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Foreign portfolio diversification and risk-sharing

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HIGHLIGHTS

- This paper analyzes risk sharing from internationally diversified portfolios.
- The factor income channel is decomposed into interest, dividend and retained earning.
- Interest receipts, dividend payments significantly contribute to absorb output shocks.
- Biases to EU markets negatively affect the extent of risk sharing.

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ABSTRACT

We investigate income smoothing associated with international portfolio diversification by decomposing the net factor income (NFI) channel into interests, dividends and retained earnings, for OECD and EU countries. We find that interest receipts and equity dividend payments contribute significantly to absorb domestic income shocks. Geographically concentrated portfolios and, in particular, biases toward EU markets have a strong negative effect on the degree of risk-sharing.

1. Introduction

Under the hypothesis of complete markets, countries can completely diversify idiosyncratic risk and remain exposed to systemic risk only ("full international risk-sharing").[1] Since the seminal work by Asdrubali et al. (1996), economic literature has extensively investigated risk-sharing channels, the extent to which risk is diversified through these channels, the patterns of risk-sharing channels in different regions of the world, and how the importance of each channel varies depending on the group of countries among which the risk is pooled.[2] Given ongoing global financial integration, much interest has been shown in the topic of net (foreign) factor income (NFI) channel and, for OECD countries, it has been found that the largest part of this channel is imputable to income from net financial asset holdings (see Balli et al., 2011). Sørensen et al. (2007) first documented how income smoothing derived from NFI increased as home bias decreased during the nineties, providing the missing link between risk-sharing and home-bias literature. This work contributes to this strand of the empirical literature along the lines of Sørensen et al. (2007) by investigating income smoothing from international portfolio diversification through the analysis of the determinants of risk-sharing achieved via interest and dividend receipts, for EU and OECD countries.[3] Decomposing the NFI channel of smoothing into

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[1] See Obstfeld and Rogoff (1996) for a detailed description of the underlying theoretical model.

[2] Amongst the most recent contributions, see, Yehoue (2011), Balli and Balli (2011), Balli et al. (2013) and Volosovych (2013).

[3] The EU sample includes Austria, Belgium, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Denmark, Sweden, UK, Czech Republic, Slovakia, Hungary and Poland. The OECD group is given by the aforementioned EU countries plus Japan, Korea, Norway, Switzerland. The rest of OECD and EU countries are not included in the analysis due to lack of data.

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interests, dividends and retained earnings, we are able to recognize the prominent role of interest receipts and equity dividend payments in smoothing domestic income shocks. Furthermore, as a consequence of high co-movement in returns within Euro Area countries, we show that the share of fixed-income assets invested in Euro Area markets has a significant, negative effect on risk-sharing via interest receipts.[4]

2. Methodology

To analyze risk-sharing achieved through internationally diversified portfolios, we look at the difference between a country's GNI and GDP over time. Consider the following identity:

$$\text{GNI}=\text{GDP}+\text{NFI}$$

where NFI (net factor income) in OECD countries is dominated by net revenues from financial assets held abroad. We proceed to subdivide NFI into sub-components, namely receipts and payments of interests, dividends and retained earnings via the following equation[5]:

$$\begin{aligned}\text{NFI} \approx\ & \text{INTEREST RECEIPTS}+\text{DIVIDEND RECEIPTS}\\ & +\ \text{RECEIPTS ON FDI REINVESTED EARNINGS}\\ & -\ \text{INTEREST PAYMENTS}-\text{DIVIDEND PAYMENTS}\\ & -\ \text{PAYMENTS ON FDI REINVESTED EARNINGS}.\end{aligned}$$

In order to quantify the amount of risk-sharing achieved through each of the sub-components, we use the following regression equation:

$$\Delta \log \widetilde{(\text{GDP}+X)}^{\,i}_t = \nu_{i,t} + \beta\ \Delta \log \widetilde{\text{GDP}}^{\,i}_t + \epsilon_{i,t} \tag{1}$$

where X corresponds to receipts (payments) on bonds, equities and foreign direct investments (FDI) assets (liabilities). For example, to examine the degree of income smoothing via interest receipts (INTEREST RECEIPTS) we estimate:

$$\Delta \log \widetilde{(\text{GDP}+\text{INTEREST RECEIPTS})}^{\,i}_t = \nu_{i,t} + \beta\ \Delta \log \widetilde{\text{GDP}}^{\,i}_t + \epsilon_{i,t} \tag{2}$$

where $\Delta \log \widetilde{(\text{GDP}+\text{INTEREST RECEIPTS})}^{\,i}_t$ is the annual change in log-GDP plus interest receipts per capita at constant prices minus the group-average counterpart, $\Delta \log(\text{GDP}+\text{INTEREST RECEIPTS})_t$, and likewise for the other components.

2.1. Diversification and risk-sharing via interest and dividend receipts and payments

In order to gauge the determinants of risk-sharing via interest and dividend receipts and payments, we follow Mèlitz and Zumer (1999) in modeling income smoothing as a time-varying process and impose a structure on the parameter β representing the percentage of smoothing achieved through factor income flows. We transform Eq. (2) allowing the generic X sub-channel of risk sharing to change over time and to be explained by some factors:

$$\Delta \log(\widetilde{\text{GDP}+X})^i_t = \nu_{i,t} + \beta(\cdot)\Delta \log \widetilde{\text{GDP}}^{\,i}_t + \epsilon_{i,t} \tag{3}$$

where $\beta(\cdot)$ measures risk-sharing via the X sub-channel, which differs from β in Eq. (2) since it depends on a number of factors. Therefore, to quantify the amount of risk-sharing, we assume that each sub-channel is explained by the following equation:

$$\beta = \beta_0 + \beta_1 \delta_i \tag{4}$$

where δ_i is an interaction variable that is assumed to explain the corresponding sub-channel. Following Mèlitz and Zumer (1999) and Sørensen et al. (2007), we extend the existing methodology as follows:

$$\beta = \beta_0 + \beta_1(\text{TREND}-\overline{\text{TREND}}_t)+\beta_2(Z^i_t-\overline{Z}_t) \tag{5}$$

where Z is a set of interaction variables that are assumed to explain the income smoothing achieved through the X sub-channel and TREND denotes a linear time trend. In this model, $1-\beta_0-\beta_1(\text{TREND}-\overline{\text{TREND}}_t)-\beta_2(Z^i_t-\overline{Z}_t)$ measures the extent of smoothing via sub-channel X. Specifically, the parameter $-\beta_0$ measures the unweighted pooled average income smoothing via the channel X; $-\beta_1$ measures the average year-by-year increase in income smoothing; and $-\beta_2$ measures the extent of linkage between interaction variables, which will be discussed in the following section, and the degree of risk-sharing.

To account for autocorrelation in the residuals, we assume that the error terms in each equation/country follow an AR(1) process. Due to the brief sample period, we assume that the autocorrelation parameter is identical across countries/equations. We allow for country-specific variances of the error terms. The estimation is carried out using a two-step generalized least-squares (GLS) estimator: the entire panel is estimated using ordinary least squares and residuals from the first step are used to estimate the variance for each country and to correct for heteroscedasticity.

3. Data

We use a dataset of 22 industrial countries with annual data between 2001 and 2012. Country selection is essentially driven by data quality and consistency requirements. The sample is divided into two country groups: EU and OECD countries. All series are expressed in real per capita terms. Major variables such as GDP, population and consumer price indices were taken from the OECD National Accounts database. The components of the NFI flows, i.e. interest receipts (payments), dividend receipts (payments) and retained earnings (payments) were obtained from detailed OECD National Accounts tables. We obtain the pair-wise volume of cross-border equity holdings in US dollars from the International Monetary Fund's Coordinated Portfolio Investment Survey (CPIS). For each country, we create a concentration index (CONCENTRATION INDEX) to quantify the ability of countries to diversify their portfolios. This index is created by adding the squares of the shares of country i's asset holdings among the top five countries. Using CPIS data, we also compute EU SHARE (OECD SHARE) as the share of the EU (OECD) countries in the country i's foreign equity or debt portfolio. We also control for the Equity Home Bias (EHB) and Debt Home Bias (DHB) levels of the countries in our sample. We employ the equity market capitalization from the World Development Indicators (WDI) database, whereas total outstanding debt is obtained from Datastream.

4. Empirical results

We identify the relative contribution of receipts and payments on bonds (and bank loans), equities and foreign direct investments (FDI) to the international risk-sharing process among OECD and EU countries. Table 1reports the detailed results for each asset category in terms of receipts, payments and net flows. At first glance, Table 1 suggests that interest receipts play a more relevant role in risk-sharing than revenues from equity and FDI assets. Breaking down the results about returns shows that interest

[4] The EU shares refer to assets invested in Euro Area markets.

[5] The remaining items (net tax on imports and net compensation of employees paid from abroad) are smaller in magnitude than the other items and are therefore not considered in the estimates.