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A Consolidated-by-Nationality Approach to Irish Foreign Exposure

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A consolidated-by-nationality approach to Irish foreign exposure*

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Abstract

How exposed is Ireland to foreign shocks? Relying on residence-based measures of foreign holdings to answer this question can be challenging. These statistics are obscured by the vast presence of Special Purpose Entities in the country. Alternatively, I construct an estimate of the Irish consolidated-by-nationality foreign balance sheet for the period between 2011 and 2019 based on a novel methodology that builds on firm-level data. I find that Ireland's consolidated foreign balance sheet is on average 46.7% smaller relative to its residence-based analogue. I interpret this result as an indication that Ireland is significantly less exposed to foreign shocks than what is suggested by residence-based statistics.

Keywords: International financial integration, financial globalisation, consolidated-by-nationality statistics.

JEL: F36, F21, F23.

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1 Introduction

How exposed is Ireland to foreign shocks? Relying on residence-based measures of foreign holdings to answer this question can be challenging. These statistics are obscured by the vast presence of Special Purpose Entities (SPEs) in the country. In residence-based statistics, foreign assets and liabilities are sorted according to the residence of the immediate counterparts. Consequently, the cross-border positions held by these Irish-resident financial intermediaries appear in Ireland's external balance sheet. However, these entities frequently have no economic ties to Irish agents. Lane (2019) notes that the large size of these holdings imply that the positions of Irish agents are not visible in the headline data. Such opaqueness poses an obstacle for policymakers when assessing the exposure of the Irish economy to foreign shocks.

Consider a foreign-owned SPE resident in Ireland whose sole purpose is to raise capital from international investors and transfer these resources to the company's headquarters located abroad. Suppose this Irish-resident company sells one billion Euros in bonds and lends one billion Euros to its parent company. Under the residence-based approach, the bonds issued by this entity and purchased by international investors will be recorded as Irish foreign liabilities. Similarly, the loans sent to its home country will be booked as Irish foreign assets. As a result, the presence of this SPE in Ireland will increase the sum of Irish external assets and liabilities by two billion Euros. However, the activities conducted by this company have virtually no relation to Irish agents. In line with this example, Galstyan et al. (2021) provide evidence of cross-country financing happening through Irish-resident SPEs.

Alternatively, one could rely on consolidated-by-nationality statistics to provide a more accurate description of Irish foreign exposure. Its key principle is to sort foreign assets and liabilities according to the nationality of the ultimate counterparts. In this example, such approach would imply leaving the holdings of the SPE out of Ireland's consolidated foreign balance sheet as these holdings do not have Irish agents as their ultimate counterparts. By not incorporating such holdings, the consolidated-by-nationality balance sheet would provide a more accurate description of the foreign exposure related to Irish agents.[1]

In this paper, I construct the Irish consolidated-by-nationality foreign balance sheet for the period between 2011 and 2019. The balance sheet is constructed using a novel methodology that builds on firm-level data. This methodology relies on both publicly available data as well as data from Bureau van Dijk's Orbis Europe and FAME. I adopt a similar categorization as that used in BIS (2015) when constructing the consolidated-by-nationality foreign balance sheet.

[1] Bénétrix and Sanchez Pacheco (2021) describe different applications of consolidated-by-nationality statistics in international macroeconomics and finance.

The key stylized fact that emerges from this analysis is that Ireland's consolidated-by-nationality foreign balance sheet is smaller when compared to its residence-based analogue. When measured by the index of international financial integration as in Lane and Milesi-Ferretti (2003), I find that Ireland's consolidated-by-nationality foreign balance sheet is on average 46.7% smaller relative to the residence-based one over the sample period. Devereux and Yu (2020) show that international financial integration increases the degree of cross-country contagion. Therefore, I interpret this finding as indicating that Ireland is less exposed to foreign shocks than what is captured by residence-based statistics.

Affiliates of foreign non-bank multinational enterprises (MNEs) represent the main source of Irish international financial integration. In 2019, their activities are associated with EUR 923.2 billion in Irish foreign assets and EUR 2,172.1 billion in foreign liabilities. Of that amount, U.S. MNEs are the most relevant ones as their activities account for over half of the Irish foreign liabilities related to foreign non-banks. This result suggests that Ireland is particularly exposed to shocks in the U.S. that affect the decision-making of these MNEs. U.S. firms are followed by German and U.K. firms in terms of the size of Irish foreign holdings associated with their activities.

The contribution of this paper is twofold. First, this paper proposes a novel methodology to estimate consolidated-by-nationality foreign holdings of countries using firm-level data. This approach is motivated by the seminal work of Kalemli-Ozcan et al. (2015). In particular, I use company-level financial and ownership data to compute consolidated holdings related to Irish MNEs operating abroad as well as to foreign MNEs operating in Ireland. The second contribution of this paper is that it is the first to produce estimates of consolidated foreign assets and liabilities for Ireland.[2]

The remainder of the paper is organized as follows. Section 2 provides further context on why consolidated-by-nationality statistics are useful in assessing foreign exposure. Section 3 presents the methodology used to estimate each category of the Irish consolidated balance sheet as well as the different data sources used. Section 4 presents the main stylized facts that emerge from the consolidated balance sheet. Section 5 concludes.

2 Foreign exposure and consolidated statistics

Affiliates of foreign MNEs operating in Ireland can react to shocks happening there as well as in their home country. However, the Irish exposure to these multinationals might not be entirely captured in residence-based statistics.

[2]This paper is part of the *Consolidated Foreign Wealth of Nations* project that seeks to construct consolidated-by-nationality estimates of foreign holdings for a large sample of countries. These estimates should complement the existing residence-based data-set from the seminal *External Wealth of Nations* work by Lane and Milesi-Ferretti.

Consider the risk that a U.S. MNE decides to shut down its operations in Ireland in case it gets hit by a negative shock at home. This group-level decision to a shock happening in the home country would produce a spillover effect in the host country. One measure to quantify the exposure the Irish economy has relative to this risk would be to look at the assets held by this MNE in the country.

However, the assets held by this MNE in Ireland will only enter the residence-based balance sheet of both countries if they were financed by U.S. residents. The portion of assets funded locally won't appear in neither Ireland's nor in the U.S. balance sheet. Despite that, the U.S. parent may still decide to dispose these assets not captured in traditional Balance of Payments statistics.

In consolidated statistics, all positions held by this MNE would be taken into account. The assets this U.S. MNE holds in Ireland would be booked as U.S. consolidated foreign assets and Irish liabilities. Similarly, the funding provided by Irish agents to this corporation would be booked as Irish consolidated foreign assets and U.S. liabilities. Therefore, the consolidated approach would provide a more comprehensive view on the exposure the Irish economy has relative to U.S. MNEs.

As in this example, the recent literature has pointed to the role MNEs play in transmitting shocks from their home country into host countries. Avdjiev et al. (2018) show that cross-border lending by global banks is influenced by monetary policy decisions taken in their home country. Similarly, Avdjiev et al. (2020) show that cross-border lending in foreign affiliates is more influenced by decision taken in the home country than those taken in the host country.

McCauley et al. (2019) pointed to the importance nationality plays in determining global decision-making in banking. Their study showed that the global retrenchment in cross-border lending seen in cross-border data following the Great Financial Crisis was not a worldwide phenomenon. Rather, their nationality-based analysis showed that this decline in cross-border lending was driven by European banks that shredded assets to restore capital ratios.

Regarding non-banks, Bénétrix and Sanchez Pacheco (2021) provide evidence that tax-related factors are associated with U.S. MNEs expanding their global footprint beyond what is captured by residence-based statistics. In general, Di Nino et al. (2020) point to the challenges involved in tracking the activities of MNEs in cross-border statistics.

Finally, Lane (2021) notes that the consolidated framework could be particularly useful in identifying ultimate financial exposures. He argues that consolidated-by-nationality approach should complement the existing residence-based statistics. This paper is the first to estimate Ireland's consolidated-by-nationality foreign holdings.

3 Methodology

The Irish consolidated foreign balance sheet is constructed using both publicly available data as well as firm-level data from Bureau van Dijk's Orbis Europe and FAME datasets. Given data availability limitations, this paper provides estimates of the consolidated balance sheet for the period between 2011 and 2019. When sorting foreign assets and liabilities, this paper follows a categorization similar to BIS (2015) and Bénétrix and Sanchez Pacheco (2021).

Foreign assets and liabilities related to the activities of multinational enterprises are divided into three categories depending on the main activity such enterprises conduct. Assets and liabilities related to the banking sector are calculated using the Bank for International Settlements data. Those related to financial non-banks and non-financial MNEs are calculated using FAME and Orbis Europe as well as U.S. Bureau of Economic Analysis data.

3.1 Non-financial foreign multinational enterprises

Estimates of Irish consolidated foreign assets and liabilities that are related to activities of non-financial foreign multinational enterprises (MNEs) are constructed using a procedure similar to that used by BIS (2015) and Bénétrix and Sanchez Pacheco (2021) for the United States. However, unlike in the U.S., there is currently no existing public estimate of asset holdings by foreign MNEs operating in Ireland nor of Irish MNEs operating in foreign countries.

In order to overcome such challenge, this paper uses company-level data to construct estimates of Irish consolidated foreign assets and liabilities. The data used comes from the FAME database which contains financial and ownership information from 687 thousand companies operating in Ireland, among which 256 thousand that are currently active. As a first step, companies that have never reported total assets are removed from the sample regardless of their status. This procedure shrinks the sample down to 301.5 thousand companies.

Given the current focus on foreign MNEs operating in Ireland, all companies whose ultimate owner is identified by FAME as an Irish national or whose ultimate owner cannot be determined are excluded from the sample.[3] Such step produces a total of twelve thousand companies operating in Ireland whose ultimate owner can be identified as non-Irish. Of this total, Figure A.1 shows that 45.7% of the firms have reported total asset

[3]The identification of the ultimate owners follows the standard classification adopted by Bureau van Dijk. More specifically, an entity is identified as the ultimate owner of any given subsidiary it it owns at least 50.01% of that subsidiary.

holdings below EUR 5mn in its last available period. However, Figure A.2 reveals that these companies hold only 0.15% of the overall sum of total assets of all foreign companies operating in Ireland.

As the focus of this paper is to estimate consolidated foreign holdings, foreign companies that have last reported total asset holdings below EUR 5 million are also excluded from the sample. This procedure produces a sample of 6,899 foreign enterprises whose ultimate owner are identified as non-Irish.

3.1.1 Identifying financial companies

The sample of foreign MNEs that last reported total assets greater than EUR 5 million contains both financial and non-financial companies. Given the current focus on determining Irish foreign assets and liabilities related to foreign non-financial MNEs, the sample must be split according to the primary activity conducted by each company. Industry activity classification information according to the UK Standard Industrial Classification (SIC) 2007 is available for 6,598 foreign companies operating in Ireland out of the 6,899 in the sample. These industry codes are equivalent to the European NACE codes.

Companies whose primary activity code is in section K ('Finance and Insurance') are removed from the sample of non-financial foreign MNEs. Similarly, companies whose code is in group 77 ('Rental and Leasing') are also excluded from the sample in question. Such decision is motivated by the substantial presence of aircraft leasing companies in Ireland as documented by Osbourne-Kinch et al (2017). A few other finance-related codes not covered by these two categories are also used to identify firms as financial companies. Table 3 contains all the five digit SIC codes used to identify financial firms. Out of the 6,899 companies in the sample, this procedure identifies 3,164 companies as non-financial and 3,735 as financial companies.

These non-financial companies jointly hold EUR 1.94 trillion in total assets and employ 355.9 thousand people according to the last available data. Figure A.3 shows the number of foreign companies by the country of the group ultimate owner. The U.S. and the U.K. represent the two countries with the largest number of companies operating in the Republic of Ireland. Within the European Union, Germany and France are the countries with the largest number of affiliates in Ireland.

Figure A.4 displays the sum of total asset holdings of these non-financial foreign MNEs according to the country of their ultimate owner. Around 65% of these holdings can be attributed to U.S.-owned companies while 6% can be apportioned to U.K.-owned companies. Figure A.5 shows the number of employees of these non-financial foreign MNEs according to the country of their ultimate owner when available.

3.1.2 Addressing reporting gaps

Many companies in the sample present gaps in their financial data. For an example, Dell Products is an U.S.-owned non-financial company operating in Ireland whose status in FAME is listed as active. Data on the total assets of this company is available for 2003-2009 and for 2011-2020 but not for 2010. In order to avoid jumps in the sample, the total asset holdings of Dell Products for the year of 2010 is assumed to be the same as in 2009.

Whenever there is missing data on an active company's total assets and/or shareholders' equity, data from the last available period prior to that one is inputted instead. That is, if a company is listed as active but has no available data for period T, data from period $T - z$ such that $z > 0$ is the smallest possible is inputted.

In case a company is not listed as active, the next step after identifying a reporting gap for a certain period T depends on whether there is financial data available for at least one period $T + k$, $k > 0$, that succeeded T. If that is the case, the data from the last available period prior to that one T is inputted.

If there is no financial data available for future periods $T + k$ for a company not listed as active, this is an indicative that the company became inactive at period T. Therefore, total assets and shareholders' equity are set to zero from that period T onward.

Besides data on total assets and shareholders' equity, data on same-group inter-company loans is used to estimate Irish foreign assets and liabilities. Inter-company loan data can be substantially more volatile than shareholders' equity and total assets and include frequent sign changes (e.g. from net creditor to net debtor) from one period to the other. Unlike equity and total assets, it is also entirely possible that companies do not report inter-company loans for a given year because there were no such claims in that period. Given these differences, inter-company loans are only included as reported.

Consolidated liabilities are estimated as the sum of the total assets of non-financial foreign MNEs operating in Ireland minus any same-group inter-company loans (assets) held by these companies. The latter represents an asset the Irish affiliate of a foreign MNE owns with respect to another company owned by the same group. As the ultimate owner of such multinational enterprise is the same, these same-group transactions are excluded when looking at consolidated-by-nationality international statistics.[4]

The result is an estimate of assets owned by foreign companies operating in Ireland with respect to Irish nationals, which is accordingly booked as Irish consolidated foreign liabilities. As it is possible that part of these assets refers to holdings owned by these Irish affiliates with respect to non-Irish nationals, the estimates presented in this paper represent an upper bound.

[4]Loans between two entities within the same group would not enter the consolidated foreign balance sheet of any country as their ultimate owner (and nationality) are the same for both.

Consolidated assets are estimated as the sum of the total liabilities of non-financial foreign MNEs operating in Ireland minus their shareholders' equity and any same-group inter-company loans (liabilities) received by these companies. The equity and inter-company loans represent liabilities the affiliates have with respect to their ultimate owner and/or to companies in the same group. Therefore, these same-group transactions are also excluded when consolidated-by-nationality international statistics.

This procedure generates an estimate of liabilities held by foreign companies operating in Ireland with respect to Irish nationals, which is booked as Irish consolidated foreign assets. It is possible that part of the remaining liabilities held by these Irish affiliates is in fact associated with non-Irish counterparts. As a result, the estimate presented in this paper also represent an upper bound.

Figure A.6 in the Appendix show the evolution of Irish foreign assets and liabilities related to non-financial MNEs. The increasing difference between foreign liabilities and assets is a result of foreign MNEs increasing their asset holdings in Ireland through equity and/or intra-group loans.

3.2 Non-financial Irish MNEs operating abroad

Data from Bureau van Dijk's Orbis Europe and the U.S. Bureau of Economic Analysis are used to estimate Irish consolidated foreign assets and liabilities related to non-financial Irish MNEs operating abroad. Taken together, these two sources contains data related to European countries and the United States shown in Table 3.

While relying solely on these sources excludes the activities of Irish MNEs in other countries, data from the IMF Coordinated Direct Investment Survey indicate that almost all activities from Irish companies happen in the covered countries. In particular, the sum of Irish outbound direct investment positions relative the countries listed in Table 3 represent on average 96% of all Irish direct investment positions whose recipients are (1) identified and (2) non-haven countries, for the period between 2009 and 2019.[5] Figure A.7 reveals that this ratio remained above 90% throughout the entire sample. Such elevated ratio indicates that just a tiny part is potentially missed when focusing on European countries and the U.S. to construct estimates of Irish foreign assets and liabilities related to non-financial Irish MNEs.

The following subsections describe the methodology used to estimate Irish consolidated foreign assets and liabilities related to non-financial Irish MNEs. The procedure adopted

[5]Haven countries include Bermuda, Cayman Islands and Jersey. These countries are excluded as the Irish direct investment position in these countries does not appropriately measure the activities of Irish MNEs in them. As such, the ratio used is given by the sum of Irish outbound FDI position relative to countries in Table 3 divided by the total Irish outbound FDI position excluding the positions whose recipients are not identified and positions relative to the three haven countries.

relative to U.S. affiliates of Irish MNEs is akin to that used in BIS (2015). In contrast, the methodology for companies located in European countries is similar to that used for non-financial foreign MNEs operating in Ireland.

3.2.1 Companies operating in the United States

The U.S. Bureau of Economic Analysis (BEA) provides detailed data on activities of U.S. affiliates of foreign MNEs. I use data from the BEA to estimate Irish consolidated foreign assets and liabilities related to non-financial Irish MNEs operating in the U.S. The procedure is similar to that used in BIS (2015) and Bénétrix and Sanchez Pacheco (2021).

For the period between 2007 and 2019, the BEA reports total asset holdings of all majority-owned U.S. affiliates of foreign MNEs at a country- and industry-level data. I proceed by subtracting the total asset holdings of financial majority-owned U.S. affiliates of Irish MNEs from the total asset holdings of all majority-owned U.S. affiliates of Irish MNEs. The resulting series is then divided by 98.5% which is the average ratio of the total asset holdings of all majority-owned U.S. affiliates of Irish MNEs and all U.S. affiliates of Irish MNEs during this period.

This procedure generates estimates of the total asset holdings of non-financial Irish MNEs operating in the United States. Such estimates are accordingly booked as Irish consolidated foreign assets related to non-financial Irish MNEs operating abroad. Irish consolidated foreign liabilities are estimated as the difference between the estimated total asset holdings of non-financial Irish MNEs operating in the U.S. and the FDI made by Ireland in the U.S. As both series are estimated in USD terms, these values are then converted to Euro using end-of-period exchange rate data from the International Monetary Fund.

For the period between 2003 and 2006, there is less detailed data available. As such, Irish consolidated foreign assets are computed as the total assets of majority-owned non-bank Irish MNEs operating in the U.S. once again divided by 98.5%.[6] Irish consolidated foreign liabilities are computed as the difference between the estimated total asset holding minues the FDI made by Ireland in the U.S. Figure A.8 shows the evolution of Irish foreign assets and liabilities related to its non-financial MNEs operating in the United States.

3.2.2 Companies operating in Europe

Irish consolidated foreign assets and liabilities related to non-financial Irish MNEs operating in Europe are estimated using Bureau van Dijk's Orbis Europe. The first step involves selecting all companies located outside of Ireland whose ultimate owners are identified in

[6]This data availability limitation implies that financial non-bank Irish MNEs operating in the U.S. albeit small are also included for this period.

Orbis Europe as Irish.[7] As in the case of foreign MNEs in Ireland, companies that have reported total assets below EUR 5 million are removed from the sample. This procedure generates a sample of 3,239 companies operating outside of Ireland whose ultimate owners are at first identified as Irish. Furthermore, Orbis Europe provides the NAICS 2007 industry code for 96.7% of the companies. Given the current focus on non-financial companies, companies whose NAICS 2007 code is 52 (Finance and Insurance) are removed from the sample which reduces it to 3,110 companies.

3.2.3 Addressing redomiciliation

Several large corporations have decided to change their legal domicile to Ireland in the past decades as noted by Avdjiev et al (2018). Once a multinational enterprise redomiciles to Ireland, all the group's affiliates will be identified as having an Irish ultimate owner in Orbis Europe. However, this change in the domicile does not affect the nationality-based ultimate ownership of assets and liabilities. Therefore, one must account for the fact that these Irish-domiciled corporations are not owned by Irish nationals and remove them from this sample accordingly.[8]

There are 772 unique ultimate owners of the companies in the sample under consideration. These ultimate owners are classified on whether there is available evidence of redomiciliation through web searches in several repositories. Among such searches, I use data from a list of corporate tax inversions since 2006 by Mider (2007). Whenever available, I also searched for evidence of change in the fiscal domicile by accessing the corporate website of these ultimate owners.

These searches identified 54 out of these 772 ultimate owners as either foreign multinational enterprises that re-domiciled to Ireland and/or companies that are not Irish-owned. All the global affiliates of these 54 multinational enterprises are removed from the sample under consideration as their ultimate owners cannot be best described as Irish nationals.

For an example, Medtronic is a Minnesota-based medical device multinational enterprise that owns 62 affiliates in countries covered by Orbis Europe. Information from both Mider (2007) as well as the company's website provide enough evidence that Medtronic has changed its domicile to Ireland in 2015. As such, all these affiliates are listed as having an Irish ultimate owner. Once it is determined that their ultimate owner cannot be best described as an Irish national, these companies are excluded from the sample that is used to compute Irish foreign assets and liabilities related to Irish non-financial multinational

[7] Orbis Europe provides data on companies operating in countries listed in Table 3 excluding the United States.

[8] In an ideal setting, one would apportion foreign assets and liabilities of multinational enterprises according to the nationality of their shareholders. Unfortunately, no such detailed data-set is available at this time.

enterprises operating abroad.

These 54 identified foreign multinational enterprises collectively own 722 affiliates located in countries covered by Orbis Europe. They have a reported cumulative EUR 734.1 billion in total assets as of 2019. Given the relevant size of these holdings, failing to identify redomiciled companies as such could produce overstated estimates of Irish foreign assets. Once these foreign-owned companies are excluded from the sample, financial data from the remaining Irish-owned non-financial companies are used to computed Irish foreign assets. Orbis Europe provides data on total asset holdings and shareholders' funds for these companies for the period between 2011 and 2019.[9] Reporting gaps are addressed using the same procedure for non-financial foreign MNEs operating in Ireland as described in subsection 3.1.2.

Irish consolidated foreign assets related to non-financial Irish MNEs operating abroad are estimated as the sum of the total asset holdings of these companies. Similarly, Irish consolidated foreign liabilities related to these companies are computed as the difference between the sum of total asset holdings and the sum of total shareholders' funds. Figure A.9 show the evolution of Irish foreign holdings related to non-financial MNEs in Europe.

3.3 Irish and foreign banks

I use data from the Bank for International Settlements (BIS) to estimate Irish consolidated foreign assets and liabilities related to activities from both Irish and foreign banks. The methodology used in this paper is similar to that used in BIS (2015) and Bénétrix and Sanchez Pacheco (2021). All original data series are expressed in U.S. dollar terms. These values are converted to Euro using end-of-period exchange rate data from the International Monetary Fund.

The claims held by Irish banks on all counterparts except Irish counterparts are booked as Irish consolidated foreign assets. This data series is available on the BIS consolidated banking statistics database on a quarterly frequency. The local liabilities of foreign banks operating in the Ireland relative to Irish counterparts are also booked as Irish foreign assets. These data series also come from the BIS database and are reported on a quarterly basis. Figure A.10 shows the evolution of Irish consolidated foreign assets related to banks. It points to a sharp reduction in foreign assets led by Irish banks reducing their foreign holdings after the Global Financial Crisis.

The liabilities related to the operations of Irish banks is estimated as the local liabilities of Irish banks abroad plus Irish banks cross-border liabilities excluding those to related

[9] Unlike in the FAME database, Orbis Europe does not provide data on same group inter-company loans.

offices.[10] Meanwhile, the total claims of foreign banks on Irish counterparts are booked as Irish foreign liabilities. Figure A.11 shows the evolution of Irish consolidated foreign liabilities related to banks. It shows that Irish banks also reduced their foreign liabilities over this period. Figure A.12 show the significant decline in Irish foreign exposure related to banks in the aftermath of the Global Financial Crisis.

3.4 Financial non-bank foreign MNEs

Irish consolidated foreign assets and liabilities related to financial non-bank foreign MNEs are estimated using data from FAME. We proceed with the sample of 3,735 financial companies located in Ireland whose ultimate owner are identified as non-Irish and have reported last reported total assets of at least EUR 5 million. This sample contains all the companies that were excluded in subsection 3.1 when computing foreign assets and liabilities related to non-financial foreign MNEs operating in Ireland.

This sample includes banks and special purpose entities that have very little or no presence at all in Ireland. Galstyan et al (2021) identify cross-country debt financing links that happen through part of these companies. These activities increase the size of Ireland's residence-based foreign balance sheet but have no little to no relation to Irish nationals or firms. Therefore, these companies must be identified and removed from the sample when estimating the consolidated-by-nationality foreign assets and liabilities related to financial non-banks.

In the case of banks, I remove from this sample companies whose SIC codes are banks as the assets and liabilities related to these companies were already estimated in subsection 3.3. This procedure reduces the sample of foreign financial non-banks down to 3,728.[11]

Identifying and removing SPEs is a particularly challenging task that involves adopting a set of assumptions. In such sample, there are companies that have a physical presence in Ireland and do business locally. However, there are also companies whose sole purpose often is to provide financial intermediation between two non-Irish nationals. While the activities of the latter group are included in residence-based international accounts, these activities should generate little to no implication in nationality-based accounts. As such, a procedure to identify and eliminate these pass-through companies is needed.

Albeit imperfect, the criterion used is that a company must have last reported at least one employee for it to remain in the sample. As a result, all foreign financial non-

[10] There is a reporting gap related to local liabilities of Irish banks abroad between 4Q2005 and 4Q2013. During this period, these local liabilities shrank by a percentage close to that observed in cross-border liabilities. As such, I use the quarterly change rates from cross-border liabilities to estimate time path of local liabilities over this period.

[11] That is, I exclude from this sample companies whose SIC code are subgroups 64110 ('Central banks') and 64191 ('Banks').

banks that have never reported the number of employees or that have last reported zero employees in Ireland are removed from the sample. This step reduces the number of companies down to 602.[12]

One example of a special purpose entity captured by this criterion and excluded from the sample is Rusal Capital DAC. Its ultimate owner is the EN+ Group from Russia that controls Rusal. Rusal Capital's main activity is best described as 'other credit granting activity' which is characterized as a financial activity. It has never reported the number of employees in Ireland. Rusal Capital owned USD 1.6 billion in total assets in 2019. This entire amount was consisted of loans to Russian companies Rusal and JSC Russian Aluminium. However, Rusal Capital DAC had a bit more than one thousand dollars in shareholders' equity. The loans given to the two Russian aluminium companies were funded by bond issuance by Rusal Capital totaling USD 1.6 billion.

In essence, Rusal Capital DAC is an Irish-resident financial corporation whose purpose is to intermediate financing from foreign investors to the two aluminium companies in Russia. While Rusal Capital has little-to-none economic ties to Irish nationals, its presence in Ireland increases the country's residence-based foreign balance sheet by approximately USD 3.2 billion.

Using this sample, Irish consolidated foreign liabilities are computed as the sum of the total asset holdings of the foreign financial non-banks minus any same-group inter-company loans (assets) held by these companies. Irish consolidated foreign assets are computed as the sum of the total liabilities of non-financial foreign MNEs operating in Ireland minus their shareholders' equity and any same-group inter-company loans (liabilities) received by these companies. Figure A.13 shows the evolution of Irish foreign assets and liabilities related to foreign financial non-banks in the country.

3.5 Irish financial non-banks

As before, I use data from Orbis Europe and the U.S. BEA to estimate the Irish consolidated foreign assets and liabilities related to the activities of Irish financial non-banks abroad.

3.5.1 Companies operating in the United States

Irish consolidated foreign assets and liabilities related to Irish financial non-banks operating in the U.S. are estimated using data from the U.S. Bureau of Economic Analysis.

[12] While the majority of companies are excluded when applying such criterion, the lack of detailed enough data constraints the choices that can be made to identify and remove pass-through companies from the sample. If such criterion was not applied, Irish consolidated foreign assets and liabilities related to foreign financial non-banks would be equal to EUR 1238.4 billion and EUR 703.3 billion, respectively in 2018. This compares to EUR 244.2 billion and EUR 428.6 billion when applying the criterion.

The estimation procedure is similar to that employed in subsection 3.2.1.

The BEA does not provide a detailed breakdown on the total asset holdings of Irish financial non-banks operating in the U.S. However, it does provide such data for majority-owned financial non-bank companies whose ultimate beneficiary owner is European excluding France, Germany, the Netherlands, Switzerland and the United Kingdom. For this 'Other Europe' group, I compute the share of total asset holdings of non-bank institutions relative to the total assets recorded under 'Finance and Insurance'. Such ratio can be calculated for the period between 2012 and 2019. For the period between 2007 and 2011, I input the value from the first observation (2012).

I then assume that the ratio of total assets holdings of majority-owned Irish financial non-banks relative to all majority-owned Irish financial companies operating in the U.S. is the same as that of the 'Other Europe' group. Using such ratio, I produce produce an estimate of the total asset holdings of majority-owned Irish financial non-banks operating in the U.S.

The second key assumption I make is that the total asset holdings of Irish majority-owned financial non-banks represent 98.5% of the total asset holdings of all Irish financial non-bank companies operating in the U.S., which is the same ratio observed for all Irish companies irrespective of their activities. Put together, these two assumptions applied to the available data generates estimates of total asset holdings of Irish financial non-banks operating in the U.S. for the period between 2007 and 2019.

A final step is needed to compute the Irish consolidated foreign liabilities related to the operation of these financial non-banks operating in the U.S. As before, these liabilities are estimated as the difference between the total asset holdings minus the FDI made by Ireland in this sector of the U.S. economy. Unfortunately, there are several data gaps in the series of Irish FDI stock in the U.S. finance and insurance ex-banking sector. Whenever there is a gap between two actual observations, the missing values are estimated by interpolation. The missing values that preceded the first actual observation (2009) and succeeded the last observation (2016) are assumed to be equal to the nearest actual observation. This procedure generates a series of Irish FDI in the U.S. finance and insurance ex-banking sector for the period between 2007 and 2019.

Irish consolidated foreign assets are equal to the estimated total asset holdings of Irish financial non-banks operating in the U.S. Meanwhile, Irish consolidated foreign liabilities are calculated as the difference between the estimated total asset holdings of these companies and the estimated series of Irish FDI in the finance and insurance ex-banking sector. Figure A.14 show the evolution of Irish foreign holdings related to Irish financial non-banks in the U.S. These estimates are very small compared to other items of the consolidated balance sheet.

3.5.2 Companies operating in Europe

In the case of Europe, the same sample of of 3,261 companies taken from Orbis Europe described in subsection 3.2.2 is used. Financial non-banks are identified as those whose NAICS 2007 code belongs in the 52 group (Finance and Insurance) but are not monetary authorities (5211) nor depository institutions (5221). Data on total asset holdings and shareholders' funds are available from 2011 to 2019. Reporting gaps are addressed using the same procedure described in subsection 3.1.2.

Irish consolidated foreign assets related to financial non-bank Irish MNEs operating abroad are estimated as the sum of the total asset holdings of these companies. Similarly, Irish consolidated foreign liabilities related to these companies are computed as the difference between the sum of total asset holdings and the sum of total shareholders' funds. Figure A.15 show the evolution of Irish foreign holdings related to Irish financial non-banks in the Europe. As in the case of companies operating U.S., these estimates are also tiny compared to other items of the Irish consolidated balance sheet.

3.6 Portfolio Investments

Consolidated foreign assets and liabilities related to portfolio investments would ideally be calculated by sorting these investments according to the nationality of the ultimate owner of each debt and equity securities worldwide. Coppola et al (2021) construct estimates of portfolio investment holdings according to the nationality of their ultimate owners. However, the fact that Ireland is one important financial hub for the European Monetary Union makes it particularly challenging to identify which assets and liabilities are ultimately held by Irish nationals.

In the absence of such nationality-based data, I use data from the Central Statistics Office (CSO) to estimate Irish consolidated foreign assets and liabilities related to portfolio investments. The CSO provides a breakdown of Ireland's residence-based international investment position according to whether they are related to activities conducted by financial intermediaries or not. The key assumption I make is that the external assets and liabilities held by these financial intermediaries are not associated with Irish nationals. As such, Irish foreign assets and liabilities are estimated as Ireland's external assets and liabilities that unrelated to financial intermediaries, respectively.

3.7 Official assets and liabilities

Irish consolidated foreign assets related to the official sector is equal to Ireland's official external assets. Data on official assets comes from the Irish Central Statistical Office (CSO) on a monthly frequency.

4 Stylized Facts

Table 1 shows Ireland's consolidated foreign balance sheet for the year of 2019. It reveals that Irish foreign assets are estimated at EUR 2.16 trillion while its foreign liabilities totaled EUR 3.44 trillion. In terms of their contribution to Irish international financial integration, non-financial foreign multinationals represent the most relevant category as the sum of foreign assets and liabilities related to them is EUR 2.21 trillion. This group is followed by non-financial Irish multinationals operating abroad with EUR 1.3 trillion and financial non-bank foreign multinationals in Ireland with EUR 0.9 trillion.

The micro-level data allows one to estimate the Irish consolidated-by-nationality foreign assets and liabilities related to non-bank foreign multinational enterprises according to the country of their ultimate owners. Figure 1 shows Irish foreign holdings related to these entities in 2019. U.S. non-bank MNEs represent the largest source of Irish foreign assets and liabilities. Collectively, activities conducted by these U.S. companies increased the sum of Ireland's foreign assets and liabilities by EUR 1,413.2 billion in that year. German and U.K. firms come in distant second and third places with a sum of foreign assets and liabilities associated to them of EUR 297.1 billion and EUR 275.1 billion respectively.

One important stylized fact that emerges from the data is that Ireland's consolidated-by-nationality foreign balance sheet is substantially smaller than its cross-border analogue. Figure 2 shows the sum of foreign assets and liabilities using both the consolidated and well as the cross-border methodologies. Data on cross-border foreign assets and liabilities comes from Lane and Milesi-Ferretti (2021). This figure shows that the consolidated balance sheet is substantially smaller throughout the entire sample period. In 2019, the sum of Irish foreign assets and liabilities stood at EUR 10.5 trillion from a cross-border perspective which compares to EUR 5.61 trillion from a consolidated-by-nationality perspective. Between 2011 and 2019, the consolidated-by-nationality balance sheet is estimated to be on average 46.7% smaller than the cross-border one.

Devereux and Yu (2020) show that greater financial integration increases contagion across countries. Therefore, this empirical finding implies that Ireland's gross exposure to foreign shocks might be less significant than when analysed through the conventional cross-border approach. Such finding is also in line with Galstyan (2019) that shows that Ireland's external balance sheet becomes smaller once foreign holdings related to special purpose entities are removed from the calculation.

Figure 3 shows the evolution of Ireland's consolidated foreign assets and liabilities respectively. Both assets and liabilities expanded during the sample period both in absolute terms as well as a percentage of GDP. However, foreign assets and liabilities relative to GDP have peaked in 2016. Figure 4 reveals that Irish non-financial multinational enterprises are responsible for most of the expansion in Ireland's consolidated foreign assets over the sample period.

Similarly, figure 5 reveals that the increase in Ireland's foreign liabilities over the past ten years were mostly related to foreign non-financial multinational enterprises. This expansion can be attributed to an increase in asset holdings in Ireland by these conglomerates that were mostly funded with equity and/or intra-group loans. Besides this expansion, Ireland's foreign liabilities also increased due to a build-up in portfolio liabilities.

The sum of Irish consolidated foreign assets and liabilities grew by 128.6% between 2011 and 2019. Of that total, 55.6% can be attributed to the expansion of the footprint of foreign non-financial multinationals in Ireland.[13] In terms of relevance, that is followed by non-financial Irish multinationals which generated a 35.6% growth contribution to the expansion of Ireland's consolidated foreign balance sheet. Foreign holdings related to the activities of foreign financial non-banks and portfolio investment have produced a contribution of around 20% each to overall balance sheet growth.

Interestingly, the banking sector generated a negative contribution of -5.2% to the expansion of Irish foreign exposure between 2011 and 2019. During the sample period, Irish banks have reduced their exposure to foreign agents. Similarly, foreign banks have also reduced their exposure to Irish agents during the same period. Figure A.12 reveals that the Irish foreign exposure attributed to banking activities peaked in 2007. Banks significantly reduced their foreign exposure in the aftermath of the Global Financial Crisis. Irish consolidated-by-nationality foreign assets related to banking companies decreased from EUR 561.6 billion in 2007 to EUR 138.3 billion in 2019. Such reduction is in line with the deleveraging of European banks that followed the financial crisis as noted by McCauley et al (2019).

While Ireland's gross exposure is smaller from a cross-border perspective, its net foreign liabilities are larger from a consolidated perspective. In 2019, Ireland's net foreign liabilities stood at EUR 1.28 trillion when analysed through the consolidated approach. This compares to a EUR 486.3 billion figure when computed using the cross-border approach. Figure 6 shows the evolution of Ireland's net foreign assets using both methodologies. It reveals that the difference between the two measures of net foreign liabilities has increased over recent years. More specifically, this figure shows that Irish consolidated net foreign liabilities have grown from EUR 315.6 billion in 2011 to EUR 1.28 trillion in 2019.

[13] The sum of Irish foreign assets and liabilities related to these companies grew by 161.9% over the sample period. As the foreign asset and liability holdings related to the companies represented 34.3% of the total in 2011, the contribution to the overall expansion in Ireland's foreign balance sheet is given by the product of the two. Therefore, the sum of the contributions across groups should be equal to the growth seen in the sum of Irish foreign assets and liabilities.

The detailed categorization used in the construction of the consolidated-by-nationality foreign balance sheet can be used to determine the drivers of this aggregate trend. Figure 7 shows the evolution of Irish net foreign assets related to each balance sheet category. This figure indicates that most of the increase in Irish net foreign liabilities is related to activities of non-financial foreign multinationals operating in Ireland. The Irish net foreign indebtedness related to such firms increased from EUR 243.5 billion in 2011 to EUR 1.03 trillion in 2019. Irish non-financial multinational enterprises have partially offset such increase as their net foreign assets position improved from EUR 119.9 billion in 2011 to EUR 502.8 billion in 2019.

5 Conclusion

Residence-based measures of Irish foreign holdings are obscured by the vast presence of financial intermediaries in the country. These companies engage in activities that substantially increase the size of Ireland's external balance sheet but have virtually no economic ties with the Irish households and firms. As a result, measures of gross foreign exposure such as the index of international financial integration overstate the degree to which the Irish economy is exposed to foreign shocks.

Alternatively, I construct an estimate of the Irish consolidated-by-nationality foreign balance sheet for the period between 2011 and 2019. This is done by employing a novel methodology that relies on company-level financial and ownership data to estimate consolidated foreign holdings. This procedure excludes holdings related to Irish-resident foreign-owned special purpose entities.

I find that Ireland's consolidated-by-nationality foreign balance sheet is on average 46.7% smaller than its residence-based analogue over the sample period. This result indicates that Ireland is significantly less exposed to foreign shocks than what is typically suggested by residence-based statistics.

In terms of relevance, foreign non-financial multinational enterprises operating in Ireland represent the most important source of Irish international financial integration. Similarly, these companies were the largest contributors to the increase in Ireland's consolidated-based international financial integration over the past ten years.

More generally, the differences between the consolidated and residence-based foreign balance sheets highlight the importance of developing consolidated-by-nationality statistics of foreign holdings.

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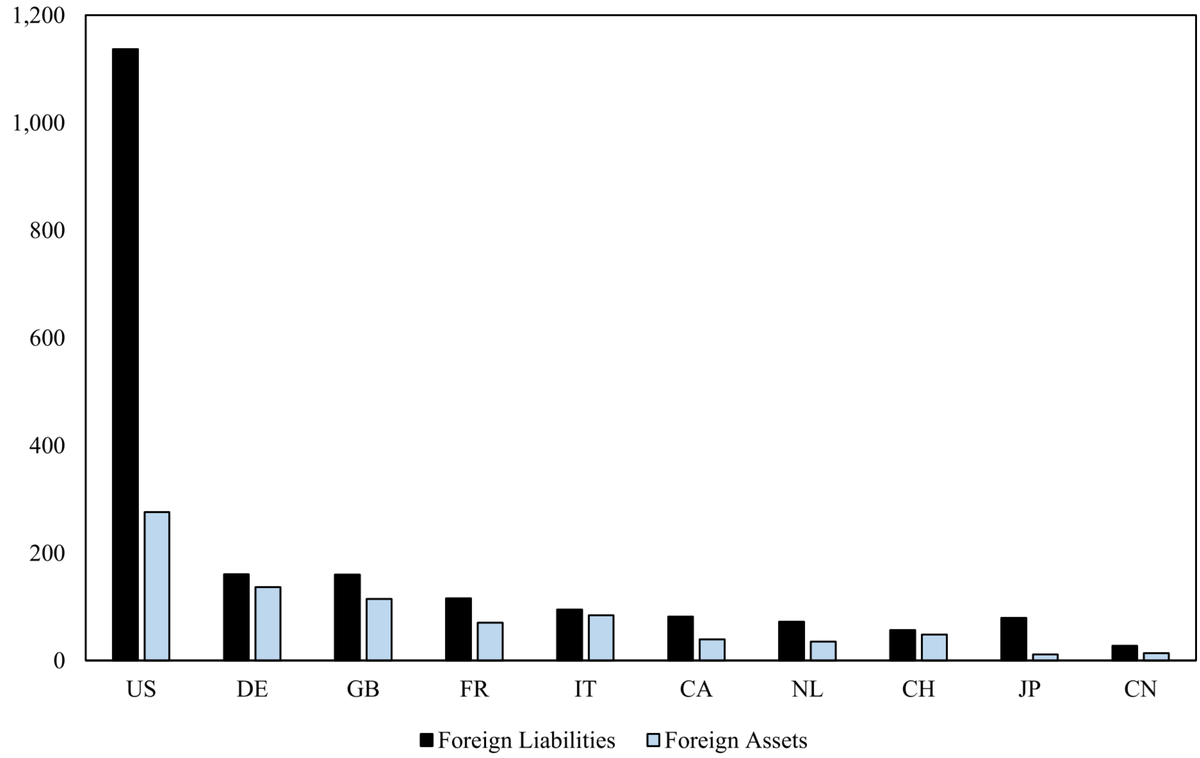
Table 1: Ireland Consolidated Foreign Balance Sheet (2019, EUR bn)

Item	**Assets**	**Liabilities**
Bank-reported		
Irish banks	87.4	58.5
Foreign banks	50.9	69.0
Financial non-banks		
Irish multinationals	47.6	32.6
Affiliates of foreign multinationals	335.5	553.5
Non-financial companies		
Irish multinationals	890.8	389.0
Affiliates of foreign multinationals	587.7	1,618.6
Portfolio investments	158.5	721.6
Official assets	5.1	-
Total	**2,163.5**	**3,442.7**

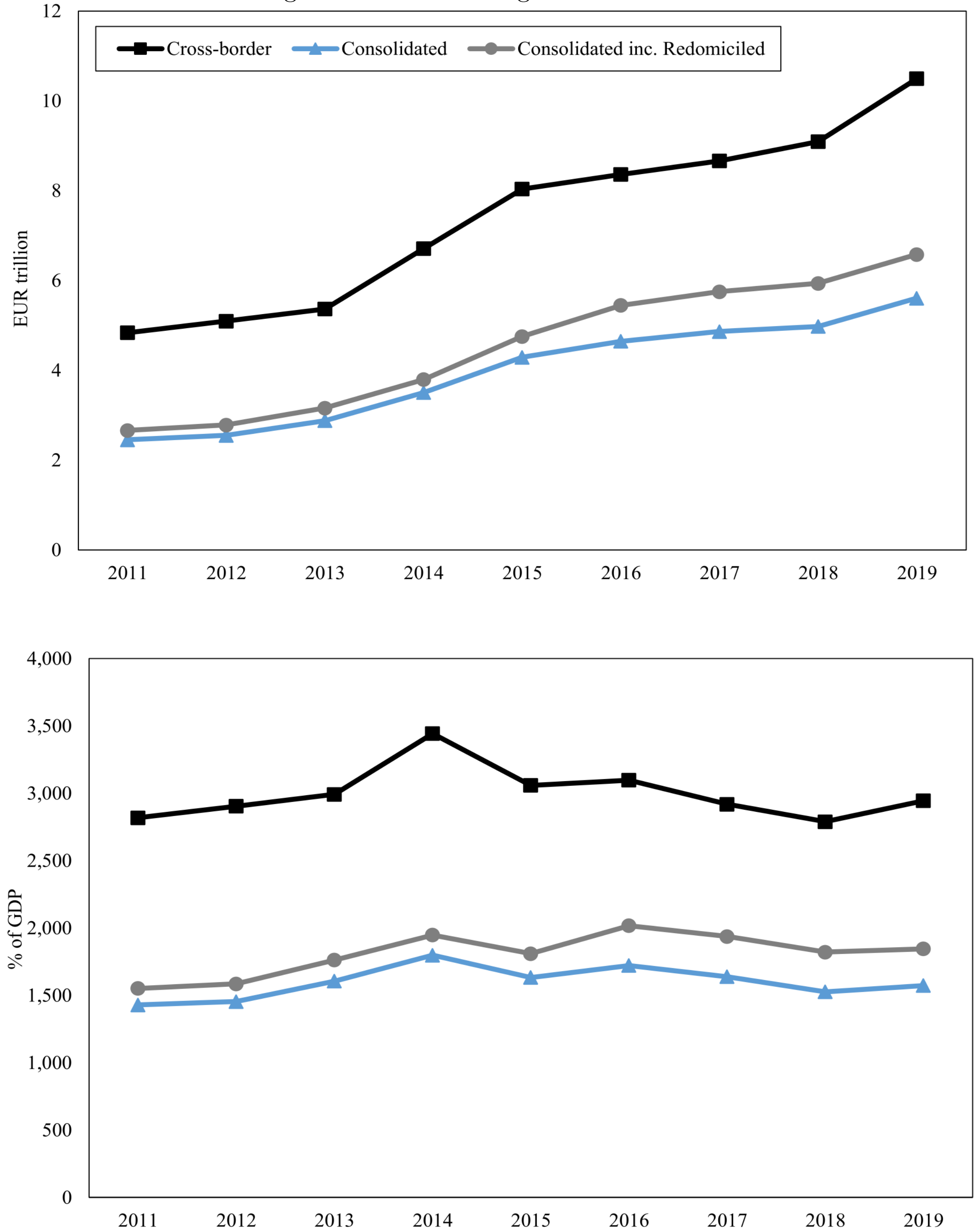
Note: This table shows the Irish consolidated foreign balance sheet for the year of 2019. The consolidated balance sheet is constructed using a methodology similar that used in BIS (2015) and Bénétrix and Sanchez Pacheco (2021). It relies on data from the U.S. Bureau of Economic Analysis, Bureau van Dijk's Orbis Europe and FAME databases, the Bank for International Settlements, Ireland's Central Statistics Office and the Central Bank of Ireland. Foreign companies that have changed their domicile to Ireland are excluded from the sample.

Figure 1: Irish Consolidated Foreign Holdings related to foreign non-banks (EUR bn)



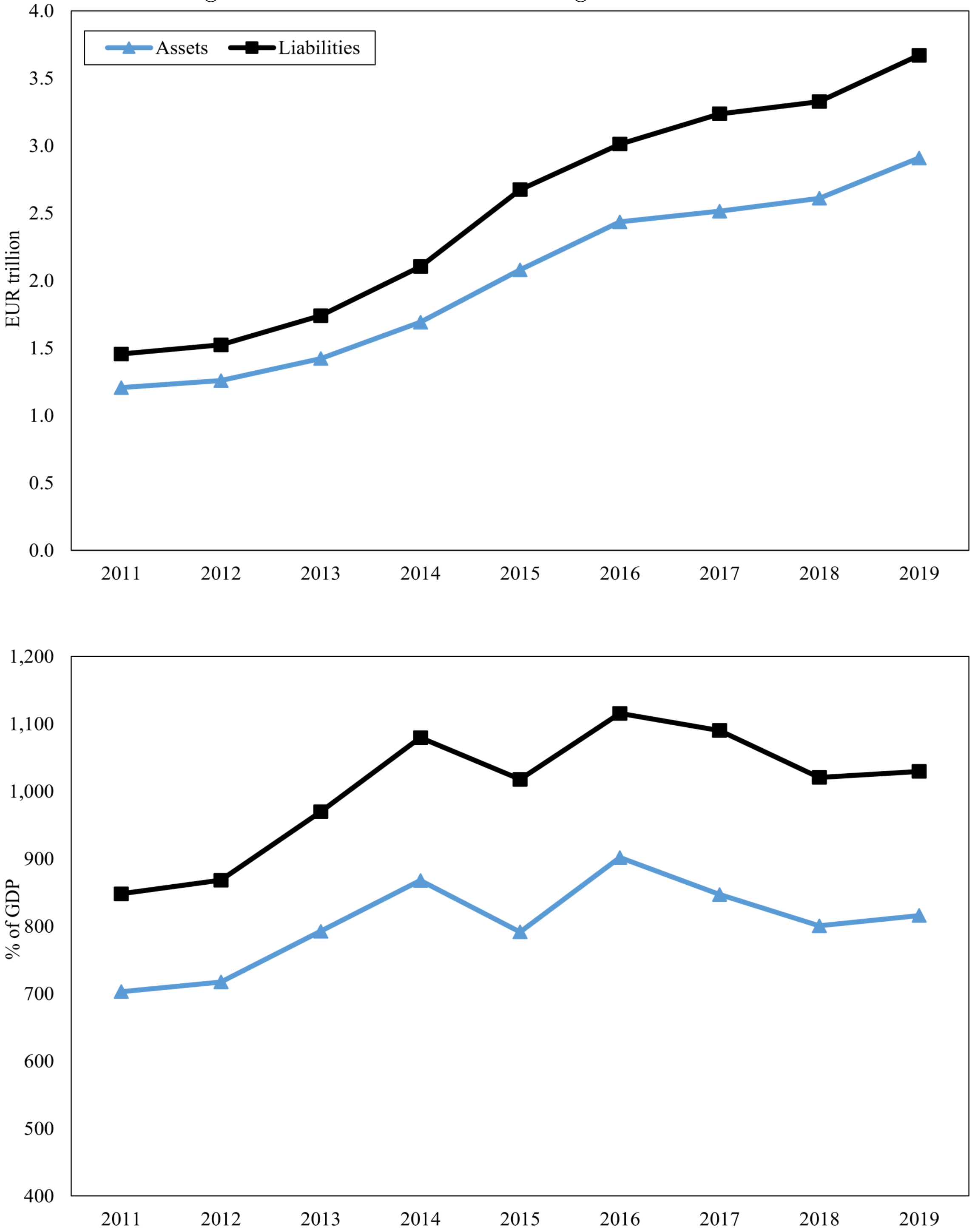
Note: This figure shows Irish consolidated foreign assets and liabilities related to foreign non-banks operating in Ireland for 2019. Foreign holdings are sorted according to the ultimate counterpart countries that own these companies operating in Ireland. These holdings are estimated using data from Bureau van Dijk's FAME data-set.

Figure 2: Sum of foreign assets and liabilities



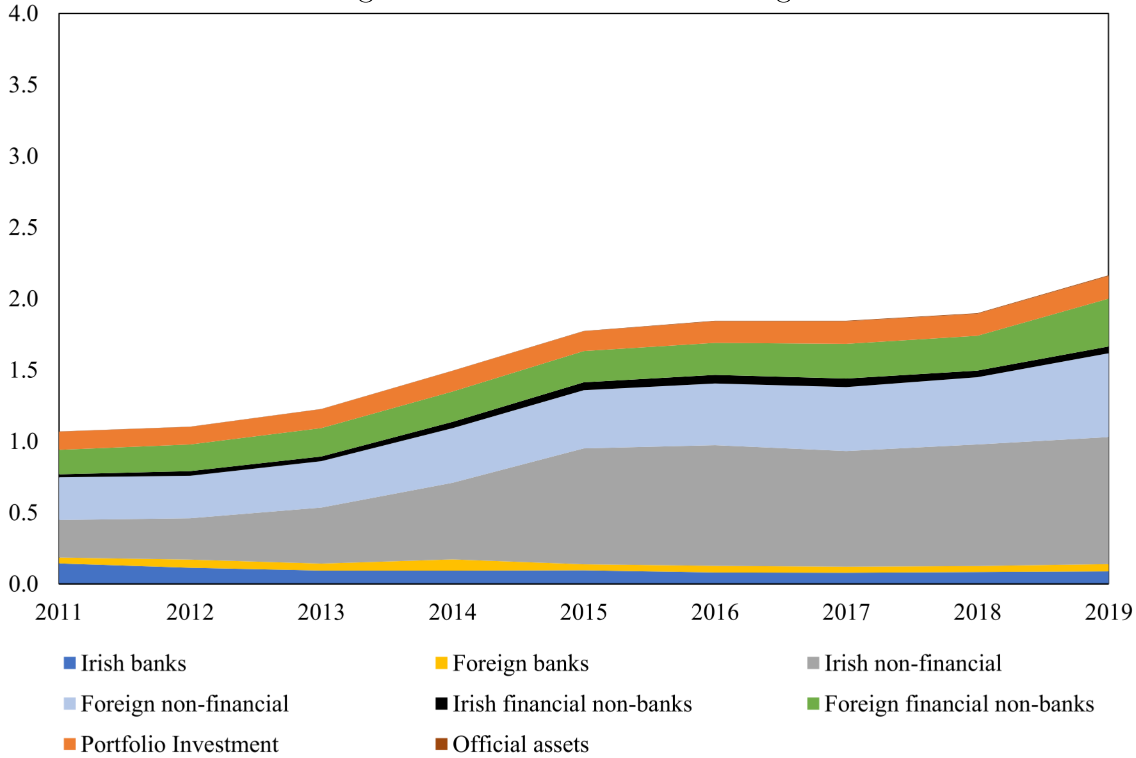
Note: This figure shows the evolution of the sum of Irish foreign assets and liabilities. The blue line shows such sum when calculated using the consolidated-by-nationality approach proposed in this paper. The black line comes from Lane and Milesi-Ferretti's *External Wealth of Nations* database and shows the sum when calculated using a residence-based approach. The grey line shows the sum from a consolidated perspective when the foreign assets and liabilities related to companies that have redomiciled to Ireland are still included in the sample.

Figure 3: Irish Consolidated Foreign Assets and Liabilities



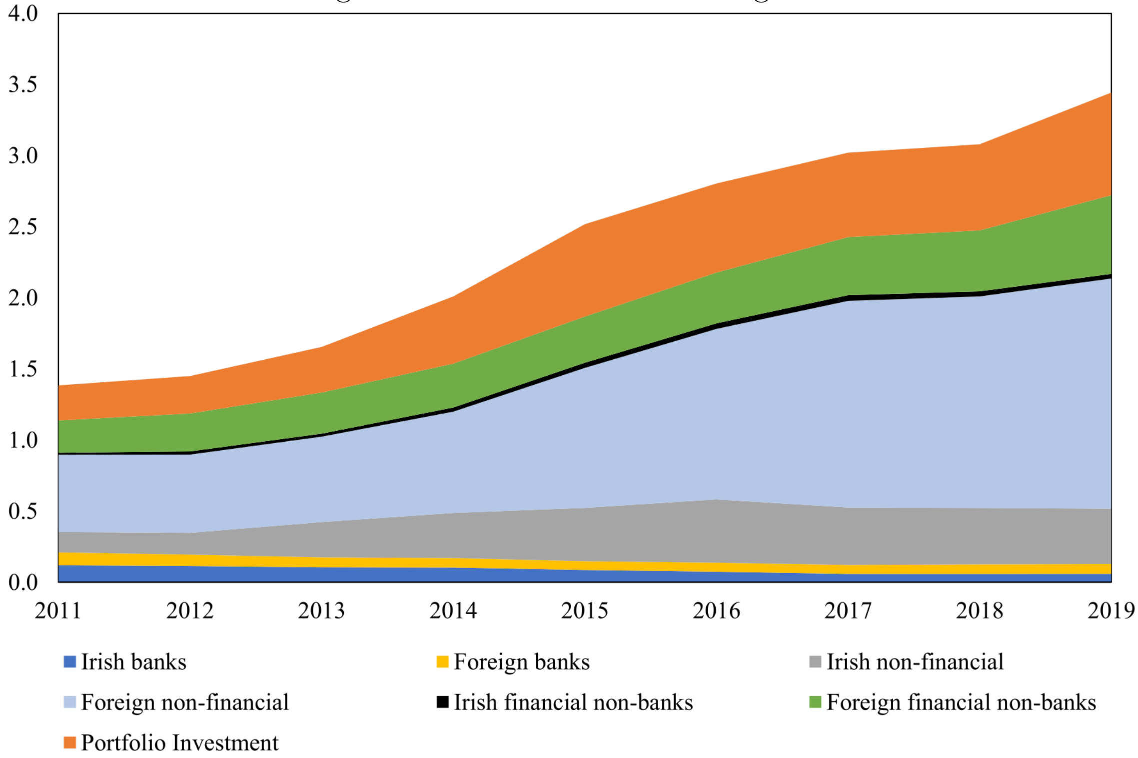
Note: This figure shows Irish consolidated foreign assets and liabilities.The top panel presents values in trillions of Euros while the bottom panel expresses the values as a percentage of GDP. While some of its components present a longer time series, the figure only shows data for the years in which estimates of all categories were available.

Figure 4: Irish consolidated foreign assets



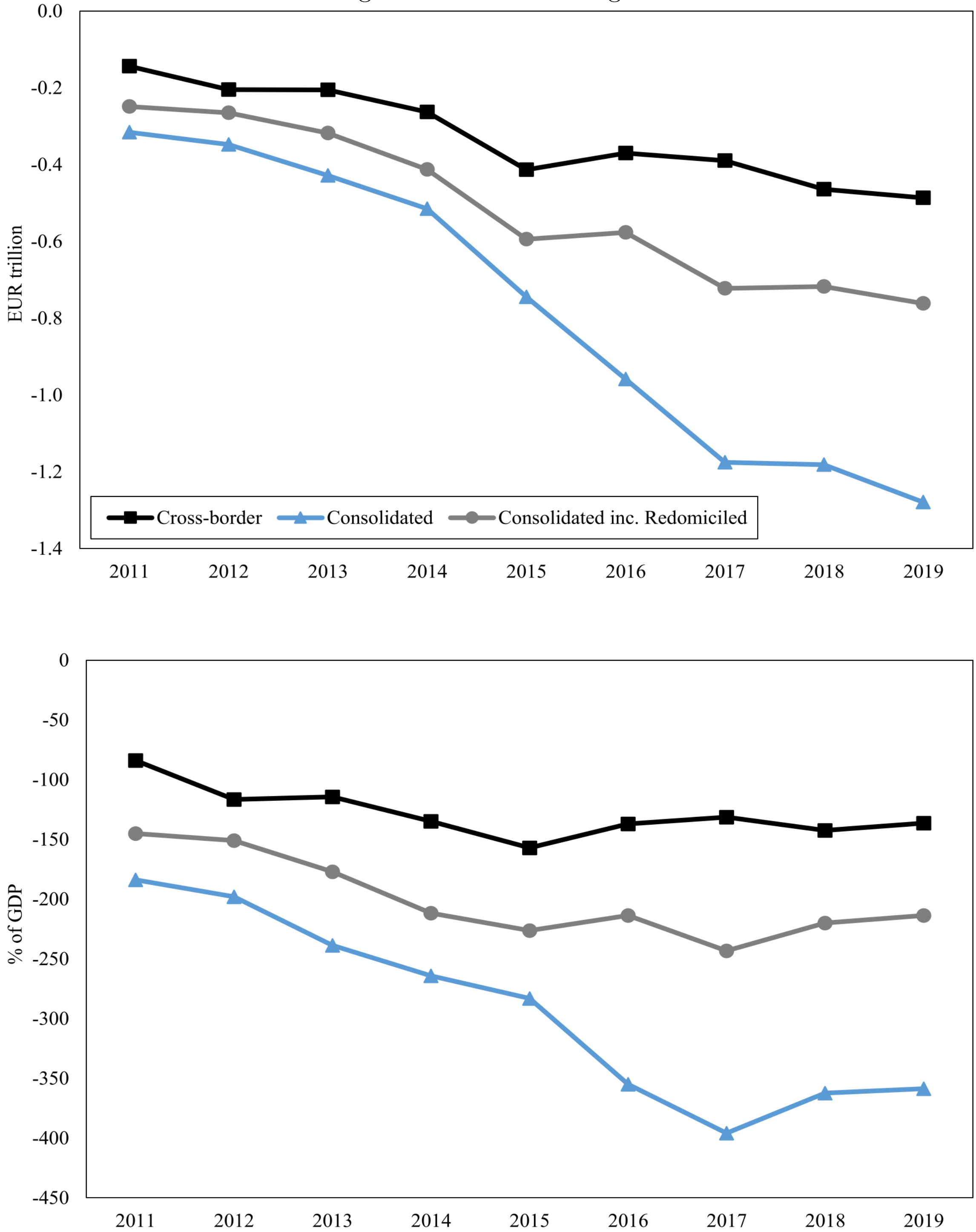
Note: This figure shows the evolution of Irish consolidated-by-nationality foreign assets related to each category. The categorization used in this paper to construct the consolidated foreign balance sheet is similar to that used in BIS (2015) and Bénétrix and Sanchez Pacheco (2021). Foreign companies that have changed their domicile to Ireland are excluded from the sample.

Figure 5: Irish consolidated foreign liabilities



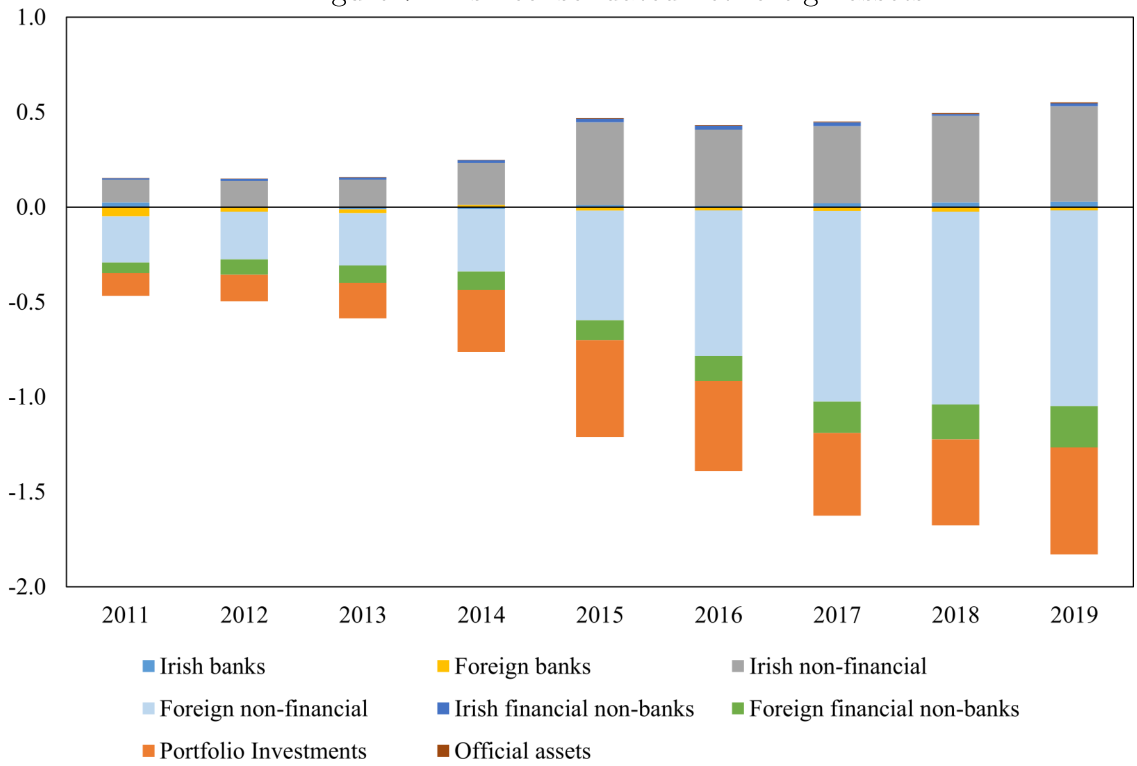
Note: This figure shows the evolution of Irish consolidated-by-nationality foreign liabilities related to each category. The categorization used in this paper to construct the consolidated foreign balance sheet is similar to that used in BIS (2015) and Bénétrix and Sanchez Pacheco (2021). Foreign companies that have changed their domicile to Ireland are excluded from the sample.

Figure 6: Irish net foreign assets



Note: This figure shows the evolution of Irish net foreign assets. The blue line shows net foreign assets when calculated using the consolidated-by-nationality approach proposed in this paper. The black line comes from Lane and Milesi-Ferretti (2018) and shows net foreign assets when calculated using a residence-based approach. The grey line shows net foreign assets from a consolidated perspective when the foreign assets and liabilities related to companies that have redomiciled to Ireland are still included in the sample.

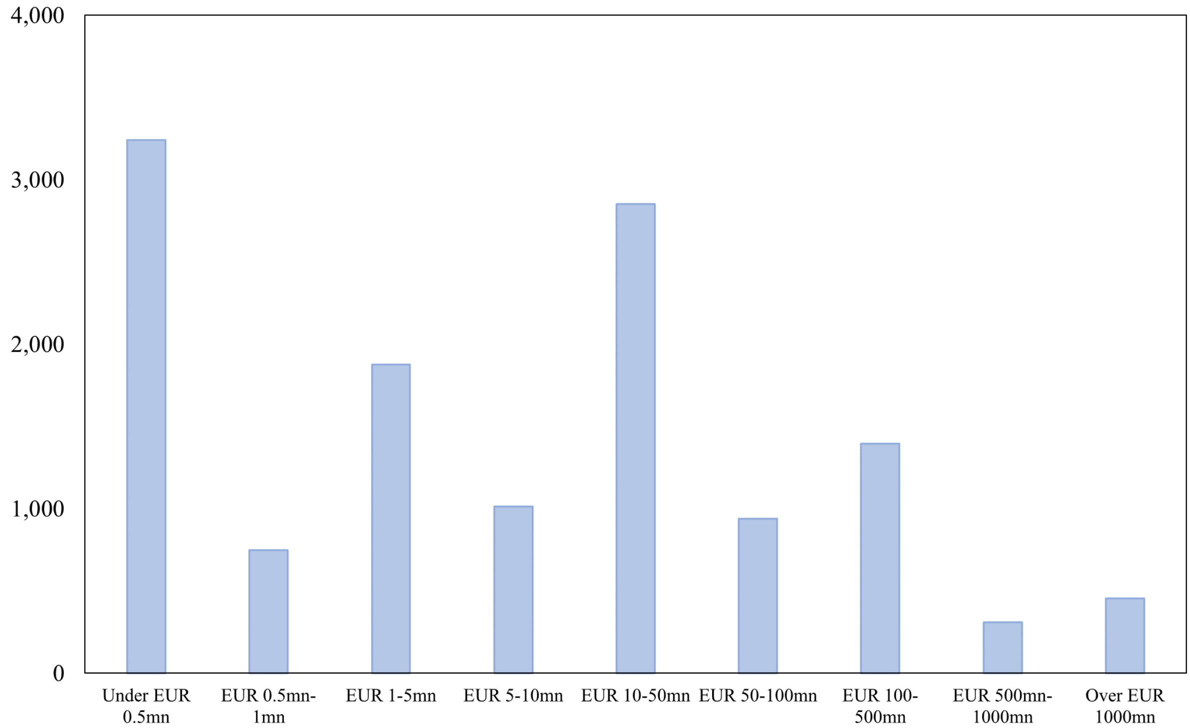
Figure 7: Irish consolidated net foreign assets



Note: This figure shows the evolution of Irish consolidated-by-nationality net foreign assets related to each category. The categorization used in this paper to construct the consolidated foreign balance sheet is similar to that used in BIS (2015) and Bénétrix and Sanchez Pacheco (2021). Foreign companies that have changed their domicile to Ireland are excluded from the sample.

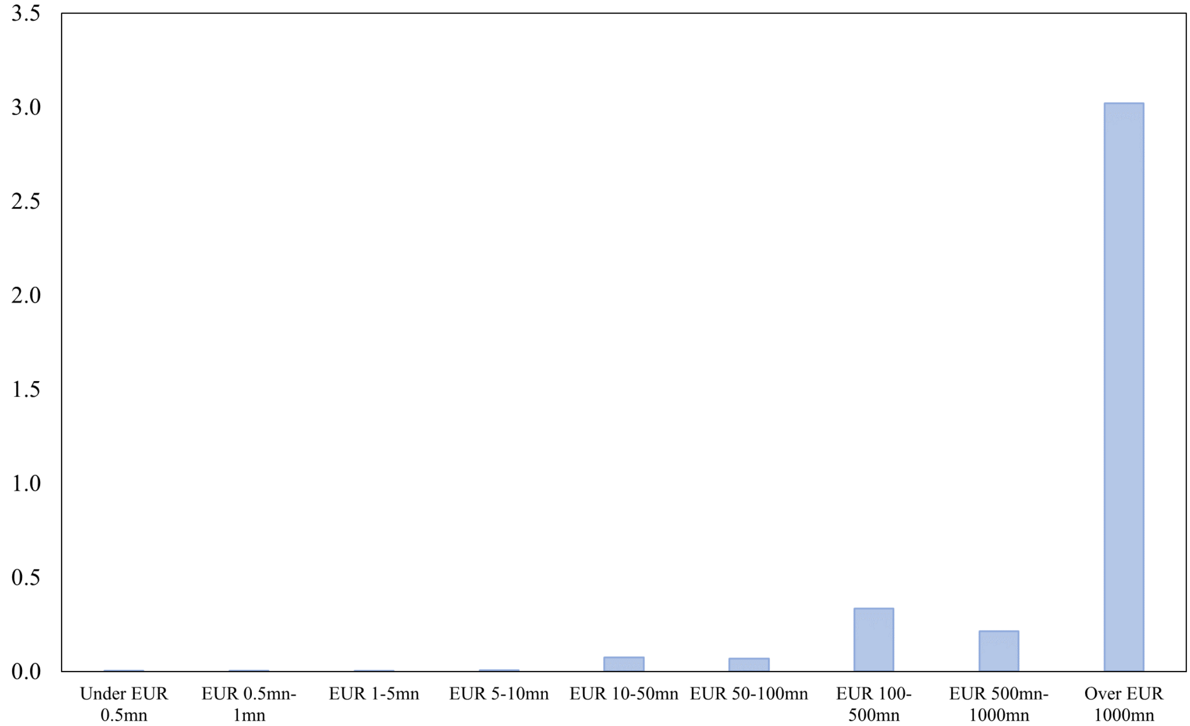
A Appendix

Figure A.1: Number of foreign MNEs per size group based on total assets



Note: This figure shows the number of companies operating in Ireland whose ultimate owner can be identified as non-Irish. Companies are grouped according to the their total asset holdings in the last available period. This figure excludes companies that have never reported total assets and includes firms that are no longer active.

Figure A.2: Sum of total assets of foreign MNEs per size group (EUR trillion)



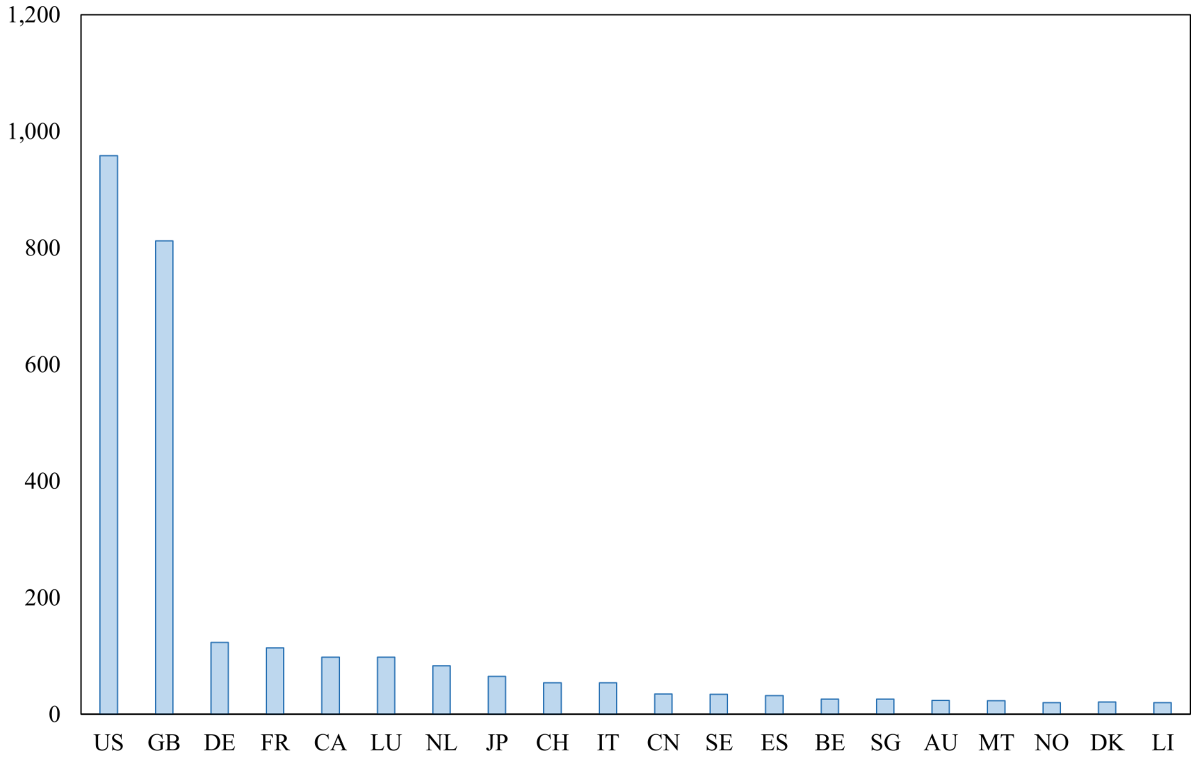
Note: This figure shows the sum of the total assets held by the companies located in each group. Only companies operating in Ireland whose ultimate owner can be identified as non-Irish are included. Companies are grouped according to the their total asset holdings in the last available period. This figure excludes companies that have never reported total assets and includes firms that are no longer active.

Table 2: SIC 2007 sub-classes excluded from the sample of non-financial MNEs

51210	64302	64999	66290	77320
64110	64303	65110	66300	77330
64191	64304	65120	69109	77341
64192	64305	65201	70221	77342
64201	64306	65202	77110	77351
64202	64910	65300	77120	77352
64203	64921	66110	77210	77390
64204	64922	66120	77220	77400
64205	64929	66190	77291	
64209	64991	66210	77299	
64301	64992	66220	77310	

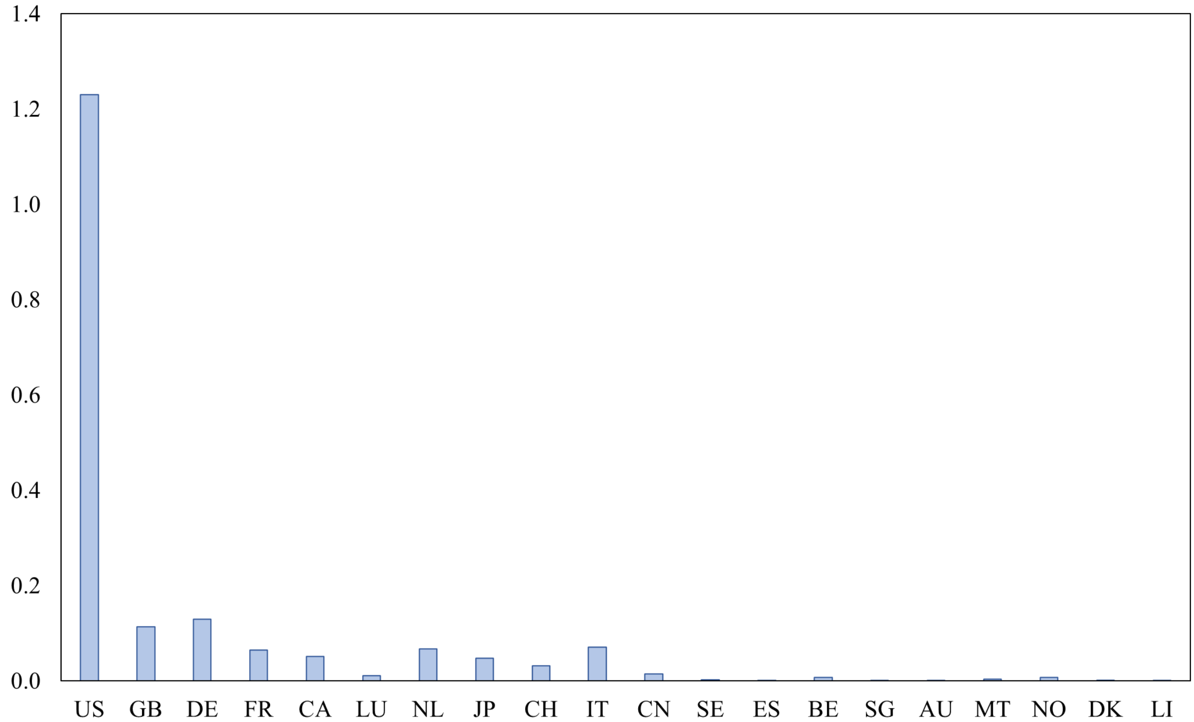
Note: This table shows the UK SIC 2007 sub-classes that are used in an attempt to identify SPEs and financial companies. These codes are equivalent to the European NACE classification. Companies whose primary activity are identified by one of these SIC codes are excluded from the sample used to estimate Irish consolidated foreign assets and liabilities.

Figure A.3: Number of non-financial foreign affiliates in Ireland by country



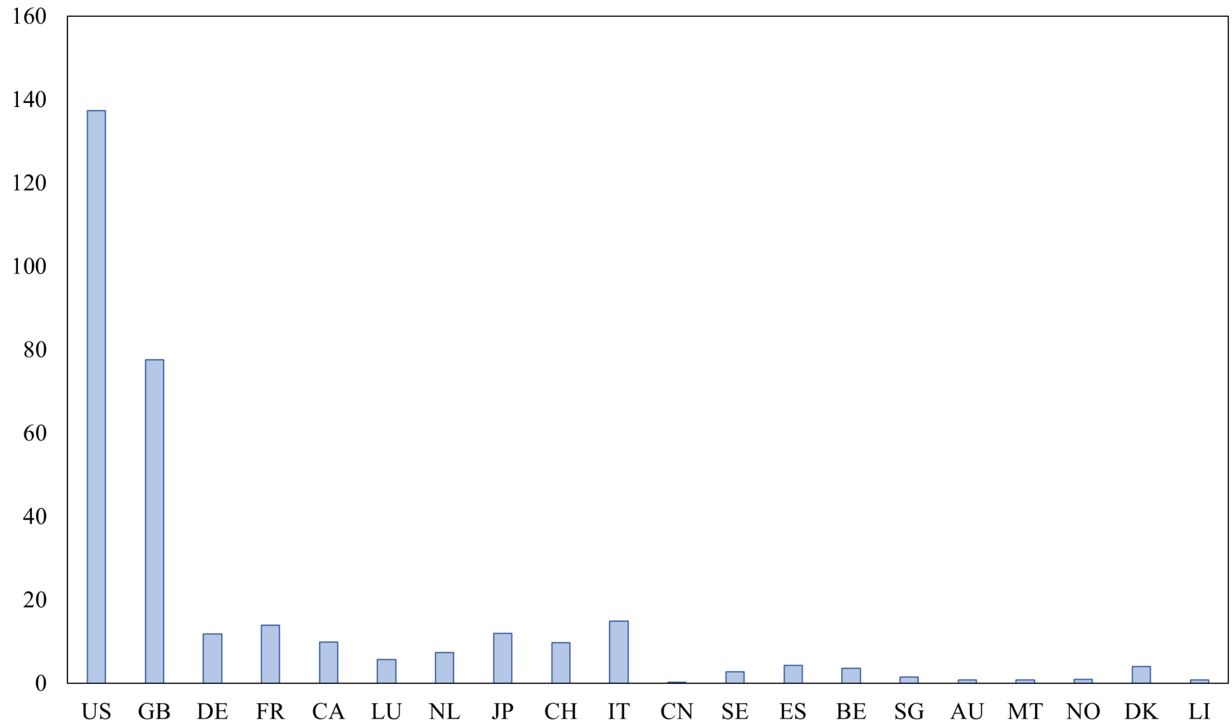
Note: This figure shows the number of companies operating in Ireland whose ultimate owner can be identified as non-Irish. Firms are sorted according to the country of their ultimate owner. Data is only displayed for the twenty countries with the largest number of companies operating in Ireland. This figure includes firms that are no longer active.

Figure A.4: Sum of total assets of non-financial foreign MNEs per country (EUR trillion)



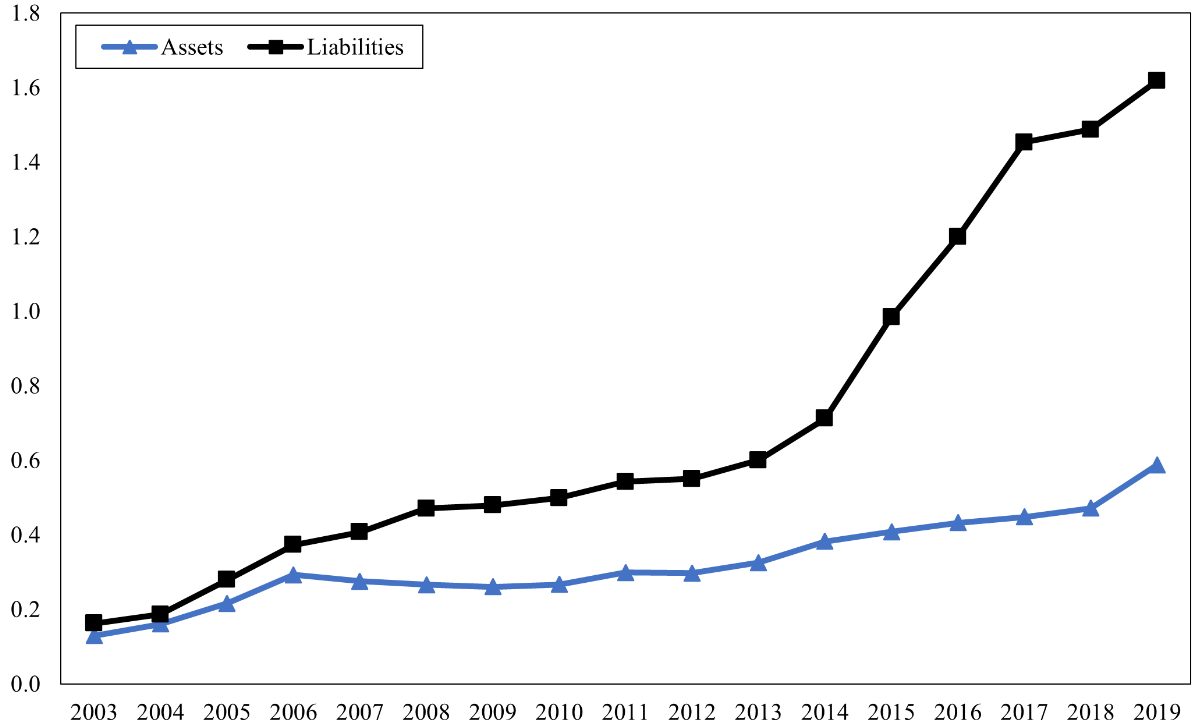
Note: This figure shows the sum of total asset holdings of companies operating in Ireland whose ultimate owner can be identified as non-Irish. Firms are sorted according to the country of their ultimate owner. Data is only displayed for the twenty countries with the largest number of companies operating in Ireland. This figure includes firms that are no longer active.

Figure A.5: Sum of employment of non-financial foreign MNEs per country (Thousand)



Note: This figure shows the sum of people employed by non-financial foreign companies operating in Ireland whose ultimate owner can be identified as non-Irish. Firms are sorted according to the country of their ultimate owner. Data is only displayed for the twenty countries with the largest number of companies operating in Ireland. This figure includes firms that are no longer active.

Figure A.6: Foreign assets and liabilities related to non-financial foreign MNEs (EUR tn)



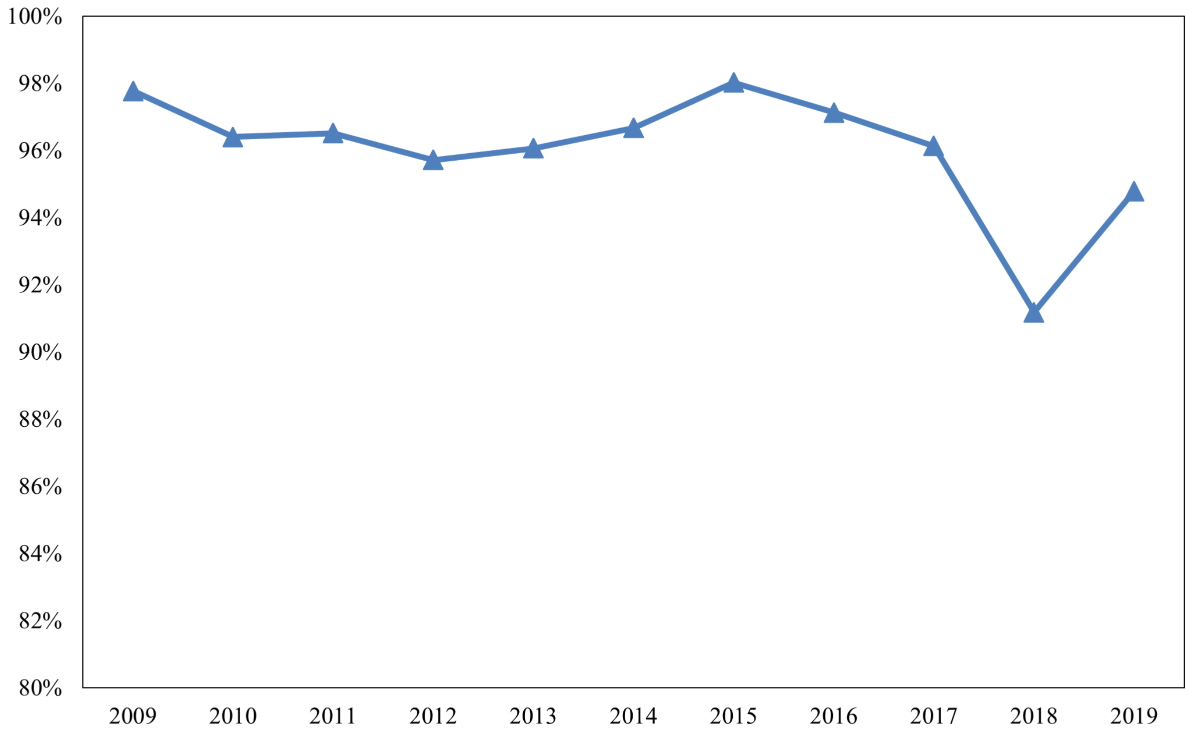
Note: This figure shows estimates of Irish consolidated foreign assets and liabilities related to the activities of non-financial foreign multinational enterprises operating in the country. Foreign liabilities are estimated as the difference between total assets and same-group inter-company loan assets of non-financial foreign multinationals. Foreign assets are estimated as the total assets of non-financial foreign MNEs minus their shareholders' equity and same-group inter-company loan liabilities.

Table 3: Countries included in estimating assets and liabilities related to Irish MNEs

Albania	Denmark	Kosovo	North Macedonia	Sweden
Andorra	Estonia	Latvia	Norway	Switzerland
Austria	Finland	Liechtenstein	Poland	Turkey
Belarus	France	Lithuania	Portugal	Ukraine
Belgium	Germany	Luxembourg	Romania	United Kingdom
Bosnia and Herzegovina	Greece	Malta	Russia	United States
Bulgaria	Greenland	Moldova	Serbia	
Croatia	Hungary	Monaco	Slovak Republic	
Cyprus	Iceland	Montenegro	Slovenia	
Czech Republic	Italy	Netherlands	Spain	

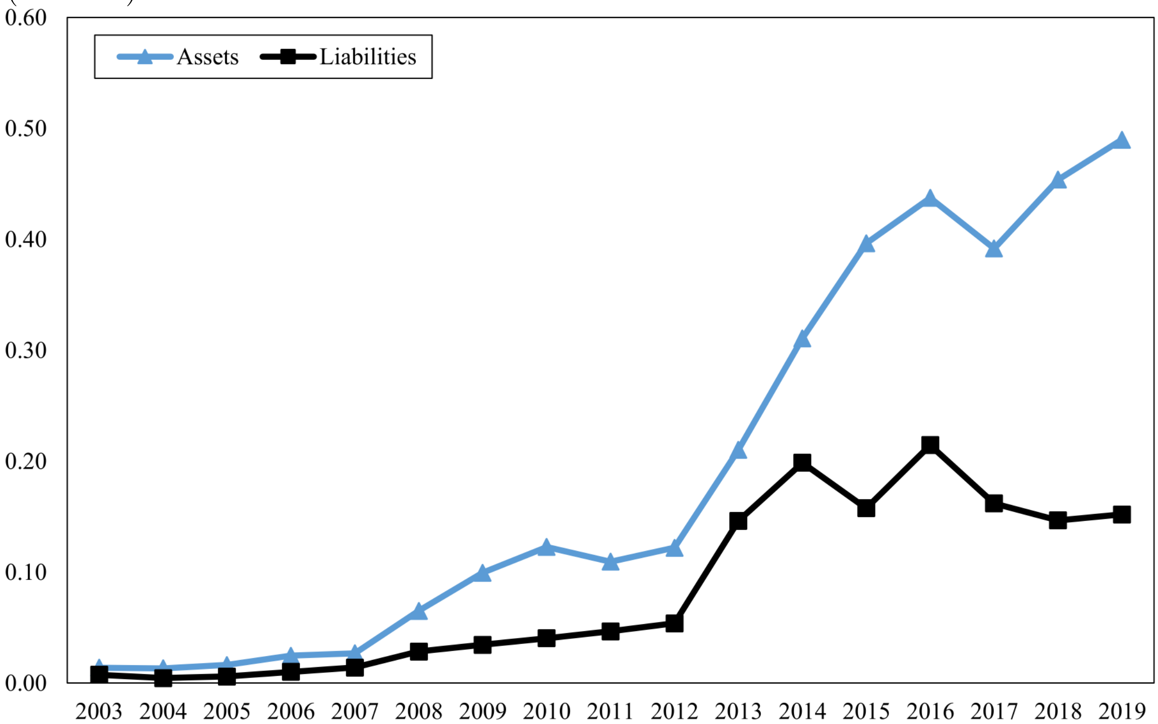
Note: This table shows the countries listed in the Orbis Europe database plus the United States. Estimates of Irish consolidated foreign assets and liabilities related to non-financial Irish MNEs are based on the positions held by such companies in these listed countries.

Figure A.7: Share of Irish outbound FDI position in covered countries relative to total



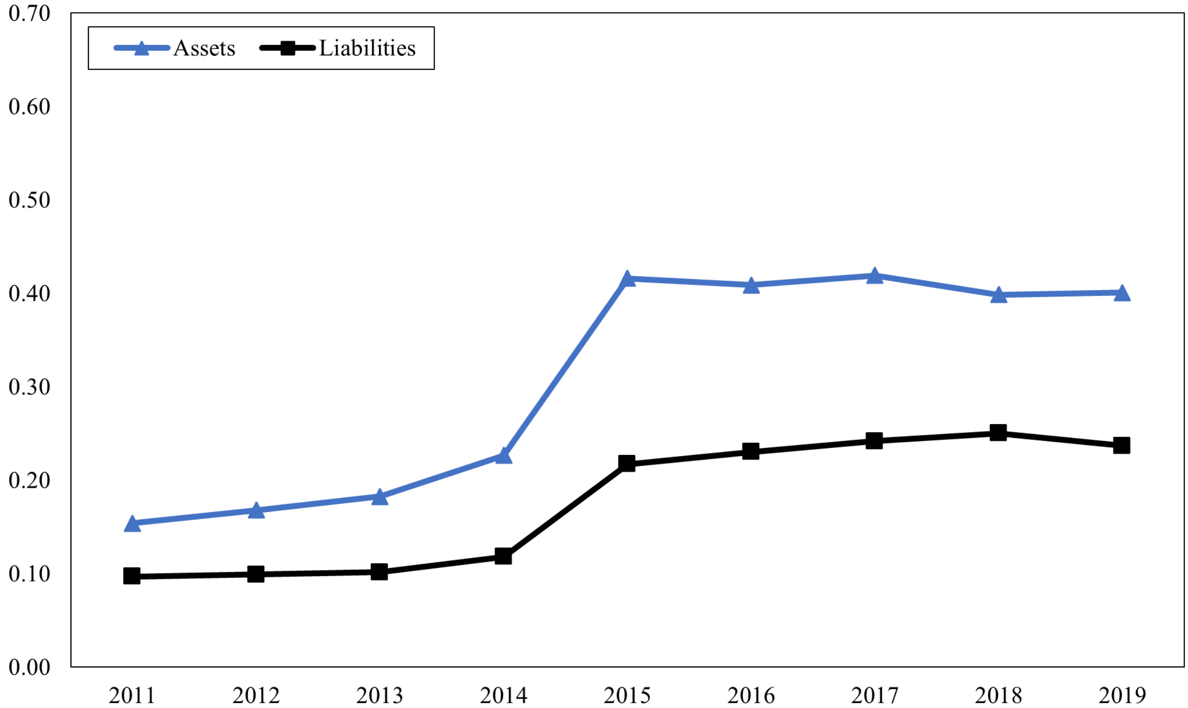
Note: This figure shows the sum of Irish outbound foreign direct investment positions in countries listed in Table 3 as a percentage of total Irish outbound FDI positions with respect to recipient countries that are possible to identify and that are non-haven countries. This is calculated as the total Irish outbound FDI position minus the position associated to unidentified recipients and the positions with respect to Bermuda, Cayman Islands and Jersey.

Figure A.8: Foreign assets and liabilities related to Irish non-financial MNEs in the U.S. (EUR tn)



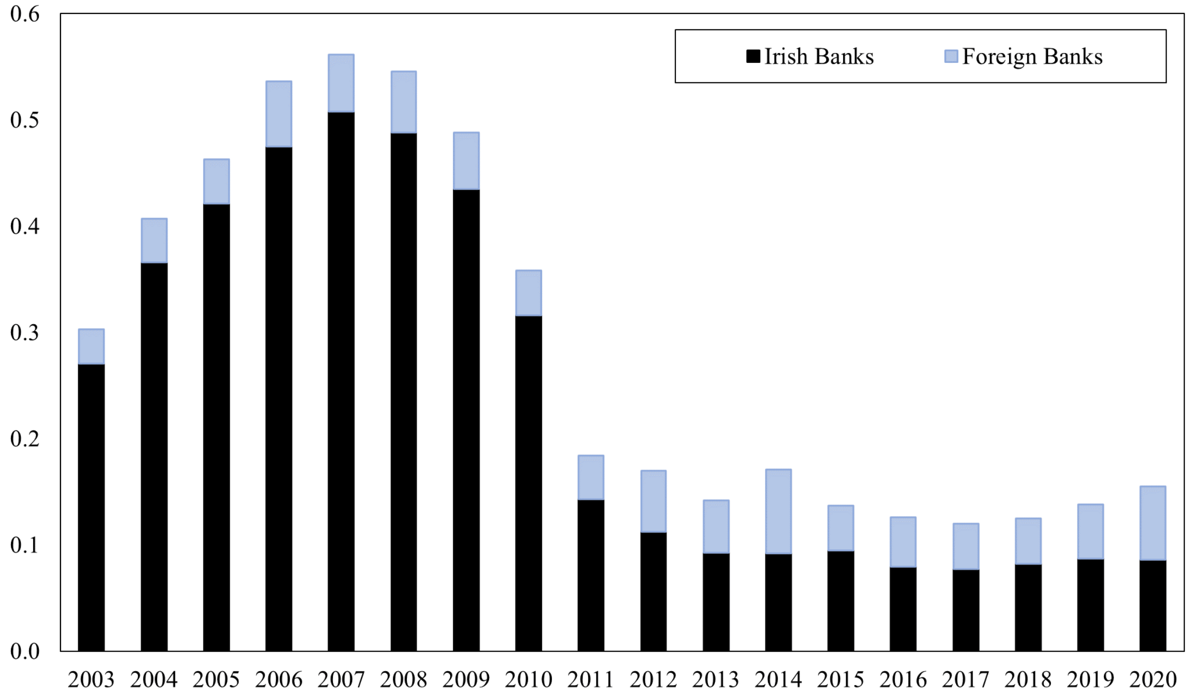
Note: This figure shows estimates of Irish consolidated foreign assets and liabilities related to the activities of non-financial Irish multinational enterprises operating in the United States. Foreign assets are estimated as the total assets of non-financial Irish MNEs. Foreign liabilities are estimated as the difference between total assets and FDI made by Ireland in the U.S.

Figure A.9: Foreign assets and liabilities related to Irish non-financial MNEs in Europe (EUR tn)



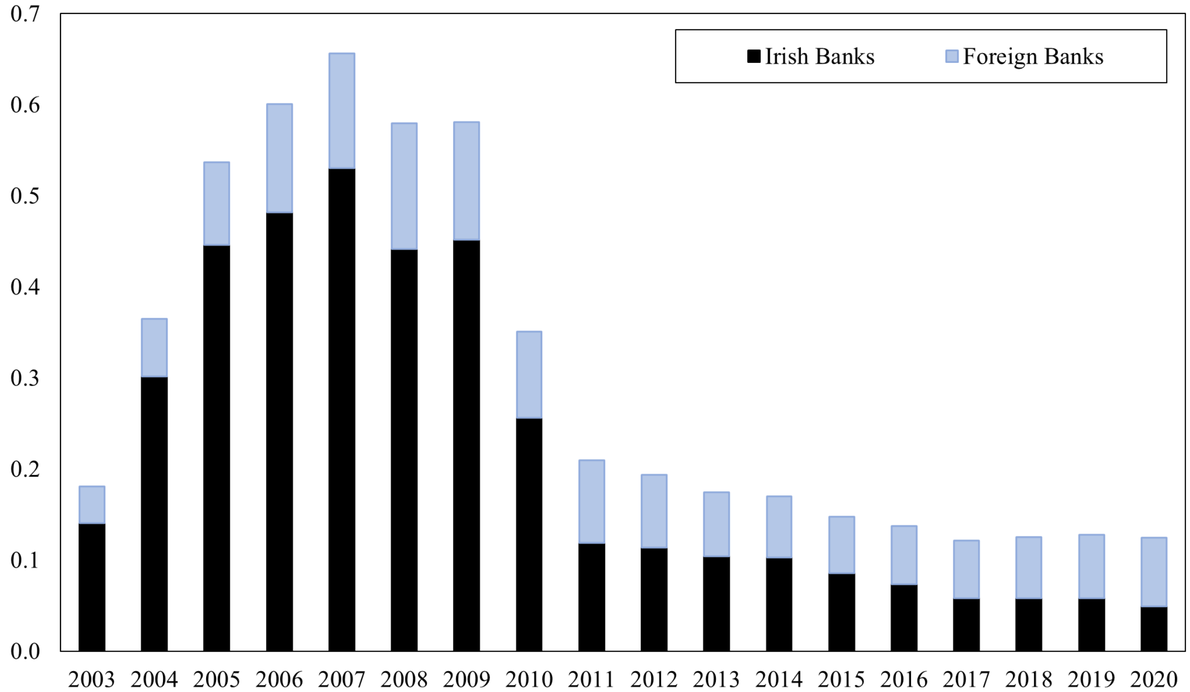
Note: This figure shows estimates of Irish consolidated foreign assets and liabilities related to the activities of non-financial Irish multinational enterprises operating in Europe. These estimates exclude foreign multinationals that have changed their domicile to Ireland. Foreign assets are estimated as the sum of total asset holdings by non-financial Irish MNEs. Foreign liabilities are estimated as the difference between the sum of total asset holdings and the sum of shareholders' funds by these companies.

Figure A.10: Consolidated foreign assets related to banks (EUR tn)



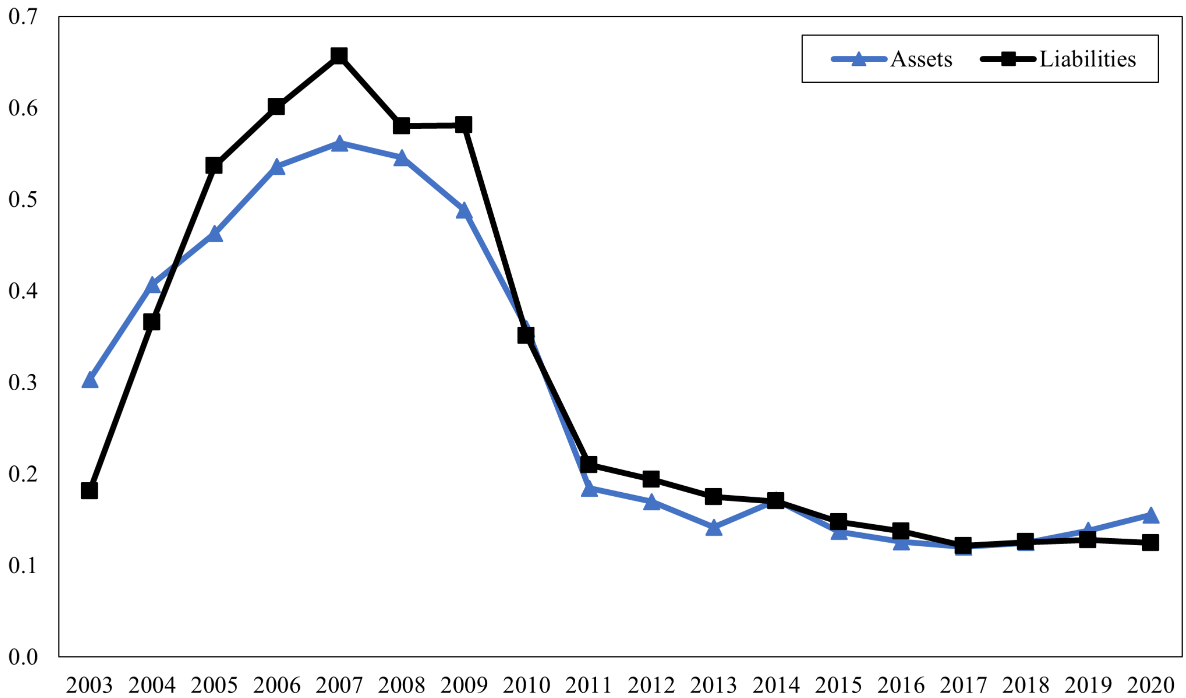
Note: This figure shows estimates of Irish consolidated foreign assets related to the activities of banks. The black bars represent Irish consolidated foreign assets attributed to the activities of Irish banks. The blue bars represent foreign assets attributed to activities of foreign banks.

Figure A.11: Consolidated foreign liabilities related to banks (EUR tn)



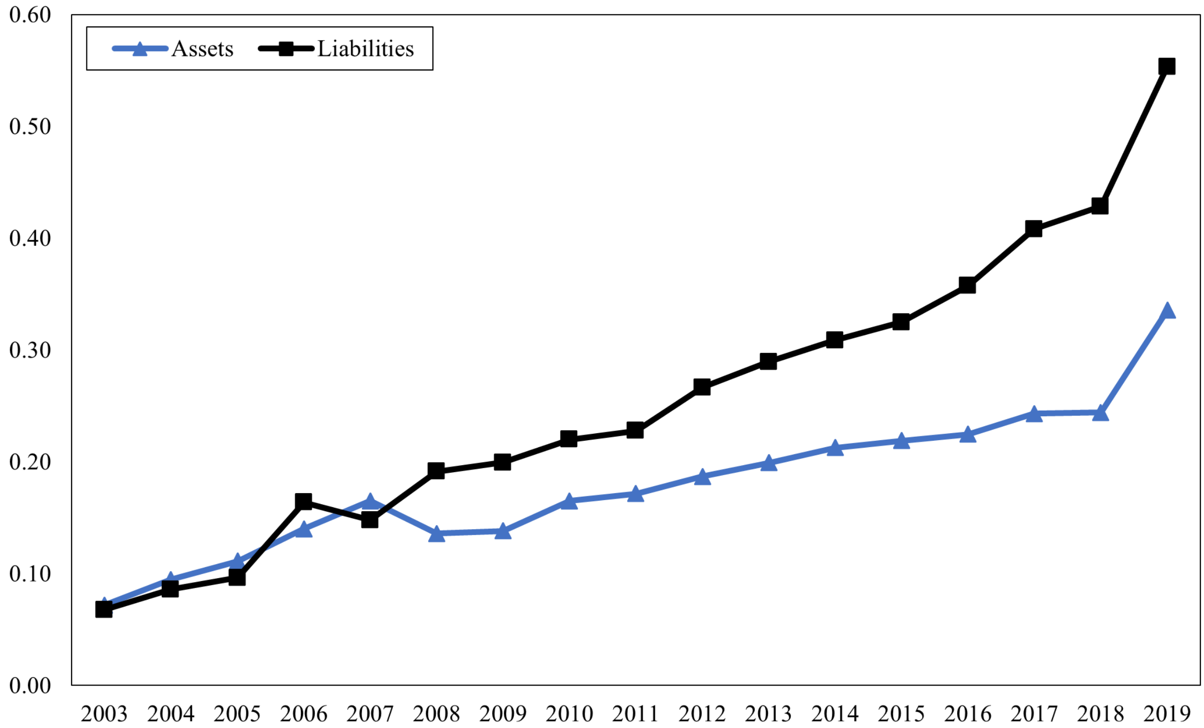
Note: This figure shows estimates of Irish consolidated foreign liabilities related to the activities of banks. The black bars represent Irish consolidated foreign liabilities attributed to the activities of Irish banks. The blue bars represent foreign liabilities attributed to activities of foreign banks.

Figure A.12: Consolidated foreign assets and liabilities related to banks (EUR tn)



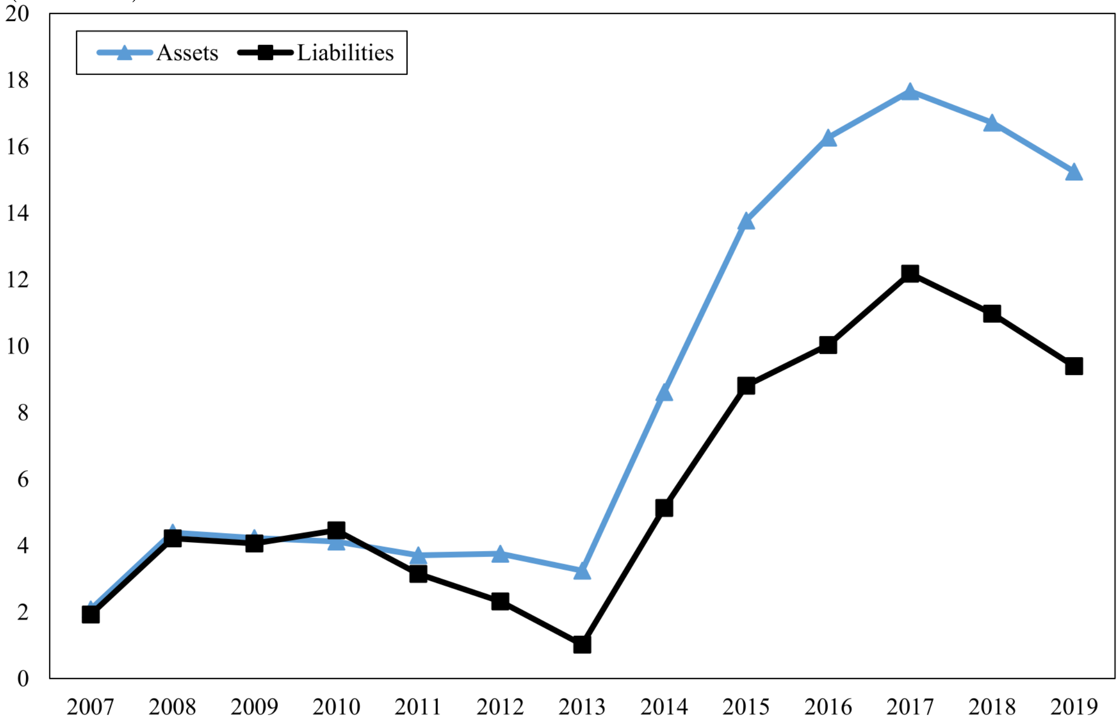
Note: This figure shows estimates of Irish consolidated foreign assets and liabilities related to the activities of banks. It includes both the assets and liabilities related to Irish banks as well as foreign banks.

Figure A.13: Foreign assets and liabilities related to foreign financial non-banks (EUR tn)



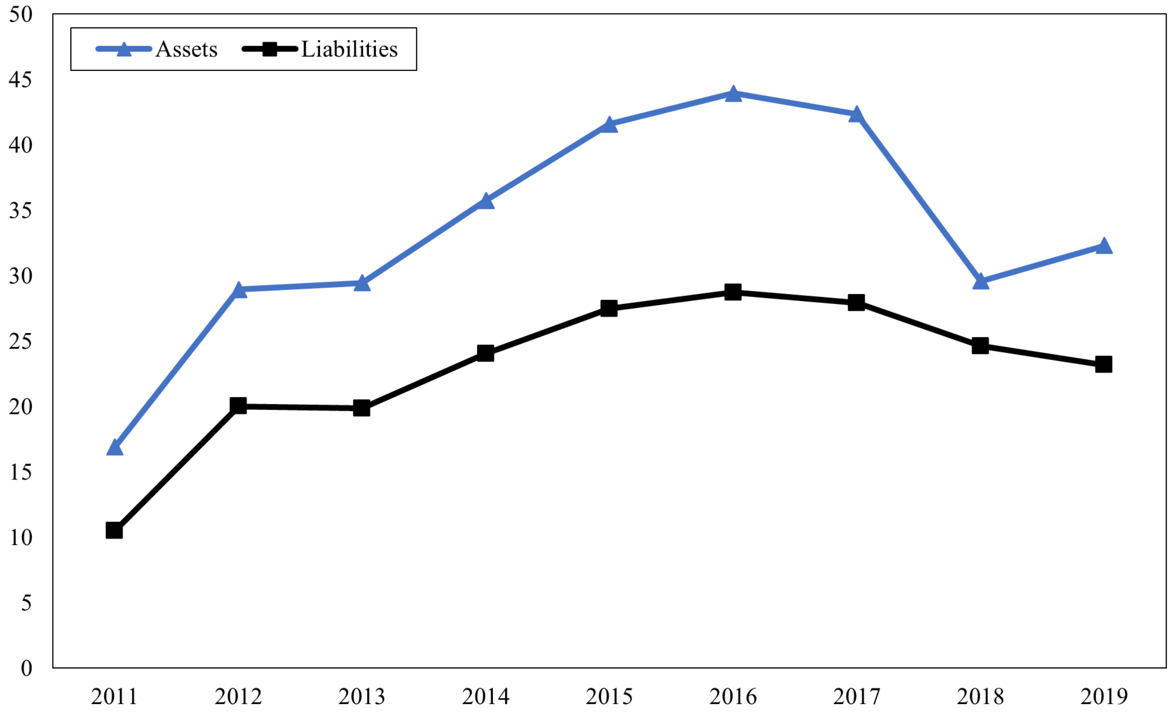
Note: This figure shows estimates of Irish consolidated foreign assets and liabilities related to the activities of foreign financial non-banks operating in Ireland. Companies that have never reported the number of people it employs are removed from the sample. Foreign liabilities are estimated as the difference between total assets and same-group inter-company loan assets of foreign financial non-banks. Foreign assets are estimated as the total assets of these companies minus their shareholders' equity and same-group inter-company loan liabilities.

Figure A.14: Foreign assets and liabilities related to Irish financial non-banks in the U.S. (EUR bn)



Note: This figure shows estimates of Irish consolidated foreign assets and liabilities related to the activities of Irish financial non-banks operating in the United States. Foreign assets are estimated as the total assets of these companies. Foreign liabilities are estimated as the difference between total assets and FDI made by Ireland in this sector in the U.S.

Figure A.15: Foreign assets and liabilities related to Irish financial non-banks in the Europe (EUR bn)



Note: This figure shows estimates of Irish consolidated foreign assets and liabilities related to the activities of Irish financial non-banks operating in Europe. These estimates exclude foreign multinationals that have changed their domicile to Ireland. Foreign assets are estimated as the sum of total asset holdings by Irish financial non-banks. Foreign liabilities are estimated as the difference between the sum of total asset holdings and the sum of shareholders' funds by these companies.