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International debt and Special Purpose Entities: evidence from Ireland

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Abstract

This paper examines international debt issuance through Irish-resident Special Purpose Entities (SPEs). Using a unique new dataset covering the population of Irish-resident SPEs reporting to the Central Bank of Ireland over the period 2005-2017, we identify cross-country debt financing links channelled through SPEs. The empirical analysis suggests that tax optimisation is an important motive, particularly for sponsors of Irish-resident securitisation vehicles, while investor protection and financial development are important additional considerations for sponsors of non-securitisation vehicles.

Keywords: international finance, special purpose entities (SPEs)
JEL Classification: F36, G23, G15

Non-technical summary

Banking activity and cross-border bank flows in many advanced economies have only recovered gradually from the global financial crisis. In contrast, the non-bank financial sector has grown more rapidly. The rapid growth in non-bank financial activities includes an important cross-border element, particularly as they are concentrated in a small number of financial centres.

This paper examines international debt issuance in the context of market-based finance entities resident in one particular financial centre, namely Ireland. Using a unique new dataset covering Irish-resident special purpose entities (SPEs) over the period 2005-2017, we study the macroeconomic determinants of debt issued through SPEs. Ireland is an ideal country in which to examine the international dimension of market-based finance, since it acts as a major global channel for cross-border financial flows and international debt issuance through SPEs.

The diverse set of sponsor and investor countries in our dataset allows us to implement an empirical analysis with an international macroeconomic focus, building on a substantial literature looking at the institutional and geographic determinants of international financial flows and applying similar methods to market-based finance. Accordingly, we examine whether certain institutional features commonly identified in the international finance literature can help explain the geographic pattern of financial assets intermediated by Irish-resident SPEs. In particular we focus on four factors: (1) financial development; (2) investor protection; (3) taxation; and (4) information asymmetries.

From an academic perspective, this paper contributes by bridging the gap between existing micro-oriented papers on market-based finance, and the more macro-focused literature on international finance. Specifically, we identify cross-country debt financing links channelled through SPEs. The descriptive analysis highlights the differing pattern of debt issuance intermediated by Irish-resident SPEs compared to conventional cross-border portfolio debt examined in much of the existing literature. Moreover, our results also highlight the importance of distinguishing between different types of market-based finance activities. Our empirical analysis suggests that debt issuance by Irish-resident securitisation vehicles, referred to as financial vehicle corporations (FVCs), is at least partly motivated by tax optimisation. Institutional factors such as investor protection and

financial development are important additional considerations for sponsors of non-securitisation issuance through special purpose vehicles (SPVs).

The relation between the institutional quality variables and debt issuance intermediated by Irish-resident SPVs is found to be quite different to that for other types of cross-border investment. Rather than acting as a deterrent, weaker financial development and investor protection, *ceteris paribus*, are associated with increased debt issuance through Irish-resident SPVs. This suggests that Irish-resident SPVs may be more attractive for countries where weaker institutions raise the cost of traditional forms of international finance.

This paper is part of a concerted effort by the Central Bank of Ireland to shed light on market-based finance activities and increase our understanding of the factors driving them. Our analysis provides evidence regarding the motivations of participants in international market-based finance, as well as describing the sources and destinations of funding raised through SPE debt. The unique new dataset that we exploit demonstrates the value of collecting adequate information in order to gain a greater understanding of the activities of SPEs, and the global market-based finance sector more generally. The paper also highlights the sheer scale of the activities taking place in Ireland, as cross-border market-based finance is concentrated in a relatively small number of international financial centres. This implies that further international cooperation may be necessary to adequately monitor global non-bank financing activity, both to increase transparency, and to improve the quantification of risk.

1. Introduction

Banking activity and cross-border bank flows in many advanced economies have only recovered gradually from the global financial crisis (McQuade and Schmitz 2017; Lane and Milesi-Ferretti 2018). In contrast, the non-bank financial sector has grown more rapidly. According to the Financial Stability Board (FSB 2018), the global value of the financial assets of non-bank financial entities grew from USD 66 trillion in 2008, to USD 99 trillion in 2016.[1] By comparison, during the same period the financial assets of banks grew from USD 123 trillion to USD 138 trillion, having peaked at 144 trillion in 2012. The rapid growth in non-bank financial activities includes an important cross-border element, particularly as they are concentrated in a small number of financial centres.

This paper examines international debt issuance in the context of market-based finance entities resident in one particular financial centre, namely Ireland. Using a unique new dataset covering Irish-resident special purpose entities (SPEs) over the period 2005-2017, we study the macroeconomic determinants of debt issued through SPEs.[2] Ireland is an ideal country in which to examine the international dimension of market-based finance, since it acts as a major global channel for cross-border financial flows and international debt issuance through SPEs (Lane and Moloney 2018).[3] As such, total assets of Irish-resident SPEs amounted to EUR 731 billion, in over 2067 vehicles in 2017Q4.[4]

SPEs have a wide range of uses and can perform a valuable function in helping to intermediate credit or spread, warehouse or repackage various risks in the global financial system. SPEs are set up by sponsor entities to fulfil narrow and/or specific purposes on behalf of the sponsor

[1] These figures are estimates from FSB (2018) definitions based on "Other Financial Intermediaries" (OFIs), which are defined as "all financial institutions that are not central banks, banks, insurance corporations, pension funds, public financial institutions, or financial auxiliaries."

[2] The analysis is conducted on the entire set of SPEs for which the Central Bank of Ireland collects data. These entities are all securitisation vehicles, and non-securitisation vehicles that avail of Section 110 of the Taxes Consolidation act (1997) of the Irish tax code. It is possible that there are SPVs that do not use Section 110, and therefore are not included in the Central Bank of Ireland's data collection exercise. As such, the importance of SPVs not covered by our data is not known with certainty. However, Golden and Hughes (2018) state that their anecdotal evidence from contacts with industry suggests that the majority of such entities do avail of Section 110, as this provides very significant tax advantages.

[3] Ireland is a significant location for market-based finance, in particular for credit intermediation, as it is the sixth largest OFI host in the world according to the FSB narrow measure of *shadow banking* assets (FSB 2017).

[4] The total assets of Irish-resident SPEs involved in securitisation amounted to EUR 401 billion of total assets, in over 963 vehicles in 2017Q4, accounting for 21 per cent of the euro area total. More broadly, the total assets of Irish-resident investment funds and SPEs stood at EUR 3.2 trillion at the end of 2016.

and are designed so that certain benefits flow to the sponsor, typically in the areas of funding, risk management, taxation, and liquidity.[5] One of the main activities of SPEs is securitisation, which involves passing credit risk to investors and often entails turning illiquid assets into liquid securities (Acharya, Schnabl and Suarez 2013, Adrian 2017). Golden and Hughes (2018) note that debt issuance through SPEs in Ireland has diversified away from debt funding secured on mortgage pools, with the latter now accounting for just 27 per cent of all securitisation entities. Another important motivation for sponsoring an SPE is to access external finance to fund investment, such that SPEs may form part of non-bank credit intermediation chains (Pozsar 2013). For the purposes of much of the analysis that follows, we divide the data into two separate categories, namely: (1) securitisation vehicles, which we refer to as *financial vehicle corporations* (FVCs), and (2) non-securitisation vehicles or *special purpose vehicles* (SPVs).

The diverse set of sponsor and investor countries in our dataset allows us to implement an empirical analysis with an international macroeconomic focus, building on a substantial literature looking at the institutional and geographic determinants of international financial flows and applying similar methods to market-based finance. Accordingly, we examine whether certain institutional features commonly identified in the international finance literature can help explain the geographic pattern of financial assets intermediated by Irish-resident SPEs. In particular we focus on four factors: (1) financial development; (2) investor protection; (3) taxation; and (4) information asymmetries.

The international finance literature repeatedly finds that proxies for a partner country's institutional and regulatory environment are important in explaining the geographic distribution of international financial flows and asset holdings. For instance, Chinn and Ito (2002, 2006) find that legal and institutional quality are linked to financial openness and financial development, such that increasing capital account liberalisation only results in financial development if a threshold level of institutional quality is achieved. Relatedly, Kose et al. (2009) show that financial development is generally positively correlated with financial openness in the pre-crisis period, while

[5] Irish-resident SPEs engage in a variety of other activities, with Golden and Hughes (2018) outlining 14 broad categories of activity into which other SPEs can be separated. Aside from securitisation, Irish-resident SPEs can be categorised as follows: (1) Investment Fund Linked; (2) External Financing; (3) Intra-group Financing; (4) Operational Leasing; (5) Loan Origination; (6) Bank-Linked Investments; (7) Resolution Vehicle; (8) Receivables Financing; (9) Repackaging; (10) Client Managed Account; (11) Insurance-Linked Investments; (12) Financial Leasing; (13) Holding Company; (14) Other Financial Investments.

Daude and Stein (2007) show that unpredictability of laws and regulations, excessive regulatory burden and government instability all deter FDI inflows.

In addition to general financial development, certain aspects of the institutional environment may be especially important for sponsors of market-based finance entities seeking to access international financial markets, in particular the extent of investor protection. Golden and Maqui (2018) examine international banks that sponsor Irish-resident SPEs and find that they tend to be characterised by weak balance sheets: these are slower growing, less profitable and have lower levels of capital. This is consistent with a number of papers examining securitisation in the US. Irani et al. (2018) estimate that a decrease in bank capital adequacy causes a significant increase in the share of loans held by non-banks. It follows that, in some instances, much of the value of using SPEs comes from avoiding bankruptcy costs for the loan originator, which provides incentives for riskier firms to use such vehicles (Gorton and Souleles 2007). Relatedly, Irish-resident SPVs employing external financing business models may ring-fence assets as collateral backing debt issued to investors, with the assets falling under Irish property law in the event of dispute (Golden and Hughes 2018). It follows that some of the intrinsic features of Irish-resident SPEs may be particularly attractive to investors from jurisdictions where investor protection is weak.

Tax optimisation is another potentially important motivation for establishing a special purpose entity. Numerous papers have highlighted the influence of corporate tax for international finance, and the location of multinational firms and banks (Feldstein 1994; Fatica and Wildmer 2018; Lane and Moloney 2018; Merz and Overesch 2016).[6] A small but growing literature focuses specifically on the location of market-based finance entities. Using data from Bureau van Dijk's *Amadeus* and *Orbis* databases, Davies and Killeen (2017) show that corporate tax rates have a significant influence on the location of foreign direct investment by non-bank financial firms, while Davies and Killeen (2018) also demonstrate that international tax treaties have an influence on the location choices of market-based finance entities in the European Union. Compared to this paper, the latter two studies primarily focus on explaining the location of market-based finance hubs rather than the country characteristics of sponsors of SPEs involved in debt issuance. Nevertheless their findings with regard to the importance of tax optimisation as a determinant of the geographic

[6] Beer and Loeprick (2018) sketch a theoretical model to investigate the role of treaty shopping in driving nominal investment flows and provide indirect evidence for their importance in emerging market economies.

location of market-based finance activities are consistent with our results.

Information asymmetries are also critically important for explaining the geographic distribution of international asset holdings. For instance, Portes and Rey (2005) use bilateral distance and the volume of telephone calls as proxies for information asymmetries and trade costs, and conclude that the geography of information is the main determinant of the pattern of international financial flows. Lane and Milesi-Ferretti (2008) examine the determinants of portfolio equity holdings across countries and find that larger bilateral stock positions are associated with proxies for informational proximity and trade costs. Examining data recorded in the IMF coordinated portfolio investment survey (CPIS), Galstyan and Lane (2013) argue that bilateral gravity-type variables, such as geographic distance, as well as common institutional linkages, are also important for the adjustment of asset allocations, especially during periods of market turbulence. More recently, by using virtual proximity between countries, measured by bilateral internet hyperlinks, Hellmanzik and Schmitz (2017) also demonstrate the critical importance of cross-border information flows for international portfolio allocation. Informational proximity could have similarly important effects in the case of cross-border market-based finance.

From an academic perspective, this paper contributes by bridging the gap between existing micro-oriented papers on market-based finance, and the more macro-focused literature on international finance. Specifically, we identify cross-country debt financing links channelled through SPEs. The descriptive analysis highlights the differing pattern of debt issuance intermediated by Irish-resident SPEs compared to conventional cross-border portfolio debt examined in much of the existing literature. Moreover, our results also highlight the importance of distinguishing between different types of market-based finance activities. Our empirical analysis suggests that debt issuance by Irish-resident securitisation vehicles (i.e. FVCs), is at least partly motivated by tax optimisation. Institutional factors such as investor protection and financial development are important additional considerations for sponsors of non-securitisation issuance through SPVs.

From a policy perspective, our results carry important implications as they are consistent with the possibility that some SPE debt issuance is motivated by tax optimisation, particularly that of FVCs. Moreover, the relation between the institutional quality variables and debt issuance intermediated by Irish-resident SPVs is found to be quite different to that for other types of cross-border

investment. Rather than acting as a deterrent, weaker financial development and investor protection, *ceteris paribus*, are associated with increased debt issuance through an Irish-resident SPV. This suggests that Irish-resident SPVs may be more attractive for countries where weaker institutions raise the cost of traditional forms of international finance.

The rest of the paper proceeds as follows: Section 2 describes the compilation of our dataset as well as the geographic distribution and evolution over time of SPE related issuance through Ireland. Section 3 describes the econometric methodology, while Section 4 presents our empirical results. Finally, Section 5 highlights a number of policy relevant conclusions.

2. Data

2.1. Sources and availability

We construct a unique dataset on Irish-resident SPEs reporting to the Central Bank of Ireland by combining unpublished, granular security and vehicle-level information on SPEs and their sponsors with information on debt issuance from the Centralised Securities Database (CSDB).

The Central Bank of Ireland collects detailed information on Irish-resident securitisation (since 2009Q4) and non-securitisation (since 2015Q3) SPEs. Using available information on both asset and liability sides from the SPE balance sheet, we are able to capture the cross-country geographical and sectoral dimensions of debt financing through SPEs. We use the term sponsor in the same sense as Golden and Hughes (2018), meaning the entity on whose behalf an SPE was established. This is usually, but not always, the ultimate beneficial owner of the SPE with an ultimate interest in the debt funding activity intermediated through the SPE. The dataset includes sponsoring entities from all economic sectors, including banks and OFIs. From the liability side, we exploit additional data from Central Bank of Ireland statistics identifying the holder of SPE debt securities on an immediate counterparty basis, that is, the first counterparty that buys the individual debt security.[7] Thus, we identify cross-country financing links channelled through Irish-resident SPEs based on the country of residence of the entity sponsoring the SPE (i.e. recipient) and the residency of the counterparty investing in debt securities (i.e. investor).

[7] The country and sector of the initial holder of the individual issued security (i.e. at the security level) is a field in both the FVC and SPV reporting templates published by the Central Bank of Ireland.

Next, security-by-security balance sheet items capturing SPE debt issuance are matched via international securities identification number (ISIN) codes with the Centralised Securities Database (CSDB) collected by the European System of Central Banks. The database contains detailed security-level information at the time of issuance on issuance date, volume of issuance and currency, maturity structure, etc. The identification at the ISIN level implies that our analysis is focused on debt funding in public markets. In principle, this would result in the exclusion of private placements as no public information is readily available for this type of financing activity. To overcome this issue, however, we further expand our dataset by extracting information on debt stock positions directly from the liability side of SPE balance sheets. Although this shortens the sample period, which is limited by the dates of the introduction of reporting requirements to the Central Bank of Ireland, this additional dimension of the data complements and enriches our study by including private placements of debt through Irish-resident SPEs.

We examine both securitisation and non-securitisation SPEs separately as their geographical patterns of cross-border interconnections are quite different. Securitisation SPEs are referred to as financial vehicle corporations (FVCs), while non-securitisation vehicles are referred to as special purpose vehicles (SPVs). The former dominate the sample, accounting for over 80 per cent of the total debt issuance in most of the years covered by our data. Interestingly, the share of SPVs increased markedly during the global financial crisis and the European sovereign debt crisis, peaking at approximately 34 per cent in 2011. Overall, our dataset captures a total of 4821 debt issuances through Irish-resident SPEs, with a total value of over EUR 500 billion, and with participants from 37 countries (32 sponsor countries and 26 investor countries including Ireland). The data are at annual frequency over the period 2005-2017 for issuance and 2014-2017 for outstanding debt positions.

The data on SPEs are combined with data from a number of publicly available sources for the purposes of the empirical analysis presented below. Standard gravity variables are taken from the Centre d'Études Prospectives et d'Informations Internationales (CEPII) (Mayer and Zignago 2011). Information on double tax treaties are taken from Deloitte (2018), while the data on legal origins come from La Porta, López-de-Silanes and Shleifer (2007). The investor protection index is taken from the World Bank Doing Business indicators, and we use the financial development

index from Svirydzenka (2016).

2.2. Geographic distribution

Figure 1 compares the geographic distribution of debt stock issued via Irish-resident SPEs to data on long-term cross-border portfolio debt taken from the IMF Coordinated Portfolio Investment (CPIS) survey.[8] Panel (a) shows a clear positive correlation between country pairs that are the sponsors and investors in Irish-resident FVCs, and the financial linkages between host and source countries arising from more conventional portfolio debt positions. However, the correlation coefficient is approximately 0.24 for FVCs, suggesting that there are also determinants of country linkages via Irish-resident FVC that are distinct from those of international portfolio debt.

In contrast, Figure 1 panel (b) suggests a negative correlation between country-pairs that are linked via conventional debt issuance, and those countries linked via Irish-resident SPVs. This negative correlation may imply that debt issuance via Irish-resident SPVs is an alternative source of financing for countries that find it difficult to access international debt funding through conventional channels. Moreover, the chart suggests that the determinants of SPV linkages are likely to be different, not just to those of conventional portfolio debt, but also to FVCs.

Figure 2, panel (a) shows the geographic location of the sponsors of FVCs in 2017. Of EUR 240 billion, UK sponsors account for the largest share of debt securitisation by Irish-resident FVCs, accounting for over 40 per cent of total issuance, followed by Ireland (16 per cent), the US (14 per cent), France (10 per cent), Belgium (7 per cent) and Germany (5 per cent). This suggests that the location of sponsors of FVCs resident in Ireland is quite concentrated, as these 6 countries account for over 90 per cent of total issuance.

Figure 2, panel (b) displays the geographic location of the investors in FVCs in 2017. Just over 50 per cent of investors are Irish-resident entities, although the majority of these are likely to be pass-through entities.[9] The next most important investor countries are the UK (20 per cent), US (10 per cent), France (6 per cent) and Luxembourg (3 per cent).

Figure 3, panel (a) illustrates the geographic breakdown of SPV sponsors in 2017. Of total EUR

[8] We conduct the comparison using long-term debt issuance as SPEs are typically involved in issuing debt with longer maturities.

[9] See Galstyan (2019).

135 billion, the US and Russia are the two largest sponsors of debt issuance by Irish-resident SPVs, accounting for 40 per cent and 30 per cent of the total, respectively. The UK (15 per cent), Ireland (4 per cent) and Luxembourg (4 per cent) are the next biggest sponsor countries.

Figure 3, panel (b) displays the geographic breakdown of SPV investors in 2017. Again, investors in Irish SPVs are quite concentrated with the top 5 countries accounting for over 92 per cent of total issuance in 2017. The top 5 consist of Ireland (29 per cent), the US (23 per cent), the UK (16 per cent), Malta (14 per cent) and Luxembourg (11 per cent).

3. Econometric methodology

3.1. Sponsor country level regression analysis

In the baseline panel specification, the security-level observations are aggregated at the sponsor country level. The dependent variable, $SPEvalue$, is the sum of the EUR value of debt stock positions (STK)/ debt issuance (ISS) by an Irish-resident SPEs from sponsor country, i, divided by the GDP of that country, at time t:

$$SPEvalue_{it} = \alpha + \beta_1 distIRL_i + \beta_2 Z_{it} + \gamma_t + \epsilon_{it} \quad (1)$$

where $distIRL$ measures the distance between the sponsor country, i, and Ireland, as a proxy for cross-border information frictions (Portes and Rey 2005; Hellmanzik and Schmitz 2017; Galstyan and Lane 2013; Lane and Milesi-Ferretti 2008). More distant countries are expected to suffer from greater information frictions, and therefore have lower exposures via Irish-resident SPEs. It follows that we anticipate a negative sign on the coefficient on distance, consistent with the results in the existing literature on conventional international financial linkages. Z is a vector of sponsor country control variables including the number of double tax treaties, an investor protection index, financial development, and a dummy variable controlling for whether the sponsor country has a common law legal origin.

Following Davies and Killeen (2018), the double tax treaty variable is included to control for the effect of tax optimisation. According to Golden and Hughes (2018) certain provisions of the Irish tax code mean that Irish-resident SPEs can be highly tax efficient, with gains taxed at rates very

close to zero.[10] One important element contributing to this is the extensive network of 73 double tax treaties maintained by the Irish government. If such a bilateral tax treaty exists, then whatever small tax payments that are made in Ireland can be used to discharge tax liabilities incurred in the partner country. Therefore, we include a variable capturing the number of bilateral tax treaties in our empirical analysis, as a proxy for incentives for the establishment of Irish-resident SPEs for the purposes of tax optimisation. As countries with fewer double tax treaties are expected to benefit more from the double tax treaties maintained by Ireland, we anticipate a negative coefficient on this variable.

Conditional on other controls, we anticipate that sponsors that do not have access to strong investor protection or highly developed financial markets in their own countries will be more likely to benefit from more favourable funding conditions by issuing debt using an Irish-resident SPE. Sponsors located in highly financially developed countries may prefer to establish an SPE in their own jurisdiction rather than establishing an Irish-resident one. Similarly, international investors may prefer to purchase debt that is covered by a common law legal system similar to the US and UK, as is available in Ireland. This implies that the coefficient on these variables would be negative.

All of the regressions are run separately for both the debt stock positions and debt issuance through Irish-resident SPEs. The issuance series, in particular, can be characterised as very 'lumpy' with non-zero values for many countries occurring only intermittently and with considerable variation in values, even within the same sponsor country. Given these properties, and the fact that we are mainly interested in cross-sectional rather than within sponsor-country variation, our empirical specification does not include country fixed effects. However, some of the regressions include time fixed effects, γ, to account for the possibility that debt issuance is being driven by time-specific unobserved factors. The baseline specification is implemented using robust standard errors.

[10] For example, according to Golden and Hughes (2018), the entire profits from a portfolio of assets of an Irish-resident investment fund can be passed through an Irish-resident SPE such that only residual amounts of taxable income remain. As a consequence, no Irish tax will be paid by the investment fund on either income gains or increases in net asset value.

3.2. Sponsor entity level regression analysis

In addition to the baseline specification, we run an alternative specification where the data are aggregated at the sponsor entity level. Here, the dependent variable, $SPEvalue$, is the EUR value of debt stock positions/debt issuance by an Irish-resident SPE divided by the GDP of sponsor country, i, for entity, e, at time t:

$$SPEvalue_{iet} = \alpha + \beta_1 distIRL_i + \beta_2 Z_{it} + \gamma_{1s} + \gamma_{2t} + \epsilon_{it} \quad (2)$$

These entity level regressions replicate the same regression specifications but at a higher level of disaggregation and including sector specific fixed effects γ_{1s}. The data include the following sectors: (1) Deposit taking corporations (DTC); (2) Financial auxiliaries (FAU); (3) Financial vehicle corporations (FVC); (4) Government (GOV); (5) Household sector (HHS); (6) Insurance (IC); (7) Investment funds (IF), (8) Non-financial corporations (NFC), (9) Other financial institutions (OFI). However, entity level control variables are not included as the focus of the analysis is on the macro-economic and institutional determinants of SPE debt issuance.

4. Results

4.1. Country level regressions

Tables 1 and 2 present the results of a pooled regression where the data are aggregated at the level of the sponsor country. Table 1 relates to FVCs, while Table 2 displays the results for SPVs.

The results in columns (1) and (2) of Table 1 relate to the outstanding stock positions of FVC debt in Irish-resident SPEs for the years after 2014. Consistent with the gravity literature on international finance, the results indicate that countries that are more distant from Ireland issue less debt using Irish-resident FVCs. The number of double tax treaties in the sponsoring country is negatively correlated with the use of FVCs in Ireland, which suggests that sponsors may choose to issue in Ireland in order to take advantage of features of the tax system in Ireland, including the extensive network of double tax treaties. The common law variable is also statistically significant, suggesting that sponsors from countries that have a similar legal origin (such as the US and UK)

have a larger stock of debt issued through Irish-resident FVCs. Although the other explanatory variables are not statistically significant, they mostly have the expected sign. The inclusion of time fixed effects in column (2) does not substantially alter our results.

Columns (3) and (4) apply the same regression specification to an alternative data set recording FVC debt *issuance* and covering a longer time period, from 2005-2017. The results are largely similar to those observed for stock positions, with negative and statistically significant coefficients recorded in the case of distance and double tax treaties, and a positive coefficient on common law. We also find marginally significant coefficients on financial development, suggesting that, after controlling for other factors, less financially developed countries tend to issue more securitised debt using Irish-resident FVCs.

Table 2 displays the results of a similar set of regressions using data on SPVs. The results for debt stock positions are displayed in columns (1) and (2) and indicate that more proximate countries, and countries with a common legal origin are more likely to sponsor debt using an SPV resident in Ireland. In addition, sponsors from countries with weaker investor protection tend to have a larger stock of debt issued by Irish-resident SPV. This suggests that institutional factors relating to property rights, as reflected in the investor protection index and common law variables, are an important motivation for the sponsors of debt issued through Irish-resident SPVs.

In contrast to FVCs, the number of double tax treaties is only found to be marginally significant in the case of SPVs. In alternative specifications where financial development is excluded, the number of observations increases substantially, and the negative coefficient on double tax treaties becomes statistically significant. At the same time, investor protection is no longer statistically significant but remains negative.[11] Relatedly, columns (3) and (4) report the results of regressions using data recording SPV debt *issuance*, and yield a coefficient on the double tax treaties variable that is negative and statistically significant at the 10 percent significance level, while delivering broadly similar signs and significance on the coefficients of the other explanatory variables. Taken together, these results suggest that tax optimisation is an important motive, particularly for sponsors of Irish-resident FVCs, while the possibility of availing of Irish standards of investor protection is an additional important consideration for sponsors of SPVs.

[11] Results of these unreported alternative specifications are available upon request.

Finally, the R-squared statistics for SPVs tend to be lower than in the case of FVCs. This is consistent with the fact that FVCs are all securitisation vehicles, while Barrett, Godfrey and Golden (2016) highlight the diverse purposes and structures underlying SPVs resident in Ireland.

4.2. Entity level regressions

Tables 3 and 4 report a similar set of regressions but now at the sponsor entity level of aggregation, and including sector fixed effects in some specifications. This increases the number of observations by a factor of approximately 20, while also introducing additional variation as is apparent from the reduced R-squared statistics.

Table 3 relates to FVCs, and columns (1) to (3) present the results for debt stock positions. The important role of distance and double tax treaties is confirmed, while the common law variable is no longer statistically significant. The coefficient on financial development is found to have a negative sign in columns (1) and (2), but this becomes statistically insignificant when sector fixed effects are included. This suggests that, in the case of FVCs, the financial development variable may capture the fact that FVCs tend to be sponsored by financial firms. Columns (4) to (6) display the results for issuance, which cover a longer time span. The results confirm that more distant sponsor countries, and those with more double tax treaties, are less likely to securitise debt through Irish-resident FVCs. Neither the results for debt stock positions nor the debt issuance appear sensitive to the inclusion of time fixed effects.

Table 4 repeats the analysis using data for SPVs. Again, columns (1) to (3) show the results for debt stock positions, while columns (4) to (6) relate to issuance, with the latter covering a longer period. The results suggest that sponsor countries with weaker investor protection and lower levels of financial development, as well as those with a common law legal origin, sponsor more debt through Irish-resident SPVs. As was the case in the country level regressions, excluding the financial development variable from the specification delivers a negative and statistically significant coefficient on double tax treaties, while the investor protection coefficient becomes insignificant but still negative. These results are consistent for both debt stock positions and debt issuance and are robust to the inclusion of time and sector fixed effects. The coefficient on distance has a negative sign but is only marginally statistically significant in columns (4) and (5).

4.3. Robustness tests

The lumpy characteristics of the data described above imply that the residuals from the OLS regressions could be non-spherical in nature. Therefore, in unreported regressions, we also implement a specification using generalised least squares (GLS). The core findings reported above are robust to this alternative specification. As a further robustness test, we also run regressions where the data are partitioned according to whether sponsor countries are advanced or emerging market economies. The coefficients on investor protection and financial development in the SPV regressions are weakened, suggesting that variation in these indicators across advanced and emerging economies is contributing to their statistical significance. Relatedly, excluding observations for Russia does not alter the main findings.

A similar analysis to that described above was also conducted on a bilateral basis, such that the observations were aggregated at the country pair level, i.e. sponsor country, i, and investor country j. However, while the coefficients on some of the variables described above were statistically significant in certain specifications, aside from geographic distance the results for investors proved not to be robust. This could reflect the fact that the investor data is on an immediate rather than ultimate investor basis. Alternatively, it may suggest the existence of a global investor pool for much of the debt issued through Irish-resident SPEs.

Overall, the empirical analysis confirms the importance of investor protection, financial development and taxation as determinants of the geographic distribution of sponsors of Irish-resident SPEs. However, the relative importance of these factors varies depending on the type of SPE. Tax considerations may be more important in the case of FVCs (securitisation vehicles), while investor protection is an additional important consideration for sponsors of SPVs (non-securitisation vehicles).

Conclusions

This paper provides an analysis of international debt issuance through Irish-resident Special Purpose Entities. Using a unique dataset covering the population of Irish-resident securitisation and non-securitisation vehicles over the period 2005-2017, we identify cross-country debt financing

links channelled through SPEs. The descriptive analysis highlights how different the pattern of debt issuance intermediated by Irish-resident SPEs is compared to conventional cross-border portfolio debt. In addition, we highlight the importance of distinguishing between securitisation and non-securitisation vehicles. We find that the issuance of debt by Irish-resident securitisation vehicles is at least partly motivated by tax optimisation, while institutional factors such as investor protection and financial development are important additional considerations for debt financing through non-securitisation vehicles.

Our analysis bridges the gap between existing micro-oriented papers on market-based finance, and the more macro-oriented international finance literature. We highlight the importance of taxation, financial development and institutional factors as determinants of international market-based finance. Our results suggest that sponsors from countries with weaker institutions may find it easier to access funding by issuing debt offshore through an SPE in a location with which investors have stronger legal rights and investor protection, such as Ireland.

This paper is part of a concerted effort by the Central Bank of Ireland to shed light on market-based finance activities and increase our understanding of the factors driving them. Our analysis provides evidence regarding the motivations of participants in international market-based finance, as well as describing the sources and destinations of funding raised through SPE debt. The unique new dataset that we exploit demonstrates the value of collecting adequate information in order to gain a greater understanding of the activities of SPEs, and the global market-based finance sector more generally. The paper also highlights the sheer scale of the activities taking place in Ireland, as cross-border market-based finance is concentrated in a relatively small number of international financial centres. This implies that further international cooperation may be necessary to adequately monitor global non-bank financing activity, both to increase transparency, and to improve the quantification of risk.

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Table 1: Pooled Panel Regression - Sponsor Country Level - Financial Vehicle Coporations

	(1)	(2)	(3)	(4)
Distance	-2.76	-2.76	-0.65	-0.65
	(0.70)***	(0.70)***	(0.20)***	(0.20)***
Double Tax Treaties	-0.06	-0.06	-0.01	-0.01
	(0.02)**	(0.02)**	(0.01)**	(0.01)**
Investor Protection Index	-0.24	-0.24	-0.02	-0.02
	(0.30)	(0.30)	(0.05)	(0.05)
Financial Development	-0.60	-0.60	-0.43	-0.46
	(1.30)	(1.32)	(0.27)	(0.27)*
Common Law	3.59	3.59	0.88	0.89
	(1.04)***	(1.05)***	(0.28)***	(0.28)***
LHS	STK	STK	ISS	ISS
Observations	93	93	372	372
R-squared	0.59	0.59	0.27	0.29
Time FE	No	Yes	No	Yes

Note: In columns (1) and (2) the dependent (left-hand side (LHS)) variable is the outstanding stock position as a share of GDP (LHS: STK), while in columns (3) and (4) the dependent variable is the level of debt issuance as a share of GDP (LHS: ISS). Data on stock positions extend from 2015-2017, issuance data cover the period 2005-2017. Estimated by OLS. Robust standard errors in parentheses. ***. **. * indicates significance at 1, 5, and 10 per cent.

Table 2: Pooled Panel Regression - Sponsor Country Level - Special Purpose Vehicles

	(1)	(2)	(3)	(4)
Distance	-0.36	-0.36	-0.08	-0.08
	(0.21)*	(0.20)*	(0.04)**	(0.04)**
Double Tax Treaties	-0.02	-0.02	-0.01	-0.01
	(0.01)	(0.01)	(0.01)*	(0.01)*
Investor Protection Index	-0.73	-0.73	-0.17	-0.17
	(0.43)*	(0.41)*	(0.10)*	(0.09)*
Financial Development	-0.64	-0.68	-0.07	-0.04
	(1.19)	(1.17)	(0.16)	(0.18)
Common Law	0.60	0.61	0.11	0.11
	(0.32)*	(0.29)**	(0.06)*	(0.06)*
LHS	STK	STK	ISS	ISS
Observations	57	57	228	228
R-squared	0.18	0.25	0.06	0.12
Time FE	No	Yes	No	Yes

Note: In columns (1) and (2) the dependent (left-hand side (LHS)) variable is the outstanding stock position as a share of GDP (LHS: STK), while in columns (3) and (4) the dependent variable is the level of debt issuance as a share of GDP (LHS: ISS). Data on stock positions extend from 2015-2017, issuance data cover the period 2005-2017. Estimated by OLS. Robust standard errors in parentheses. ***. **. * indicates significance at 1, 5, and 10 per cent.

Table 3: Pooled Panel Regression - Sponsor Entity Level - Financial Vehicle Corporations

	(1)	(2)	(3)	(4)	(5)	(6)
Distance	-0.72	-0.71	-0.67	-0.20	-0.19	-0.15
	(0.19)***	(0.19)***	(0.17)***	(0.06)***	(0.06)***	(0.04)***
Double Tax Treaties	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01
	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***	(0.01)***
Investor Protection Index	-0.62	-0.62	-0.46	-0.08	-0.08	0.02
	(0.41)	(0.41)	(0.42)	(0.09)	(0.09)	(0.12)
Financial Development	-3.47	-3.64	-2.60	-0.14	-0.27	-0.01
	(1.41)**	(1.40)***	(1.58)	(0.20)	(0.17)	(0.23)
Common Law	0.10	0.12	0.10	-0.02	-0.01	-0.03
	(0.24)	(0.24)	(0.26)	(0.06)	(0.05)	(0.06)
LHS	STK	STK	STK	ISS	ISS	ISS
Observations	2,382	2,382	2,382	9,528	9,528	9,528
R-squared	0.11	0.11	0.16	0.01	0.01	0.03
Time FE	No	Yes	Yes	No	Yes	Yes
Sector FE	No	No	Yes	No	No	Yes

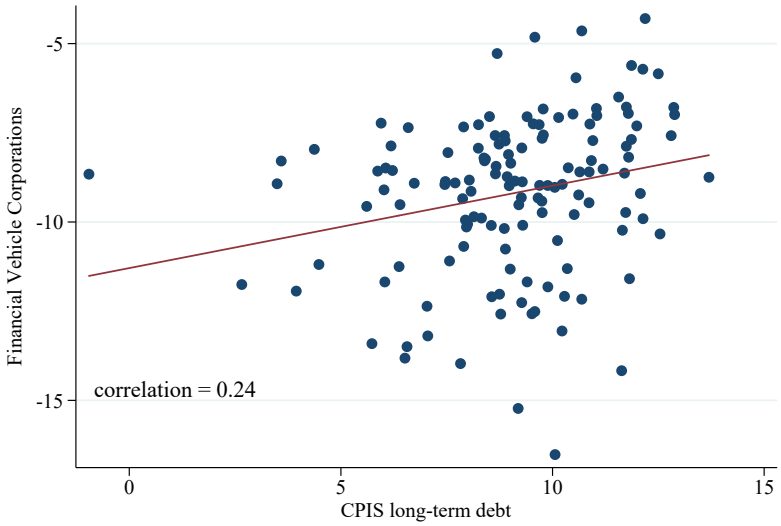
Note: In columns (1), (2) and (3) the dependent (left-hand side (LHS)) variable is the outstanding stock position as a share of GDP (LHS: STK), while in columns (4), (5) and (6) the dependent variable is the level of debt issuance as a share of GDP (LHS: ISS). Data on stock positions extend from 2015-2017, issuance data cover the period 2005-2017. Estimated by OLS. Robust standard errors in parentheses. ***. **. * indicates significance at 1, 5, and 10 per cent.

Table 4: Pooled Panel Regression - Sponsor Entity Level - Special Purpose Vehicles

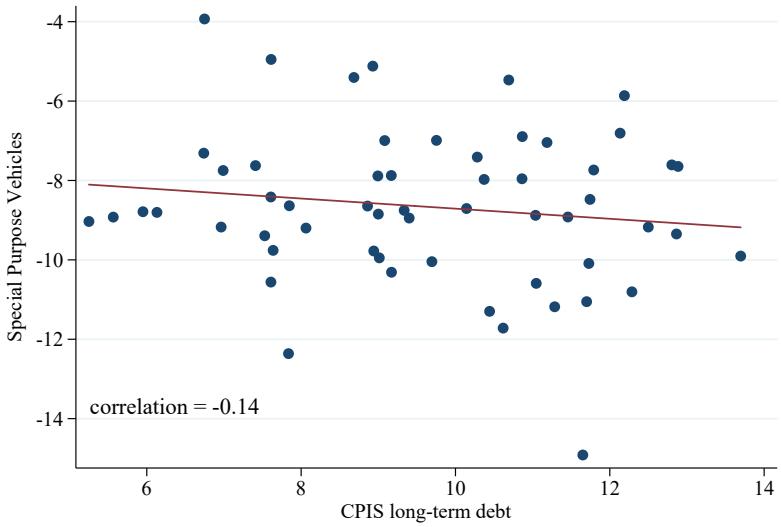
	(1)	(2)	(3)	(4)	(5)	(6)
Distance	-0.34	-0.34	-0.17	-0.10	-0.10	-0.06
	(0.27)	(0.27)	(0.19)	(0.06)*	(0.06)*	(0.04)
Double Tax Treaties	0.01	0.01	0.01	0.01	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Investor Protection Index	-1.77	-1.77	-1.70	-0.38	-0.38	-0.37
	(1.06)*	(1.06)*	(1.03)*	(0.21)*	(0.21)*	(0.20)*
Financial Development	-4.57	-4.60	-3.45	-0.76	-0.75	-0.49
	(1.77)**	(1.77)***	(1.44)**	(0.30)**	(0.30)**	(0.23)**
Common Law	1.64	1.64	1.62	0.32	0.32	0.31
	(0.87)*	(0.87)*	(0.85)*	(0.15)**	(0.15)**	(0.15)**
LHS	STK	STK	STK	ISS	ISS	ISS
Observations	864	864	864	3,456	3,456	3,456
R-squared	0.04	0.04	0.05	0.01	0.01	0.02
Time FE	No	Yes	Yes	No	Yes	Yes
Sector FE	No	No	Yes	No	No	Yes

Note: In columns (1), (2) and (3) the dependent (left-hand side (LHS)) variable is the outstanding stock position as a share of GDP (LHS: STK), while in columns (4), (5) and (6) the dependent variable is the level of debt issuance as a share of GDP (LHS: ISS). Data on stock positions extend from 2015-2017, issuance data cover the period 2005-2017. Estimated by OLS. Robust standard errors in parentheses. ***. **. * indicates significance at 1, 5, and 10 per cent.

Figure 1: Special Purpose Entities and Coordinated Portfolio Investment Survey



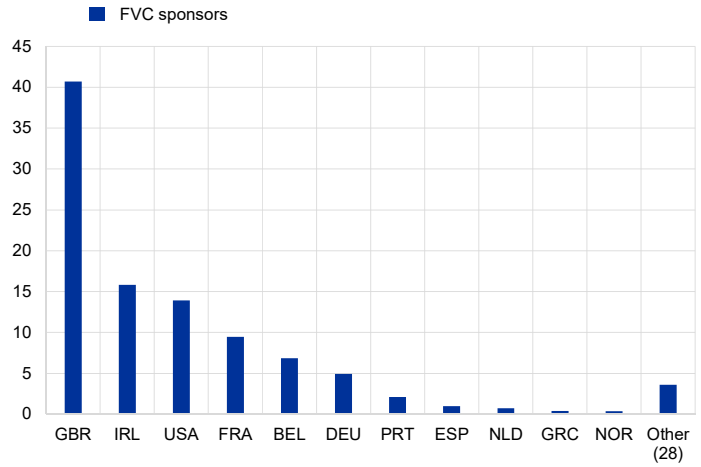
(a)



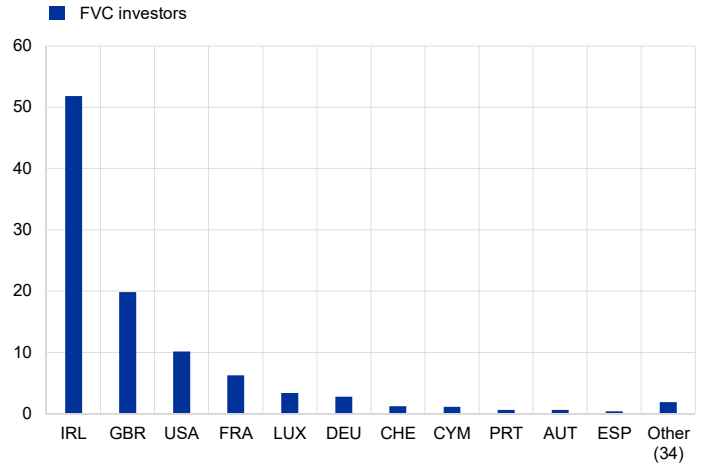
(b)

Note: Units are logs of the total value of outstanding stocks. Observations record mean country-pair values (i.e. host-source in the case of the CPIS or sponsor-investor values in the case of SPEs) for the period 2015-2017.
Source: Authors' calculations based on Central Bank of Ireland SPE statistics and IMF Coordinated Portfolio Investment Survey.

Figure 2: Financial Vehicle Corporations, Geographic Breakdown in 2017



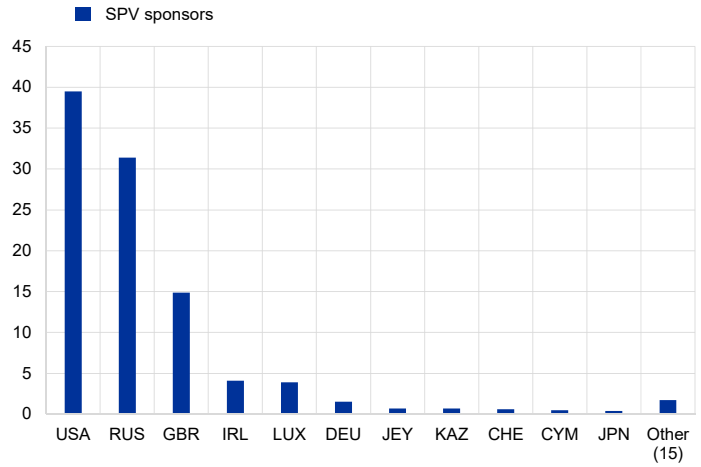
(a)



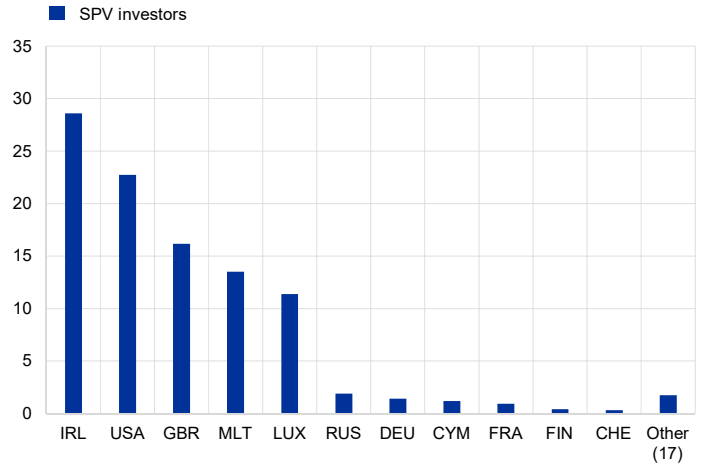
(b)

Note: Percent of total stocks outstanding of Irish-resident FVCs in 2017. Financial Vehicle Corporations (FVCs) refers to securitisation vehicles.
Source: Authors' calculations based on Central Bank of Ireland SPE statistics.

Figure 3: Special Purpose Vehicles, Geographic Breakdown in 2017



(a)



(b)

Note: Percent of total stocks outstanding of Irish-resident SPVs in 2017. Special Purpose Vehicles (SPVs) refers to non-securitisation vehicles.
Source: Authors' calculations based on Central Bank of Ireland SPE statistics.

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