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ABSTRACT

Is the Financial Safety Net a Barrier to Cross-Border Banking?

A bank's interest expenses are found to increase with its degree of internationalization as proxied by its share of foreign liabilities in total liabilities or a Herfindahl index of international liability concentration, especially if the bank is performing badly. Our benchmark estimation suggests that an international bank's cost of funds raised through a foreign subsidiary is between 1.5% and 2.4% higher than the cost of funds for a purely domestic bank, which is a sizeable difference given an overall mean cost of funds of 3.3%. These results are consistent with limited incentives for national authorities to bail out an international bank, but also with an international bank recovery and resolution process that is inefficient. In any event, the operation of the financial safety net appears to be a barrier to cross-border banking.

JEL Classification: F36, G21 and G28
Keywords: bank bailouts, cross-border banking and international burden sharing

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* This paper's findings, interpretations, and conclusions are entirely those of the authors and do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.

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1. Introduction

Regulatory barriers to cross-border banking have been removed around the world.[1] As a result, banking markets have internationalized, as measured by the external assets and liabilities of domestic banks as well as by the ownership of banks.[2] All the same, banking markets in many countries continue to be dominated by purely national banks. This suggests that to some extent effective barriers to cross-border banking still exist. In practice, many banks may fail to internationalize, as they fear that they will be able to rely less on the financial safety net. This reflects that countries have a reduced incentive to bail out an international bank, and that intervention and resolution options to contain losses at international banks may be more limited.

This paper shows evidence that a bank's cost of funds rises significantly with its degree of internationalization as indexed by its share of foreign liabilities in overall liabilities, consistent with a less reliable financial safety net for cross-border banks. Our benchmark estimation suggests that an international bank's cost of funds raised through a foreign subsidiary is between 1.5% and 2.4% higher than the cost of funds for a purely domestic bank, which is a sizeable difference given an overall mean cost of funds of 3.3% in our sample. Moreover, the interest expenses of banks with large foreign liabilities are relatively more sensitive to bank performance as indexed by bank profitability, suggesting effective market discipline of cross-border banks.

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[2] See Allen et al. (2011, Table 1.1) for information on the development of cross-border banking in Europe as measured by the external assets and liabilities relative to GDP.

Additional evidence of higher interest expenses for international banks is found when we use alternative measures of bank internationalization. Specifically, interest expenses decline with the Herfindahl index of international liability concentration, and they decline relatively more with profitability for banks that own subsidiaries in more foreign countries.

Our finding that cross-border bank face higher interest expenses, especially if they are performing badly, is consistent with a reluctance on the part of national authorities to contribute to the bailout of a cross-border bank. Freixas (2003) provides a theoretical modeling of incentives to engage in fiscal burden sharing to resolve a cross-border bank failure. Recapitalizing a distressed international bank is taken to be costly relative to simply liquidating the bank. The benefits of recapitalizing the bank, however, are dispersed over the countries where the bank operates. For the bank to be recapitalized, the concerned countries have to collectively share the cost. Contributing to this cost is an international public good. Underprovision of this public good may result in liquidation of the bank in equilibrium, despite the fact that the summed international benefits of recapitalization exceed its cost.[3] Possible international coordination failure at the recapitalization stage in case of a cross-border bank, as modeled by Freixas (2003), may cause bank liability holders to charge higher interest rates to cross-border banks. As a related issue, national authorities may have limited legal options to resolve distress at an international bank in a quick and cost-effective manner to contain the joint losses of national financial safety nets and bank liability holders, resulting in higher expected losses for bank liability holders.

[3] Building on Freixas (2003), Goodhart and Schoenmaker (2009) consider whether some simple international burden sharing rules would, if adhered to, lead countries to recapitalize banks with a particular international structure.

Alternatively, international banks may have higher interest expenses due to a lack of international cooperation in the regulatory treatment of solvent banks. Bank regulators, in particular, may fail to exchange relevant supervisory information, making it difficult to monitor international banks properly. Also, some countries engage in ring-fencing, i.e. they impose restrictions on profit or capital transfers among a parent banks and its subsidiaries located in different jurisdictions (see Cerutti, Ilyina, Makarova, and Schmieder, 2010). This increases the fragility of individual parts of an international banking group potentially giving rise to higher interest expenses.[4] Furthermore, international differences in bank regulation – in part reflecting regulatory competition - may give rise to regulatory arbitrage by cross-border banks, enabling them to take on more risk leading to higher interest expenses. Houston, Lin and Ma (2011) find evidence that banks have transferred funds to markets with fewer regulations.

Cross-border banking entails various costs and benefits unrelated to the financial safety net and to bank regulation. A policy-related cost of cross-border banking is posed by international double taxation of a bank's foreign-source income (see Huizinga, Voget and Wagner (2011)). Also on the cost side of expansion abroad, Berger, DeYoung, Genay, and Udell (2000) show that foreign banks tend to be less efficient than domestic banks, with foreign banks with a US parent bank being an exception. International expansion only makes sense for a bank, if this generates sufficient benefits to exceed these various costs. The benefits of cross-border banking potentially include being able to serve internationally active customers, asset diversification gains, economies of scale, access to agglomeration benefits in international financial centers, and international regulatory arbitrage (see Claessens and Van Horen (2009),

[4] Risk for liability holders at foreign subsidiaries similarly increases if the parent bank can decide to 'cut loose' a subsidiary in case it experiences distress. Dermine (2006) reports that Bank of Nova Scotia and Crédit Agricole abandoned insolvent subsidiaries in Argentina.

Committee on the Global Financial System (2010), and McCauley, McGuire and von Goetz (2010)). Garcia-Herrero and Vazquez (2007) specifically find that international banks attain higher risk-adjusted returns attributed to diversification gains.

In our regressions, we find a positive and significant relationship between a bank's foreign liabilities share and its interest expenses when we control for bank asset risk as potentially affected by international regulatory arbitrage and by international risk diversification. Our result of strong market discipline of internationalized banks is subjected to three further robustness checks.

First, we acknowledge that a bank's internationalization decision is potentially endogenous to its interest expenses. A bank that is unexpectedly confronted with high interest expenses may, for instance, reduce its degree of internationalization as a way to bring its interest expenses back down. Endogeneity of this kind may dampen our estimated effect of bank internationalization on bank interest expenses. To control for this, we apply instrumental variable estimation to our interest expense equations, using indices of country-level international economic integration as instruments for bank-level internationalization. Our instruments, in particular, relate to tourism, foreign direct investment (FDI), international trade, and international portfolio investment. This approach is motivated by a literature that explains cross-border banking bilaterally on the basis of FDI, international trade, and other determinants (see Grosse and Goldberg (1991), Brealey and Kaplanis (1996), and Focarelli and Pozzolo (2005)). As expected, our instrumental variables results show a stronger impact of bank internationalization on bank interest expenses.

Second, we consider whether bank liability holders exercise market discipline on cross-border banks through the interest costs of the unconsolidated parent of a multinational bank. The

unconsolidated parent bank may be relatively exposed to the risk of a less reliable financial safety resulting from the international expansion of the overall bank, as this part of the bank is likely to receive bailout support only from the parent country authorities in case of distress. We indeed find that the sensitivity of the cost of funds of the unconsolidated parent bank to overall bank performance rises relatively much with overall bank internationalization, as evidence of a reduced reliance on the financial safety net of especially the unconsolidated parent.

Third, we examine whether bank liability holders discipline cross-border banks through reduced deposit growth rates (of the consolidated bank). We find some evidence that cross-border banks experience lower deposit growth rate. This evidence is obtained in specifications that contain bank fixed effects, but it is not robust to eliminating them.

This paper contributes to an extensive literature on market discipline of banks. Flannery and Sorescu (1996) find that spreads on bank subordinated debentures reflect bank risk relatively more during the last three years of the 1983-1991 period, following policy changes that increased the default risk on subordinated bank debentures. For European data over the 1991-2001 period, Sironi (2003) instead finds that spreads on bank subordinated notes and debentures are relatively insensitive to bank risk in the second part of the 1990s, which is attributed to a disappearing perception of safety net guarantees on the part of investors. Park and Peristiani (1998) show that riskier thrifts in the US pay higher interest rates, and attract smaller amounts of uninsured deposits. Goldberg and Hudgins (2002) similarly find that failed banks exhibit declining proportions of uninsured deposits to total deposits prior to failure. Billet, Garfinkel, and O'Neal (1998) conclude that market discipline by uninsured depositors may be ineffective, as riskier banks are able to increase their use of insured deposits. Demirgüç-Kunt and Huizinga (2004) show evidence that a system of explicit deposit insurance weakens market discipline of banks by

depositors using data for around 80 countries, although Martinez Peria and Schmukler (2001) find no evidence of this using data for Argentina, Chile, and Mexico during the 1980s and 1990s.[5]

The remainder of this paper is organized as follows. Section 2 discusses the data, and in particular our measures of bank internationalization. Section 3 presents the results on the impact of bank internationalization on the interest market discipline by depositors through banks' funding costs and deposit growth rates. Section 4 concludes.

2. The data

In this paper, we examine an international sample of 898 banks located in 83 countries for the period 1999-2009. Income statement and balance sheet information on individual banks is taken from the Bankscope database.[6] In addition, Bankscope provides a bank's significant shareholdings in other banks, if any. Using this information, we can match owning banks with directly owned banks. To ensure data quality, we only include owning banks that report some ownership data in a given year and are publicly listed. In addition, we require the owning bank to have a consolidated balance sheet in Bankscope so that we are able to measure the size of owned banks relative to the size of the consolidated owning bank.

[5] Several studies examine whether a bank's size reduces market discipline, as a large bank may be deemed too big to fail. Kane (2000) considers US bank mergers, finding that stockholders of large-bank acquirers have gained value when a deposit institution target is large and even more value when a deposit institution target was previously headquartered in the same state. Benston, Hunter and Wall (1995) similarly find that bank mergers and acquisitions are in part motivated by enhancing the deposit insurance put option. Penas and Unal (2004) consider the returns to bond holders around US bank mergers, finding that adjusted returns on merging banks' bonds are positive across pre-merger and announcement months

[6] We compile time series information on ownership relationships using Bankscope's yearly CDs from 1999 to 2008, while ownership data for 2009 are gathered from Bankscope as available through the Wharton Research Data Services (WRDS).

In this paper, we are interested in seeing whether international banks can rely relatively less on the financial safety net in their countries of operation. For this purpose, we construct several indices of bank internationalization for parent banks. These internationalization indices pertain to foreign subsidiaries and not to foreign branches, as information on foreign branches is not available from Bankscope. Furthermore, we only use information on directly owned foreign subsidiaries. Thus, our internationalization measures to some extent undermeasure the size and complexity of a bank's foreign operations.[7]

First, we consider internationalization as indicated by the extent to which a bank's liabilities are foreign. Banks with large foreign liabilities potentially receive lower bailout benefits. We focus on bank liabilities, as these are commensurate to the potential size of bank bailouts. *Foreign liability share*, specifically, is constructed as the ratio of the sum of all foreign subsidiaries' liabilities, weighted by the parent bank's ownership share, to the consolidated liabilities of the parent firm. The mean value of the foreign liabilities share is 1.9% for the samples of all banks as seen in Table 1, and it is around 5.4% for the sample of only international banks.[8] Figure 1 plots the distribution of the foreign liabilities share for only banks with at least some foreign liabilities, which constitute 34.8% of the overall sample. Among these banks, 55.5% are seen to have a foreign liabilities share of less than 2.5%.

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[7] For the EU, the European Central Bank (2010, Tables 11 and 13) reports that the total assets of foreign intra-EU branches of EU banks amounted to 3.3 trillion euros in 2008, while total assets of foreign intra-EU subsidiaries of EU banks were 4.6 trillion euros in that year. Foreign subsidiaries thus represent 58% of the assets of intra-EU foreign bank establishments. Our data do not appear to undermeasure the overall importance of foreign subsidiaries in the EU. The ECB data for the EU, in particular, allow us to calculate a foreign subsidiary assets share relative to the total assets of credit institutions of 14.1%, while our Bankscope data yield a comparable foreign subsidiary assets share relative to the consolidated assets of banks of 13.1%. Our focus on banks also implies that we ignore the non-bank subsidiaries that banks tend to have (see Herring and Carmassi, 2010, p. 209).

[8] The calculated value of the foreign liabilities share potentially exceeds 1, as some foreign subsidiaries may have internal debt to the parent bank. Indeed, there are very few observation of the foreign liabilities share exceeding 1, and this variable reaches a maximum of 1.64 in our sample.

As an alternative internationalization measure, we consider the level of concentration of the overall bank's liabilities among the countries where the parent bank has some liabilities. A bank with highly concentrated bank liabilities can expect higher bailout benefits, as there is less of a free-rider problem if only one or a few countries can be expected to pay for a bailout. As our concentration variable, we take a Herfindahl index of the concentration of bank liabilities among all countries where the parent bank operates, including the parent bank's country of residence. Specifically, *concentration* is constructed as the sum of the squared shares of a parent bank's liabilities in each of the countries where it operates. For this purpose, a parent bank's share of liabilities in a foreign country is the sum of the liabilities of all foreign subsidiaries in that country weighted by the parent bank's ownership share, divided by the parent bank's consolidated liabilities. The share of liabilities for the parent country is equal to 1 minus the ownership-weighted liability share for all the foreign countries. For a domestic bank, concentration has a value of 1, and Table 1 correspondingly shows that concentration has a maximum value of one. The mean value of concentration is 0.967, which reflects that most banks have liabilities highly concentrated in a single country, mostly the parent country. The minimum value of concentration is 0.271 for a bank with liabilities that are highly dispersed internationally. Figure 2 displays the distribution of the concentration variable.[9]

[9] Both the foreign liabilities share and concentration are based on a foreign subsidiary's liabilities weighted by the parent bank ownership share. Alternatively, we considered constructing analogous internationalization variables that take into account fully the liabilities of only majority-owned foreign subsidiaries. These alternative internationalization variables turn out to be highly correlated to the ones based on weighted ownership shares. Specifically, the correlations between the two foreign liabilities shares and the two concentration variables are 0.835, and 0.969, respectively. Given these high correlations, we only consider internationalization variables based on weighted ownership shares in this paper.

Finally, we consider several alternative internationalization variables based on the number of countries in which an owning bank operates. Among these, *international* is a dummy variable that takes on a value of 1, if a bank has an ownership share of at least 50% in at least one foreign subsidiary. Table 1 shows that 27.0% of banks are international by this measure. The variable *countries* is the number of countries in which a parent bank has a majority ownership stake in a bank, including the parent county. This variable has a mean of 1.540 and a maximum of 22, as seen in Table 1. Figure 3 displays the distribution of the countries variable for the sample of international banks. Most of these banks are active in only one or a few foreign countries, but there are 127 observations (from 36 banks) with majority-owned banks in 5 or more countries, including the parent country. As an alternative, we will also consider the log of the number of countries where a bank operates. This variable has a mean of 0.267.

In the empirical part, we examine whether internationalization affects market discipline. Depositors and other bank liability holders can impose market discipline on a risky bank resulting in a higher interest expenses on bank liabilities. Our main interest expense variable is constructed as the ratio of interest expenses to total liabilities at the consolidated bank level. This variable reflects potential stresses at the group level as well the bank's overall access to the financial safety net in the countries where it operates. Alternatively, we consider interest expenses relative to total liabilities at the level of the unconsolidated parent bank. The unconsolidated parent bank is possibly also affected by stresses anywhere in the international banking group, but it primarily has to rely on the financial safety net of the parent country. The mean values of the interest expense ratios at the consolidated and unconsolidated levels are 0.033 and 0.039, respectively. In a robustness check, we also consider whether market discipline gives rise to lower growth rates of deposits at internationalized banks. The deposit growth rate, which

is computed as the annual rate of real growth of deposits in percent, has a mean value of 0.089 in the sample.

Stronger market discipline should be applied to banks that are at greater risk of failure. Underperforming banks should be especially at risk. Thus, our main index of failure risk is a bank's profitability rate, constructed as the ratio of pre-tax profits over total asset and lagged one period to reduce endogeneity concerns. The profitability variable has a sample mean of 0.013. Alternatively, we consider an index of bank risk measuring bank asset volatility. Specifically, bank asset volatility is the delevered standard deviation of bank stock returns, or more precisely the annualized standard deviation of bank stock returns multiplied by the ratio of the market value of common equity to the imputed market value of assets, computed as the book value of assets plus the market value of common equity and minus the book value of common equity (see Nikolova, 2003).

The empirical work includes several bank-level and country-level control variables. Banks that are large in absolute terms – or relative to their national economies – may face lower interest expenses on account of being too-large-to-fail, or alternatively pay higher interest rates if they are too-big-to-save. To control for a bank's absolute size, we include the assets variable, constructed as the log of total bank assets, with a mean value of 22.9. To represent a bank's relative size, the liabilities over GDP variable is computed as the ratio of a bank's total liabilities to GDP, with a mean value of 0.098. Further, overhead is the ratio of personnel and other non-interest expenses to total assets with a mean value of 0.028, and short term debt is short term debt divided by total liabilities with a mean of 0.815. Our macroeconomic control variables are consumer price inflation, the growth rate of real GDP per capita, GDP per capita in thousands of constant 2000 US dollars, and inflation difference constructed as the average foreign-country

inflation rate weighted by the bank's foreign liabilities minus the inflation rate in the parent country.

Finally, there are four indices of country-level economic integration that are used as instruments for bank-level internationalization. First, tourism is the total number of tourist arrivals in and departures from a country normalized by its population with a mean of 0.789. Second, FDI stands for foreign direct investments flows, both inward and outward, relative to GDP with a mean of 0.054. Third, openness is sum of imports and exports over GDP with a mean of 0.539. Fourth, portfolio position stands for the stocks of inward and outward portfolio investments of a country divided by its GDP with a mean of 0.994.

To conclude this section, Table 2 provides pairwise correlations between our internationalization variables, and the interest expense and deposit growth variables. The correlation between the consolidated interest expense variable and the foreign liabilities share is positive and significant at 1%, while the correlation between consolidated interest expense and liability concentration is negative and significant at 1%. Further, consolidated interest expense is positively correlated with the international dummy, the number of countries, and the log of the number of countries, all with significance levels of 1%. These correlations are all consistent with a more fragile financial safety net for internationalized banks. Correlations between unconsolidated interest expense and the internationalization variables, instead, are statistically insignificant throughout. Also, correlations between consolidated deposit growth and internationalization variables are insignificant, whereas the bank internationalization variables are significantly correlated among themselves, as expected.

3. Empirical results on internationalization and market discipline

In this section, we present empirical results on the market discipline of internationalized banks. To start, section 3.1 presents results of regressions that relate a bank's consolidated interest expenses to measures of bank internationalization and to bank profitability as an index of bank performance. Next, in section 3.2 we consider the possibility that consolidated interest expenses are endogenous to bank internationalization. In particular, we present regressions where we include lagged values of our internationalization measures, and where we instrument for bank internationalization using indices of a country's international economic integration. Section 3.3 examines how the relation between consolidated interest expenses and bank internationalization is affected by bank asset volatility to reflect bank risk. Finally, section 3.4 presents results on bank internationalization and market discipline through the parent bank's unconsolidated interest expenses and the consolidated bank's deposit growth rate.

3.1. Interest expenses and internationalization

In this subsection, we first relate a bank's consolidated interest expenses to its foreign liabilities share, and subsequently to other indicators of bank internationalization. The basic estimating relationship between consolidated interest expenses, the bank's foreign liabilities share, and its profitability to represent bank performance is as follows:

$$Interest\ expense_{ijt} = \alpha_j + y_t + \beta_1 Foreign\ liabilities\ share_{ijt} +$$

$$\beta_2\ Profit_{ijt-1} * Foreign\ liabilities\ share_{ijt} + \beta_3\ Bank_{ijt} + \beta_4\ Country_{jt} + \varepsilon_{ijt}$$

where the subscripts *i*, *j*, and *t* denote the bank, the country, and the year, and α_j and y_t are country and year fixed effects. Further, $Bank_{ijt}$ is a set of bank variables including lagged bank profitability and $Country_{jt}$ is a set of macroeconomic variables.

The coefficient β_1 reflects the effect of bank internationalization per se (as proxied by the foreign liabilities share) on interest expenses. Importantly, bank internationalization potentially reduces a bank's access to the financial safety net, leading to higher interest expenses.

Banks expand abroad presumably to become more profitable and/or to mitigate (stand-alone) bank risk.[10] We control for these channels by which internationalization may affect interest expenses by including the lagged profit variable and, in some specifications, the bank asset volatility variable in the regressions.

The coefficient β_2 captures whether the relationship between interest expenses and a bank's foreign liabilities share depends on its performance, as proxied by the lagged bank profitability variable. In particular, a negative estimated coefficient β_2 indicates that bank interest expenses rise relatively much with the foreign liabilities share for badly performing banks, i.e. banks with low profitability. Badly performing banks stand a greater chance of bank distress and of needing to access the financial safety net. Thus, a negative value of β_2 suggests that banks with a high foreign liabilities share can expect less from the financial safety net in case they become distressed.

In Table 3 we report interest expense regressions including the foreign liabilities share, country and year fixed effects and with standard errors clustered at the bank level. To start, regression 1 include the foreign liabilities share itself but not its interaction with profitability. The foreign liabilities share obtains a positive coefficient that is statistically insignificant. Regression 2 in addition includes an interaction of the foreign liabilities share and profitability yielding positive and negative coefficients that are both statistically insignificant.

[10] Garcia-Herrero and Vazquez (2007) find that international banks attain higher risk-adjusted returns attributed to diversification gains. Amihud, DeLong, and Saunders (2002) find that cross-border mergers neither increases nor decreases the acquiring bank's risk.

As seen in Figure 1, the distribution of the foreign liabilities share mostly shows low values, with several significantly higher values. Therefore, the estimation could primarily be driven by a relatively small number of outliers. To control for this, regressions 3 and 4 exclude observations of the foreign liabilities share exceeding 0.3, while they are otherwise analogous to regressions 1 and 2. In regression 3, the foreign liabilities variable obtains a coefficient of 0.020 that is significant at the 10% level. In regression 4, the foreign liabilities share obtains a positive coefficient of 0.040 that is significant at 1%, while its interaction with profitability obtains a negative coefficient of -1.491 that is significant at 1%.

The relation between interest expenses and the foreign liabilities share could be nonlinear. A low level of foreign liabilities, in particular, may increase interest expenses relatively much, as it introduces the complication of an international financial safety net coverage. To test this, regressions 5 and 6 include a squared foreign liabilities share variable starting from regressions 1 and 2. In regression 5, the coefficient for the foreign liabilities share is estimated to be 0.021 and significant at 10%, while the coefficient for the squared foreign liabilities share variable is negative and statistically insignificant. In regression 6, the foreign liabilities share and its interaction with profitability are estimated to be positive and negative at the 5% level, while the squared foreign liabilities and its interaction with profitability are estimated with insignificant coefficients.

A bank's consolidated interest expenses may rise mechanically with its foreign liabilities share if the general rate of interest in the foreign countries where it operates is higher. To control for this possibility, regression 7 and 8 include the *Foreign liabilities share*Inflation difference* interaction variable in regressions 1 and 2, where inflation difference is the difference between the foreign-liabilities weighted foreign inflation rate and the parent-country inflation rate. We

expect this control variable to obtain a positive coefficient, as banks that venture into high-inflation countries are likely to raise some local-currency funds in these countries. In regressions 7 and 8, this control variable obtains positive coefficients that are significant at 1%. The foreign liabilities variable obtains a coefficient of 0.015 in regression 7 that is significant at 5%. This estimated coefficient is somewhat higher than the corresponding estimate of 0.012 in regression 1, which reflects that banks tend to raise foreign liabilities in countries with average inflation rates that are slightly lower than the parent-country inflation rate.[11] In regression 8, neither the foreign liabilities share nor its interaction with bank profitability obtain statistically significant coefficients.

Finally, regressions 9 and 10 add the *Foreign liabilities share*Inflation difference* variable to regressions 5 and 6, which include squared terms in the foreign liabilities share. In regression 10, the linear and squared foreign liabilities variables enter with positive and negative coefficients that are significant at 1% and 5%, respectively. Their interactions with profitability obtain coefficients with opposite signs that are also significant at 1% and 5%. Together these results suggest that consolidated interest expenses rise with the foreign liabilities share at a decreasing rate, especially for banks with low profitability. This is strong evidence that international banks, and especially badly performing ones, experience market discipline through higher consolidated interest expenses.

We can use the estimated coefficients in regression 10 to evaluate the economic significance of the impact of the foreign liabilities share on bank interest expenses. Specifically, a one-standard deviation increase in the foreign liabilities share of 0.065 (evaluated mean profitability of 0.013, mean inflation difference of -0.008, and mean foreign liabilities share of

[11] The inflation difference variable has a negative mean of -0.008 as seen in Table 1.

0.019 from Table 1) is estimated to increase the interest expense by 0.00183 or 0.183% [= (0.063 -2.278*0.013 - 0.180*2*0.019 + 11.134*2*0.019*0.013 - 0.489*0.008)*0.065)]. This is equivalent to a share of 0.00183/0.024, or 7.6%, of the standard deviation of the interest variable, which is 0.024 from Table 1. Thus, variation in the foreign liabilities share can explain only a small part of the variation in bank interest expenses. This is not surprising, as most banks are purely domestic and even most international banks have predominantly domestic liabilities.

Perhaps a more meaningful way to assess the impact of internationalization on interest costs is to compare the absolute cost of funds for an internationalized bank to the cost of funds for a similar, purely domestic bank. Across regressions 3, 5, 7, and 9, we obtain significant coefficients on the linear foreign liabilities share that range from 0.015 to 0.024. This suggests that the (marginal) cost of foreign liabilities is between 1.5% and 2.4% higher than the cost of funds for a purely domestic bank, which is a material difference given an overall mean interest expense of 3.3% from Table 1.[12]

By implication, the interest expense ratio is estimated to be between 8 and 13 basis points higher for the average internationalized bank with a foreign liabilities share of 5.4%. For comparison, using ratings information Ueda and di Mauro (2010) estimate that protected banks in G20 countries and in Spain and Switzerland received interest subsidies in the range of 10-50 basis points in 2007 on account of their too-big-to-fail status. These various estimates together suggest that protected banks around the world are subsidized by the financial safety net due to

[12] Perhaps this is an overestimate, as our estimation suffers from a left-out-variable bias caused by a lack of data on a bank's foreign liabilities through its foreign branches. In the EU, the average bank's foreign liabilities through its foreign subsidiaries represent about 58% of its total foreign liabilities (see footnote 7). This suggests that the marginal cost of foreign liabilities could be in a lower 1.0% to 1.6% range, if we assume that foreign liabilities through foreign branches and subsidiaries are highly correlated and that they lead to similar market discipline through higher interest expenses.

too-big-to-fail considerations, even if internationalization per se increases bank interest expenses on account of a relatively less reliable financial safety net for international banks.

In Table 4 we present regressions where we replace the foreign liabilities share with one of several other internationalization measures. Regressions 1 and 2 include the foreign liability concentration ratio, and are otherwise analogous to regressions 1 and 2 of Table 3. In regression 2, the concentration variable obtains a negative and significant coefficient, consistent with the view that banks with internationally more concentrated liabilities face lower interest expenses because they can rely more on the financial safety net. Regression 3 and 4 include the international dummy variable, yielding a negative and significant interaction term of the international dummy and bank profitability, as evidence that banks with at least one majority-owned foreign subsidiary and low profitability face higher interest costs. Regressions 5-6 and 7-8 include the number of countries and its log, respectively. In regressions 6 and 8, the interaction terms of the included internationalization measure and bank profitability obtain negative coefficients that are significant at 10% and 1%, respectively. This indicates that banks with operations in many countries and low profitability pay higher interest expenses, consistent with view that such banks are subject to a less dependable financial safety net. Overall, the results of Table 4 provide further evidence that internationalized banks are subject to enhanced market discipline through higher consolidated interest expenses, especially if they are performing badly.

Next, we consider whether the main results of Tables 3 and 4 are robust to including bank fixed effects, instead of country fixed effects. In particular, Table 5 re-estimates regressions 1-4 of Table 3 and the regressions of Table 4 for the case where we include bank fixed effects. The foreign liabilities share is positive and significant at the 5% or 10% level in regressions 1-4, and the concentration variable is negative and significant at 10% and 5% in regressions 5-6,

consistent with effective market discipline on internationalized banks. However, the log of the number of countries is negative and significant at 10% in regression 11, running counter to the idea that internationalized banks pay higher interests, but this variable is insignificant in regression 12, which includes an interaction term of the log of the number of countries with profit. In regression 12, this interaction term obtains a negative and significant coefficient, suggesting that it is appropriate to include this interaction term.

The signs of estimated coefficients for interaction terms of the included internationalization variable and bank profitability in the table are all consistent with effective market discipline of internationalized banks with low profitability, and they are statistically significant (except in regression 2 where the interaction of the foreign liabilities share and bank profitability obtains a negative coefficient that is marginally insignificant at 10%, with a p-value of 0.106). Comparing regressions 3 in Table 3 and 5, we see that the foreign liabilities share obtains coefficients of 0.020 and 0.021 that are of comparable size.

Overall, the results in Tables 3-5 suggest that internationalized banks pay significantly higher interest expenses, especially if they are badly performing. This is evidence that liability holders of internationally active banks expect relatively large losses to materialize. This is consistent with the view that international bank bailouts are a public good, to which national financial safety net managers contribute reluctantly. Alternatively, financial safety net managers may have difficulty intervening at a distressed international bank quickly even if they cooperate, with the potential for losses to liability holders to magnify.

3.2. Endogeneity issues

Our results so far suggest that bank internationalization leads to higher consolidated interest expenses. This implies that an international bank that faces high interest expenses may be able to reduce these by lowering its degree of internationalization. Thus, higher interest expenses may trigger a reduction in internationalization, making internationalization endogenous to interest expenses. If so, the estimated impact of our internationalization measures on interest expenses may be biased downward in absolute terms. This section presents the results from two approaches aiming to deal with possible endogeneity. First, we present a set of interest expense regressions where we replace the included internationalization measure by its lagged value, reducing the potential for reverse causation. Second, we estimate IV regressions where we use indices of international economic integration at the country level to instrument for bank-level internationalization. Measures of country-level economic integration are positively correlated with measures of bank-level internationalization, but they are unlikely to be affected by the level of bank interest expenses, and hence are likely to be appropriate instruments.

To start, Table 6 present results of interest expense regressions analogous to Table 5 where the included internationalized measure has been lagged one year, reducing the sample by about a third. The regressions include county fixed effects, and control for clustering of the errors at the bank level. In regressions 3 and 4, the lagged foreign liabilities share obtains coefficient of 0.025 and 0.031 that are significant at the 5% and 10% level, respectively, and slightly larger and smaller than the estimated coefficients of 0.020 and 0.040 in regressions 3 and 4 of Table 3. In regression 6, we see that interest expenses are negatively and significantly related to the lagged concentration variable, with a coefficient that is slightly more negative than the corresponding coefficient in regression 2 of Table 4. Further, there are negative and

significant interaction terms of the lagged foreign liabilities share variable and the profit variable in regression 2, and of the lagged international variable with the profit variable in regression 8, consistent with a reduced reliance on the financial safety net by internationalized banks. Overall, the results of Table 6 suggest a positive impact of bank internationalization on bank interest expenses after we lag the internationalization variables, while the magnitude of the effect is similar to Tables 3 and 4.

Next, we use an instrumental variable approach to control for the possible endogeneity of interest expenses. As instruments for our bank-level internationalization indices, we use four measures of country-level international economic integration: the number of tourist arrivals and departures over total population, the sum of inward and outward FDI over GDP, exports plus imports over GDP, and the sum of portfolio-investment assets and liabilities over GDP. We use a country fixed-effects model with two-step GMM estimation clustering standard errors at the bank level. Exploiting the Frisch-Waugh-Lovell (FWL) theorem set out in Lovell (1963), we partial out the country fixed effects and the constant without affecting the estimation of the coefficients for the remaining regressors.

The IV estimation is applied to the interest expense specifications of Table 5 with country fixed effects. All the instruments are expected to have a positive impact on bank internationalization indices (with the exception of concentration), as banks in internationally integrated economies should internationalize more. The estimated coefficients from the first-stage regressions provided in Table 7 tend to confirm this expectation, as the instruments generally obtain positive signs. The instruments do not individually have high levels of significance except FDI, which is statistically significant in all first-stage regression except regression 10, but together the instruments suffice to identify the various internationalization

measures. The joint significance tests for excluded instruments are rejected for all regressions at minimally the 5% level, with p-values presented in the table. The first-stage regressions for the interaction terms of an internationalization variable with profit also perform well (unreported). Underidentification does not seem to be a problem, as all regressions in the table pass underidentification tests with at least 10% significance.

Our instruments reflect country-level economic integration, and there is no obvious reason why they should affect bank-level interest expenses other than through bank-level internationalization. Indeed, our instruments do not significantly affect interest expenses when included in baseline regressions, while the included foreign liability share variable continues to be statistically significant as in the earlier results. We report the results of overidentifying restrictions tests in the form of Hansen J-tests for our efficient GMM estimation. The results indicate that the overidentifying restrictions tests are met in all regressions that show significant results concerning bank internationalization at the second stage. They, however, reject the validity of the instruments at 10% in the regressions 7, 9 and 11, which include the international dummy or the (log of the) number of countries, without an interaction term with profit.

In the second-stage regression 1 and 3, the foreign liability share is estimated with coefficients of 0.076 and 0.083 that are significant at the 5% and 1% levels, respectively. These estimated coefficients are higher than the corresponding coefficients in Table 3, which suggests a downward bias in our earlier estimation. In regression 5, the concentration variable enters with a negative coefficient of -0.045 that is significant at 1%, and more negative than the corresponding estimate in regression 1 of Table 4, which similarly is consistent with a less pronounced impact of internationalization on interest expenses in the OLS estimation. Otherwise, estimated coefficients associated with internationalization variables and their interactions with profits are

estimated to be statistically insignificant in Table 7. For the regressions that alternatively include the international dummy and the (log of the) number of countries, Hausman endogeneity tests, however, suggest that there is no need for IV estimation, while in regressions including the foreign liabilities share and concentration variables (except regression 4) there is reason for IV estimation. Overall, the IV estimation in Table 7 offers some evidence that bank internationalization causes higher consolidated bank interest expenses, consistent with the perception of a more fragile financial safety net for internationalized banks.

3.3. Robustness check: measuring bank risk by asset volatility

So far we used bank profitability to proxy for the likelihood that a bank would have to access the financial safety net. In this section, we in addition use a measure of a bank's asset risk to represent the chance that a bank will experience distress. In particular, the asset volatility variable represents the bank's share price volatility adjusted for bank leverage. Precisely, asset volatility is calculated as the annualized standard deviation of weekly dividend-inclusive bank stock returns, multiplied by the ratio of the market value of common equity to the imputed market value of assets (calculated as the book value of assets plus the market value of common equity and minus the book value of common equity). The asset volatility variable controls for potentially different asset risk profiles of international banks resulting from international risk diversification and international regulatory arbitrage.

We present three tables with interest expense regressions that include the asset volatility variable and interactions of this variable with our internationalization measures. Specifically, Table 8 presents regressions with country fixed effects (analogous to Tables 3 and 4), Table 9

presents regressions with bank fixed effects (analogous to Table 5), and Table 10 presents IV regressions to deal with possible endogeneity (analogous to Table 7).

In Table 8, the asset volatility variable enters with positive coefficients that are significant at 10% in all but 2 of the regressions. In regression 3 and 4, the foreign liabilities share obtains coefficients that are positive and significant. In regression 5, concentration has a significantly negative coefficient, indicating higher interest expenses for more internationalized, less concentrated banks. The interaction terms with the internationalization variables are estimated with insignificant coefficients throughout. The results of regressions with bank fixed effects reported in Table 9 are similar. There is evidence that foreign liabilities share and concentration affect bank interest expenses in ways that are consistent with effective market discipline of internationalized banks, but interaction terms of asset volatility with internationalization measures are estimated with insignificant coefficients. In regression 8, the international dummy has a negative and marginally significant coefficient, unlike in the corresponding regression in Table 8 and unlike regression 7 in Table 9 where we do not include an interaction of asset volatility and the international dummy.

Table 10 presents IV regressions that include asset volatility and its interaction term with the included internationalization variable. Instrumentation is very similar with our earlier IV estimation in Table 7, and underidentification is not found to be a problem. As in Table 7, regressions 7, 9 and 11 cannot pass the Hansen-J test of the overidentifying restrictions with significance of 10%, but for these regressions the endogeneity tests (with as a null hypothesis no need for IV estimation) are not rejected suggesting IV estimation is not necessary. As in the earlier two tables, Table 10 does not provide any significant interaction terms. Nevertheless, there is considerable evidence for a positive relationship between interest expense and the degree

of bank internationalization. The foreign liabilities share and concentration are significant in all regressions in which they are included. Furthermore, the coefficients of these variables are very close to the significant coefficients in Table 7 providing IV estimation without asset volatility. In regressions 10 and 12, the number of countries and log of the number of countries have positive coefficients significant at 10%, unlike in Table 7.

Overall, the positive relationship between interest expenses and internationalization is robust to including asset volatility in the regressions, consistent with market discipline of internationalized banks. The sensitivity of interest expenses to measures of internationalization, however, does not appear to be affected by bank asset volatility.

3.4. Robustness check: unconsolidated interest expense and deposit growth rates

So far we have examined whether bank internationalization affects a bank's consolidated interest expenses to test for market discipline on internationalized banks. In this section, we consider whether internationalization in addition affects the interest expenses of the unconsolidated parent bank, and also the rate of deposit growth of the consolidated bank.

There are two reasons to focus on unconsolidated parent-bank interest expenses rather than consolidated interest expenses. First, the unconsolidated parent bank is mainly a responsibility of the bank's home-country financial safety net, more so than other parts of a multinational bank. All the same, the unconsolidated parent bank is likely to be treated differently from a stand-alone domestic bank, if the unconsolidated parent bank can only be saved if the consolidated bank is saved as well. In particular, market discipline of internationalized banks through higher unconsolidated-bank interest expenses suggests that unconsolidated parents can be expected to receive relatively little from their domestic financial

safety nets. A further reason to focus on unconsolidated parent-bank interest expenses is that they potentially are primarily in the currency denomination of the parent country, mitigating concerns that interest expenses reflect differences in nominal interest rates across the countries where the multinational bank operates. A disadvantage of focusing on unconsolidated interest expenses, however, is that they to some extent can reflect interest rates on intra-bank loans that may differ from market-determined interest rates, for instance so as to shift taxable profits internationally within the multinational bank. Also, we reduce the sample size by about two thirds by examining unconsolidated interest expenses.

Table 11 presents regressions with unconsolidated interest expenses as the dependent variable including country fixed effects. In regression 4, we find that the consolidated-bank foreign liabilities share and its interaction with the consolidated-bank profit variable receive coefficients of 0.070 and -3.924 that are both significant at 1%. Both estimated coefficients are larger in absolute value than the coefficients in the corresponding consolidated interest expense regression 4 of Table 3. Thus, the sensitivity of unconsolidated interest expenses to overall profitability increases relatively much with overall internationalization, consistent with market discipline of especially the unconsolidated parent of a multinational bank. Similarly, in regression 6 the sensitivity of unconsolidated interest expenses to overall profitability is found to increase relatively much with the overall concentration variable (compared to consolidated interest expenses as seen from regression 2 of Table 4 where the estimated coefficient on the interaction of concentration and profit is smaller and insignificant).

In regression 7, we see that the international dummy receives a negative coefficient of -0.008 that is significant at 5%, suggesting an internationalized bank faces lower interest expenses. In regression 8, however, the international dummy receives a coefficient that is

insignificant, while the interaction of international with profit receives a negative coefficient that is significant at 5%, consistent with market discipline of underperforming internationalized banks. This suggests that the negative and significant coefficient on the international dummy in regression 7 results from left out variable bias. Regressions 9-12 including the (log of the) number of countries display similar patterns.

Table 12 is similar to Table 11 but it includes bank fixed effects. In regression 2, the interaction of the foreign liabilities share and profit obtains a negative and significant coefficient, unlike in regression 2 of Table 11. Conversely, the concentration variable receives an insignificant coefficient in regression 6 of Table 12. Furthermore, the international dummy and the (log of the) number of countries obtain insignificant coefficients in regressions 7, 9, and 11 of Table 12.

To conclude this section, we examine whether deposit growth rates provide evidence of market discipline on internationalized banks. In particular, internationalized banks may experience lower deposit growth rates, especially if they are performing badly, as evidence of market discipline. Table 13 provides regressions of consolidated-bank deposit growth rates including country fixed effects that are similar to the earlier sets of interest expense regressions. In regression 8, the international dummy obtains a negative coefficient of -0.025 that is significant at 10%, consistent with market discipline on internationalized banks. Otherwise, none of the internationalization variable or interactions of these variables with profit obtains a significant coefficient. Thus, in Table 13 we find little scant evidence of market discipline of internationalized banks through deposit growth rates.

Finally, Table 14 reports results analogous to Table 13 including bank fixed effects. The foreign liabilities share is seen to obtain negative and significant coefficients in regression 1, 2

and 4 in line with the market discipline hypothesis. Similarly, the concentration variable obtains positive and significant coefficients in regressions 5 and 6, consistent with the market discipline hypothesis. Furthermore, in regression 8 a positive and significant interaction term of international dummy and profit suggests higher sensitivity of deposit growth rates to the bank performance for internationalized banks - which is also confirmed by regression 12 including the log number of countries. In addition, regressions 10 and 12 provide evidence for an immediate negative impact of number of countries on deposit growth rates. Overall, Table 14 suggests that there is some effective market discipline through deposit growth rates of internationalized banks.

4. Conclusion

This paper provides evidence that internationalized banks face higher interest expenses. In particular, consolidated banks with a higher share of foreign liabilities and a lower international concentration of their liabilities pay higher interest expenses. Our benchmark estimation suggests that an international bank's cost of funds raised through a foreign subsidiary is between 1.5% and 2.4% higher than the cost of funds for a purely domestic bank, which is a sizeable difference given an overall mean cost of funds of 3.3% in our sample. Our finding that internationalized banks face higher interest expenses is robust to IV estimation where we use indices of country-level economic integration to instrument for bank-level internationalization. We find evidence that bank internationalization is associated with higher interest expenses of the unconsolidated parent bank as well, and with lower deposit growth rates of the consolidated bank.

These results suggest that the bank liability holders of internationalized banks expect to suffer relatively high losses on their holdings. Bank liability holders only suffer losses following

bank distress if they are not made whole by the financial safety net. Hence, bank liability holders of internationalized banks appear to rely relatively little on the financial safety net. This could reflect that national financial safety net manages are less likely to contribute to the bailout of a cross-border bank, or that the recovery and resolution process as applied to a cross border bank is expected to be relatively inefficient.

A less reliable financial safety net for international banks puts international banks at a competitive disadvantage, and is a barrier to international banking market integration. Any lower implicit subsidies through national financial safety nets, in particular, imply a higher cost of funds for internationally active banks. To remedy the potentially discriminatory nature of the financial safety net against international banks, institutional reform can be envisaged. Specifically, decisions regarding the bailouts of international banks can be taken away from national authorities and, instead, be entrusted to international bodies. The EU, for instance, could create a European Resolution Authority to make formal decisions on international European bank bailouts.[13] Such a resolution authority would be in a position to internalize all the international externalities of a cross-border bank bailout, and presumably it would have powers to assign the overall fiscal burden to the countries involved.

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[13] In the EU context, international agreements regarding bank regulation and resolution so far inadequately address potential international conflicts of interest regarding distressed banks. The directive on the winding-up of credit institutions (European Commission, 2001) determines that the parent country's legal system applies in case of a bank dissolution and that all bank creditors have to be treated equally in case of an internationally branched bank, while not addressing the parent country's disincentive to provide bail out funding. The EU directive on financial conglomerates (European Commission, 2001) requires each cross-border bank to have a principle supervisor which is intended to play a leading role in case of an international bank restructuring or winding-up. This potentially improves the availability of information at the time of bank distress, but it does not eliminate the basic conflict of interest among the involved states regarding fiscal burden sharing. The creation of the European Banking Authority in 2011 may similarly strengthen the supervision of large cross-border banks in the EU, without affecting the outcome of international bank resolutions. The EU has set out to improve its framework for bank recovery and resolution, but these efforts are currently only at the consultative stage (see European Commission, 2011).

The advantage of such an approach is that it could bring about recapitalizations of international banks that are collectively optimal at the time of an international banking crisis. A disadvantage of improved access to the financial safety net for international banks, however, is that it may increase moral hazard contributing to excessive risk taking. On balance, it is not clear whether it is desirable to improve the bailout prospects of international banks.

Less ambiguously, the international economy can benefit from enlarging the recovery and resolution options available to authorities dealing with weakened international banks (as envisaged by the European Commission, 2011). In the end, quick intervention strategies and least-cost resolution methods should be made applicable to all banks, regardless of their degree of internationalization. This would reduce moral hazard and the likelihood of a costly bailout for domestic and cross-border banks alike, thereby creating a level playing field for all banks.

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Appendix. Variable definitions and data sources

Variable	Description	Sources
Foreign liabilities share	Sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities	Bankscope
Concentration	Sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates	Bankscope
International	Dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank	Bankscope
Countries	Number of countries where a bank has a majority stake in a bank, including the parent country	Bankscope
Log of countries	Natural logarithm of the number of countries where a bank has a majority state in a bank, including the parent country	Bankscope
Interest expense	Interest expense over bank liabilities excluding non-interest bearing debt	Bankscope
Interest expense, unconsolidated	Interest expense over bank liabilities excluding non-interest bearing debt in the unconsolidated statement of the parent bank	Bankscope
Deposit growth	Growth rate of a bank's customer and short term funding after dividing by the GDP deflator in percent	Bankscope and WDI
Lagged profit	Pre-tax profits divided by assets, lagged one period	Bankscope
Lagged asset volatility	Bank asset volatility calculated as $\text{stddev}(E) * (E/V)$, where stddev(E) is the annualized standard deviation of weekly dividend-inclusive bank stock returns, E is the market value of common equity and V is the book value of assets plus the market value of common equity minus the book value of common equity, lagged one period	Bankscope and Datastream
Assets	Log of assets in millions of 2000 US dollars	Bankscope and WDI
Liabilities over GDP	Bank liabilities divided by GDP of the home country	
Overhead	Ratio of personnel and other non-interest expenses to assets	Bankscope
Short term debt	Bank's customer and short term funding divided by total interest-bearing debt	Bankscope
Inflation	Rate of change in consumer prices	WDI
GDP growth	Rate of real per capita GDP growth	WDI
GDP per capita	GDP per capita in thousands of constant 2000 U.S. dollars	WDI
Tourism	Sum of number of tourist arrivals and departures over population of the country	WDI
FDI	Sum of inward and outward flows of foreign direct investments over GDP	WDI
Openness	Sum of exports and imports over GDP	WDI
Portfolio position	Sum of assets and liabilities with respect to a country's portfolio investment position over GDP	IMF IFS
Inflation difference	The difference between foreign inflation and parent-country inflation where foreign inflation is the sum of foreign-country inflation rates weighted by the foreign countries' shares in total foreign liabilities of a parent bank	Bankscope and WDI

Table 1. Summary statistics on internationalization and other variables

Foreign liabilities share is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. *Interest expense* is interest expense over bank liabilities excluding non-interest bearing debt. *Interest expense, unconsolidated* is interest expense over bank liabilities excluding non-interest bearing debt in the unconsolidated statement of the parent bank. *Deposit growth* is the growth rate of a bank's customer and short term funding after dividing by the GDP deflator in percent. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Lagged asset volatility* is calculated as $\text{stddev(E)} * (\text{E/V})$, where stddev(E) is annualized standard deviation of weekly dividend-inclusive bank stock returns, E is market value of common equity and V is book value of assets plus market value of common equity minus book value of common equity, lagged one period. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is customer and short term funding to total interest paying debt. *Inflation* is the rate of change in consumer prices. *GDP growth* is the rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Inflation difference* is the difference between foreign inflation and parent-country inflation where foreign inflation is the sum of foreign-country inflation rates weighted by the foreign countries' shares in total foreign liabilities of a parent bank. Data for this variable in this table only reflect observations with a positive foreign liabilities share. *Tourism* is total number of touristic arrivals and departures over total population. *FDI* is the sum of inward and outward flows of foreign direct investments over GDP. *Openness* is the sum of exports and imports of goods and services over GDP. *Portfolio position* is the sum of assets and liabilities regarding a country's portfolio investment position over GDP.

Variables	Obs	Mean	Std. Dev.	Min	Max
Foreign liabilities share	3684	0.019	0.065	0	1.640
Concentration	3682	0.967	0.086	0.271	1
International	3684	0.270	0.444	0	1
Countries	3684	1.540	1.312	1	22
Log of countries	3684	0.267	0.491	0	3.091
Interest expense	3684	0.033	0.024	0.000	0.289
Interest expense, unconsolidated	1366	0.039	0.044	0.000	0.731
Deposit growth	3671	0.089	0.243	-3.527	3.372
Lagged profit	3684	0.013	0.025	-0.437	0.293
Lagged asset volatility	3124	0.040	0.049	0.000	0.664
Assets	3684	22.900	2.197	17.540	28.788
Liabilities over GDP	3684	0.098	0.220	0.000	1.983
Overhead	3684	0.028	0.019	0.002	0.200
Short term debt	3684	0.815	0.170	0	0.995
Inflation	3684	0.037	0.056	-0.040	0.961
GDP growth	3684	0.021	0.030	-0.210	0.433
GDP per capita	3684	24.994	14.606	0.154	63.475
Inflation difference	1274	-0.008	0.083	-0.961	0.451
Tourism	3075	0.789	1.378	0.008	14.221
FDI	3075	0.054	0.070	0.001	1.009
Openness	3075	0.539	0.538	0.190	4.381
Portfolio position	3075	0.994	0.705	0.000	15.126

Table 2. Correlations for interest expense, deposit growth and internationalization variables

Interest expense is interest expense over bank liabilities excluding non-interest bearing debt. *Interest expense, unconsolidated* is interest expense over bank liabilities excluding non-interest bearing debt in the unconsolidated statement of the parent bank. *Deposit growth* is the growth rate of a bank's customer and short term funding after dividing by the GDP deflator in percent. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. *** denotes significance at 1%.

	Interest expense	Interest expense, uncons.	Deposit growth	Foreign liabilities share	Concentration	International	Countries	Log of countries
Interest expense	1							
Interest expense, unconsolidated	0.558***	1						
Deposit growth	-0.092***	0.024	1					
Foreign liabilities share	0.134***	0.016	-0.008	1				
Concentration	-0.157***	-0.014	0.004	-0.965***	1			
International	0.171***	-0.018	-0.025	0.399***	-0.534***	1		
Countries	0.098***	-0.032	-0.017	0.357***	-0.478***	0.677***	1	
Log of countries	0.144***	-0.032	-0.020	0.412***	-0.550***	0.894***	0.914***	1

Table 3. A bank's foreign liabilities and bank interest expense

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Inflation difference* is the difference between foreign inflation and parent-country inflation where foreign inflation is the sum of foreign-country inflation rates weighted by the foreign countries' shares in total foreign liabilities of a parent bank. In regressions 3 and 4 we require *Foreign liabilities share* to be less than 0.3. We estimate all regressions using country and year fixed effects. The standard errors clustered at bank level are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Assets	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Liabilities over GDP	-0.004	-0.004	-0.005*	-0.005*	-0.004	-0.005*	-0.005*	-0.005*	-0.005*	-0.006**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Overhead	0.070	0.068	0.068	0.066	0.070	0.068	0.045	0.045	0.046	0.044
	(0.045)	(0.045)	(0.044)	(0.043)	(0.045)	(0.044)	(0.045)	(0.045)	(0.045)	(0.044)
Short term debt	-0.023***	-0.022***	-0.023***	-0.022***	-0.023***	-0.022***	-0.023***	-0.023***	-0.023***	-0.023***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Inflation	0.097***	0.097***	0.098***	0.097***	0.097***	0.096***	0.134***	0.133***	0.133***	0.136***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.021)	(0.021)	(0.021)	(0.021)
GDP growth	-0.032	-0.032	-0.035*	-0.035*	-0.031	-0.031	-0.038*	-0.038*	-0.038*	-0.037*
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)	(0.020)	(0.019)
GDP per capita	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Foreign liabilities share	0.012	0.027	0.020*	0.040***	0.021*	0.048**	0.015**	0.019	0.024**	0.063***
	(0.008)	(0.017)	(0.011)	(0.014)	(0.012)	(0.022)	(0.008)	(0.014)	(0.011)	(0.019)
Lagged profit	-0.061*	-0.051	-0.060*	-0.047	-0.060*	-0.047	-0.059*	-0.056*	-0.058*	-0.048
	(0.033)	(0.035)	(0.033)	(0.035)	(0.033)	(0.035)	(0.032)	(0.034)	(0.032)	(0.034)
Lagged profit*Foreign liabilities share		-1.042		-1.491***		-1.845**		-0.292		-2.278***
		(1.045)		(0.522)		(0.906)		(0.988)		(0.804)
Foreign liabilities share squared					-0.013	-0.078			-0.014	-0.180**
					(0.009)	(0.131)			(0.009)	(0.084)
Lagged profit*Foreign liabilities share squared						4.395				11.134**
						(8.455)				(5.439)
Inflation difference*Lagged foreign liabilities share							0.440***	0.434***	0.439***	0.489***
							(0.084)	(0.084)	(0.084)	(0.088)
N	3684	3684	3651	3651	3684	3684	3676	3676	3676	3676
R-sq	0.670	0.671	0.670	0.672	0.670	0.672	0.669	0.669	0.669	0.672

Table 4. Alternative internationalization measures and bank interest expense

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. We estimate all regressions using country and year fixed effects. The standard errors clustered at bank level are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Assets	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Liabilities over GDP	-0.004	-0.004*	-0.004	-0.004	-0.003	-0.003	-0.003	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Overhead	0.070	0.068	0.070	0.066	0.070	0.068	0.070	0.066
	(0.045)	(0.045)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)
Short term debt	-0.023***	-0.022***	-0.023***	-0.022***	-0.023***	-0.022***	-0.023***	-0.022***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Inflation	0.097***	0.096***	0.098***	0.097***	0.098***	0.098***	0.098***	0.098***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
GDP growth	-0.031	-0.031	-0.032	-0.032	-0.033	-0.032	-0.033	-0.032
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
GDP per capita	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	-0.061*	-0.678	-0.061*	-0.046	-0.062*	0.017	-0.062*	-0.048
	(0.033)	(0.443)	(0.033)	(0.035)	(0.033)	(0.061)	(0.033)	(0.035)
Concentration	-0.009	-0.018**						
	(0.006)	(0.008)						
Lagged profit*Concentration		0.630						
		(0.457)						
International			0.000	0.002				
			(0.001)	(0.001)				
Lagged profit*International				-0.144***				
				(0.046)				
Countries					-0.000	0.000		
					(0.000)	(0.001)		
Lagged profit*Countries						-0.071*		
						(0.040)		
Log of countries							-0.001	0.001
							(0.001)	(0.001)
Lagged profit*Log of countries								-0.169***
								(0.065)
N	3682	3682	3684	3684	3684	3684	3684	3684
R-sq	0.670	0.671	0.669	0.671	0.670	0.671	0.670	0.671

Table 5. A bank's internationalization and bank interest expense with bank fixed effects

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. In regressions 3 and 4 we require *Foreign liabilities share* to be less than 0.3. We estimate all regressions using bank and year fixed effects. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	0.002	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Liabilities over GDP	-0.006	-0.007	-0.006	-0.006	-0.006	-0.006	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Overhead	0.268***	0.270***	0.242***	0.245***	0.270***	0.271***	0.272***	0.273***	0.273***	0.274***	0.274***	0.274***
	(0.094)	(0.093)	(0.083)	(0.084)	(0.095)	(0.094)	(0.096)	(0.096)	(0.096)	(0.096)	(0.096)	(0.096)
Short term debt	-0.002	-0.001	-0.002	-0.001	-0.003	-0.001	-0.002	-0.001	-0.003	-0.001	-0.003	-0.001
	(0.011)	(0.010)	(0.011)	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Inflation	0.080***	0.078***	0.081***	0.080***	0.080***	0.079***	0.080***	0.079***	0.080***	0.080***	0.080***	0.080***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
GDP growth	-0.050**	-0.050**	-0.055**	-0.055**	-0.050**	-0.049**	-0.050**	-0.050**	-0.050**	-0.049**	-0.050**	-0.049**
	(0.023)	(0.022)	(0.022)	(0.022)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
GDP per capita	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	-0.076*	-0.056	-0.073*	-0.061	-0.076*	-0.975*	-0.076*	-0.059	-0.077*	0.028	-0.077**	-0.058
	(0.039)	(0.043)	(0.039)	(0.043)	(0.039)	(0.540)	(0.039)	(0.043)	(0.039)	(0.070)	(0.039)	(0.042)
Foreign liabilities share	0.022**	0.048*	0.021*	0.037**								
	(0.010)	(0.025)	(0.011)	(0.017)								
Lagged profit*Foreign liabilities share		-1.895		-1.173**								
		(1.170)		(0.567)								
Concentration					-0.008*	-0.022**						
					(0.004)	(0.010)						
Lagged profit*Concentration						0.919*						
						(0.557)						
International							-0.002	-0.000				
							(0.001)	(0.002)				
Lagged profit*International								-0.120**				

								(0.049)				
Countries									-0.000	0.000		
									(0.000)	(0.000)		
Lagged profit*Countries										-0.090**		
										(0.042)		
Log of countries											-0.002*	0.000
											(0.001)	(0.001)
Lagged profit*Log of countries												-0.172**
												(0.072)
N	3684	3684	3651	3651	3682	3682	3684	3684	3684	3684	3684	3684
R-sq	0.355	0.362	0.363	0.366	0.353	0.359	0.353	0.356	0.352	0.357	0.353	0.358

Table 6. A bank's lagged internationalization and bank interest expense

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Lagged foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities, lagged one period. *Lagged concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates, lagged one period. *Lagged international* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank, lagged one period. *Lagged countries* is the number of countries where a bank operates including the parent country, lagged one period. *Lagged log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country, lagged one period. In regressions 3 and 4 we require the *Lagged foreign liabilities share* to be less than 0.3. We estimate all regressions using country and year fixed effects. The standard errors clustered at bank level are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Liabilities over GDP	-0.006**	-0.007**	-0.007**	-0.007**	-0.006**	-0.006**	-0.005*	-0.006**	-0.005*	-0.005*	-0.005*	-0.005*
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Overhead	0.100*	0.097*	0.084	0.083	0.098*	0.096*	0.101*	0.097*	0.102*	0.101*	0.101*	0.098*
	(0.056)	(0.055)	(0.053)	(0.053)	(0.056)	(0.055)	(0.057)	(0.057)	(0.057)	(0.056)	(0.057)	(0.056)
Short term debt	-0.025***	-0.025***	-0.025***	-0.025***	-0.025***	-0.025***	-0.025***	-0.024***	-0.025***	-0.025***	-0.025***	-0.025***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Inflation	0.090***	0.089***	0.091***	0.091***	0.090***	0.090***	0.091***	0.091***	0.091***	0.091***	0.091***	0.091***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
GDP growth	-0.026	-0.026	-0.037*	-0.037*	-0.030	-0.030	-0.027	-0.025	-0.027	-0.027	-0.027	-0.027
	(0.023)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
GDP per capita	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	-0.027	-0.018	-0.018	-0.016	-0.026	-0.861	-0.029	-0.016	-0.030	-0.009	-0.030	-0.023
	(0.042)	(0.042)	(0.041)	(0.042)	(0.042)	(0.541)	(0.042)	(0.042)	(0.043)	(0.066)	(0.042)	(0.043)
Lagged Foreign liabilities share	0.032	0.055	0.025**	0.031*								
	(0.026)	(0.034)	(0.012)	(0.016)								
Lagged profit*Lagged Foreign liabilities share		-1.982**		-0.408								
		(0.983)		(0.964)								
Lagged Concentration					-0.009	-0.021*						
					(0.007)	(0.012)						
Lagged profit*Lagged Concentration						0.845						
						(0.547)						
Lagged International							0.000	0.003				

							(0.001)	(0.002)				
Lagged profit*Lagged International								-0.186**				
								(0.073)				
Lagged Countries									-0.000	-0.000		
									(0.000)	(0.001)		
Lagged profit*Lagged Countries										-0.020		
										(0.043)		
Lagged Log of countries											-0.001	0.001
											(0.001)	(0.002)
Lagged profit*Lagged Log of countries												-0.142
												(0.095)
N	2340	2340	2320	2320	2339	2339	2340	2340	2340	2340	2340	2340
R-sq	0.702	0.704	0.696	0.696	0.693	0.694	0.697	0.699	0.698	0.698	0.697	0.698

Table 7. Instrumental variable regressions for internationalization measures and bank interest expense

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. We estimate all regressions using two-step GMM with country and year fixed effects. Country fixed effects and the constant are partialled out, without changing the results. The following instruments are used: *Tourism* which is the total number of tourist arrivals and departures over total population; *FDI* which is the sum of inward and outward flows of foreign direct investments over GDP; *Openness* which is the sum of exports and imports of goods and services over GDP; *Portfolio position* which is the sum of assets and liabilities with respect to a country's portfolio investment position over GDP. We also report the coefficient estimates for the instrumental variables in the first stage regression for *Foreign liabilities share*, the p-value of the F-test of joint significance of instruments in this first stage regression, the p-value of the Hansen J-test of overidentifying restrictions, the Hausman specification error test of the difference between IV and OLS estimations as an endogeneity test, and the p-value of an LM test regarding the correlation of exogenous instruments with endogenous instruments as a test of underidentification. In regressions 3 and 4 we require the instrumented *Foreign liabilities share* to be less than 0.3. The standard errors clustered at the bank level are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Liabilities over GDP	-0.009**	-0.008**	-0.010***	-0.009***	-0.009***	-0.009***	-0.009**	-0.006	-0.014	-0.008	-0.012**	-0.007
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.009)	(0.008)	(0.006)	(0.005)
Overhead	0.046	0.048	0.045	0.050	0.047	0.050	0.050	0.047	0.039	0.052	0.046	0.050
	(0.046)	(0.044)	(0.046)	(0.044)	(0.046)	(0.044)	(0.047)	(0.045)	(0.048)	(0.045)	(0.046)	(0.044)
Short term debt	-0.019***	-0.020***	-0.019***	-0.019***	-0.019***	-0.019***	-0.021***	-0.023***	-0.021***	-0.023***	-0.021***	-0.023***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Inflation	0.134***	0.135***	0.132***	0.132***	0.132***	0.131***	0.143***	0.134***	0.144***	0.137***	0.144***	0.134***
	(0.022)	(0.023)	(0.023)	(0.023)	(0.022)	(0.023)	(0.022)	(0.024)	(0.022)	(0.023)	(0.021)	(0.024)
GDP growth	-0.140***	-0.140***	-0.145***	-0.145***	-0.138***	-0.138***	-0.145***	-0.142***	-0.156***	-0.152***	-0.151***	-0.147***
	(0.029)	(0.027)	(0.029)	(0.028)	(0.029)	(0.028)	(0.028)	(0.028)	(0.028)	(0.027)	(0.028)	(0.027)
GDP per capita	0.000	0.000	0.000**	0.000**	0.000	0.000	0.000**	0.001**	0.001**	0.001*	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	-0.062**	-0.077***	-0.059**	-0.078***	-0.062**	1.108	-0.053**	-0.066***	-0.051*	-0.420	-0.052**	-0.070***
	(0.025)	(0.021)	(0.025)	(0.021)	(0.025)	(0.849)	(0.025)	(0.021)	(0.026)	(0.265)	(0.025)	(0.021)
Foreign liabilities share	0.076**	0.027	0.083***	0.035								
	(0.031)	(0.041)	(0.030)	(0.044)								
Lagged profit*Foreign liabilities share		3.209		3.055								

		(2.223)		(2.394)								
Concentration					-0.045***	-0.026						
					(0.016)	(0.020)						
Lagged profit*Concentration						-1.186						
						(0.853)						
International							0.006	-0.005				
							(0.007)	(0.008)				
Lagged profit*International								0.631				
								(0.419)				
Countries									0.003	-0.002		
									(0.003)	(0.005)		
Lagged profit*Countries										0.349		
										(0.257)		
Log of countries											0.007	-0.005
											(0.007)	(0.009)
Lagged profit*Log of countries												0.747
												(0.511)
First Stage Regressions:												
Tourism	0.0149	0.016	0.025**	0.026**	-0.045**	-0.047**	-0.043	0.036	-0.227	-0.130	-0.053	0.004
	(0.016)	(0.018)	(0.011)	(0.012)	(0.019)	(0.022)	(0.073)	(0.072)	(0.169)	(0.171)	(0.066)	(0.067
FDI	0.083***	0.073**	0.065***	0.051***	-0.121***	-0.101**	0.585***	0.534***	1.413***	0.945	0.645***	0.529**
	(0.025)	(0.031)	(0.019)	(0.019)	(0.038)	(0.041)	(0.157)	(0.172)	(0.546)	(0.608)	(0.169)	(0.216)
Openness	0.021	0.023	0.004	0.005	-0.0129	-0.015	0.254	0.237	0.041	-0.021	0.166	0.144
	(0.028)	(0.029)	(0.025)	(0.025)	(0.047)	(0.048)	(0.163)	(0.163)	(0.606)	(0.609)	(0.191)	(0.191)
Portfolio position	0.013	0.014	0.009	0.010*	-0.014	-0.015	-0.026	-0.049	0.333	0.320	0.33	0.018
	(0.008)	(0.009)	(0.006)	(0.006)	(0.010)	(0.011)	(0.046)	(0.050)	(0.253)	(0.267)	(0.058)	(0.063)
Lagged profit*Tourism		-0.014		-0.015		0.042		-3.294**		-4.878*		-2.595**
		(0.243)		(0.199)		(0.377)		(1.442)		(2.909)		(1.285)
Lagged profit*FDI		0.787		1.049		-1.588		3.097		32.306		7.671
		(1.014)		(0.946)		(1.856)		(9.356)		(27.385)		(7.727)
Lagged profit*Openness		-0.218		-0.125		0.221		0.839		3.981		1.340
		(0.204)		(0.152)		(0.307)		(2.317)		(4.229)		(1.951)
Lagged profit*Portfolio position		-0.043		-0.026		0.069		1.885*		1.586		1.3127
		(0.156)		(0.126)		(0.239)		(1.055)		(2.024)		(0.928)
N	3075	3075	3052	3052	3073	3073	3075	3075	3075	3075	3075	3075
R-sq	0.235	0.234	0.284	0.277	0.268	0.264	0.289	0.246	0.236	0.240	0.273	0.232
Excluded instruments F-test	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.014	0.010	0.001	0.000
Hansen J-test (p-value)	0.622	0.922	0.694	0.952	0.690	0.960	0.091	0.500	0.091	0.321	0.083	0.433
Endogeneity test (p-value)	0.042	0.060	0.057	0.102	0.040	0.055	0.535	0.640	0.334	0.674	0.374	0.538
Underidentification test (p-value)	0.007	0.027	0.011	0.029	0.011	0.042	0.001	0.002	0.059	0.014	0.021	0.015

Table 8. A bank's internationalization and market bank interest expense controlling for asset volatility

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Lagged asset volatility* is calculated as $\text{stddev(E)} * (\text{E/V})$, where stddev(E) is annualized standard deviation of weekly dividend-inclusive bank stock returns, E is market value of common equity and V is book value of assets minus the book value of common equity plus market value of common equity, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. In regressions 3 and 4 we require the *Foreign liabilities share* to be less than 0.3. We estimate all regressions using country and year fixed effects. The standard errors clustered at bank level are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Liabilities over GDP	-0.005*	-0.005*	-0.006**	-0.006**	-0.005*	-0.005*	-0.005*	-0.005*	-0.004	-0.004	-0.005*	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Overhead	0.019	0.019	0.017	0.018	0.019	0.019	0.019	0.019	0.019	0.019	0.018	0.019
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.050)	(0.051)	(0.051)
Short term debt	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***	-0.023***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Inflation	0.134***	0.134***	0.135***	0.134***	0.134***	0.134***	0.134***	0.134***	0.134***	0.132***	0.134***	0.133***
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
GDP growth	-0.088***	-0.088***	-0.088***	-0.088***	-0.087***	-0.087***	-0.087***	-0.087***	-0.088***	-0.087***	-0.088***	-0.088***
	(0.025)	(0.025)	(0.026)	(0.026)	(0.025)	(0.026)	(0.025)	(0.026)	(0.025)	(0.026)	(0.025)	(0.026)
GDP per capita	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	-0.048	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.048	-0.048	-0.048	-0.048
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Lagged Asset volatility	0.034*	0.034*	0.035*	0.034*	0.034*	0.036	0.035*	0.034*	0.034*	0.019	0.034*	0.034*
	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.170)	(0.019)	(0.020)	(0.019)	(0.029)	(0.019)	(0.020)
Foreign liabilities share	0.012	0.014	0.033***	0.031*								
	(0.008)	(0.013)	(0.011)	(0.016)								
Lagged Asset volatility*Foreign liabilities share		-0.040		0.085								
		(0.230)		(0.370)								
Concentration					-0.013**	-0.013						
					(0.006)	(0.008)						

Lagged Asset volatility*Concentration						-0.001						
						(0.176)						
International							0.001	0.001				
							(0.001)	(0.001)				
Lagged Asset volatility*International								0.003				
								(0.031)				
Countries									-0.000	-0.000		
									(0.000)	(0.000)		
Lagged Asset volatility*Countries										0.014		
										(0.018)		
Log of countries											0.000	-0.000
											(0.001)	(0.001)
Lagged Asset volatility*Log of countries												0.012
												(0.035)
N	3124	3124	3101	3101	3123	3123	3124	3124	3124	3124	3124	3124
R-sq	0.693	0.693	0.695	0.696	0.694	0.694	0.693	0.693	0.692	0.693	0.692	0.692

Table 9. A bank's internationalization and bank interest expense controlling for asset volatility with bank fixed effects

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Lagged asset volatility* is calculated as $\text{stddev(E)} * (\text{E/V})$, where stddev(E) is annualized standard deviation of weekly dividend-inclusive bank stock returns, E is market value of common equity and V is t book value of assets minus the book value of common equity plus market value of common equity, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. In regressions 3 and 4 we require the *Foreign liabilities share* to be less than 0.3. We estimate all regressions using bank and year fixed effects. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	0.002	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Liabilities over GDP	-0.009*	-0.008*	-0.009*	-0.009*	-0.009*	-0.008*	-0.008*	-0.008*	-0.008*	-0.008*	-0.008*	-0.008*
	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Overhead	0.190***	0.190***	0.189***	0.189***	0.189***	0.189***	0.194***	0.195***	0.194***	0.194***	0.194***	0.195***
	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)
Short term debt	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Inflation	0.107***	0.107***	0.108***	0.108***	0.108***	0.108***	0.106***	0.105***	0.107***	0.107***	0.107***	0.106***
	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
GDP growth	-0.082***	-0.082***	-0.083***	-0.082***	-0.082***	-0.082***	-0.083***	-0.081***	-0.082***	-0.082***	-0.082***	-0.082***
	(0.025)	(0.025)	(0.025)	(0.026)	(0.025)	(0.026)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
GDP per capita	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	-0.018	-0.019	-0.018	-0.018	-0.018	-0.018	-0.017	-0.018	-0.018	-0.017	-0.017	-0.018
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.027)	(0.028)	(0.027)	(0.028)	(0.027)	(0.028)
Lagged Asset volatility	-0.021	-0.021	-0.020	-0.022	-0.021	0.030	-0.021	-0.023	-0.020	-0.018	-0.020	-0.021
	(0.017)	(0.018)	(0.017)	(0.018)	(0.017)	(0.211)	(0.017)	(0.018)	(0.017)	(0.028)	(0.017)	(0.018)
Foreign liabilities share	0.016***	0.014	0.020**	0.015								
	(0.005)	(0.009)	(0.008)	(0.012)								
Lagged Asset volatility*Foreign liabilities share		0.075		0.184								
		(0.229)		(0.435)								
Concentration					-0.012***	-0.010*						
					(0.004)	(0.006)						

Lagged Asset volatility*Concentration						-0.051						
						(0.218)						
International							-0.001	-0.002*				
							(0.001)	(0.001)				
Lagged Asset volatility*International								0.021				
								(0.022)				
Countries									-0.000	-0.000		
									(0.000)	(0.000)		
Lagged Asset volatility*Countries										-0.002		
										(0.016)		
Log of countries											-0.002	-0.002
											(0.001)	(0.001)
Lagged Asset volatility*Log of countries												0.006
												(0.030)
N	3124	3124	3101	3101	3123	3123	3124	3124	3124	3124	3124	3124
R-sq	0.429	0.429	0.428	0.428	0.429	0.429	0.427	0.428	0.427	0.427	0.428	0.428

Table 10. Instrumental variable regressions for internationalization and bank interest expense controlling for asset volatility

The dependent variable is *Interest expense*, which is interest expense over bank liabilities excluding non-interest bearing debt. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Lagged asset volatility* is calculated as $\text{stddev(E)} * \text{(E/V)}$, where stddev(E) is annualized standard deviation of weekly dividend-inclusive bank stock returns, E is market value of common equity and V is the book value of assets minus the book value of common equity plus market value of common equity, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. We estimate all regressions using two-step GMM with country and year fixed effects. Country fixed effects and the constant are partialled out, without changing the results. The following instruments are used: *Tourism* which is total number of tourist arrivals and departures over total population; *FDI* which is the sum of inward and outward flows of foreign direct investments over GDP; *Openness* which is the sum of exports and imports of goods and services over GDP; *Portfolio position* which is the sum of assets and liabilities with respect to a country's portfolio investment position over GDP. We also report the coefficient estimates for the instrumental variables in the first stage regression for *Foreign liabilities share*, the p-value of the F-test of joint significance of instruments in this first stage regression, the p-value of the Hansen J-test of overidentifying restrictions, the Hausman specification error test of the difference between IV and OLS estimations as an endogeneity test, and the p-value of an LM test regarding the correlation of exogenous instruments with endogenous instruments as a test of underidentification. In regressions 3 and 4 we require the instrumented *Foreign liabilities share* to be less than 0.3. The standard errors clustered at the bank level are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001**	-0.001**	-0.001***	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Liabilities over GDP	-0.008**	-0.008**	-0.010***	-0.010***	-0.009***	-0.009***	-0.011***	-0.012**	-0.019*	-0.029**	-0.015**	-0.020**
	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.005)	(0.010)	(0.014)	(0.006)	(0.009)
Overhead	0.025	0.027	0.021	0.024	0.024	0.025	0.032	0.028	0.010	-0.003	0.023	0.016
	(0.053)	(0.048)	(0.053)	(0.048)	(0.053)	(0.048)	(0.052)	(0.047)	(0.057)	(0.054)	(0.054)	(0.050)
Short term debt	-0.024***	-0.024***	-0.024***	-0.024***	-0.024***	-0.024***	-0.023***	-0.023***	-0.023***	-0.022***	-0.023***	-0.022***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)
Inflation	0.145***	0.149***	0.147***	0.151***	0.147***	0.150***	0.164***	0.166***	0.163***	0.181***	0.163***	0.177***
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.025)	(0.027)	(0.026)	(0.028)	(0.025)	(0.028)
GDP growth	-0.126***	-0.126***	-0.133***	-0.132***	-0.126***	-0.127***	-0.131***	-0.133***	-0.149***	-0.167***	-0.138***	-0.150***
	(0.030)	(0.031)	(0.030)	(0.031)	(0.030)	(0.031)	(0.031)	(0.038)	(0.031)	(0.038)	(0.029)	(0.036)
GDP per capita	0.000	0.000	0.000**	0.000**	0.000	0.000	0.000*	0.000*	0.001**	0.001**	0.001**	0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	-0.063*	-0.065**	-0.058*	-0.063*	-0.059*	-0.063*	-0.055	-0.055*	-0.048	-0.045	-0.050	-0.048
	(0.035)	(0.032)	(0.035)	(0.032)	(0.035)	(0.032)	(0.033)	(0.029)	(0.034)	(0.032)	(0.033)	(0.030)
Lagged asset volatility	0.023	0.016	0.024	0.015	0.022	-0.381	0.022	0.021	0.024	0.157	0.022	0.024

	(0.027)	(0.017)	(0.028)	(0.016)	(0.028)	(0.602)	(0.027)	(0.017)	(0.030)	(0.109)	(0.028)	(0.017)
Foreign liabilities share	0.071**	0.093**	0.077**	0.083**								
	(0.029)	(0.044)	(0.030)	(0.042)								
Lagged asset volatility*Foreign liabilities share		-0.890		-0.389								
		(1.169)		(1.376)								
Concentration					-0.041***	-0.051**						
					(0.016)	(0.023)						
Lagged asset volatility *Concentration						0.397						
						(0.599)						
International							0.010	0.011				
							(0.007)	(0.010)				
Lagged asset volatility* International								-0.065				
								(0.198)				
Countries									0.005	0.010*		
									(0.004)	(0.006)		
Lagged asset volatility*Countries										-0.133		
										(0.104)		
Log of countries											0.011	0.019*
											(0.007)	(0.011)
Lagged asset volatility*Log of countries												-0.188
												(0.198)
First Stage Regressions:												
Tourism	0.030**	0.032**	0.025**	0.029***	-0.048**	-0.053***	-0.05	-0.029	-0.208	-0.196	-0.055	-0.041
	(0.013)	(0.012)	(0.011)	(0.010)	(0.020)	(0.019)	(0.076)	(0.081)	(0.188)	(0.200)	(0.071)	(0.078)
FDI	0.058**	0.029	0.063***	0.031	-0.114***	-0.055	0.597***	0.681***	1.489**	0.724	0.662***	0.567**
	(0.025)	(0.032)	(0.021)	(0.024)	(0.042)	(0.047)	(0.172)	(0.186)	(0.583)	(0.640)	(0.172)	(0.235)
Openness	0.014	0.015	0.006	0.005	-0.019	-0.021	0.265	0.262	0.155	0.169	0.233	0.230
	(0.030)	(0.031)	(0.027)	(0.027)	(0.050)	(0.051)	(0.193)	(0.194)	(0.772)	(0.781)	(0.231)	(0.237)
Portfolio position	0.005	0.003	0.011	0.007	-0.011	-0.008	0.013	-0.028	0.303	0.343	0.044	0.027
	(0.007)	(0.010)	(0.007)	(0.008)	(0.011)	(0.013)	(0.050)	(0.057)	(0.268)	(0.306)	(0.062)	(0.072)
Lagged asset volatility*Tourism		-0.115		-0.128		0.178		-0.775		-0.441		-0.482
		(0.090)		(0.087)		(0.146)		(0.593)		(1.544)		(0.596)
Lagged asset volatility*FDI		1.004		1.168		-2.127		-3.638		28.912*		3.455
		(0.769)		(0.712)		(1.319)		(5.656)		(16.870)		(5.009)
Lagged asset volatility*Openness		0.177		0.057		-0.177		1.081		-0.253		0.408
		(0.110)		(0.074)		(0.149)		(0.797)		(2.133)		(0.844)
Lagged asset volatility*Portfolio position		0.176**		0.131*		-0.226*		1.488**		-0.073		0.840
		(0.087)		(0.067)		(0.122)		(0.580)		(1.183)		(0.616)
N	2730	2730	2711	2711	2729	2729	2730	2730	2730	2730	2730	2730
R-sq	0.316	0.323	0.356	0.356	0.341	0.341	0.335	0.336	0.198	-0.088	0.295	0.226
Excluded instruments F-test	0.001	0.000	0.000	0.000	0.000	0.000	0.008	0.001	0.021	0.033	0.001	0.002
Hansen J-test (p-value)	0.418	0.874	0.356	0.763	0.380	0.829	0.060	0.318	0.071	0.488	0.066	0.394
Endogeneity test (p-value)	0.050	0.053	0.185	0.184	0.090	0.069	0.356	0.423	0.263	0.147	0.265	0.210
Underidentification test (p-value)	0.044	0.019	0.025	0.013	0.029	0.009	0.004	0.002	0.091	0.082	0.028	0.012

Table 11. A bank's internationalization and unconsolidated bank interest expense

The dependent variable is *Interest expense, unconsolidated* which is interest expense over bank liabilities excluding non-interest bearing debt calculated using unconsolidated statements of the parent bank. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. In regressions 3 and 4 we require the *Foreign liabilities share* to be less than 0.3. We estimate all regressions using country and year fixed effects. The standard errors clustered at bank level are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000	-0.000	-0.000	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
Liabilities over GDP	-0.008	-0.007	-0.011	-0.011	-0.008	-0.008	-0.007	-0.008	-0.004	-0.005	-0.005	-0.006
	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Overhead	-0.119	-0.137	-0.095	-0.107	-0.119	-0.139	-0.122	-0.139	-0.093	-0.105	-0.098	-0.115
	(0.137)	(0.142)	(0.138)	(0.140)	(0.137)	(0.142)	(0.137)	(0.141)	(0.137)	(0.139)	(0.137)	(0.141)
Short term debt	-0.046***	-0.045***	-0.046***	-0.044***	-0.046***	-0.044***	-0.046***	-0.043***	-0.048***	-0.046***	-0.047***	-0.045***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)
Inflation	0.051*	0.047*	0.051*	0.044*	0.051*	0.045*	0.054**	0.047**	0.053**	0.049**	0.053**	0.048**
	(0.027)	(0.024)	(0.027)	(0.022)	(0.027)	(0.024)	(0.026)	(0.022)	(0.026)	(0.023)	(0.026)	(0.022)
GDP growth	0.010	0.015	0.010	0.018	0.011	0.017	-0.000	0.004	0.005	0.006	0.001	0.004
	(0.044)	(0.043)	(0.044)	(0.042)	(0.044)	(0.043)	(0.044)	(0.043)	(0.044)	(0.044)	(0.044)	(0.043)
GDP per capita	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	0.137	0.170	0.134	0.187	0.137	-1.381**	0.137	0.188	0.138	0.363**	0.137	0.182
	(0.110)	(0.117)	(0.110)	(0.119)	(0.110)	(0.659)	(0.111)	(0.121)	(0.111)	(0.183)	(0.112)	(0.119)
Foreign liabilities share	0.012	0.040	0.024	0.070***								
	(0.014)	(0.025)	(0.023)	(0.027)								
Lagged profit*Foreign liabilities share		-2.294		-3.924***								
		(1.680)		(1.062)								
Concentration					-0.009	-0.029**						
					(0.011)	(0.014)						
Lagged profit*Concentration						1.560**						
						(0.737)						
International							-0.008**	-0.004				
							(0.004)	(0.004)				
Lagged profit*International								-0.314**				

								(0.128)				
Countries									-0.003***	-0.001		
									(0.001)	(0.001)		
Lagged profit*Countries										-0.192*		
										(0.100)		
Log of countries											-0.010***	-0.006
											(0.004)	(0.004)
Lagged profit*Log of countries												-0.383**
												(0.178)
N	1378	1378	1360	1360	1377	1377	1378	1378	1378	1378	1378	1378
R-sq	0.361	0.364	0.357	0.363	0.361	0.365	0.365	0.369	0.366	0.369	0.368	0.372

Table 12. A bank's internationalization and unconsolidated bank interest expense with bank fixed effects

The dependent variable is *Interest expense, unconsolidated* which is interest expense over bank liabilities excluding non-interest bearing debt calculated using unconsolidated statements of the parent bank. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Short term debt* is ratio of customer and short term funding to total interest paying debt. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. In regressions 3 and 4 we require the *Foreign liabilities share* to be less than 0.3. We estimate all regressions using bank and year fixed effects. The standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	0.004	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.004	0.005	0.005	0.005
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Liabilities over GDP	-0.001	-0.001	0.000	-0.000	-0.001	-0.001	-0.002	-0.003	0.001	-0.002	0.000	-0.002
	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Overhead	0.181	0.200*	0.185	0.205*	0.178	0.197*	0.182	0.192	0.183	0.190	0.184	0.191
	(0.121)	(0.116)	(0.121)	(0.116)	(0.121)	(0.116)	(0.123)	(0.119)	(0.123)	(0.120)	(0.123)	(0.120)
Short term debt	-0.041	-0.040	-0.040	-0.039	-0.041	-0.039	-0.040	-0.037	-0.042	-0.040	-0.041	-0.039
	(0.044)	(0.043)	(0.044)	(0.044)	(0.044)	(0.043)	(0.044)	(0.043)	(0.044)	(0.043)	(0.044)	(0.043)
Inflation	0.042**	0.037**	0.041**	0.035**	0.042**	0.036**	0.043**	0.037**	0.042**	0.040**	0.043**	0.038**
	(0.020)	(0.017)	(0.019)	(0.017)	(0.020)	(0.017)	(0.020)	(0.017)	(0.020)	(0.018)	(0.020)	(0.017)
GDP growth	-0.029	-0.024	-0.030	-0.026	-0.028	-0.024	-0.032	-0.031	-0.029	-0.030	-0.031	-0.031
	(0.041)	(0.040)	(0.042)	(0.040)	(0.041)	(0.040)	(0.039)	(0.038)	(0.041)	(0.040)	(0.039)	(0.038)
GDP per capita	-0.000	-0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged profit	0.117	0.172	0.116	0.176	0.115	-1.456**	0.118	0.192	0.117	0.332	0.118	0.182
	(0.155)	(0.174)	(0.156)	(0.176)	(0.156)	(0.634)	(0.154)	(0.180)	(0.154)	(0.250)	(0.154)	(0.175)
Foreign liabilities share	0.001	0.035	0.032	0.072**								
	(0.025)	(0.032)	(0.023)	(0.033)								
Lagged profit*Foreign liabilities share		-2.923*		-3.174**								
		(1.550)		(1.485)								
Concentration					-0.006	-0.025						
					(0.017)	(0.021)						
Lagged profit*Concentration						1.629**						
						(0.794)						
International							-0.004	0.001				
							(0.006)	(0.007)				
Lagged profit*International								-0.333**				

								(0.156)				
Countries									-0.001	0.001		
									(0.001)	(0.002)		
Lagged profit*Countries										-0.173		
										(0.107)		
Log of countries											-0.005	-0.001
											(0.006)	(0.007)
Lagged profit*Log of countries												-0.395*
												(0.203)
N	1378	1378	1360	1360	1377	1377	1378	1378	1378	1378	1378	1378
R-sq	0.054	0.061	0.051	0.060	0.054	0.061	0.055	0.065	0.054	0.060	0.056	0.064

Table 13. A bank's internationalization and deposit growth rates

The dependent variable is *Deposit growth*, which is the growth rate of a bank's customer and short term funding after dividing by the GDP deflator in percent. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. In regressions 3 and 4 we require the *Foreign liabilities share* to be less than 0.3. We estimate all regressions using country and year fixed effects. The standard errors clustered at bank level are given in parentheses.*, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	0.005	0.005	0.006	0.006	0.005	0.005	0.006	0.006	0.006	0.005	0.006	0.006
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Liabilities over GDP	0.009	0.010	-0.001	-0.001	0.011	0.011	0.012	0.015	0.012	0.014	0.013	0.016
	(0.055)	(0.055)	(0.056)	(0.056)	(0.055)	(0.054)	(0.055)	(0.055)	(0.057)	(0.057)	(0.056)	(0.057)
Overhead	-0.760	-0.759	-0.737	-0.735	-0.761	-0.755	-0.764	-0.742	-0.755	-0.736	-0.757	-0.733
	(0.661)	(0.662)	(0.664)	(0.665)	(0.661)	(0.662)	(0.660)	(0.663)	(0.662)	(0.666)	(0.661)	(0.665)
Inflation	-0.301*	-0.300*	-0.298*	-0.296*	-0.300*	-0.298*	-0.303*	-0.300*	-0.303*	-0.304*	-0.303*	-0.303*
	(0.162)	(0.162)	(0.163)	(0.164)	(0.162)	(0.162)	(0.162)	(0.162)	(0.161)	(0.162)	(0.161)	(0.162)
GDP growth	0.317	0.317	0.322	0.320	0.316	0.315	0.305	0.302	0.318	0.316	0.313	0.310
	(0.259)	(0.259)	(0.261)	(0.260)	(0.259)	(0.259)	(0.259)	(0.259)	(0.259)	(0.259)	(0.259)	(0.259)
GDP per capita	-0.001	-0.001	-0.000	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Lagged profit	0.522	0.518	0.514	0.499	0.520	1.626	0.515	0.436	0.520	0.018	0.517	0.442
	(0.374)	(0.395)	(0.374)	(0.404)	(0.374)	(3.113)	(0.371)	(0.406)	(0.374)	(0.751)	(0.372)	(0.405)
Foreign liabilities share	-0.048	-0.054	-0.151	-0.171								
	(0.055)	(0.074)	(0.103)	(0.106)								
Lagged profit*Foreign liabilities share		0.368		1.607								
		(3.438)		(5.836)								
Concentration					0.045	0.060						
					(0.052)	(0.058)						
Lagged profit*Concentration						-1.129						
						(3.327)						
International							-0.015	-0.025*				
							(0.015)	(0.015)				
Lagged profit*International								0.721				
								(0.641)				
Countries									-0.002	-0.006		

									(0.004)	(0.005)		
Lagged profit*Countries										0.447		
										(0.463)		
Log of countries											-0.010	-0.021
											(0.013)	(0.014)
Lagged profit*Log of countries												0.918
												(0.844)
N	3740	3740	3706	3706	3738	3738	3740	3740	3740	3740	3740	3740
R-sq	0.067	0.067	0.068	0.068	0.067	0.067	0.067	0.068	0.067	0.068	0.067	0.068

Table 14. A bank's internationalization and deposit growth rates with bank fixed effects

The dependent variable is *Deposit growth*, which is the growth rate of a bank's customer and short term funding after dividing by the GDP deflator in percent. *Assets* is the natural logarithm of total assets in constant 2000 US dollars. *Liabilities over GDP* is total bank liabilities divided by GDP. *Overhead* is personnel expenses and other non-interest expenses over total assets. *Inflation* is rate of change in consumer prices. *GDP growth* is rate of real per capita GDP growth. *GDP per capita* is GDP per capita in thousands of constant 2000 dollars. *Lagged profit* is pre-tax profits divided by total assets, lagged one period. *Foreign liabilities share* is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. *Concentration* is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. *International* is a dummy variable that equals 1 if a bank has a least 50% ownership of a foreign bank. *Countries* is the number of countries where a bank operates including the parent country. *Log of countries* is the natural logarithm of the number of countries where a bank operates including the parent country. In regressions 3 and 4 we require the *Foreign liabilities share* to be less than 0.3. We estimate all regressions using bank and year fixed effects. Robust standard errors are given in parentheses. *, ** and *** denote significance at 10%, 5% and 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Assets	0.237***	0.239***	0.238***	0.239***	0.238***	0.239***	0.237***	0.239***	0.238***	0.237***	0.238***	0.240***
	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.051)	(0.050)	(0.050)	(0.051)	(0.051)	(0.051)	(0.051)
Liabilities over GDP	0.009	0.010	0.029	0.028	0.011	0.011	-0.001	0.001	0.007	0.014	0.002	0.007
	(0.271)	(0.271)	(0.293)	(0.293)	(0.271)	(0.271)	(0.271)	(0.271)	(0.272)	(0.271)	(0.270)	(0.270)
Overhead	-0.116	-0.206	-0.132	-0.197	-0.135	3.694	-0.106	-0.327	-0.118	-1.245	-0.114	-0.339
	(0.594)	(0.653)	(0.596)	(0.659)	(0.594)	(4.270)	(0.596)	(0.680)	(0.595)	(1.130)	(0.595)	(0.670)
Inflation	-2.916***	-2.922***	-2.863***	-2.878***	-2.914***	-2.919***	-2.948***	-2.949***	-2.933***	-2.945***	-2.933***	-2.935***
	(1.016)	(1.014)	(1.028)	(1.025)	(1.017)	(1.015)	(1.015)	(1.013)	(1.016)	(1.015)	(1.018)	(1.016)
GDP growth	-0.081	-0.076	-0.081	-0.077	-0.077	-0.073	-0.086	-0.079	-0.085	-0.086	-0.085	-0.084
	(0.181)	(0.181)	(0.182)	(0.182)	(0.182)	(0.182)	(0.181)	(0.182)	(0.179)	(0.181)	(0.180)	(0.182)
GDP per capita	0.514*	0.511*	0.525*	0.520*	0.516*	0.513*	0.496	0.488	0.510*	0.500	0.503	0.492
	(0.310)	(0.309)	(0.314)	(0.313)	(0.309)	(0.309)	(0.309)	(0.307)	(0.309)	(0.308)	(0.309)	(0.307)
Lagged profit	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Foreign liabilities share	-0.249**	-0.353***	-0.281	-0.357*								
	(0.117)	(0.136)	(0.190)	(0.182)								
Lagged profit*Foreign liabilities share		8.043		6.083								
		(8.079)		(9.036)								
Concentration					0.191*	0.245**						
					(0.102)	(0.099)						
Lagged profit*Concentration						-3.916						
						(4.740)						
International							-0.024	-0.045				
							(0.034)	(0.031)				
Lagged profit*International								1.530*				
								(0.900)				
Countries									-0.008	-0.016**		
									(0.008)	(0.008)		

Lagged profit*Countries										0.961		
										(0.593)		
Log of countries											-0.024	-0.048*
											(0.031)	(0.028)
Lagged profit*Log of countries												2.015*
												(1.125)
N	3740	3740	3706	3706	3738	3738	3740	3740	3740	3740	3740	3740
R-sq	0.080	0.080	0.080	0.081	0.080	0.080	0.079	0.081	0.079	0.081	0.079	0.081

Figure 1. Distribution of a bank's foreign liabilities share

This figure shows the distribution of *Foreign liabilities share*, which is the sum of the liabilities of foreign subsidiary banks weighted by the parent bank's ownership share divided by the parent bank's consolidated liabilities. Information in the figure is limited to the 1280 observations, out of a total of 3684 observations, with a positive *Foreign liabilities share.* Two observations with a value higher than 1 are also excluded.

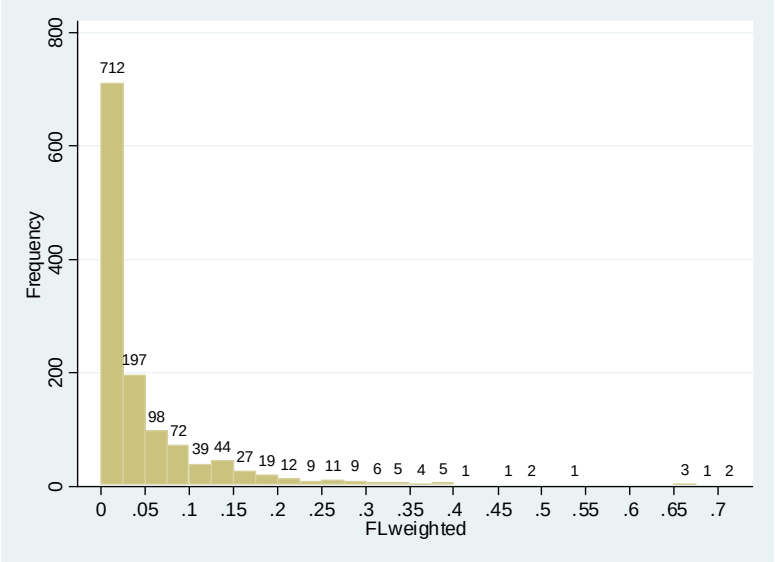

Figure 2. Distribution of a bank's liability concentration

This figure shows the distribution of Concentration, which is the sum of the squared shares of the liabilities weighted by the parent bank's ownership ship relative to the parent's bank consolidated liabilities for all countries where the parent bank operates. Information in the figure is limited to the 1279 observations, out of a total of 3682 observations, with a *Concentration* of less than one, indicating some foreign liabilities.

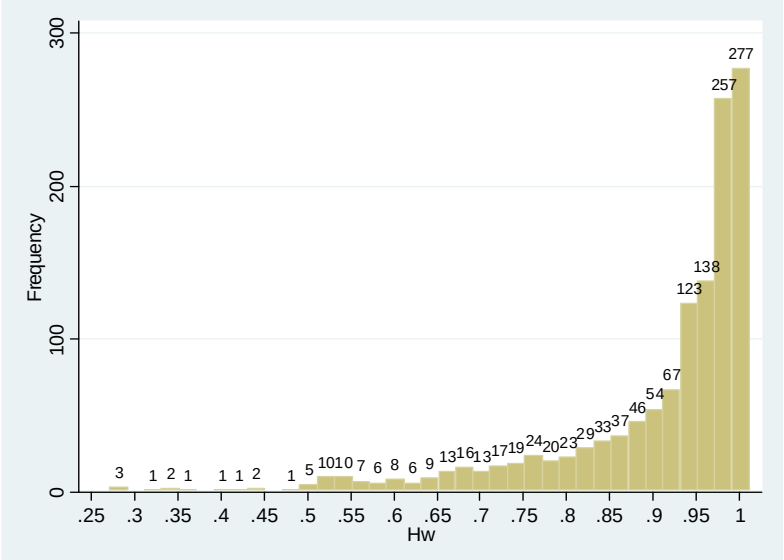

Figure 3. Distribution of the number of countries where a bank operates

This figure shows the distribution of *Countries*, which is the number of countries where a bank operates majority-owned banks including the parent country. Information in the figure is limited to the 991 observations, out of a total of 3684 observations, of banks with some liabilities in majority-owned foreign subsidiaries.