International Investment Patterns:
The Case of German Sectors

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Trinity Economics Papers

Department of Economics

Trinity College Dublin

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February 3, 2018

Abstract

In this paper we exploit the newly augmented Coordinated Portfolio Investment Survey data of the IMF to study the cross-border inter-sectoral portfolio asset holdings of Germany. Our analysis reveals a significant degree of heterogeneity in the international asset positions of various German holding entities. The findings of our study also suggest differential relations between portfolio holdings and a set of "gravity-style" factors across holder-issuer pairings of various sectors. We conclude that aggregate-level patterns in international portfolio holdings may not persist in inter-sectoral data.

JEL: F30, F41, G15

Keywords: international portfolios, sectoral holdings, gravity

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1 Introduction

For an open economy, the composition of the international balance sheet is important in understanding sensitivity to external shocks and the extent of international risk sharing. With the relatively recent advent of the Coordinated Portfolio Investment Survey (CPIS) data, it is now possible to gain further insight into the international investment risk profile of a country by gauging underlying domestic sectoral exposures to foreign sector entities. In particular, information on the holders and issuers of securities is essential for understanding the distribution of financial risk (Avdjiev et al., 2016; FSB, 2017). Accordingly, by allowing for a more detailed analysis of international financial linkages and transmission mechanisms, the additional sectoral data can assist policy-makers in the formulation of more effective macroeconomic interventions. In this paper, we take a closer look at the international portfolio investment data of Germany by examining the holdings of domestic sectors across foreign issuing sectors.[1]

The international finance literature has produced a plethora of studies examining patterns in the aggregate portfolio holdings of countries (Ahearne et al., 2004; Aviat and Coeurdacier, 2007; Karlsson and Nordén, 2007; Lane and Milesi-Ferretti, 2008; Forbes, 2010; Curcuru et al., 2011; Coeurdacier and Rey, 2013). Furthermore, some studies, including Christelis and Georgarakos (2013) and Didier et al. (2013) for example, have analysed international holdings in individual sectors. Nevertheless, this research is unable to fully investigate how international asset allocations are influenced by investor heterogeneity. Indeed, Grinblatt and Keloharju (2000) highlight that households and institutional investors exhibit notable discrepancies in trading behaviour.

Our approach in this paper is in a similar vein to the work of Galstyan et al. (2016). Exploiting the CPIS data that disaggregate the holders and issuers of international securities along sector-to-country, but not inter-sectoral, lines, they find that patterns evident in aggregate data do not uniformly apply across the various holding and issuing sectors. In contrast, we focus on the sectoral portfolio holdings of Germany, the EU's largest economy, vis-à-vis foreign issuing sectors. Given the role of Germany as a major net external creditor, it presents itself as an interesting case for the study of sectoral portfolio exposures.

At the aggregate level, we find that Germany holds a very low share of equity and debt assets in emerging markets, while the euro area constitutes the main issuing player across both asset classes. At the sectoral level, we detect a significant degree of heterogeneity in portfolio asset holdings. For example, we find that German non-bank (other) financial corporations are

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[1]At the time of writing, data on international cross-sectoral holdings were limited, thus restricting our analysis to Germany only.

the main holders of equity assets, with money market funds leading the way in this sector. This pattern tends to hold across foreign banks, other financial corporations, and nonfinacial corporate issuers. Regarding long-term debt, we find that the same story applies in terms of the main holder, with the foreign general government sector added to the list of the preceding issuers. In absolute terms, the total foreign debt exposure of German money market funds stands at a sizeable 713 billion U.S. dollars, almost three times as much as its total foreign equity exposures. On the other hand, nonfinancials represent the second largest holders of equities while banks represent the second largest holders of debt.

Following the literature on bilateral aggregate portfolio investment patterns across countries (Portes and Rey, 2005; Lane and Milesi-Ferretti, 2008), we adopt a gravity-style framework, akin to the one employed in the international trade literature, to analyse some of the potential drivers of German sectoral portfolio holdings. We find a significant degree of heterogeneity in the relation between holdings and gravity covariates across sectoral holder-issuer pairings. For instance, the long-term debt asset holdings of German banks tend to be highly sensitive to the geographical proximity of foreign financial issuers, which may be driven by a demand for euro-denominated bonds given the liability structure of the holder. In contrast, German bank holdings of foreign sovereign bonds are insensitive to distance, reflecting in part an aversion to exposures to relatively indebted euro area governments and a flight to safety. Meanwhile, governed by reserve management priorities, the debt holdings of the German government are insensitive to distance across different foreign issuers. This breakdown by holding-to-issuing sectors helps us to better understand the driving forces behind more aggregated findings such as those in Galstyan et al. (2016). More generally, we report that patterns identified in aggregate portfolio data may not necessarily apply symmetrically at the more granular inter-sectoral level.

The remainder of the paper is structured as follows. Section 2 sketches a simple optimal portfolio choice model that provides some insight into the factors determining sectoral asset holdings. Section 3 provides an overview of the data employed. Section 4 takes a preliminary look at the distribution of German portfolio investment holdings across foreign issuers both at the aggregate and sectoral levels. In Section 5 we discuss our econometric findings. Finally, Section 6 concludes.

2   Methodological Framework

In this section, akin to the approach of Coeurdacier and Guibaud (2011), we sketch a simple one-period model of portfolio asset holdings. The theoretical framework that follows ignores the roles of transaction or information costs (frictions) and the exchange rate, and is only

designed to provide a basic first-pass guide to the empirical analysis in later sections.

Home sector i derives expected utility in wealth W according to the negative exponential function

$$\mathbb{E}_t\big[U(W_{i,t+1})\big] = -\mathbb{E}_t\Big[e^{-\gamma_i W_{i,t+1}}\Big] \tag{1}$$

where $\gamma_i > 0$ is the coefficient of absolute risk aversion and $\gamma_{r,i} \equiv \gamma_i W_{i,t}$ is the coefficient of relative risk aversion at start of period wealth. Sector i allocates its wealth at the start of period $t + 1$, $W_{i,t}$, across J country-sector risky assets with respective returns r_j and a global risk-free asset with return r_f such that wealth at the end of the period is given by

$$W_{i,t+1} = \sum_{j=1}^{J} \lambda_{i,j,t+1} W_{i,t}(1 + r_{j,t+1}) + \underbrace{\big(1 - \sum_{j=1}^{J} \lambda_{i,j,t+1}\big) W_{i,t}(1 + r_{f,t+1})}_{\lambda_{i,f,t+1}} \tag{2}$$

where $\boldsymbol{\lambda} = [\lambda_1\ \lambda_2 \ldots \lambda_J\ \lambda_f]'$ denote the portfolio asset shares. Thus the rate of return on the portfolio of sector i is given by

$$r_{p,i,t+1} = \frac{W_{i,t+1}}{W_{i,t}} - 1 = \boldsymbol{\lambda}'_{j,i,t+1}(\boldsymbol{r_{j,t+1}} - r_{f,t+1}.\boldsymbol{\iota}) + r_{f,t+1} \tag{3}$$

where $\boldsymbol{\lambda_j} = [\lambda_1\ \lambda_2 \ldots \lambda_J]'$, $\boldsymbol{r_j} = [r_1\ r_2 \ldots r_J]'$ and $\boldsymbol{\iota}$ is a $J \times 1$ vector of ones.

The objective of the sector is to select portfolio asset shares that maximise (1) subject to (3). We assume that returns on risky assets have a joint normal distribution where $\boldsymbol{\bar{r}_j} = \mathbb{E}[\boldsymbol{r_j}]$ is the vector of expected returns on the J risky assets and $\boldsymbol{\Omega}$ is the corresponding (non-singular) $J \times J$ variance-covariance matrix of returns. The expected return on the portfolio and corresponding return variance can therefore be written as $\bar{r}_p = \mathbb{E}[r_p] = \boldsymbol{\lambda}'_j(\boldsymbol{\bar{r}_j} - r_f.\boldsymbol{\iota}) + r_f$ and $\sigma_p^2 = \boldsymbol{\lambda}'_j \boldsymbol{\Omega} \boldsymbol{\lambda_j}$ respectively. If r_p is normally distributed, then $U(W)$ is lognormally distributed. Dropping i and t subscripts for brevity, the expected value of $U(W)$, noting that $W_{t+1} = W_t(1 + r_{p,t+1})$, is

$$\mathbb{E}\big[U(W)\big] = -ce^{-\gamma_r[\boldsymbol{\lambda}'_j(\boldsymbol{\bar{r}_j} - r_f.\boldsymbol{\iota}) + r_f] + \frac{1}{2}\gamma_r^2 \boldsymbol{\lambda}'_j \boldsymbol{\Omega} \boldsymbol{\lambda_j}} \tag{4}$$

where $c = e^{-\gamma_r}$. As the expected utility function is monotonic in its exponent, the maximisation problem is equivalent to

$$\max_{\boldsymbol{\lambda}} E\big[U(W)\big] = \boldsymbol{\lambda}'_j(\boldsymbol{\bar{r}_j} - r_f.\boldsymbol{\iota}) - \frac{1}{2}\gamma_r \boldsymbol{\lambda}'_j \boldsymbol{\Omega} \boldsymbol{\lambda_j}. \tag{5}$$

The maximand is now linearly related to the expected portfolio return and variance. The

corresponding J first-order conditions are

$$\nabla_{\boldsymbol{\lambda}} f = \bar{\boldsymbol{r}}_{\boldsymbol{j}} - r_f.\boldsymbol{\iota} - \underbrace{\gamma_r \boldsymbol{\Omega} \boldsymbol{\lambda_j}}_{risk\ premia} = \boldsymbol{0}. \tag{6}$$

Solving for $\boldsymbol{\lambda_j}$ gives the optimal investment shares (demands) for risky assets

$$\boldsymbol{\lambda_j^*} = \frac{1}{\gamma_r} \boldsymbol{\Omega}^{-1}(\bar{\boldsymbol{r}}_{\boldsymbol{j}} - r_f.\boldsymbol{\iota}). \tag{7}$$

Optimal demand for the risk-free asset is thus given by $\lambda_f^* = 1 - \boldsymbol{\lambda_j^{*\prime}}.\boldsymbol{\iota}$.

Equation (7) indicates that the higher the sector's coefficient of relative risk aversion ($\gamma_{r,i}$), the smaller the proportion of its wealth that is invested in the risky assets. Moreover, the optimal portfolio shares depend on the expected returns and covariances of assets. In particular, ceteris paribus, higher expected returns are associated with higher corresponding asset demands, with individual elements of the covariance matrix determining the relative weights on expected returns. Meanwhile, riskier assets, ceteris paribus, command lower shares.

3 Data

We conduct our analysis of German cross-border holdings of portfolio equity and debt assets at the sectoral level for the year 2014 using data from the Coordinated Portfolio Investment Survey (CPIS).[2] In the data, short-term debt securities have an original term to maturity of one year or less, while long-term debt securities have an original term to maturity of more than one year. The relatively recently augmented CPIS data cover the sectoral identities of both portfolio security issuing countries and portfolio security holding countries. For Germany, the CPIS also provides data on holder-issuer pairings at the sectoral level.[3] The sectoral categories of the holder are the central bank (CB), deposit-taking corporations excluding the central bank (BANKS), other financial corporations (OFC), general government (GG), nonfinancial corporations (NFC), households (HH), and non-profit institutions serving households (NPISH). In a similar fashion, the sectoral categories of the issuer are the central bank (CB), deposit-taking corporations excluding the central bank (BANKS), other financial corporations (OFC), general government (GG), and nonfinancial corporations (NFC). In addition, the CPIS data provide a decomposition of the OFC category into subsectors, with

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[2]The time dimension is dictated by data availability. We note that, with a general increase across all portfolio investment categories, the net international investment position of Germany, year-on-year, improved significantly in 2014.

[3]After excluding off-shores, the sample of issuing countries for which we have cross-sectoral data includes Australia, Austria, Belgium, Brazil, Canada, China, France, India, Italy, Japan, Korea, Mexico, Netherlands, Russia, Spain, Sweden, Turkey, United Kingdom, United States.

insurance corporations and pension funds (IPF), money market funds (MMF), and others (OOFC) comprising the overall sector.

The international macro finance literature has examined a number of "gravity-style" factors as potential covariates of cross-border asset holdings. Aggregate economic activity is one prominent factor that is thought to be positively associated with asset returns. For example, supply-side models have been developed to rationalise and predict stock market returns based on macroeconomic performance. These theoretical frameworks posit that equity returns have their roots in the productivity of the underlying real economy, with returns following the path of economic growth. Under the mechanism, GDP growth first leads to corporate profit growth. Subsequently, aggregate corporate earnings growth translates into earnings per share growth, which in turn translates into equity gains.[4,5] More generally, we note that foreign economic development can also be inversely related to the riskiness of, and risk aversion towards, foreign assets.

Research also suggests that market capitalisation plays a significant role in the relation between returns and output growth. Under the "financing" hypothesis based on Tobin's q theory for instance, countries characterised by more developed or larger financial markets, as proxied by high market capitalisation, can display a more pronounced link between stock returns and growth. Furthermore, market capitalisation is predicted to co-move positively with the degree to which corresponding stocks feature in international investment portfolios (Mauro, 2003; Coeurdacier and Guibaud, 2011).

Information or transaction costs can reduce the expected effective returns on assets. These are often proxied by geographical distance in the literature on international investment portfolio holdings. At the same time, however, distance may proxy for an international diversification motive, with foreign assets in more distant countries receiving higher weights in the international portfolio.[6] Finally, while not directly present in our model, foreign asset holdings also serve as a hedge against the risk of depreciation vis-à-vis major import partners, with imports proxying for the strength of bilateral relations. As Aviat and Coeurdacier (2007), Lane and Milesi-Ferretti (2008) and Peter (2012), amongst others, report, bilateral trade flows impart a positive effect on bilateral asset holdings.

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[4]According to the CCAPM too, procyclical securities will earn higher expected returns. Such assets display a low correlation between pay-offs and the marginal utility of consumption, thereby requiring higher returns in order to increase demand.

[5]At the same time, it should be noted that economic growth emanates partly from increased capital and labor inputs, which may not necessarily benefit equity holders. In addition, technology (or total factor productivity) improvements leading to rising output levels do not necessarily imply higher profits if firm competition translates into benefits being disseminated to consumers and workers. Lastly, a decoupling of the GDP growth-equity return relation can occur in the presence of more multinationals that rely more heavily on global income growth.

[6]Due to their potentially lower correlation structure.

Accordingly, we also collect data on some of the potential gravity covariates of portfolio asset holdings highlighted by the literature. Data on geographical distance between corresponding capital cities are obtained from the CEPII Distances database. Levels of bilateral German goods and services imports are sourced from the IMF's Direction of Trade Statistics repository. Meanwhile, market capitalisation and per capita GDP are taken from the World Development Indicators database.[7]

4   The Distribution of Portfolio Asset Holdings

4.1   Aggregate holdings

German aggregate international portfolio holdings in 2014 were quite sizeable, standing at approximately 2180 billion U.S. dollars. Figure 1(a) indicates that approximately 80 percent of these holdings can be attributed to long-term debt, with the remaining share consisting primarily of equities.

Table 1 provides some stylized facts on the distribution of German portfolio equity and debt holdings across country groups (panel A) and the allocation of German portfolio holdings across asset classes in each country group (panel B) in 2014. From panel A of the table, we find that Germany holds the majority of their cross-border long- and short-term portfolio debt assets (83 and 68 percent respectively) in advanced economies. Conversely, the majority share of total German portfolio equity holdings (59 percent) are allocated to "Off-shores". Emerging markets, however, constitute a very small share across asset classes.

Moving to Panel B, we observe that approximately 81 percent of German portfolio holdings in each of advanced and emerging country groups are allocated to long-term portfolio debt assets. In contrast, total holdings in "Off-shores" are dominated by portfolio equities. Overall, portfolio equity and long-term debt holdings represent the largest shares in total holdings at both the aggregate and country group levels. Notably, short-term debt holdings exhibit a share of around 1 percent at all levels.

We provide a further geographical decomposition of German portfolio asset holdings in Table 2. The table indicates a significant degree of holdings across asset classes in the euro area, with shares of total portfolio equity, long-term debt, and short-term debt standing at approximately 38, 64, and 61 percent respectively. Probing into country-level data within the currency union, the largest unilateral receiver of German portfolio investments is neighbouring France, while Greece and Portugal on the periphery of the zone are the smallest.[8] This pattern

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[7]For imports, GDP and market capitalisation we use data for the year 2013. The results are affected marginally when data for the year 2014 are used instead.

[8]We have classified Ireland as an off-shore centre due to its special status.

is not affected by the inclusion of holdings in the United Kingdom. Relative to the euro area, the United States commands lower shares of German portfolio equity and debt holdings. Lastly, the rest of the world (ROW) accounts for 18, 17, and 10 percent of German portfolio equity, long-term debt and short-term debt assets.

Overall, larger German holdings in the euro area could be a reflection of familiarity bias and the high degree of integration (Lane, 2006). Nevertheless, the holdings in the United States and the rest of the world are quite sizeable and may imply a diversification motive. Moreover, the table informally suggests that geographical distance, potentially proxying for informational frictions and trade costs, is inversely related to the international portfolio holdings of Germany.

4.2   Sectoral holdings

For each asset category, Table 3 gives the distribution of aggregate German holdings in each country group across German holding sectors. In the cases of portfolio equity and long-term debt, led by money market funds, German other financial corporations have the largest holding shares in both advanced and emerging market economies. Regarding long-term debt, German banks are the second largest investors in advanced and emerging country groups (31 and 8 percent of respective totals). In contrast, while German banks are the second largest holders of emerging market equities (18 percent), German nonfinancials, and in particular households (holding 21 percent), are the second largest holders of equity assets issued by advanced countries.

Looking at short-term portfolio debt holdings, German banks have the largest allocation in advanced economies (58 percent), while money market funds dominate emerging countries (91 percent). Finally, although the German central bank and general government sectors generally exhibit low holding shares across the board, a notable outlier arises in the case of long-term debt. In this latter instance, government involvement is non-negligible with shares of around 8 and 4 percent in advanced and emerging country groups respectively. Consistent with Table 1, Table 4 overall indicates that German sectoral holdings of portfolio equity and debt assets are heavily skewed towards the industrialised world, perhaps reflecting the discrepancy in both the size and sophistication of financial markets across advanced and emerging country cohorts. A clear exception to this pattern is the "other" other financial corporations category with 32 percent of equity holdings allocated to emerging markets.

Tables 5-8 display the international portfolio exposures of German sectors to various foreign issuing sectors. In relation to sectoral equity holdings, we find in Table 5 that the majority of total equity assets (66 percent) are held by other financial corporations, with money market funds overwhelmingly constituting the largest player. Disaggregating total equities by

sector of issuance, this trend also tends to hold across equities issued by foreign banks, other financial corporations, and nonfinancials. German nonfinancials, of which households play the most significant role, are the second largest holders of total portfolio equity assets, taking up a share of 25 percent. At the level of issuing sectors, nonfinancials continue to hold the second largest shares across foreign other financial corporations and nonfinancials, accounting for 36 and 23 percent of issued equities. One exception however are the equities issued by foreign banks, of which 26 percent are held by German banks as the second largest holder, reflecting a relatively strong degree of cross-border intra-industry financial trade.

While Table 5 provides a vertical distribution of equities issued by foreign sectors to Germany across sectoral investors, Table 6 provides a horizontal distribution of each German sector's portfolio equity holdings across various foreign sectors. The table indicates that the relatively small equity holdings of the general government (see Table 5) are skewed towards nonfinancials with an allocation of approximately 71 percent. This pattern of heavier holdings in nonfinancials is present across almost all German sectors. The only exception is the insurance and pension funds sector, which allocates just 9 percent of its holdings to nonfinancials in comparison to approximately 90 percent to other financial corporations. Although foreign banks represent the second largest player in terms of equity holding allocations for the general government and banks in Germany, overall on the aggregate they are allocated the smallest share of holdings at 9 percent.

Tables 7 and 8 repeat the analysis of Tables 5 and 6 in the case of long-term portfolio debt.[9] In relation to foreign portfolio debt (Table 7), we find that other financial corporations hold the majority of total long-term debt assets (54 percent), with money market funds acting as the leading contributor. Meanwhile, banks represent the second largest player, holding approximately 30 percent of total debt securities. This allocation pattern tends to persist across the different issuing sectors. Finally, the importance of nonfinancials, general government and the central bank as holders of international portfolio debt tends to vary across issuing sectors.

Table 8 suggests a non-negligible degree of heterogeneity in German sectoral exposures to foreign issuing sectors. While German nonfinancials and banks are mostly exposed to foreign banks, the central bank and general government are mostly exposed to foreign sovereigns. On the other hand, debt-issuing foreign banks and governments, characterised by similar holding allocations (30 percent), are the leading sectors for German other financial corporations. Decomposing German nonfinancials and other financial corporations shows further heterogeneity in holdings at the respective subsectoral levels. For instance, under nonfinancials,

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[9]Given the negligible share of short-term portfolio debt holdings (Table 1), we direct focus to long-term debt.

most of the respective long-term debt holdings of households and NPISHs are allotted to banks (approximately 45 percent) while German nonfinancial corporations hold most of their debt in other financial corporations (approximately 39 percent). Finally, in relation to other financial corporations, both money market funds and insurance and pension funds allocate most of their foreign holdings to sovereign and bank debt (30/27 and 37/38 percent respectively). We also note that German money market funds and other OFCs, which can engage in liquidity transformation, hold larger shares of debt in foreign other financial corporations than German insurance and pension funds. This pattern is consistent with the recent FSB (2017) report.

As Figure 1(b) further illustrates, the total exposures of German money market funds, households, and banks to foreign equities (top three holders) are quite large in absolute terms, standing at around 240, 79, and 37 billion U.S. dollars respectively. In a similar fashion, Figures 1(c) and 1(d) show that the total foreign (long- and short-term) debt exposures of money market funds, banks, and insurance and pension funds (top three holders) are approximately 713, 549, and 253 billion U.S. dollars respectively. In a broad sense, being more exposed to foreign portfolio equity, German money market funds may carry relatively more risk compared to other sectors and therefore may be a likely source of financial instability.

4.3 On sectoral heterogeneity

The intrinsic characteristics of various sectors play an important role in explaining the differential patterns in international portfolio investments. For instance, reserve management considerations play an important role in government bond holdings, while capital requirements are an important determinant of bank portfolio holdings. Driven by regulatory requirements, German bank holdings of equities are relatively low. In contrast, such requirements in the banking sector favour holdings of certain categories of bonds. These include bonds issued by central European governments, carrying a zero risk weight, and those denominated in euro (Acharya and Steffen, 2015; Buch et al., 2016).

Tables 7 and 8 show that German banks hold relatively high shares of foreign sovereign bonds. Hildebrand et al. (2012) find that big banks and regional banks tend to be the main parties investing in these bonds. Furthermore, Gennaioli et al. (2014) show that bank holdings of sovereign debt are determined primarily by liquidity considerations. Bolton and Jeanne (2011) emphasize the importance of sovereign bonds as a buffer against idiosyncratic shocks since these assets can be used as collateral for interbank lending or repos. Demand by German banks for government bonds is also influenced by collateral requirements for additional liquidity from the ECB. Lastly, given the asymmetry in the maturities of their

assets and liabilities, banks have a desire for more liquid assets. Indeed, the new "Basel III" framework requires banks to hold high-quality liquid assets that can meet expected cash outflows (Fidrmuc et al., 2015). Regarding the German central bank, we observe that portfolio holdings are composed of long-term debt issued by foreign banks and governments. Similarly, Miller and Vallée (2011) report that central banks normally "park" their foreign exchange reserves in safe or highly liquid foreign assets such as foreign government securities. This pattern is consistent with the wider macroeconomic stability objectives of the national central bank.

Turning to the next category, insurers invest in assets with the aim of covering long-term liabilities to policy holders, while pension funds invest in assets to cover the future pension income claims of the participants of the fund. As a result, insurance and pension funds tend to have a preference for safe long-term assets and are generally viewed as stabilising financial market participants. As Domanski et al. (2015) demonstrate, due to the hunt for duration as well as asset-liability management issues, insurers can actually increase their demand for long-term bonds when long-term interest rates fall. Moreover, new regulation for insurers in Europe in the form of "Solvency II" places a higher emphasis on asset-liability management and creates stronger incentives for long-term liabilities to be accompanied by longer maturity bonds. Relative to banks and insurers, pension funds normally have longer investment horizons.

German money market funds have sizeable shares in equity and debt assets across different foreign issuing sectors. Such funds tend to be pooled investment vehicles that benefit from economies of scale and offer reduced risk as a result of portfolio diversification into different instruments, markets, and debt issuers. Money market funds also benefit from relative investment expertise which can be too costly for other investors to achieve, especially households or medium-sized companies.

Households are considered to be the least sophisticated investing sector. Furthermore, they are relatively flexible in terms of asset choice as they are not subject to the regulatory constraints faced by other sectors. Table 5 indicates that German households hold around a fifth of the foreign issued equities to Germany. However, as Goetzmann and Kumar (2008) and Christelis and Georgarakos (2013) report, the majority of households do not directly hold securities, and if they do, the holdings are normally concentrated in just a few stocks. Interestingly, Baltzer et al. (2013) find the existence of a cross-border local bias in the international equity allocations of German households. Specifically, German individual investors display an affinity for holdings in firms headquartered in the bordering country that is closest to their place of residence, with this pattern being disproportionately driven by foreign companies

that are relatively close to the border. Regarding debt, while banks hold government bonds in order to manage the liquidity of their portfolios, individuals hold them in money market accounts that offer checking services (Canzoneri et al., 2013). These securities are also held by importers and exporters as transaction balances. Thus, government instruments facilitate transactions in a number of ways.

Overall, a first level of disaggregation of international portfolio holdings to equity and debt categories is important for the reason that equity-based finance is generally associated with enhanced international risk sharing while debt-based finance is viewed as resulting in higher macroeconomic vulnerability (Rogoff, 1999; Lane and Milesi-Ferretti, 2001, 2007). A second level of disaggregation is warranted on the basis of the heterogeneity in the investor base: any analysis of aggregate holdings, while useful, may be restrictive, since the transmission of international financial shocks may depend on the identities of the issuers and holders of portfolio securities.

5   Bilateral Sectoral Holdings and Gravity Covariates

In this section, we analyse some of the potential factors affecting the international cross-sectoral portfolio holdings of Germany. The study is conducted in the same spirit as the gravity-style regressions typically estimated at the aggregate level.[10] Accordingly, for each German holding and foreign issuing sector pair, we estimate the cross-section equation

$$h_c^{ij,k} = \boldsymbol{\beta}' \mathbf{Z}_c^{ij,k} + \epsilon_c^{ij,k} \tag{8}$$

where $h_c^{ij,k}$ is the natural logarithm of the portfolio holdings of German sector i in asset class k issued by sector j of foreign country c. The vector $\mathbf{Z}_c^{ij,k}$ of controls includes the logs of geographical distance between capitals, German goods and services imports from country c, as well as market capitalisation and per capita GDP of country c.[11] Allowing for possible cross-equation correlations, we apply the method of seemingly unrelated regressions (SUR) for unbalanced panels in order to maximise information by employing more observations and improve efficiency.[12]

Turning to Table 9, we report the regression results for the equity asset holdings of German banks excluding the central bank (ODX), households (HH), insurance and pension funds

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[10]Okawa and Van Wincoop (2012) elaborate on the theoretical foundations underlying the use of the gravity model in explaining international investment patterns.

[11]Due to the limited sample size, we have confined our regressors to a small set of factors. The vector **Z** contains a constant term.

[12]It is important to mention that the SUR method is not guaranteed to deliver a positive definite residual covariance matrix in the case of unbalanced panels. We thank Christopher Baum for pointing this out and sharing his STATA code.

(IPF), and money market funds (MMF) vis-à-vis foreign issuing banks, nonfinancials (NF), and other financial corporations (OFC). While the distance variable is significantly negative in only four instances, it retains the expected negative sign in most specifications suggesting that the information effect dominates the diversification motive. Thus, equity holdings tend to be concentrated more heavily in countries characterised by a closer geographic proximity to Germany. Interestingly, in contrast to the other holding sectors, the two insignificantly positive coefficients on distance pertain to German bank holdings in foreign banks and other financial corporations. Compared to households, one might expect larger institutional investors, such as banks, to be able to acquire information on stocks in distant countries more easily and at lower cost given the scale and reach of their operations. Moreover, we note that the majority of the statistically significant distance coefficients arise when the issuer of equities is the nonfinancial sector, perhaps reflecting a greater degree of informational frictions or asymmetries in this case.

Regarding German imports, we find that the statistically significant coefficients are all positive. This result is consistent with investors hedging against the risk of depreciation vis-à-vis leading import partners. In particular, the evidence suggests that German banks are the primary hedgers while the variable is predominantly insignificant in the case of remaining holding sectors with a varying sign. Meanwhile, equity market capitalisation, reflecting financial size as put forward by the gravity equation for financial asset trade, is typically positive and statistically significant. As anticipated, the implication is that German sectors have higher portfolio equity holdings in countries characterised by larger stock markets. Lastly, GDP per capita is positively associated with German holdings in foreign issued equities by nonfinancial and other financial corporation sectors. However, with foreign issuing banks, the correlations (although largely positive) are statistically insignificant.

In Table 10, we show the regression estimates for the long-term debt holdings of German sectors across the foreign issuing general government and nonfinancials sectors. Examining the effect of distance, we point out that all estimates are insignificant in the case of foreign sovereign bonds. For instance, the insignificant positive distance coefficient for German bank holdings of foreign sovereign bonds may be explained by an aversion to exposures to highly indebted euro area governments and a flight to safety in the form of U.S. Treasury bonds. Conversely, significantly negative coefficients only appear in the second panel in the case of banks and money market funds where debt is issued by nonfinancials. Notably, the debt holdings of the German general government sector are insensitive to distance in both panels. In addition, ignoring standard errors, the relation is positive. This may be due to the position being concentrated in major reserve currencies as opposed to neighbouring countries.

While we observe some evidence for a hedging motive in the first panel, the opposite can be claimed in the case of nonfinancial issuers in the second panel of Table 10. The market capitalisation variable is generally insignificant with some evidence that financial size matters for German money market funds. In relation to per capita GDP however, we mostly find a strong positive correlation in both panels, suggesting that German sectoral holdings are tilted more heavily towards the sectors of more developed foreign economies.

Finally, in Table 11 we present debt regressions for foreign financial issuing sectors: banks and other financial corporations. The table offers more evidence in favour of an inverse relation between holdings and distance although the corresponding German general government holdings still remain insensitive to the variable. Opposing the arguments of Hübner and Joliet (2013) for example, our results for distance do not suggest that EMU biases the debt portfolio of the sovereign towards euro-denominated positions. As shown, German bank holdings tend to exhibit the largest sensitivity to distance. Across Tables 10 and 11, with the exception of foreign sovereign issuers as discussed, the strong sensitivity of German bank holdings of debt to distance may be due to euro-denominated bonds providing a more natural hedge to currency fluctuations (Lane and Shambaugh, 2010; Boermans and Vermeulen, 2016). More generally, euro area institutional investors managing asset-liability positions, such as banks, insurers and pension funds, often consider the currency denomination of assets to be highly pertinent given significant holdings of euro-denominated liabilities. That is, the liability structure of the investor can be an important determinant of asset demand. As mentioned in sub-section 4.3, regulatory requirements in the banking sector also favour German bank holdings of bonds denominated in euro. The particularly pronounced correlations with distance in the case of foreign financial (bank and OFC) issuers, which may be driving corresponding findings in more aggregate studies, are consistent with the high degree of integration and trading activity in the financial sector of the euro area (Lane, 2006). The results pertaining to imports are mixed across sectors with little evidence of a hedging motive. Finally, coefficients on market capitalisation and GDP per capita are all positive and statistically significant with varying point estimates of the elasticities across holding sectors in the case of both issuers.

Collectively, our analysis tenders some important intial insights into the differential patterns of cross-border inter-sectoral portfolio asset holdings in the case of Germany, and their heterogeneous links to fundamental "gravity-style" factors that have roots in standard portfolio problems. For instance, German households are more exposed to distance as a barrier to foreign equity holdings compared to other German sectors, especially when foreign nonfinancials are the issuers (Table 9). Meanwhile, for the foreign debt asset holdings of German households, which carry a lower weight than equity (Figure 1), geographical proximity matters

most in the case of foreign issuing banks (Table 11). These heterogeneous effects of distance for German households across foreign issuing sectors may be a reflection of heterogeneous bilateral information asymmetries, especially in the case of more complex securities such as strip, covered and index bonds. By equation (7), these differential effects on holdings can materialise through the differential effects on expected effective asset returns across the various issuers.

The largest coefficients on GDP per capita in equity and debt regressions arise in the case of German household holdings in foreign other financial corporations. Moreover, the correlations are relatively sizable in the case of foreign nonfinancial issuers. By comparison, for these foreign issuers, German insurance, pension and money market funds are either insensitive to GDP per capita or exhibit a weaker sensitivity. This is likely a reflection of the relative flexibility of households in investment choices, as discussed in sub-section 4.3, and their search for yield, while the aforementioned funds tend to be partially characterised by predefined mandates that earmark securities in particular countries, issued by a particular sector, or of a specific maturity. The latter reasoning could further be driving the insignificance of the distance variable for German insurance and pension funds in debt regressions across all issuers. The investment strategies of professional fund managers may also be dictated by long-term fundamentals and not short-term business cycle trends.

Inspecting German insurance and pension funds, whose foreign asset holdings are significantly tilted towards safer long-term debt (Figure 1), GDP per capita displays the strongest positive correlations in the cases of foreign sovereign and bank debt issuers compared to other foreign issuers. Moreover, relative to other German holding sectors, the elasticity between GDP per capita and foreign debt holdings is highest for German insurance and pension funds under foreign issuing banks (Table 11), and second highest for the same holding sector under foreign issuing governments (Table 10). Conversely, for German insurance and pension funds, market capitalisation only plays a significant role in the cases of equity issuance by foreign nonfinancials and other financial corporations repsectively (Table 9). Higher levels of foreign economic development may be linked to higher expected returns on corresponding foreign assets and lower risk aversion towards these assets. Such a trend would entail increased holdings of these securities. Naturally, the size of the effect will depend on the degree to which the foreign issuing sector is reliant on its local economy versus the global economy, and the extent to which cross-country business cycles are synchronised.

Interestingly, German bank holdings are most sensitive to GDP per capita in the case of debt issued by foreign sovereigns (Table 10). Banks normally require liquidity when the economy in question is productive and investment opportunities are growing. Yielding suffi-

ciently procyclical returns, public bonds fit the purpose of offering such liquidity.[13] In relation to German imports, the argument of a hedging motive for German banks is only evident in the case of foreign equity issuance, and is strongest when foreign banks and other financial corporations are the issuing entities (Table 9). The strength of bilateral relations, as proxied for by imports, plays the expected role in debt regressions only in the case of German government holdings in foreign sovereigns and banks. As shown in Table 8, these core foreign sectors constitute over 60 percent of German government debt asset holdings. The national macroeconomic and fiscal stability objectives of the state help to explain the associated regression findings. By taking positions in the banking and government sectors of important foreign trading partners, the German government hedges its nation against potential losses vis-à-vis these foreign countries.

While there is scant evidence of a hedging motive in the holdings of German money market funds across asset classes and foreign sector issuers, GDP per capita imparts the largest effect for this holding sector in the case of equity issued by foreign other financial corporations (Table 9). Notably, the distance and market capitalisation effects for German money market funds are strongest (negative and positive respectively) in the case of debt issued by foreign other financial corporations (Table 11).

Our findings ultimately underscore the importance of incorporating heterogeneity in investor behaviour at a more granular level in international macro finance models. From a policy viewpoint, the regression results imply that changes in monetary, fiscal or trade policies across partner countries can impart asymmetric effects across cross-border holder-issuer pairings of various sectors.

6   Conclusions

This paper explores the distribution and drivers of the cross-border inter-sectoral portfolio investment holdings of Germany using the recently released disaggregated data of the Coordinated Portfolio Investment Survey produced by the IMF. Given the status of Germany as a major net external creditor, it offers itself as an interesting case for the analysis of sectoral portfolio exposures. Our study reveals that the international portfolio equity and debt asset holdings of Germany vary considerably along sectoral lines.

Furthermore, our paper examines the relation between German sectoral holdings and a number of "gravity-style" factors in the case of each asset class and foreign issuing sector. The results show heterogeneity in the sensitivities of holdings to the proposed covariates across

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[13]Note that German bank holdings of debt issued by foreign nonfinancials are highly positively associated with GDP per capita (Table 10).

domestic sectors for a given foreign issuing sector, and also across foreign issuing sectors for a given domestic holding sector. The regression findings thus underline the point that aggregate-level patterns in international portfolio holdings may not persist in sector-level data.

From an empirical perspective, detailed data on holders and issuers of international securities can prove to be useful in understanding the distribution of macro-financial risks. From a theoretical perspective, Coeurdacier and Rey (2013) have indicated that accounting for investor heterogeneity in general equilibrium models is a major objective. As such, our findings should be of interest to academic researchers and policy-makers alike.

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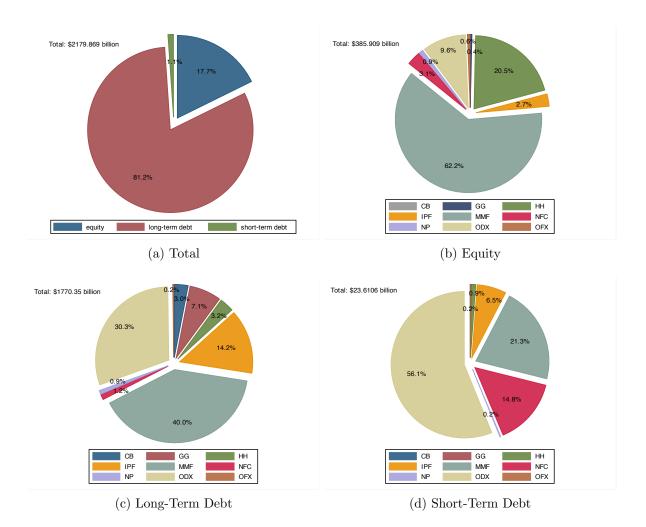
Figure 1: International Portfolio Holdings of Germany

(a) Total

(b) Equity

(c) Long-Term Debt

(d) Short-Term Debt

Notes: Calculations are based on CPIS data. "CB" is the central bank, "GG" is the general government, "HH" are households, "IPF" are insurance and pension funds, "MMF" are money market funds, "NFC" are non-financial corporations, "NP" are non-profit institutions serving households, "ODX" are deposit-taking corporations (banks) excluding the central bank, and "OFX" denotes the "other" category in the *other financial corporations* sector. Households (HH), non-financial corporations (NFC), and non-profit institutions serving households (NP) form the *non-financials* sector. Insurance and pension funds (IPF), money market funds (MMF), and other (OFX) form the *other financial corporations* sector.

Table 1: Portfolio Shares

	PE	PDL	PDS
Panel A: vertical			
Advanced	38.04	83.06	68.23
Emerging	3.02	6.11	2.15
Off-Shores	58.94	10.83	29.61
Panel B: horizontal			
Advanced	17.62	81.26	1.13
Emerging	18.89	80.63	0.48
Off-Shores	71.11	27.62	1.28
Total	31.76	67.10	1.13

Notes: PE, PDL, and PDS denote German portfolio equity, long-term debt, and short-term debt asset holdings respectively. Panel A gives the distribution of German holdings across country groups in each asset class. Panel B shows the distribution of German holdings across asset classes in each country group. Figures are percentage shares of respective totals.

Table 2: Vertical Portfolio Shares, II

	PE	PDL	PDS
Panel A: vertical			
Euro Area	38.45	63.69	60.60
France	18.60	18.06	29.03
Netherlands	6.83	13.16	5.11
Italy	3.25	11.73	18.60
Austria	1.99	5.45	0.58
Belgium	1.78	3.37	2.72
Finland	1.30	2.17	0.07
Greece	0.07	0.28	0.07
Portugal	0.19	1.11	0.11
Spain	4.44	8.36	4.32
United States	30.04	9.78	16.87
United Kingdom	13.22	9.12	12.57
ROW	18.30	17.42	9.97

Notes: PE, PDL, and PDS denote German portfolio equity, long-term debt, and short-term debt asset holdings respectively. The table corresponds to Panel A of Table 1 and gives a more detailed distribution of German holdings across the industrialised world in each asset class. Off-shores are excluded. Figures are percentage shares of respective totals.

Table 3: Vertical Sectoral Portfolio Shares By Country Group

	PE		PDL		PDS	
	ADV	EM	ADV	EM	ADV	EM
Central Bank	0.0	0.0	3.0	0.0	0.0	0.0
General Government	0.4	0.0	7.4	3.5	0.2	0.0
Banks	8.6	18.0	30.6	8.2	57.8	9.1
Nonfinancials	25.2	17.1	5.6	3.5	17.0	0.0
Households	21.3	14.5	3.4	2.3	1.0	0.0
Nonfinancial Corporations	2.9	2.5	1.2	0.9	15.9	0.0
NPISHs	0.9	0.1	0.9	0.3	0.2	0.0
Other Financial Corporations	65.8	64.9	53.5	84.8	24.9	90.9
Insurance and Pension Funds	3.0	0.3	14.5	8.0	5.2	0.0
Money Market Funds	62.4	59.9	38.8	76.6	19.7	90.9
Other	0.4	4.6	0.2	0.2	0.0	0.0
All sectors	100	100	100	100	100	100

Notes: PE, PDL, and PDS denote German portfolio equity, long-term debt, and short-term debt asset holdings respectively. ADV and EM denote the advanced and emerging country groups respectively. The table gives the distribution of aggregate German holdings in each country group for each asset class across German holding sectors. Off-shores are excluded. Figures are percentage shares.

Table 4: Horizontal Sectoral Portfolio Shares Across Country Groups

	PE		PDL		PDS	
	ADV	EM	ADV	EM	ADV	EM
Central Bank			100.0	0.0		
General Government	100.0	0.0	98.9	1.1	100.0	0.0
Banks	91.6	8.4	99.4	0.6	99.6	0.4
Nonfinancials	97.1	2.9	98.5	1.5	100.0	0.0
Households	97.1	2.9	98.4	1.6	100.0	0.0
Nonfinancial Corporations	96.4	3.6	98.3	1.7	100.0	0.0
NPISHs	99.6	0.4	99.3	0.7	100.0	0.0
Other Financial Corporations	95.8	4.2	96.5	3.5	91.1	8.9
Insurance and Pension Funds	99.5	0.5	98.7	1.3	100.0	0.0
Money Market Funds	95.9	4.1	95.6	4.4	88.9	11.1
Other	68.2	31.8	97.8	2.2	100.0	0.0
All sectors	95.8	4.2	97.7	2.3	97.4	2.6

Notes: PE, PDL, and PDS denote German portfolio equity, long-term debt, and short-term debt asset holdings respectively. ADV and EM denote the advanced and emerging country groups respectively. The table gives the distribution of sectoral German holdings across country groups in each asset class. Off-shores are excluded. Figures are percentage shares.

Table 5: Vertical Sectoral Holdings, Equity

Vertical shares	Total	Banks	OFC	NF
Central Bank	0.0	0.0	0.0	0.0
General Government	0.4	0.8	0.2	0.4
Banks	9.0	25.5	6.6	7.5
Nonfinancials	24.9	8.3	36.1	23.4
Households	21.0	6.9	31.9	19.4
Nonfinancial Corporations	2.9	0.8	3.4	3.0
NPISHs	0.9	0.6	0.8	1.0
Other Financial Corporations	65.8	65.5	57.1	68.7
Insurance and Pension Funds	2.9	0.4	11.8	0.4
Money Market Funds	62.3	64.9	44.5	67.7
Other	0.6	0.1	0.8	0.6
All sectors	100	100	100	100

Notes: The sectors "OFC" and "NF" are "other financial corporations" and "nonfinancials" repsectively. The subsector "NPISH" under nonfinancials is "non-profit institutions serving households". The table gives the distribution of portfolio equity asset holdings across German sectoral holders by foreign issuing sector. Off-shores are excluded. Figures are percentage shares.

Table 6: Horizontal Sectoral Holdings, Equity

Horizontal shares	Banks	OFC	NF
Central Bank			
General Government	18.7	10.7	70.5
Banks	26.0	16.3	57.8
Nonfinancials	3.0	32.2	64.7
Households	3.0	33.6	63.4
Nonfinancial Corporations	2.4	26.2	71.4
NPISHs	5.9	20.1	73.9
Other Financial Corporations	9.1	19.3	71.6
Insurance and Pension Funds	1.3	89.8	9.0
Money Market Funds	9.5	15.8	74.6
Other	1.9	30.3	67.6
All sectors	9.1	22.2	68.7

Notes: The sectors "OFC" and "NF" are "other financial corporations" and "nonfinancials" repsectively. The subsector "NPISH" under nonfinancials is "non-profit institutions serving households". The table gives the distribution of German sectoral portfolio equity asset holdings across foreign issuing sectors. Off-shores are excluded. Figures are percentage shares.

Table 7: Vertical Sectoral Holdings, Debt

Vertical shares	Total	Banks	OFC	GG	NF
Central Bank	2.9	1.9	0.0	6.7	0.0
General Government	7.3	2.8	14.9	10.6	0.6
Banks	30.1	41.8	23.2	29.6	11.3
Nonfinancials	5.5	6.8	10.4	1.3	6.2
Households	3.4	4.4	6.4	0.6	3.5
Nonfinancial Corporations	1.2	1.2	2.6	0.3	1.7
NPISHs	0.9	1.2	1.3	0.3	0.9
Other Financial Corporations	54.2	46.6	51.5	51.9	82.0
Insurance and Pension Funds	14.4	15.8	9.6	15.9	13.6
Money Market Funds	39.6	30.6	41.7	36.0	68.0
Other	0.2	0.2	0.3	0.1	0.4
All sectors	100	100	100	100	100

Notes: The sectors "OFC", "GG", and "NF" are "other financial corporations", "general government", and "nonfinancials" repsectively. The subsector "NPISH" under nonfinancials is "non-profit institutions serving households". The table gives the distribution of portfolio long-term debt asset holdings across German sectoral holders by foreign issuing sector. Off-shores are excluded. Figures are percentage shares.

Table 8: Horizontal Sectoral Holdings, Debt

Horizontal shares	Banks	OFC	GG	NF
Central Bank	23.2	0.0	76.8	0.0
General Government	13.1	37.7	48.1	1.1
Banks	47.8	14.2	32.7	5.2
Nonfinancials	42.3	34.6	7.6	15.5
Households	44.9	35.1	5.7	14.3
Nonfinancial Corporations	32.2	38.9	9.2	19.6
NPISHs	46.5	26.9	12.6	14.0
Other Financial Corporations	29.6	17.5	31.9	21.0
Insurance and Pension Funds	37.9	12.3	36.7	13.1
Money Market Funds	26.5	19.4	30.2	23.8
Other	36.0	25.6	12.1	26.3
All sectors	34.4	18.4	33.3	13.9

Notes: The sectors "OFC", "GG", and "NF" are "other financial corporations", "general government", and "nonfinancials" repsectively. The subsector "NPISH" under nonfinancials is "non-profit institutions serving households". The table gives the distribution of German sectoral portfolio long-term debt asset holdings across foreign issuing sectors. Off-shores are excluded. Figures are percentage shares.

Table 9: Equity Regressions

Issuer: Banks	ODX	HH	IPF	MMF
Distance	0.49	-1.24	-0.49	-1.25
	(1.06)	(0.89)	(0.77)	(0.78)
Imports	1.47	-0.65	-0.43	-0.86
	(0.88)*	(0.67)	(0.61)	(0.60)
Market Cap.	0.51	1.20	-0.19	1.24
	(0.73)	(0.56)**	(0.44)	(0.49)**
GDP per capita	0.75	0.07	0.49	-0.06
	(0.61)	(0.50)	(0.61)	(0.45)
Obs.	14	16	10	18

Issuer: NF	ODX	HH	IPF	MMF
Distance	-0.69	-0.79	-0.12	-0.76
	(0.34)**	(0.30)***	(0.37)	(0.27)***
Imports	0.69	-0.04	0.13	-0.13
	(0.26)***	(0.23)	(0.26)	(0.21)
Market Cap.	1.29	1.24	0.52	1.12
	(0.23)***	(0.18)***	(0.19)***	(0.17)***
GDP per capita	0.93	0.73	0.68	0.58
	(0.20)***	(0.16)***	(0.30)**	(0.15)***
Obs.	17	19	15	19

Issuer: OFC	ODX	HH	IPF	MMF
Distance	0.20	-0.89	-2.70	-0.02
	(0.57)	(0.88)	(1.10)**	(0.71)
Imports	1.26	1.22	-0.98	0.51
	(0.45)***	(0.71)*	(0.84)	(0.55)
Market Cap.	0.65	1.19	1.62	0.72
	(0.36)*	(0.49)**	(0.54)***	(0.44)
GDP per capita	0.62	1.85	1.64	1.14
	(0.32)*	(0.96)*	(0.93)*	(0.41)***
Obs.	14	14	11	19

Notes: The dependent variable is the logarithm of the specified German sector's portfolio equity asset holdings in the specified issuing sector across foreign countries. All regressors are in logs. Amongst the German holders, "ODX" are banks excluding the central bank, "HH" are households, "IPF" are insurance and pension funds, and "MMF" are money market funds. Amongst the foreign issuers, "NF" are nonfinancials and "OFC" are other financial corporations. Estimated by seemingly unrelated regressions (SUR) for unbalanced panels. Asterisks ***,**,* indicate significance at 1%, 5% and 10% levels respectively.

Table 10: Debt Regressions, Nonfinancials

Issuer: GG	GG	ODX	HH	IPF	MMF
Distance	1.38	0.11	-0.46	0.60	-0.57
	(1.05)	(1.02)	(0.86)	(1.04)	(0.71)
Imports	1.80	1.03	-0.41	1.20	0.03
	(0.81)**	(0.76)	(0.63)	(0.82)	(0.54)
Market Cap.	-0.21	-0.39	-0.13	-0.77	-0.19
	(0.63)	(0.61)	(0.50)	(0.60)	(0.44)
GDP per capita	2.19	1.87	0.54	1.99	0.81
	(1.10)**	(0.80)**	(0.67)	(0.83)**	(0.40)**
Obs.	15	18	17	17	19

Issuer: NF	GG	ODX	HH	IPF	MMF
Distance	0.60	-1.23	-1.09	-1.43	-1.53
	(1.43)	(0.60)**	(0.71)	(1.20)	(0.68)**
Imports	0.72	-0.43	-0.39	-0.43	-0.92
	(1.05)	(0.46)	(0.58)	(0.92)	(0.52)*
Market Cap.	-0.07	0.48	0.48	0.29	0.85
	(0.73)	(0.37)	(0.41)	(0.69)	(0.42)**
GDP per capita	1.26	1.23	0.86	0.00	0.71
	(1.98)	(0.35)***	(0.34)**	(1.10)	(0.39)*
Obs.	11	18	17	15	18

Notes: The dependent variable is the logarithm of the specified German sector's portfolio long-term debt asset holdings in the specified nonfinancial issuing sector across foreign countries. All regressors are in logs. Amongst the German holders, "GG" is the general government, "ODX" are banks excluding the central bank, "HH" are households, "IPF" are insurance and pension funds, and "MMF" are money market funds. Amongst the foreign issuers, "NF" are nonfinancials. Estimated by seemingly unrelated regressions (SUR) for unbalanced panels. Asterisks ***,**,* indicate significance at 1%, 5% and 10% levels respectively.

Table 11: Debt Regressions, Financials

Issuer: Banks	GG	ODX	HH	IPF	MMF
Distance	0.05	-2.25	-2.19	-0.88	-1.29
	(0.70)	(0.36)***	(1.12)*	(0.78)	(0.40)***
Imports	0.97	-0.83	-1.08	0.11	-0.43
	(0.55)*	(0.26)***	(0.82)	(0.57)	(0.30)
Market Cap.	0.30	1.10	0.87	0.46	0.64
	(0.40)	(0.24)***	(0.71)	(0.49)	(0.25)**
GDP per capita	0.95	1.15	1.16	2.17	0.83
	(0.76)	(0.22)***	(0.86)	(0.60)***	(0.23)***
Obs.	14	17	16	17	18

Issuer: OFC	GG	ODX	HH	IPF	MMF
Distance	0.78	-2.53	-1.06	-0.52	-1.98
	(1.39)	(1.00)**	(1.23)	(0.72)	(0.68)***
Imports	1.12	-0.08	-0.26	0.36	-0.92
	(1.09)	(0.76)	(0.93)	(0.55)	(0.53)*
Market Cap.	0.25	1.84	0.94	0.64	1.53
	(0.73)	(0.61)***	(0.74)	(0.43)	(0.42)***
GDP per capita	1.94	0.90	3.27	1.61	0.81
	(1.19)	(0.56)	(1.17)***	(1.21)	(0.40)**
Obs.	14	14	14	12	18

Notes: The dependent variable is the logarithm of the specified German sector's portfolio long-term debt asset holdings in the specified financial issuing sector across foreign countries. All regressors are in logs. Amongst the German holders, "GG" is the general government, "ODX" are banks excluding the central bank, "HH" are households, "IPF" are insurance and pension funds, and "MMF" are money market funds. Amongst the foreign issuers, "OFC" are other financial corporations. Estimated by seemingly unrelated regressions (SUR) for unbalanced panels. Asterisks ***,**,* indicate significance at 1%, 5% and 10% levels respectively.