

What Types of Capital Flows Improve International Risk Sharing? Remittances! *

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Abstract. Cross-border capital flows are expected to lead to more efficient international risk sharing by facilitating borrowing and lending in global financial markets. We examine international risk sharing outcomes of various types of capital flows in a large sample of emerging market and developing economies during the 1990-2018 period. Using a variety of empirical techniques and a wide range of cross-border flows, including FDI, portfolio equity, debt flows, and remittance flows, we conclude that a higher share of remittance inflows to GDP is associated with increased international risk sharing. Other types of capital flows do not appear to be consistently associated with better risk sharing outcomes. These findings are robust to the use of different econometric specifications, country-specific characteristics and controls.

Keywords: remittance inflows, international risk sharing, capital flows.

JEL classification: E1, F02, F4, G01

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1. Introduction

The ability to disentangle fluctuations in consumption from those in output is an important determinant of economic welfare. Ownership of foreign assets that can be sold during bad times and access to short-term foreign borrowing for consumption needs are examples of arrangements that help de-link consumption from output fluctuations.¹ Provided that fluctuations in income are not fully synchronized across countries, and financial markets are operating efficiently, risks associated with output uncertainty can be shared across borders through capital flows, thus lowering dependence of consumption movements on domestic output fluctuations.

The extant empirical literature finds only minimal impact of cross-border capital flows, such as FDI, portfolio equity, and debt flows, on international risk sharing. Equity flows are correlated with improved risk sharing in advanced economies, but there appears to be no robust relationship between most types of capital flows and the extent of risk sharing in emerging market and developing economies (EMDEs).

Although different types of capital flows have been extensively investigated in this context, there has been no comprehensive study on the implications of remittance inflows for international risk sharing. For many emerging market and developing economies remittances are seen as substitute to cross-border capital flows. They represent an important source of external finance and during the last decade, have been sizeable both compared to FDI and other portfolio flows, and as a share of GDP (Figure 1).

In theory, the ability of remittances to *de-link* fluctuations in country-specific consumption growth from those in country-specific output growth is closely related to the motives to remit. These motives may affect the volume of flows and their variability during the business cycle. The most basic distinction is between altruistic motives and those driven by self-interest. If remittances are driven by altruistic motives, they will likely be counter-cyclical and contribute to a lower sensitivity of consumption to income changes. On the other hand, if they are driven by self-interest and are mainly used for investment purposes, they will likely be pro-cyclical and lead to higher co-movement between consumption and income growth (Acosta et al., 2009).²

Remittances can help stabilize consumption inter-temporally by supporting saving and improving access to financial services (Adams and Cuenca, 2013; Acosta et al., 2009; Mandelman and Zlate, 2012). They appear to be a stable form of foreign currency financing, unlike FDI and portfolio flows, which exhibit a high degree of volatility over time (Figure 2). Understanding the role of remittances on risk sharing is important since they are the second largest form of foreign

¹ The former refers to *ex-ante* risk sharing arrangements and the latter is an example of *ex-post* intertemporal smoothing of consumption. Standard theory predicts that cross-border financial flows would facilitate international borrowing and lending in response to shocks, thus lowering the sensitivity of consumption to income changes. Obstfeld (1994) and Lewis (1996) are early seminal studies on the topic. See Kose, Prasad and Terrones (2009), Bai and Zhang (2012), Rangvid et al. (2016), and Hevia and Servén (2018) for more recent evidence and a review of the literature.

² See De et al. (2019) for a detailed discussion of the motives to remit. They find that remittances are typically *acyclical*, and may help de-link consumption growth from business cycle fluctuations.

finance in terms of size, and also relatively stable compared to FDI and portfolio flows. Given that remittances, unlike other types of capital flows, are unrequited transfers that do not have to be paid back and target the very consumers that are more likely to be liquidity constrained, they may help disentangle fluctuations of consumption from those of output, thus improving standard measures of international risk sharing.

We study the role of remittances as a possible driver of the temporal changes in the sensitivity of country-specific consumption to country-specific output changes in EMDEs, which is one of the standard measures of international risk sharing in the literature. Given the gap in this literature, the paper offers to shed light into the role of remittance inflows for helping improve risk sharing in EMDEs.³ Our study also offers a comprehensive comparison of the effects of various types of capital flows on international risk sharing outcomes spanning a relatively long period that includes the era of financial globalization and the Global Financial Crisis of 2007-09.

We report two main findings. First, higher remittances to GDP are correlated with better international risk sharing outcomes in EMDEs. This finding is robust to the use of different controls, time periods and estimation methods. Second, empirical tests do not support a robust link between increased capital flows, such as FDI, equity and debt flows, and improved international risk sharing in EMDEs.

The remainder of the paper is structured as follows. The next section briefly describes the database and empirical framework. Section 3 analyzes the linkages between remittances to GDP and international risk sharing, and undertakes a battery of robustness tests. Section 4 offers some concluding remarks.

2. Database and Empirical framework

2.1. Database

We examine the relationship between cross-border capital flows and international risk sharing using a rich database that includes a large sample of emerging market and developing countries. Real consumption and real GDP data are drawn from the World Bank's World Development Indicators (WDI) Database. Population statistics are drawn from the United Nations' National Accounts Main Aggregates Database. It is widely known that aggregate output and consumption data are nonstationary, whereas first differences of these variables are stationary. Hence, we follow the standard practice and carry out the analysis using first differenced series.

Total remittances include personal transfers, defined as all current transfers in cash or in kind received by resident households from nonresident households, and compensation of employees, defined as gross earnings of workers residing abroad less than a year. The data on migrant

³ A few previous studies have investigated the ability of remittances to reduce macroeconomic volatility. Balli and Rana (2015) follow a methodology pioneered by Asdrubali, Sorensen and Yosha (1996) and show that remittances help *de-link* national income from domestic output fluctuations. This paper studies how remittance inflows affect measures of international risk sharing.

remittance inflows are drawn from the IMF’s Balance of Payments Statistics based on the Balance of Payments Manual 6 (BPM6). The database also includes *de-jure* measures of financial integration and trade openness. For *de-jure* financial integration, we use Chinn and Ito (2006) measure, which offers the most comprehensive coverage of countries and period. Financial flows data are drawn from the IMF’s Balance of Payments accounts and Lane and Milesi-Ferretti (2007) datasets.⁴ Following earlier work, we drop countries with population less than one million. We also drop countries for which fewer than ten observations of remittance inflows are available. In the end, for our baseline results we utilize a sample of 79 EMDEs over the period 1990-2018.⁵

2.2. Empirical Methodology

We follow standard literature that has tested various implications of the consumption Euler equation to estimate the extent of international risk sharing in aggregate data (Obstfeld, 1994; Lewis, 1996; Kose, Prasad and Terrones, 2009). These studies employ a simple framework that is based on the predictions of the standard complete markets model and regress country-specific consumption growth on country-specific output growth:

$$\Delta c_{t+1}^j - \Delta c_{t+1} = \alpha + \beta(\Delta y_{t+1}^j - \Delta y_{t+1}) + \epsilon_{t+1}^j \quad (1)$$

where Δc_{t+1}^j (Δy_{t+1}^j) denotes country j consumption (output) per capita growth at time $t + 1$; Δc_{t+1} (Δy_{t+1}) denotes world consumption (output) growth at time t ; ϵ_{t+1}^j follows a stationary process and represents measurement error in consumption; and where β measures the extent of risk sharing. Theoretically, in a model with complete international financial markets and perfect risk sharing, the coefficient β , which captures the degree of countries’ uninsured idiosyncratic consumption risk, is equal to zero. In practice, earlier studies interpret β pragmatically and argue that this coefficient can be used to measure the degree of risk sharing. The smaller the extent of idiosyncratic comovement between country-specific consumption and output growth the smaller β , and the greater the degree of international risk sharing (Asdrubali et al., 1996; Kose et al., 2009).⁶ Δc_{t+1} and Δy_{t+1} are measures of aggregate (common) fluctuations on consumption and output, respectively. Since countries cannot eliminate risks associated with aggregate fluctuations, but only share them efficiently, the common component of each variable is subtracted from the corresponding country specific variable.

⁴ Lane and Milesi-Ferretti (2007) dataset on financial assets and liabilities ends in 2011. This dataset is constructed using information from the IMF Balance of Payments as well as other sources. As a result, it offers a better coverage for developing economies in the earlier years of our sample compared to the IMF Balance of Payments. We use growth rates of each variable in Lane and Milesi-Ferretti (2007) dataset to extend the IMF Balance of Payments data backwards.

⁵ Table A1 presents the list of countries. For comparison and further robustness, we also pool this country group with advanced economies (AEs). In that case, the sample includes 110 countries. On average, total remittances have been less than 0.2 percent of GDP for the AEs, so we do not include them in the baseline.

⁶ The extent of risk sharing can be calculated as $(1 - \beta)$, where β is the coefficient of regressing country-specific consumption growth on country-specific output growth (Artis and Hoffmann, 2012; Sorensen et al., 2007). If $\beta = 1$, then there is no risk sharing. If $\beta = 0$, then the country has achieved full risk sharing.

To estimate more directly the quantitative effects of financial integration and other foreign currency inflows on international risk sharing, we follow the standard approach in the literature and consider the impact of each type of flows on the comovement between country-specific consumption growth and country-specific output growth (Lewis, 1996; Kose et al., 2009). In particular, we simply regress country specific consumption growth on country specific output growth:

$$\Delta c_{t+1}^j - \Delta c_{t+1} = \alpha + \gamma I_{jt} + \beta(\Delta y_{t+1}^j - \Delta y_{t+1}) + \delta I_{jt}(\Delta y_{t+1}^j - \Delta y_{t+1}) + \epsilon_{t+1}^j \quad (2)$$

where, I_{jt} represents the remittance inflows as a ratio to GDP, or other cross-border financial flows (as a percent of GDP) at time t . The coefficient β estimates the sensitivity of country-specific consumption growth to country-specific-output growth, as in equation (1). An interaction term is added to the regression and measures the extent to which cross-border flows help *de-link* country-specific consumption growth from country-specific output growth. A negative δ suggests that the variable of interest (I_{jt}) can help lower the sensitivity of country-specific consumption growth to country-specific output fluctuations, and thus improve international risk sharing.

3. Remittances and International Risk Sharing

3.1. Baseline results

We estimate equation (2) for an array of specifications and controls employing a dynamic panel framework that uses generalized least square (GLS) estimates for panel data following Ostergaard, Sorensen and Yosha (2002). This methodology allows estimation in the presence of $AR(1)$ autocorrelation within panels and cross-sectional correlation and heteroskedasticity across panels. Table 1 shows the effect of remittance inflows on risk sharing for different country groups. The country groups considered are: EMDEs, which include both emerging market and developing economies; all countries, which include emerging market and developing economies, as well as advanced economies; and high-remittance countries, defined as countries that have experienced remittances relative to their GDP greater than the sample median during the last decade.⁷ The results show that the interaction coefficient of remittances to GDP is negative and statistically different from zero for all specifications. We also control for measures of de-jure financial integration, and the coefficient of interaction of remittances to GDP remains negative and statistically different from zero, suggesting that remittance inflows are indeed correlated with better international risk sharing.

⁷ The group of emerging market economies has been the main recipient of capital flows from advanced economies during the last two decades. On the other hand, remittances as a percentage of GDP has been low for this group. The group of other developing economies has relied more heavily on remittance inflows and has also benefitted from considerable cross-border capital flows (Figure 2).

The estimated coefficient of regressing country-specific consumption growth on country-specific output growth is 0.8 in the baseline regression.⁸ The effect of remittance inflows on risk sharing is captured by δ , which appears to be negative and statistically significantly different from zero at 5 percent confidence level. Following the framework in equation (2), the extent of risk sharing for a country receiving remittance inflows to GDP equal to the median of the sample for the last 10 years (1.6 percent) can be calculated as $(1 - \beta - \delta * median_{REM})$, where the last term ($\delta * median_{REM}$) represents the portion of risk sharing achieved through remittances, and $median_{REM}$ refers to the median of remittances to GDP. The estimate for δ would suggest that, on average, about 15 percent of the achieved risk sharing in EMDEs can be attributed to remittances.

Next, in Table 2 we examine the relationship between risk sharing and remittance inflows to GDP, while controlling for other types of financial flows. The results show that the coefficient of the interaction of remittances to GDP with country-specific output growth is always negative and statistically significantly different from zero for the sample of EMDE economies. This indicates that a higher volume of remittances relative to GDP is associated with a lower correlation between country-specific consumption growth and country-specific output growth, or better international risk sharing. The estimated coefficient δ appears to be stable (at around negative 0.01) across different specifications.

The coefficients on the other variables, corresponding to the interaction of output growth with other types of cross-border flows, do not suggest a robust relationship between higher financial integration and improved risk sharing. For the stock of liabilities to GDP, the coefficients are not statistically significant. The composition of the stock of liabilities to GDP also does not explain the lack of risk sharing associated with these types of flows either as reported by Kose, Prasad and Terrones (2009).

Table 3 compares the risk sharing potential of remittance inflows with that of other types of financial flows. The coefficient of interest, δ^i , is presented in the third row and corresponds to the interaction of country-specific per capita output growth with each of the variables. The second column shows the baseline result for the effects of remittance inflows on risk sharing in EMDEs. The third column estimates the same regression for personal transfers as percent of GDP. The results are similar, suggesting that personal transfers, like overall remittances, are correlated with better international risk sharing, i.e., results are not driven by the compensation of employees residing temporarily abroad. The other columns show the extent to which other types of capital flows are correlated with better risk sharing outcomes. The results suggest that, unlike in the case of remittances to GDP, other foreign currency flows are not robustly correlated with better international risk sharing outcomes.

A higher stock of liabilities does not appear to be correlated with better risk sharing outcomes. The coefficient δ^i is not statistically different from zero for total liabilities, and for FDI and

⁸ This estimate is similar to previous studies in the literature (Kose, Prasad and Terrones, 2009; Fratzscher and Imbs, 2009)

portfolio equity liabilities. In the case of FDI, portfolio equity and debt flows the coefficient exhibits a negative sign, but the coefficients are not statistically significantly different from zero.

3.2. Robustness

To check the robustness of our findings, we conduct a battery of additional tests. We employ different country samples, control for simultaneous effects of different types of financial flows and check the robustness of our results for different time periods and alternative methodologies.

Additional controls. In Table 4, we investigate the effects of remittance inflows on risk sharing while controlling for both de-jure financial integration and other types of financial flows. The main findings hold. First, remittances are robustly correlated with better international risk sharing outcomes. Second, the results also do not support the hypothesis that other types of cross-border financial flows, de-jure financial integration, or trade flows are correlated with better risk sharing outcomes.⁹ These results are consistent with the results in the literature that fail to find a robust impact of financial flows on risk sharing in EMDEs (Kose et al., 2009; Bai and Zhang, 2012).

Alternative methodologies and alternative time periods. The estimation of equation (2) may bring up various econometric challenges, especially in short samples. For example, if income is non-stationary and income growth exhibits positive serial correlation – as supported by aggregate data – the error term would predict future income and will be correlated with contemporaneous output growth in equation (2). This implies that consumption growth may be correlated with the error term. Therefore, Ordinary Least Square (OLS) estimation would yield biased results as it would not control for endogeneity. In other words, β and δ would be unidentified if there exist no valid instruments for income growth. To overcome some of these challenges, we utilized a dynamic panel framework that uses generalized least square (GLS) estimates that control for autocorrelation within and across panels, as well as heteroskedasticity.

At the same time, these types of challenges are less likely to be a problem with long enough time series. Our sample of 29 years is long enough to produce results not subject sample-size related caveats in a fixed panel regression framework (panel OLS). We also check the robustness of our results for a longer time frame that spans the period 1980-2018. The results are similar to the baseline findings, suggesting that remittances are robustly correlated with better international risk sharing outcomes.¹⁰

The baseline results are also robust when controlling for other types of cross-border flows across country groups. The interaction coefficient of remittances with output growth is always negative

⁹ The literature does not provide clear guidance as to what the effects of trade on the sensitivity of consumption growth to income changes should be. Ostergaard, Sorensen and Yosha (2002) attribute a lower sensitivity of consumption to income changes in individual U.S. states (compared to the U.S.) to imports of an individual state being able to adjust relatively more rapidly. This is consistent with the theory that trade openness will help lower the sensitivity of consumption to income changes. On the other hand, trade integration may lead to specialization and an increase in output volatility (Kose, Prasad and Terrones, 2003). This would mean that a higher level of either *ex-ante* smoothing or *ex-post* lending and borrowing is required to *de-link* domestic consumption from domestic output fluctuations.

¹⁰ The results are available upon request.

and statistically significant from zero, suggesting that remittance inflows help improve risk sharing.

4. Conclusions

We conduct a comprehensive empirical analysis of the relationship between cross-border flows and international risk sharing outcomes in emerging market and developing economies. In particular, we study the relationship using a rich database that covers a large number of developing economies over more than three decades. Our results suggest that, contrary to the predictions of theory, increased financial integration, as witnessed by financial account liberalization, and increased FDI, equity, and debt flows, has not been associated with better risk sharing outcomes in developing countries. At the same time, a ratio of higher remittance inflows to GDP is associated with better risk sharing.

These results point to an interesting puzzle. Theory predicts that cross-border financial flows would enhance opportunities to share risks efficiently, and thus lower the comovement between country-specific consumption growth and country-specific output growth. Contrary to these predictions, both cross-border flows and de-jure measures of financial integration appear not to be robustly correlated with better international risk sharing outcomes in emerging markets and developing economies, despite the fact that these countries have eliminated a nontrivial portion of de-jure controls on capital inflows and have experienced a significant increase in financial flows during the past two decades.¹¹ On the other hand, remittance inflows appear to be robustly correlated with better risk sharing outcomes.

These results point to at least two areas for future research. First, it would be useful to examine the risk-sharing consequences of different types of capital flows using a dynamic multi-country general equilibrium model. Second, it would be useful to conduct a comprehensive study of the linkages between the effects of remittances on risk sharing and country-specific characteristics.

¹¹ Rangvid et al. (2016) find that there has been considerable variation in consumption risk sharing during 1875-2012 period. Helva and Serven (2016) also show that improvement in risk sharing can only be observed in high-income countries during the 1971-2010 period. Recent theoretical work suggests that limited international risk sharing in emerging market and developing economies can be the consequence of costs to adjusting portfolio positions that reduce short-term mobility of financial capital (Bengui et al., 2013).

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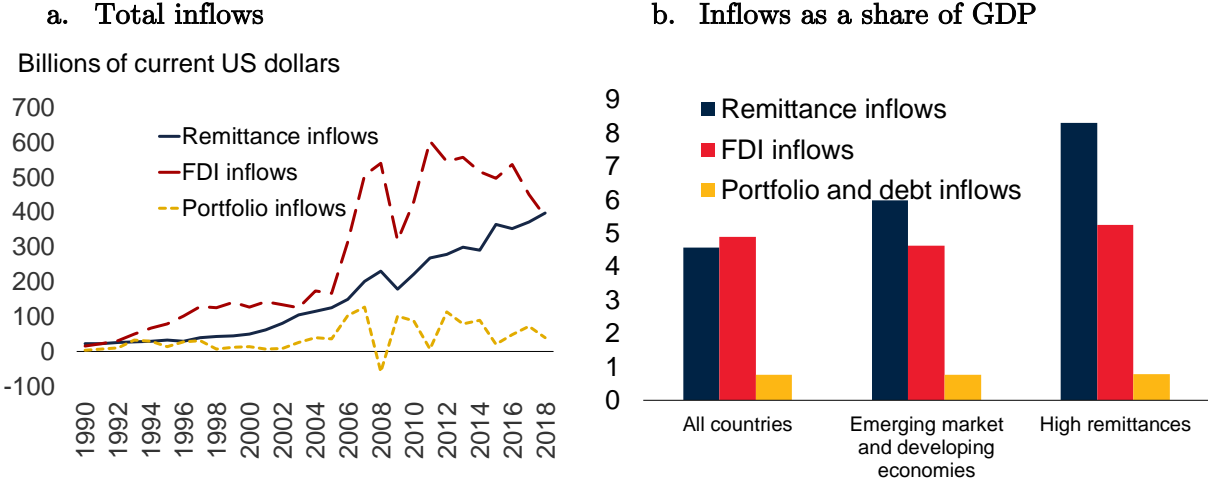
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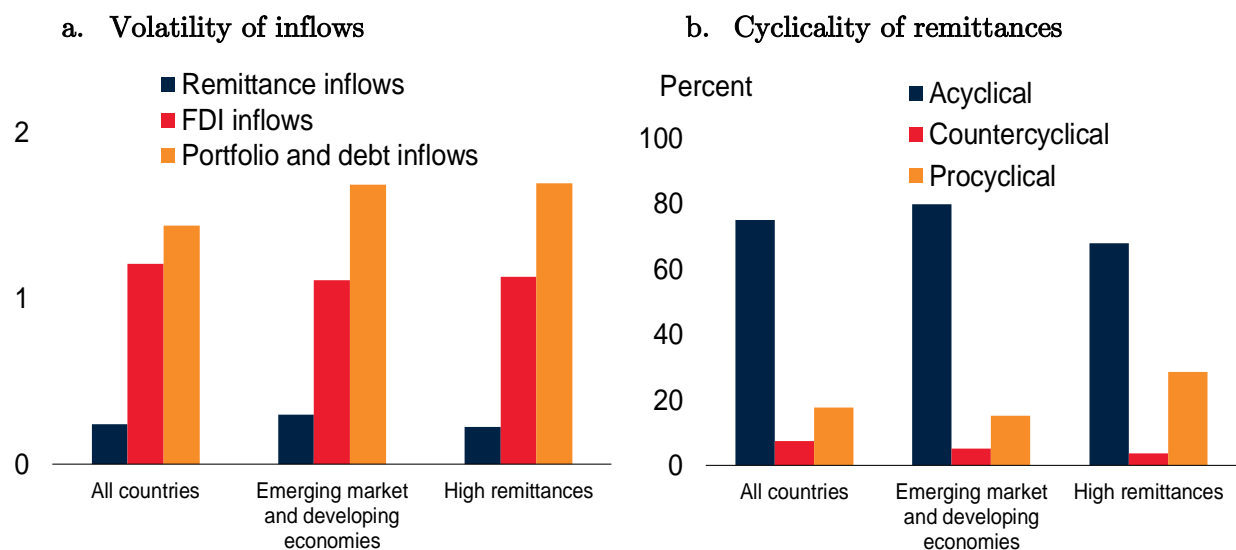
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Figure 1. Remittances and capital flows to emerging market and developing economies



Sources: World Bank’s World Development Indicators and IMF Balance of Payments.
 Notes: a. Sum of 79 EMDE economies. b. Unweighted averages. High remittances denotes the group of high-remittance countries, defined as those with remittance inflows greater than the median during the 2009-2018 period. All countries group includes advanced economies. Sample period 1990-2018 or as dictated by availability of data.

Figure 2. Cyclical properties of inflows



Sources: World Bank's World Development Indicators and IMF Balance of Payments.

Notes: a. Median across countries for each group. Volatility is defined as the standard deviation of the detrended ratio of the relevant inflow to GDP. b. Cyclicality is defined as the correlation between the detrended real series of GDP and remittance inflows. Each series is decomposed into trend and cyclical components using a Hodrick-Prescott (HP) filter and the sample period is 1990–2018. Remittances are considered *procyclical* if the correlation between the cyclical components of remittances and output is positive and statistically different from zero, *countercyclical* if it is negative and statistically different from zero, and *acyclical* if the correlation is not statistically different from zero. See notes to Figure 1 for definition of country groups.

Table 1. International risk sharing and remittance inflows

	EMDE	High remittances	All countries	EMDE	High remittances	All countries
Output growth	0.798 [0.021]***	0.838 [0.031]***	0.758 [0.016]***	0.825 [0.031]***	0.755 [0.046]***	0.829 [0.029]***
Remittance inflows	-0.000 [0.000]*	-0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]
Remittances × Output growth	-0.009 [0.004]**	-0.010 [0.006]*	-0.006 [0.004]*	-0.009 [0.004]**	-0.006 [0.004]*	-0.007 [0.004]**
De- jure				-0.001 [0.002]	-0.004 [0.002]*	-0.004 [0.001]***
De- jure × Output growth				-0.069 [0.059]	0.040 [0.064]	-0.123 [0.039]***
Constant	0.004 [0.003]	0.001 [0.004]	0.003 [0.002]**	0.005 [0.003]	0.004 [0.004]	0.006 [0.002]***
Observations	1,745	1,134	2,606	1,745	1,224	2,606
Number of countries	79	55	110	79	55	110

Sources: World Development Indicators, IMF Balance of Payments

Notes: Robust standard errors are reported in brackets. Generalized least squares regression model including time fixed effects. The dependent variable is the idiosyncratic growth of per capita consumption ($\Delta c_{t+1}^j - \Delta c_{t+1}$). The estimates are based on equation (2). Output growth refers to idiosyncratic growth of per capita GDP ($\Delta y_{t+1}^j - \Delta y_{t+1}$). Remittance inflows refer to remittances divided by GDP. EMDE refers to emerging market and developing economies. “High remittances” denotes the group of high-remittance countries, defined as those with remittance inflows greater than the median during the 2009-2018 period. All countries include advanced economies. Sample period 1990-2018 or as dictated by availability of data. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Table 2. International risk sharing, remittances, and cross-border flows

	Total liabilities	FDI liabilities	Portfolio equity liabilities	Debt liabilities	FDI inflows	Portfolio equity inflows	Debt inflows	Trade openness
Output growth	0.799	0.799	0.789	0.803	0.802	0.800	0.802	0.805
	[0.022]***	[0.024]***	[0.024]***	[0.025]***	[0.022]***	[0.022]***	[0.022]***	[0.040]***
Remittance inflows	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	[0.000]*	[0.000]	[0.000]*	[0.000]*	[0.000]	[0.000]	[0.000]*	[0.000]*
Remittances × Output growth	-0.009	-0.010	-0.009	-0.009	-0.010	-0.010	-0.010	-0.009
	[0.004]**	[0.004]***	[0.004]**	[0.004]**	[0.004]**	[0.004]**	[0.004]**	[0.004]**
Interaction	-0.000	-0.000	-0.000	-0.000	0.000	0.000	-0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Interaction × Output growth	0.000	0.000	0.003	-0.000	-0.000	-0.003	-0.000	-0.000
	[0.000]	[0.001]	[0.002]	[0.000]	[0.001]	[0.003]	[0.000]	[0.001]
Constant	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.003
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Observations	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745
Number of countries	79	79	79	79	79	79	79	79

Sources: World Development Indicators, IMF Balance of Payments, Lane and Milesi-Ferretti (2007)

Notes: Emerging market and developing economies (EMDE) country group. Generalized least square regression model including time fixed effects. Robust standard errors are reported in brackets. The dependent variable is the idiosyncratic growth of per capita consumption ($\Delta c_{t+1}^j - \Delta c_{t+1}$). The estimates are based on equation (2). Output growth refers to idiosyncratic growth of per capita GDP ($\Delta y_{t+1}^j - \Delta y_{t+1}$). Remittance inflows refer to remittances as a percentage to GDP. Trade openness is defined as the sum of exports and imports to GDP. Interaction refers to the variable in the respective column as percent to GDP. Sample period 1990-2018 or as dictated by availability of data. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Table 3. Determinants of international risk sharing

	Baseline	Remittance inflows	Personal transfers	Total Liabilities	FDI Liabilities	Portfolio equity liabilities	Debt liabilities	FDI inflows	Portfolio equity inflows	Debt inflows	De-jure	Trade Openness
Output growth	0.770 [0.018]***	0.798 [0.021]***	0.831 [0.025]***	0.770 [0.018]***	0.770 [0.021]***	0.773 [0.018]***	0.774 [0.022]***	0.773 [0.018]***	0.771 [0.018]***	0.772 [0.018]***	0.802 [0.030]***	0.777 [0.040]***
Interaction term		-0.000 [0.000]*	-0.000 [0.000]	-0.000 [0.000]	-0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	0.000 [0.000]	0.000 [0.000]	-0.000 [0.000]	-0.001 [0.002]	0.000 [0.000]
Interaction × Output growth		-0.009 [0.004]**	-0.015 [0.005]***	0.000 [0.000]	0.000 [0.001]	-0.000 [0.001]	-0.000 [0.000]	-0.000 [0.001]	-0.002 [0.003]	-0.000 [0.000]	-0.076 [0.057]	-0.000 [0.001]
Constant	0.004 [0.003]	0.004 [0.003]	0.005 [0.003]*	0.004 [0.003]	0.004 [0.003]	0.004 [0.003]	0.004 [0.003]	0.004 [0.003]	0.004 [0.003]	0.004 [0.003]	0.004 [0.003]	0.003 [0.003]
Observations	1,745	1,745	1,512	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745
Number of countries	79	79	75	79	79	79	79	79	79	79	79	79

Sources: World Development Indicators, IMF Balance of Payments, Chinn-Ito (2006), Lane and Milesi-Ferretti (2007)

Notes: Emerging market and developing economies (EMDE) country group. Generalized least square regression model including time fixed effects. Robust standard errors are reported in brackets. The dependent variable is the idiosyncratic growth of per capita consumption ($\Delta c_{t+1}^i - \Delta c_{t+1}$). The estimates are based on equation (2). Output growth refers to idiosyncratic growth in per capita GDP ($\Delta y_{t+1}^j - \Delta y_{t+1}$). De-jure is the financial integration measure obtained from Chinn-Ito (2006). Trade openness is defined as the sum of exports and imports to GDP. Interaction refers to the variable in the respective column as percent to GDP. Sample period 1990-2018 or as dictated by availability of data. All regressions include a constant term. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Table 4. International risk sharing, cross-border flows and de-jure financial openness

	Total liabilities	FDI liabilities	Portfolio equity liabilities	Debt liabilities	FDI inflows	Portfolio equity inflows	Debt inflows	Trade openness
Output growth	0.822	0.819	0.811	0.824	0.822	0.826	0.824	0.820
	[0.031]***	[0.032]***	[0.033]***	[0.033]***	[0.031]***	[0.031]***	[0.031]***	[0.044]***
Remittance inflows	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	[0.000]	[0.000]	[0.000]*	[0.000]*	[0.000]	[0.000]	[0.000]	[0.000]*
Remittances × Output growth	-0.009	-0.010	-0.009	-0.009	-0.010	-0.009	-0.009	-0.009
	[0.004]**	[0.004]**	[0.004]**	[0.004]**	[0.004]**	[0.004]**	[0.004]**	[0.004]**
Interaction	-0.000	-0.000	-0.000	-0.000	0.000	0.000	-0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Interaction × Output growth	0.000	0.000	0.003	-0.000	-0.000	-0.002	-0.000	0.000
	[0.000]	[0.001]	[0.002]	[0.000]	[0.001]	[0.003]	[0.000]	[0.001]
De- jure integration	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
De- jure × Output growth	-0.059	-0.055	-0.058	-0.059	-0.048	-0.066	-0.057	-0.071
	[0.059]	[0.061]	[0.059]	[0.060]	[0.059]	[0.059]	[0.060]	[0.061]
Constant	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.003
	[0.003]	[0.003]	[0.003]*	[0.003]*	[0.003]	[0.003]	[0.003]	[0.003]
Observations	1,745	1,745	1,745	1,745	1,745	1,745	1,745	1,745
Number of countries	79	79	79	79	79	79	79	79

Sources: World Development Indicators, IMF Balance of Payments, Chinn-Ito (2006), Lane and Milesi-Ferretti (2007)

Notes: Emerging market and developing economies (EMDE) country group. Generalized least square regression model including time fixed effects. Robust standard errors are reported in brackets. The dependent variable is the idiosyncratic growth of per capita consumption ($\Delta c_{t+1}^i - \Delta c_{t+1}$). The estimates are based on equation (2). Output growth refers to idiosyncratic growth of per capita GDP ($\Delta y_{t+1}^j - \Delta y_{t+1}$). De-jure is the financial integration measure obtained from Chinn-Ito (2006). Trade openness is defined as the sum of exports and imports to GDP. Interaction refers to the variable in the respective column as percent to GDP. Sample period 1990-2018 or as dictated by availability of data. *, **, and *** denote statistical significance at 10, 5, and 1 percent levels, respectively.

Table A1. List of countries

Country	Country Code	EMDE	High-remittance countries	Emerging markets (EM)	Other developing economies (OE)	Advanced economies (AE)	Country	Country Code	EMDE	High-remittance countries	Emerging markets (EM)	Other developing economies (OE)	Advanced economies (AE)
Albania	ALB	x	x		x		Republic of Korea	KOR					x
Argentina	ARG	x			x		Sri Lanka	LKA	x	x		x	
Armenia	ARM	x	x		x		Liberia	LBR	x	x		x	
Australia	AUS					x	Lithuania	LTU					x
Austria	AUT					x	Latvia	LVA					x
Belgium	BEL					x	Morocco	MAR	x	x	x		
Benin	BEN	x	x		x		Republic of Moldova	MDA	x	x		x	
Burkina Faso	BFA	x	x		x		Mexico	MEX	x	x	x		
Bangladesh	BGD	x	x		x		TFYR of Macedonia	MKD	x	x		x	
Bulgaria	BGR	x	x		x		Mali	MLI	x	x		x	
Bosnia and Herzegovina	BIH	x	x		x		Mongolia	MNG	x	x		x	
Belarus	BLR	x			x		Mozambique	MOZ	x			x	
Bolivia	BOL	x	x		x		Malawi	MWI	x			x	
Brazil	BRA	x		x			Malaysia	MYS	x		x		
Botswana	BWA	x			x		Niger	NER	x	x		x	
Switzerland	CHE					x	Nigeria	NGA	x	x		x	
Canada	Can					x	Nicaragua	NIC	x	x		x	
China	CHN	x		x			Netherlands	NLD					x
Côte d'Ivoire	CIV	x			x		Norway	NOR					x
Colombia	COL	x		x			New Zealand	NZL					x
Costa Rica	CRI	x			x		Pakistan	PAK	x	x	x		
Cyprus	CYP					x	Panama	PAN	x			x	
Czech Republic	CZE					x	Peru	PER	x		x		
Germany	DEU					x	Philippines	PHL	x	x	x		
Denmark	DNK					x	Poland	POL	x	x	x		
Dominican Republic	DOM	x	x		x		Portugal	PRT					x
Ecuador	ECU	x	x		x		Paraguay	PRY	x	x		x	
Egypt	EGY	x	x	x			Russian Federation	RUS	x		x		
Spain	ESP					x	Saudi Arabia	SAU	x		x		
Estonia	EST					x	Senegal	SEN	x	x		x	
Finland	FIN					x	El Salvador	SLV	x	x		x	
France	FRA					x	Slovakia	SVK					x
United Kingdom	GBR					x	Slovenia	SVN					x
Georgia	GEO	x	x		x		Sudan	SDN	x			x	
Ghana	GHA	x	x		x		Sierra Leone	SLN	x			x	
Guinea	GIN	x			x		Sweden	SWE					x
Guinea-Bissau	GNB	x	x		x		Swaziland	SWZ	x	x		x	
Greece	GRC					x	Thailand	THA	x		x		
Guatemala	GTM	x	x		x		Tajikistan	TJK	x	x		x	
China, Hong Kong	HKG					x	Trinidad and Tobago	TTO	x			x	
Honduras	HND	x	x		x		Togo	TGO	x	x		x	
Croatia	HRV	x	x		x		Tunisia	TUN	x	x		x	
Hungary	HUN	x	x	x			Turkey	TUR	x		x		
Indonesia	IDN	x		x			U.R. of Tanzania: Mainland	TZA	x			x	
India	IND	x	x	x			Ukraine	UKR	x	x		x	
Ireland	IRL					x	Uruguay	URY	x			x	
Israel	ISR					x	United States	USA					x
Italy	ITA					x	Uganda	UGA	x	x		x	
Jordan	JOR	x	x		x		Venezuela	VEN	x			x	
Japan	JPN					x	Vietnam	VNM	x	x		x	
Kazakhstan	KAZ	x			x		South Africa	ZAF	x		x		
Kyrgyzstan	KGZ	x	x		x		Zambia	ZMB	x				
Cambodia	KHM	x			x								

Notes: EMDEs refers to emerging market and developing economies. The group of “high remittance countries” includes those with remittance inflows greater than the median during the 2009-2018 period.