250**	0.0443***
	(-19.10)	(0.00)	(-5.44)	(-3.11)	(10.00)
GDP_i	0.0281*	-0.0117	0.446***	-0.736***	0.107***
	(1.99)	(-0.36)	(4.26)	(-3.35)	(8.92)
GDP_j	-0.0157***	-0.0263***	-0.256**	-0.692***	0.161***
	(-3.65)	(-3.65)	(-3.23)	(-3.61)	(12.73)
Spec					
Trade	-0.5284***	-0.0076*	-0.1422***	-0.0257***	0.0311***
	(-9.25)	(-2.36)	(-3.43)	(-6.90)	(4.00)
Size	-0.0042**	0.0001	0.0002	0.0001	0.0001
	(-2.80)	(1.94)	(0.11)	(0.24)	(0.46)
Finance	-0.0005**	0.0000	-0.0021*	-0.0000	0.0001
	(-3.23)	(1.82)	(-2.31)	(-0.76)	(1.32)
BC					
Trade	0.0271***	0.2041***	0.0491***	-0.0146	0.0002
	(6.62)	(10.24)	(5.80)	(-1.34)	(0.04)
Spec	-0.0034***	0.406***	-0.0032	-0.058*	-0.07***
	(-11.97)	(6.32)	(-1.23)	(-2.20)	(-11.31)
Finance	-0.0416***	-0.192***	-0.769***	-0.0056	0.0498
	(-3.85)	(-6.04)	(-4.02)	(-0.07)	(1.57)
N	2040	1070	202	134	1030
R^2					
Trade	-0.01	0.35	0.39	0.47	-0.09
Spec	0.22	0.11	0.17	0.18	0.01
BC	0.26	-0.26	0.29	-0.01	-1.28

t statistics in parentheses
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 4: Indirect impact on risk diversification separated by country groups. Data is total trade data. Risk sharing is measured by consumption correlation.

Table (4) presents the results of decomposition effects for consumption risk sharing. The results of the decomposition of the effects derivate from the former estimation mainly in three aspects: In the European CEEC grouping, specialization as driving force of trade changes from negative insignificant for the financial risk sharing estimation to positive insignificant for consumption risk sharing. The second change is visible for the European core countries. Market size differences are now positive insignificant and were negative insignificant as explanation for specialization. However, both are minor changes and almost negligible. The third change is more severe than the former two. The trade impact on business cycle co-movement is no longer insignificant but negative and highly significant. Based on the almost not visible share of intra-industry trade, this change might just reflect inter-industry trade with final consumption goods. Therefore, the results indicate that increasing trade leads to divergence of business cycles in the south Latin American group.

Financial integration can increase as well as decrease consumption correlation between two countries. The composition of the consumption bundles and the consumption path are sensitive to the conditions of the financial markets. In dependence of the dominating consumption target, financial integration boosts or reduces consumption correlation. Therefore, we turn to the impact of the

financial framework of the home and the partner country. The results for the financial control variables are presented in the Appendix Table (10).

Most obviously is the change for the Latin American countries. Both groupings react more sensitive to the financial conditions. In particular, the results indicate that the size and activity of the stock market and the degree of financial development of the home as well as of the partner country are important factors for the consumption correlation within both groups. However, the respective direction of the impact is not always identical for both groupings. The Asian country group now reacts relatively stronger to the financial status of the partner country. Furthermore, the own financial framework looses impact in the Asian group. In contrast to the financial risk sharing, the financial controls loose their total impact for the European CEEC countries. No significant effect is found for these countries with respect to consumption correlation. The European core countries shift their sensitivity towards the financial framework of the partner country. The stock market activities especially of the partner country impact the bilateral consumption correlation highly negative. Overall, the results do not provide a clear-cut picture of the role of the financial markets is not obvious, neither for the financial risk sharing nor the consumption risk sharing estimation. Only a slight tendency in importance towards the Asian and Latin American countries is perceptible. The results lead to the assumption that the importance of financial markets may increase with risk sharing not within but between the various country groups.

4.2 Estimations with Industry Trade Data

Financial Risk Sharing To analyse whether the effects are different for different industries, the estimation of equations (1) - (4) are repeated with disaggregated industry trade data. To estimate equations (1) - (4) with disaggregated industry trade data for the European and Latin American countries requires some changes to the country groups. The two European groups are merged together because of lacking data for the CEEC. Consequently some European countries are dropped. Furthermore, the time period is shortened to the years 1999 - 2004 because of the data availability.[19] The same pooling procedure is applied to the two Latin American country groups.[20] The pooling of the two European and the two Latin American data might dilute the estimation results.

The direct estimation results deviate slightly from the previous results. Table (5) column 1 shows the results for Asia, industry 0, "Food and Live Animals". The coefficient of the direct variables on risk sharing for the Asian countries have the same signs as the coefficients of the estimation utilizing the total direction trade data. Yet, the coefficients of trade and business cycles now turn out to be highly significant. With respect to the indirect effects, the results indicate

[19] Malta, Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Portugal, Romania, Slovak Republic, Slovenia and Czech Republic are the dropped countries for the estimation with 1dig industry trade data.

[20] The Bahamas, Bolivia, Chile, Ecuador, El Salvador, Honduras, Panama, Uruguay are dropped from the Latin American country group.

that specialization is now a main driver for trade between the Asian countries. Hence, with diverging specialization this might reflect an increase of "Food and Live Animals"-trade. This specific intra-industry trade is a rather small part of the general trade impact on risk sharing since trade consists mainly of inter-industry trade of final goods. The transferred shocks through trade do not affect each country to the same extent. Consequently, the need of risk sharing is not enforced by trade. The coefficients of the geographic variables exhibit the expected sign and indicate existing bilateral trade flows of these industry-products within the Asian group. This confirms the low intra-industry trade share. Not surprisingly, industry trade is a strong driver for specialization between these Asian countries. For these countries, the relation between trade and specialization - and vice versa - is the same for each analysed industry. Also the estimation results of (4) remain almost the same. All the coefficients are robust across the various analysed industries.

The 1dig "Food and Live Animals" results of the European countries differ substantially from the total trade estimation. The second column of Table (5) presents the results for the industry estimation. The coefficient of the trade impact is insignificant. With respect to the total trade estimation the effect of the trade impact on financial risk sharing is insignificant for Europe Core but significantly negative for Europe CEEC. Firstly, after the aggregation of the two European groups the effect of disaggregated industry trade on financial risk sharing turns out to be insignificant. Secondly, the missing data for many of the CEEC decreases the significance of the trade impact. The indirect impact of specialization through trade is significantly positive. Thus, the inter-industry trade increases the financial risk sharing within the European country group. However, the direct specialization impact on financial risk sharing is negative. This is consistent with the specialization impact of the CEEC but contradicts to the specialization impact of the core countries in the total trade estimation. The effect stays the same for each separate industry estimate. This might indicate a weak regional link between the countries.

	Asia	Europe	Latin America
Risk			
Trade	-0.1093***	0.0017	0.0716
	(-4.34)	(1.27)	(1.83)
Spec	0.0020	-0.0021**	0.0053
	(1.83)	(-2.73)	(1.31)
BC	0.174***	-0.0000	0.0007
	(7.40)	(-0.02)	(0.13)
Trade			
Spec	0.0965***	0.264***	0.0425***
	(15.36)	(7.57)	(6.50)
GDP_i	0.1339	0.1677***	0.2207***
	(0.17)	(5.52)	(5.20)
GDP_j	0.0074	0.1048***	0.2454***
	(0.06)	(3.64)	(5.71)
Spec			
Trade	0.6511***	0.1255**	-0.0713
	(5.77)	(3.10)	(-1.00)
Size	-0.327	-0.0125	0.0012
	(-1.14)	(-0.56)	(0.03)
Finance	-0.0992**	-0.0010	-0.0026
	(-2.88)	(-0.65)	(-0.34)
BC			
Trade	0.0241***	0.144***	0.104*
	(5.66)	(3.63)	(2.40)
Spec	-0.0002***	-0.0086***	-0.0015**
	(-5.85)	(-4.32)	(-2.71)
Finance	0.0022***	-0.0001	0.0001
	(14.84)	(-0.59)	(0.11)
N	711	631	731
R^2 Risk	0.36	-1.1653	0.10
R^2 Trade	-3.44	-0.68	0.19
R^2 Spec	0.29	0.01	0.01
R^2 BC	0.11	-2.13	-0.03

t statistics in parentheses
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 5: Direct and indirect impact on risk diversification separated by country groups. Data is disaggregated industry trade data. Risk sharing is measured by net foreign asset positions.

However, the impact turns positive if the number of industries in the analysis is enlarged. Thus, the weak regional link is not caused by a weak European link generally but by a weak link between the respective industries. The business cycle co-movements show the expected impact on risk sharing. With diverging business cycles the risk sharing between the European countries increases. The significance of this impact is even higher for a higher number of industries in the analysis. In contrast to the total trade estimation, dissimilar countries are included in the European group. Thus, risk sharing in dependence of diverging business cycles is more likely to occur. The change of the business cycle impact is even more accounted for by the new country grouping as the indirect effects of business cycle co-movements stay almost unchanged. Only specialization affects the co-movements now differently than in the total trade estimation. The negative specialization impact differs from the CEEC effect with total trade data

with respect to the sign and from the core countries with respect to the significance. Though, with total trade the CEEC specialization impact is positive and highly significant, it is the exception of the specialization impacts of all country groupings. Therefore, the transformation into a negative significant impact for the whole European group is not surprising and rather intuitive. All the impacts do not vary by the different industry estimates. Only industry three "Fuels, Lubricants, etc" has some changes in signs, but just for insignificant impacts.

The Latin America countries now show no significant direct impact on risk sharing at all. The estimation results for the 1dig "Food and Live Animals" industry are shown in column 3 of Table (5). Analogue to the European countries, the aggregation of both Latin American country groups dilute the results. This is valid for all tested industries. The indirect channels are also very weak. Especially specialization seems to be not affected by any link between the Latin American countries. Trade on the other hand depends significantly on specialization patterns within the group and the geographic variables as well. Only distance looses its significance. Again, this supports the missing linkages between the Latin American countries. The influences on business cycle co-movements depend on the industry. Specialization drives the divergence of diverging business cycles significantly for "Food and Live Animals", "Beverages and Tobacco", "Crude Materials" and "Fuels, Lubricants, etc". For "Chemicals, relatd. Prod. NES", "Manufactured Goods" and "Machines, Transport Equip." specialization still impacts business cycle co-movements negatively. The influence is not significant anymore. However, trade drives business cycle convergences significantly for all industries but "Beverages and Tobacco".

Overall the diverse impact of trade and specialization on business cycles indicate that business cycles diverge by proceeding specialization and converge with increasing trade integration. This supports the results of Frankel and Rose (1998) that demand shocks and intra-industry trade cause business cycles to converge. Additionally, the further results show that the impact of specialization on trade is always significant whereas trade affects specialization not in all cases. The trade impact on specialization turns significant if the number of specialization possibilities is extended. These findings confirm Fidrmuc (2004). He stated that not only trade intensity but also trade composition affects business cycles behaviour.

Trade and specialization drive bilateral consumption correlation for all country groups. Hence, trade integration uncouples consumption from domestic production and increases the share of foreign goods in the consumption composition. The positive impact of specialization on consumption correlation emphasizes this effect additionally. However, a significant trade impact is present only for the Latin American countries and specialization is significant for Asia and Latin America. Again, the results stay the same for each tested industries. The direct impacts change with the number of industries. Analogue to the financial risk sharing estimation the composition of trade and specialization is the crucial factor.

Consumption Risk Sharing The results for consumption risk sharing in Table (6) emphasize the indirect channels. The coefficients of most of the variables are robust across estimations, especially for the European countries. In particular, the strength of the indirect impacts stays comparatively unchanged for the European as well as for the Latin American countries. The consistent indirect influence is no surprise: Changing the measure for risk sharing does not alter the channels between the three main variables: trade, specialization and business cycle co-movements.

	Asia	**Europe**	**Latin America**
Risk	con_I		
Trade	0.0000	-0.0000	0.000002*
	(1.16)	(-0.19)	(2.53)
Spec	0.431***	0.0000	0.0000006***
	(8.55)	(1.62)	(8.17)
BC	0.0895***	-0.0600**	0.1015***
	(7.37)	(-3.13)	(9.83)
Trade			
Spec	0.0442***	0.256***	0.0534***
	(14.57)	(7.25)	(7.74)
GDP_i	0.4919***	0.1707***	0.1465***
	(4.39)	(5.50)	(3.54)
GDP_j	0.0427	0.1080***	0.2050***
	(0.40)	(3.65)	(4.91)
Spec			
Trade	0.1355***	0.0119**	-0.0052
	(12.21)	(2.87)	(-0.73)
Size	0.2182	-0.0121	-0.0275
	(0.45)	(-0.52)	(-1.00)
Finance	-0.5617	-0.1016	-0.2609
	(-0.18)	(-0.59)	(-0.34)
BC			
Trade	-0.0173***	0.133***	0.110*
	(-3.69)	(3.40)	(2.53)
Spec	-0.0248***	-0.692***	-0.00171
	(-9.07)	(-3.40)	(-0.03)
Finance	0.368**	-0.0843	0.171
	(2.67)	(-0.44)	(0.37)
N	711	613	731
R^2 Risk	-0.56	-0.84	-1.76
R^2 Trade	-0.54	-2.16	0.04
R^2 Spec	-0.05	-0.01	-0.01
R^2 BC	-0.31	-0.46	-0.03

t statistics in parentheses
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 6: Direct and indirect impact on risk diversification separated by country groups. Data is disaggregated industry trade data. Risk sharing is measured by consumption correlations.

However, the direct channels show a different impact on consumption correlation than on financial risk sharing. The most obvious change of the trade impact occurs for the Asian countries. In the case of consumption correlation the influence of trade turns insignificant. This might by intuitive as Kim et al. (2006) point out that the credit market is not an important channel for risk sharing between the Asian countries. However, the results indicate that there is risk sharing between the Asian countries. Risk sharing also increases with trade between these countries but the credit market is not used for risk sharing activities. These considerations are confirmed by a moderate positive impact of business cycle co-movements on risk sharing. For the European countries the effect of trade on consumption correlation remains insignificant. One notable change is the insignificant coefficient for the specialization impact on risk sharing. With increasing specialization between the countries the composition of their consumption bundles adjusts more and more. The effect of business cycle co-movements remains significantly negative. For Latin America, increasing trade, specialization and business cycle co-movements boost the consumption correlation within the group. Again, all the industry estimation results do not vary between the analysed industries, indicating the robustness of these results.

5 Robustness

As a check for the robustness, we run the estimation with varying explanatory variables. For trade we implement two additional trade measures according to (6) and (7). Moreover, we construct measure (5) with a different datasets. We also include two different specialization indices. For this purpose we use value added industry data and data from two different data sets for measure (8). Business cycle co-movements are presented by current GDP correlation as well as GDP growth correlation. To all these alterations in the explanatory variables the results are robust. The only exception is the Asian country group with respect to the business cycle co-movement. Precisely, in the financial risk sharing estimation the correlation of the pure GDP data is dropped with any trade measure in the estimation. However, correlation of GDP growth can be used without difficulties with any trade measure.

We applied a second check for the explained variables. As a measure of consumption correlation we used also pure consumption correlation and the correlation of consumption growth. Again the results were all robust. Above all, with the consumption risk sharing, the Asian results with regard to business cycle co-movement do not display the dropped trade measure.

Finally, we switch the estimation method from 3sls to 2sls and equation by equation estimation as further tests of robustness. In both cases, the results are mostly robust for all country groups. Yet, specialization changes its impact on risk sharing in three country groups and the effect of business cycles on risk sharing for one group. The results are least robust for the Latin American countries.[21]

[21] In addition to the 2sls and equation-by-equation estimation, we run the regression with a

According to these sensitivity analyses the results are robust. Only the results for the Latin American countries should be interpreted with caution.

6 Conclusion

In this paper we analyse the impact of increasing trade, specialization and business cycle co-movements on risk-sharing within three country groups. Additionally, we study the simultaneous effects between these three explaining variables by allowing for endogeneity among these variables. In order to account for different stages of integration within a country group we split the European and the Latin American countries in two different country groups: for Europe, CEEC and Core, and for Latin America, Central and South.

The results indicate that more similar countries share more risk with each other. These results are valid for the financial risk-sharing as well as for the consumption risk-sharing estimation. The impact of trade and specialization on risk sharing differs for each country group. The Asian and European Core countries increase their risk-sharing among each other the more diverse their industrial specialization. In contrast, the CEEC and both Latin American country groups tend to increase their intra-group risk-sharing the more synchronized their industrial patterns are. Furthermore, trade always increases business cycle co-movements with exception of the Latin American countries. On the other hand specialization leads to diverging business cycles except for the CEEC. The mutual trade and specialization relations imply a noticeable impact of intra-industry trade in each country group. Again, the southern Latin American countries march to a different drummer and show a positive trade impact on specialization and vice versa.

Overall, the results imply that there is a tendency for synchronized countries with respect to industry patterns and business cycles to share their risk with each other. Within these respective country groups intra-industry trade accounts for a noticeable share in total trade. The Latin American country groups present an exception. They also do not show the same share of intra-industry trade and a much weaker intra-group link.[22] Hence, there might be scope and need for further integration and risk sharing among the Latin American countries. This is a subject with growing importance, especially in course of a proceeding decoupling process from the USA.

panel-corrected standard error method and a pooled linear standard method.

[22] Interestingly, these "hard" fact results are supported by the Latinobarómetro (2007). This survey finds a rather weak will for integration among the Latin American population. Even more, the willingness for integration and bearing of possible concessions is lower in the southern than in the central Latin American countries. These findings again support the present results with more integrated and connected central Latin American countries than Latin American south.

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8 Appendix

Countries

- **Asia**
  - Australia
  - China
  - Hong Kong
  - Indonesia
  - India
  - Japan
  - Korea, south
  - Malaysia
  - Myanmar
  - New Zealand
  - Philippines
  - Singapore
  - Thailand
  - Taiwan
  - Vietnam

Europe

- Austria
- Belgium
- Bulgaria
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Latvia
- Lithunia
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovak Republic
- Slovenia
- Spain
- Sweden
- United Kingdom

Europe, Core

- Austria
- Belgium
- Denmark
- Finland
- France
- Germany
- Greece
- Ireland
- Italy
- Luxembourg
- Malta
- Netherlands
- Portugal
- Spain
- Sweden
- United Kingdome

Europe, CEEC

- Bulgaria
- Cyprus
- Czech Republic
- Estonia
- Hungary
- Latvia
- Lithunia
- Poland
- Romania
- Slovak Republic
- Slovenia

Latin America

- Argentina
- Bahamas, The
- Bolivia
- Brazil
- Chile
- Colombia
- Costa Rica
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama
- Paraguay
- Peru
- Uruguay
- Venezuela

Latin America, Central
- Costa Rica
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama

Latin America, South
- Argentina
- Bahamas, The
- Bolivia
- Brazil
- Chile
- Colombia
- Ecuador
- Paraguay
- Peru
- Uruguay
- Venezuela

Control Variables

	Asia	**Europe CEEC**	**Europe Core**	**Latin America Central**	**Latin America South**
GDP_i	0.0265	-0.0178	0.421***	-0.590**	0.0785***
	(1.88)	(-0.56)	(3.96)	(-2.64)	(5.83)
GDP_j	-0.0154***	-0.0261***	-0.2130**	-0.5760**	0.1420***
	(-3.57)	(-3.71)	(-2.66)	(-2.95)	(10.49)
Language	0.5430***	0	0	0	0.0375***
	(24.51)	.	.	.	(3.66)
Border	0.0571***	0.1350***	0.1110**	0.0807	0.1510***
	(3.58)	(16.74)	(3.29)	(1.76)	(19.25)
Religion	-0.0044***	0.0003	0	0.1605***	-0.0200***
	(-4.48)	(0.58)	.	(4.43)	(-6.47)
Ethnik	0.2540***	0	0	-0.1690***	0.0916***
	(11.59)	.	.	(-3.71)	(9.56)
Democracy	0.0056	0.0626***	0	0	0
	(0.52)	(6.89)	.	.	.
Distance	-0.0834***	0.0183	-0.7670**	0.7080	-0.1252***
	(-4.00)	(0.93)	(-2.76)	(0.98)	(-3.71)

t statistics in parentheses
$^*p < 0.05,\ ^{**}p < 0.01,\ ^{***}p < 0.001$

Table 7: Trade controls for financial risk sharing. Trade data is total trade data. Financial risk sharing is measured by net foreign asset positions.

	Asia	Europe CEEC	Europe Core	Latin America Central	Latin America South
Financial Depth	0.18841***	-0.0006*	0.0002	0.0011*	-0.0027
	(8.34)	(-2.36)	(1.56)	(2.51)	(-0.32)
Activity Int.	-0.2167***	0.0002	-0.0003*	-0.0009*	-0.0006
	(-9.44)	(0.70)	(-2.13)	(-2.38)	(-0.12)
Size Stock-Market	0.0250**	0.0002	-0.0001	-0.0001	0.0011
	(2.73)	(0.74)	(-0.49)	(-0.40)	(0.44)
Financial Development	-0.0505*	0.0004	-0.0003*	-0.0002	-0.0073
	(-2.38)	(1.18)	(-1.99)	(-0.65)	(-0.70)
Activity Stock-Market	0.0021	0.0002	-0.0001	0.0004	-0.0095
	(0.23)	(1.02)	(-0.84)	(0.44)	(-0.78)
Fin. Depth Partner	0.0701***	0.0033***	0.0001	0.0011*	-0.0043
	(6.40)	(12.36)	(0.24)	(2.52)	(-1.41)
Activity Int. Partner	-0.1440***	-0.0030***	-0.0001	-0.0009*	-0.0004
	(-9.85)	(-8.64)	(-0.68)	(-2.35)	(-0.09)
Size Stock-M. Partner	0.010	-0.0001	-0.0001	-0.0001	0.0023
	(1.69)	(-0.44)	(-0.06)	(-0.40)	(0.91)
Fin. Dev. Partner	0.0029	-0.0013***	-0.0006***	-0.0002	-0.0080
	(0.25)	(-5.63)	(-6.12)	(-0.75)	(-1.61)
Activity Stock-M. Partner	-0.0100	0.0013***	0.0001	0.0003	-0.0201
	(-1.39)	(6.95)	(0.43)	(0.36)	(-1.84)

t statistics in parentheses
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 8: Financial controls for financial risk sharing. Trade data is total trade data. Financial risk sharing is measured by net foreign asset positions.

	Asia	**Europe CEEC**	**Europe Core**	**Latin America Central**	**Latin America South**
GDP_i	0.0281*	-0.0117	0.446***	-0.736***	0.107***
	(1.99)	(-0.36)	(4.26)	(-3.35)	(8.92)
GDP_j	-0.0157***	-0.0263***	-0.256**	-0.692***	0.161***
	(-3.65)	(-3.65)	(-3.23)	(-3.61)	(12.73)
Language	0.545***	0	0	0	0.0416***
	(24.60)	.	.	.	(4.12)
Border	0.0577***	0.136***	0.0715*	0.100*	0.167***
	(3.61)	(16.64)	(2.16)	(2.23)	(21.87)
Religion	-0.0453***	0.0038	0	0	0
	(-4.55)	(0.64)	.	.	.
Ethnic	0.255***	0	0	-0.192***	0.0550***
	(11.64)	.	.	(-4.25)	(6.17)
Democracy	0.0046	0.0635***	0	0	-0.242***
	(0.43)	(6.63)	.	.	(-8.74)
Distance	-0.0073***	0.0014	-0.110***	0.021	-0.0006
	(-3.49)	(0.67)	(-4.05)	(0.29)	(-0.19)

t statistics in parentheses

$^{*}p < 0.05,\ ^{**}p < 0.01,\ ^{***}p < 0.001$

Table 9: Trade controls for consumption risk sharing. Trade data is total trade data. Consumption risk sharing is measured by consumption correlation.

	Asia	Europe CEEC	Europe Core	Latin America Central	Latin America South
Financial Depth	-0.00550	-0.174	0.403	-0.193	0.0462
	(-0.06)	(-0.92)	(0.90)	(-0.50)	(0.40)
Activity Int.	-0.0375	0.0207	-0.474	0.716*	-0.0097
	(-0.45)	(0.11)	(-1.10)	(2.17)	(-0.12)
Size Stock-Market	-0.0109	0.0677	-0.0160	-0.489*	0.0542
	(-0.33)	(0.33)	(-0.11)	(-1.97)	(1.53)
Finanical Development	0.0076	0.136	0.448	-0.964***	-0.0656
	(0.09)	(0.51)	(0.84)	(-4.33)	(-0.46)
Activity Stock-Market	0.001	0.0031	-0.017	0.233***	-0.109***
	(0.29)	(0.23)	(-1.18)	(3.40)	(-5.16)
Fin. Depth Partner	0.239***	0.0876	0.660*	-0.288	-0.0648
	(6.00)	(0.46)	(2.54)	(-0.75)	(-1.22)
Activity Int. Partner	-0.208***	-0.323	-0.514*	0.749*	0.0298
	(-3.91)	(-1.32)	(-2.35)	(2.30)	(0.37)
Size Stock-Market Partner	0.0840***	-0.118	0.138	-0.472	0.0779
	(3.81)	(-0.61)	(1.11)	(-1.87)	(1.77)
Fin. Dev. Partner	-0.0743	-0.0612	0.524	-0.919***	0.0842
	(-1.78)	(-0.38)	(1.70)	(-4.05)	(1.05)
Activity Stock-M. Partner	0.0008	0.0082	-0.0523***	0.230**	-0.134***
	(0.30)	(0.61)	(-4.33)	(3.28)	(-7.32)

t statistics in parentheses
$^{*}p < 0.05,\ ^{**}p < 0.01,\ ^{***}p < 0.001$

Table 10: Financial controls for consumption risk sharing. Trade data is total trade data. Consumption risk sharing is measured by consumption correlation

Results of Robustness Check

	Asia	Europe CEEC	Europe Central	Latin America Central	Latin America South
Risk					
Trade^{CvW}	-0.1684***	-0.0002***	0.0005*	-0.0001**	-0.0103***
	(-10.57)	(-7.58)	(2.05)	(-2.87)	(-3.74)
Spec	-0.0475**	-0.1950***	0.0011***	-0.0013	-0.4246*
	(-3.11)	(-8.74)	(7.98)	(-0.76)	(-2.48)
BC	0.2652***	0.0005***	-0.0001	0.0002**	-0.0365***
	(9.71)	(4.59)	(-0.36)	(2.88)	(-4.26)
Trade					
Spec	-0.0018***	-0.320***	-0.001***	-0.0769***	-0.0071**
	(-15.61)	(-8.86)	(-9.65)	(-4.36)	(-3.26)
GDP_i	0.0012	-0.0175	0.0089*	-0.207*	-0.0128
	(0.23)	(-0.31)	(2.35)	(-2.15)	(-1.86)
GDP_j	-0.0001	-0.022	0.0009	-0.173*	0.0021
	(-0.12)	(-1.57)	(0.32)	(-2.05)	(0.31)
Spec					
Trade^{CvW}	-0.4933***	-0.0011***	-0.5091***	-0.0071***	-0.0208***
	(-22.08)	(-6.24)	(-5.66)	(-8.96)	(-4.36)
Size	-0.0554***	0.0007**	-0.0110	0.0001	0.0004
	(-4.37)	(2.60)	(-0.84)	(0.05)	(0.28)
Finance	-0.004**	0.0001	-0.0159	0.0002	0.0007
	(-2.96)	(1.89)	(-1.95)	(-0.75)	(1.35)
BC					
Trade^{CvW}	0.0502***	0.0107***	0.145***	-0.0042	-0.0062
	(22.17)	(8.23)	(6.61)	(-1.59)	(-1.67)
Spec	0.0021***	0.663***	0.0056	-0.0467	-0.0699***
	(5.69)	(8.90)	(1.89)	(-1.66)	(-11.36)
N	2011	1063	196	134	1030
R^2 Risk	-0.78	-1.73	-2.12	0.65	-1.54
R^2 Trade	-0.2	-0.58	0.47	0.38	-0.01
R^2 Spec	-0.56	0.06	0.25	0.20	-0.14
R^2 BC	-1.14	-0.53	0.30	0.05	-1.33

Table 11: Direct and indirect impact on financial risk sharing. Trade is measured by the third trade index analogue to Deardorff (1998). Trade data is total trade data. Risk sharing is measured by net foreign asset positions.

	Asia	Europe CEEC	Europe Core	Latin America Central	Latin America South
	nfa_ij				
Risk					
Trade	-0.2241	-0.0403***	-0.0017***	-0.0023**	-0.0373
	(-1.30)	(-7.50)	(-3.78)	(-2.73)	(-0.93)
Spec 2	0.0903	-0.6631***	-0.0063***	0.0005	0.01
	(0.98)	(-9.48)	(-3.96)	(0.11)	(1.61)
BC	0.3115	0.0115***	-0.0002	0.0022**	-0.2584***
	(1.59)	(9.90)	(-0.44)	(3.18)	(-4.48)
Trade					
Spec 2	-0.0172***	0.253	0.0281	-0.486***	-0.0001
	(-14.91)	(1.51)	(0.60)	(-6.08)	(-0.02)
GDP_i	0.0227	-0.0179	0.553***	-0.202	0.0938***
	(1.66)	(-0.54)	(4.94)	(-0.97)	(6.86)
GDP_j	-0.0021	-0.0110	-0.275**	-0.191	0.154***
	(-0.56)	(-0.90)	(-3.13)	(-0.92)	(11.04)
Spec 2					
Trade	-0.1234***	-0.0024**	-0.0035	-0.0146***	0.0051
	(-11.59)	(-2.69)	(-1.04)	(-8.85)	(1.27)
Size	-0.110***	0.0008	0.0005	0.0004	0.0097
	(-3.72)	(0.95)	(0.06)	(0.04)	(1.14)
Finance	-0.1113***	0.0043**	0.1203	0.0033	0.0068
	(-4.16)	(3.06)	(1.61)	(0.29)	(0.28)
BC					
Trade	0.0198***	0.2901***	0.0285	-0.0283*	-0.0150**
	(4.62)	(9.96)	(1.87)	(-2.33)	(-3.23)
Spec 2	-0.0021***	0.466***	-0.0777***	-0.0186**	0.0003
	(-11.70)	(15.27)	(-17.76)	(-2.80)	(0.54)
Finance	-0.0478***	-0.349***	0.205	-0.0170	0.0031
	(-4.35)	(-7.49)	(0.61)	(-0.20)	(0.11)
N	2040	1070	202	134	1030
R^2 Risk	0.42	-1.73	-0.4	0.64	0.09
R^2 Trade	0.22	0.39	0.48	0.18	0.49
R^2 Spec	0.21	0.1	0.35	0.09	0.01
R^2 BC	0.22	-3.9	-5.74	-0.21	0.04

t statistics in parentheses
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 12: Direct and indirect impact on financial risk sharing. Specialisation is measured by a second index which is constructed with value added data. Trade data is total trade data. Risk sharing is measured by net foreign asset positions.

	Asia	Europe CEEC	Europe Core	Latin America Central	Latin America South
Risk					
'Trade	-0.2578	-0.0297***	-0.0008	-0.0032***	-0.0216
	(-1.51)	(-6.18)	(-1.56)	(-3.95)	(-0.44)
Spec	0.0140	-0.1597***	0.0008***	-0.0029	-0.2169
	(1.05)	(-8.77)	(5.58)	(-1.60)	(-1.25)
BC III	0.3551	0.0078***	0.0011**	0.0017*	-0.2406**
	(5.79)		(2.65)	(2.26)	(-3.03)
Trade					
Spec	-0.0443***	-0.0543	-0.134***	-1.50***	0.410***
	(-19.07)	(-0.27)	(-5.18)	(-3.69)	(9.56)
GDP_i	0.0264	-0.0165	0.421***	-0.588**	0.0786***
	(1.87)	(-0.52)	(3.95)	(-2.63)	(5.84)
GDP_j	-0.0161***	-0.0282***	-0.211**	-0.574**	0.142***
	(-3.75)	(-4.02)	(-2.63)	(-2.95)	(10.49)
Spec					
FR_I	-0.536***	-0.0072*	-0.1411***	-0.0259***	0.0303***
	(-9.38)	(-2.26)	(-3.42)	(-6.95)	(3.88)
Size	-0.0050**	0.00007*	-0.0003	0.0001	0.0001
	(-3.26)	(2.10)	(-0.21)	(0.21)	(0.50)
Finance	-0.0005**	0.0001	-0.0022*	-0.0001	0.0001
	(-3.19)	(1.85)	(-2.41)	(-0.64)	(1.44)
BC III					
Trade	0.0338***	0.2226***	0.0474***	-0.0179	0.0085
	(8.31)	(10.59)	(5.57)	(-1.65)	(0.16)
Spec	-0.0025***	0.614***	-0.0027	-0.0469	-0.0670***
	(-8.76)	(9.72)	(-1.01)	(-1.79)	(-11.13)
Finance	-0.0370***	-0.210***	-0.717***	-0.0167	0.0519
	(-3.43)	(-6.52)	(-3.73)	(-0.19)	(1.64)
N	2040	1070	202	134	1030
R^2 Risk	0.42	-1.19	-1.32	0.62	-0.32
R^2 Trade	-0.01	0.33	0.40	0.45	0.01
R^2 Spec	0.22	0.11	0.17	0.18	0.01
R^2 BC III	0.28	-0.78	0.31	0.01	-1.18

t statistics in parentheses
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 13: Direct and indirect impact on financial risk sharing. Business Cycle co-movements are measured by gdp growth correlations. Trade data is total trade data. Risk sharing is measured by net foreign asset positions.

	Asia	Europe CEEC	Europe Core	Latin America Central	Latin America South
Risk	nfa_ij				
Trade	-0.7803	-0.0109	-0.0015	-0.0098	-0.9814***
	(-0.66)	(-0.68)	(-0.71)	(-1.63)	(-4.02)
Spec	-0.2008***	0.0754**	0.0007*	-0.0194	0.6729***
	(-3.37)	(2.67)	(2.00)	(-1.28)	(5.72)
BC	0.5674***	0.0017***	-0.001***	0.0009	0.0294
	(6.58)	(3.58)	(-4.29)	(1.76)	(1.48)
Trade					
Spec	-0.0024**	0.482***	-0.0411*	0.0078	0.0360**
	(-2.78)	(10.48)	(-2.36)	(0.02)	(2.95)
GDP_i	0.0029	-0.0016	0.0573***	-0.111***	0.0091***
	(1.95)	(-0.45)	(4.40)	(-4.86)	(6.47)
GDP_j	0.0003	-0.0020***	-0.0332***	-0.104***	0.0151***
	(0.78)	(-3.32)	(-3.38)	(-4.97)	(10.82)
Spec					
Trade	-0.2024***	0.0118***	-0.0661	-0.0133***	0.0147*
	(-4.55)	(6.94)	(-1.71)	(-3.63)	(2.43)
Size	-0.1448***	0.0008	-0.0032	0.0010	0.0014
	(-7.84)	(1.74)	(-0.15)	(0.28)	(0.81)
Finance	-0.0076***	0.0004	-0.0155	-0.0004	0.0009
	(-4.87)	(0.76)	(-1.55)	(-0.98)	(1.73)
BC III					
Trade	0.234***	0.846***	0.315***	0.304**	-0.147***
	(7.77)	(8.19)	(4.16)	(3.07)	(-4.15)
Spec	-0.0119***	0.262	0.0196	0.199	-0.0211
	(-8.01)	(1.42)	(1.23)	(0.75)	(-1.14)
Finance	-0.0287**	-0.121***	-0.486*	0.0003	0.0058
	(-2.71)	(-4.19)	(-2.48)	(0.00)	(0.20)
N	2040	1070	202	134	1030
R^2 Risk	0.43	0.59	0.53	0.68	0.27
R^2 Trade	0.56	0.42	0.51	0.60	0.50
R^2 Spec	0.25	0.21	0.21	0.27	0.02
R^2 BC III	0.34	0.28	0.37	0.22	0.03

t statistics in parentheses
$^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table 14: Direct and indirect impact on risk sharing with OLS. Trade is measured by total trade data. Risk sharing is measured by net foreign asset positions.