THE STABILIZING ROLE OF LOCAL CLAIMS IN LOCAL CURRENCY ON THE VARIATION OF FOREIGN CLAIMS

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Abstract

The paper provides an in-depth analysis of the development of and stabilizing factors behind foreign claims for international banking groups. It focuses on the headquarters locations of the 76 banking groups that participated in the assessment exercise for global systemically important banks at the end of 2020, examining the behavior of their banking systems' foreign claims (assets) from 2000 to 2022. The study finds that during systemic crises, banking systems with a higher reliance on local claims in local currency (claims booked by foreign branches or subsidiaries vis-à-vis their own residents in the country's currency) experience a significantly smaller decline in foreign claims. Specifically, a one standard deviation increase in the ratio of local claims in local currency to foreign claims reduces the decline in foreign claims by 0.11 standard deviations during a crisis. Additionally, the paper provides evidence that a high proportion of local claims in local currency mitigates the variation in foreign claims when the country hosting the banking system's headquarters is experiencing economic growth or stock market volatility.

Keywords: foreign claims, local claims in local currency, systemic crises, BIS CBS.

JEL classification: F21, F23, F44, G15, G21.

Resumen

El presente documento ofrece un análisis en profundidad de la evolución y los factores estabilizadores de los activos exteriores de los grupos bancarios internacionales. El trabajo se centra en los países sede de los 76 grupos bancarios que participaron en el ejercicio de evaluación de los bancos de importancia sistémica global (G-SIB) a finales de 2020, examinando el comportamiento de los activos exteriores de sus sistemas bancarios entre 2000 y 2022. El estudio concluye que, durante las crisis sistémicas, aquellos sistemas bancarios con una mayor dependencia de los activos locales en moneda local (activos contabilizados por sucursales o filiales extranjeras frente a sus propios residentes en la moneda del país) experimentan un descenso significativamente menor de los activos exteriores. En concreto, un aumento de una desviación típica en la proporción de activos locales en moneda local frente a activos exteriores reduce el descenso de los activos exteriores en 0,11 desviaciones típicas durante una crisis. Además, el documento demuestra que una elevada proporción de activos locales en moneda local mitiga la variación de los activos exteriores cuando el país en el que tiene su sede el sistema bancario experimenta crecimiento económico o volatilidad bursátil.

Palabras clave: activos exteriores, activos locales en moneda local, crisis sistémicas, BIS CBS.

Códigos JEL: F21, F23, F44, G15, G21.

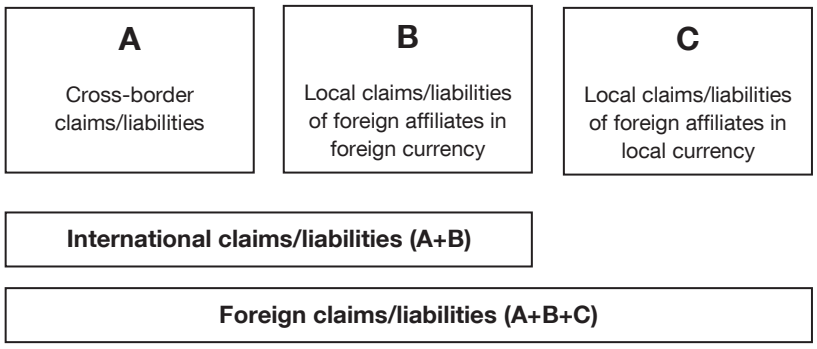
1. Introduction

The Global Financial Crisis (GFC) urged policymakers to take specific measures to limit future massive public interventions to restore financial stability in the event of market turbulences. In particular, the Basel Committee of Banking Supervision (BCBS) agreed on a methodology to identify and assess, on an annual basis, global systemically important banks (G-SIB) and to require them a loss absorbency requirement based on their systemic footprint.

The G-SIB assessment methodology is an indicator-based measurement approach, reflecting dimensions by which a bank may generate cross-border spillovers and negative global externalities resulting in higher losses in the event of distress or failure. The higher the score a bank obtains, the higher its global, system wide, loss- given-default and, therefore, the higher its required G-SIB capital buffer. The foreign activity of banks is one of the considered dimensions, captured by the Cross-jurisdictional claims[1] and Cross-jurisdictional liabilities indicators. Those metrics are intended to reflect the extent to which a bank is global under the assumption that the greater a bank's global reach, the more difficult to coordinate its resolution and the more widespread the spillovers from its failure (Basel Committee on Banking Supervision, (2018)).

The referred Cross-jurisdictional indicators are computed on a consolidated basis. Specifically, as shown in Chart 1, these indicators comprise data on (i) cross-border positions (claims and liabilities booked by the headquarters or by any branch or subsidiary vis-à-vis residents of a country other than that of the banking office that has recorded the position); (ii) local positions in local currency (claims and liabilities booked by foreign branches or subsidiaries to their own residents in the country's currency) and (iii) local positions in foreign currency (claims and liabilities booked by foreign branches or subsidiaries to their own residents denominated in any other currency different from

Chart 1: Types of claims and liabilities in the Cross-jurisdictional indicators



Source: Bank for International Settlements (2019) and own elaboration.

[1] Claims refer to financial assets, mainly made up of loans, deposits, reverse repos, debt securities holdings, equity instruments, account receivables and derivatives.

the country's currency). All these types of foreign positions are equally weighted in the G-SIB assessment methodology (Basel Committee on Banking Supervision, (2018)). Consequently, the framework relies on a gross measure of foreign activity that does not differentiate between business models of international banking, thus implicitly if all of them carry the same global systemic risk. This paper studies empirically whether this implicit assumption is correct.

Intuitively, financially autonomous banks' affiliates -understood as offices that finance their investment in local claims in local currency with local liabilities in local currency- are less vulnerable to fluctuations in international funding markets or other economic developments in the other countries in which the international banking group operates.

From a theoretical point of view, there are several reasons that may lead to predict a reduced propagation of shocks on a global scale by more decentralized international banks. First, the access to central banks' facilities in local currency, which will be less available in any other currency in a global crisis scenario. Second, when claims and liabilities are denominated in the same currency, currency mismatches are lower and, therefore, the impact of exchange rate movements is lower too. Third, since both financing and investment are local, local offices can be better isolated from fluctuations in international capital flows.

The collapse of Iceland's major international banks in October 2008 illustrates well how sharp unexpected changes in exchange rates and reversal of capital inflows can lead to the materialization of funding risks when no emergency facilities are available[2]. Similarly, the Great Financial Crisis offers a good example of the potential impact on financial stability of currency mismatches. Before 2008, some large internationally active banks had granted a significant amount of loans in local currency funded in foreign currency. When dollar-funding froze, there was a noteworthy retrenchment in cross-border banking flows, while local claims remained significantly more stable (Gambacorta et al. (2019), McCauley et al. (2012), and Muñoz de la Peña and Van Rixtel (2015)). Currency and maturity mismatches were identified as the major factors contributing to trigger the crisis (Gambacorta et al. (2019)).

Chart 2 from Aldasoro et al. (2022) shows the evolution of banks' foreign claims just before the Great Financial Crisis (GFC). It can be observed that banks' cross-border investments tend to expand more rapidly in boom times and retrench sharply in times of stress, while the investment in the form of local claims features fluctuations of lower magnitude around the GFC (in line also with the evidence reported in Gambacorta et al. (2019), McCauley et al. (2012) and Muñoz de la Peña and Van Rixtel (2015)). In contrast to the decline in foreign claims during the GFC, both cross-border and local claims grew during the Covid-19 crisis. Cross-border claims grew by 9% in the year to end-2020, while

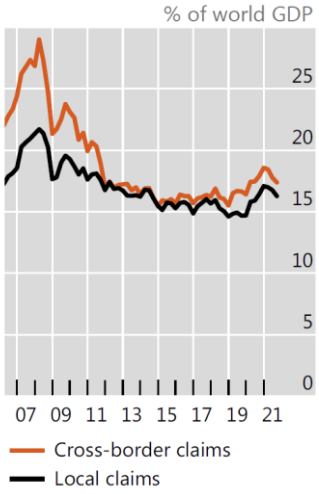
[2]Prior to the collapse of the major international Icelandic banks in October 2008, a large portion of their foreign and short-maturity liabilities were denominated in foreign currencies (Buiter and Sibert (2011)). When international markets dried out, the Icelandic Central Bank was unable to obtain foreign swap lines to provide banks with emergency facilities in foreign currency. The Icelandic crisis had important international spillovers; in Europe, investors and some financial institutions in countries such as the United Kingdom and the Netherlands, were heavily affected (Danielsson (2009)).

local claims in local currency grew by 14.5% in the year to end-2020. This is likely a consequence of the extraordinary policy measures taken by central banks and governments to provide liquidity and support credit. The exogenous nature of the shock probably contributed to banks acting as a first line of defense against the shock[3].

It can also be observed that cross border claims represented a higher fraction of foreign claims than local claims prior to the GFC, and very similar afterwards. This suggests that cross-border banking activity can contribute to the pro-cyclicality in international capital flows by more than locally originated and funded activity, giving raise to potentially larger feedback loops with an impact on the real economy.

In distress situations, a sudden stop in cross-border funding may force banks more reliant on cross-border funding to cut credit and fire-sell collateral (e.g. if they are not able to rollover maturing liabilities) by more than banks reliant on a local funding model. Similarly, bank borrowers which are not able to replace international bank credit with local sources may be forced to contract their economic activity, creating negative feedback effects on the real economy. Conversely, thanks to diversification, the model reliant on cross-border activities (rather than locally funded) might be less vulnerable to local funding shocks. Therefore, elucidating which of the two opposite forces dominates in making one model overall more or less vulnerable than the other is an empirical question, and is this is indeed the question that this paper aims to address.

Chart 2: Evolution of cross-border and local claims



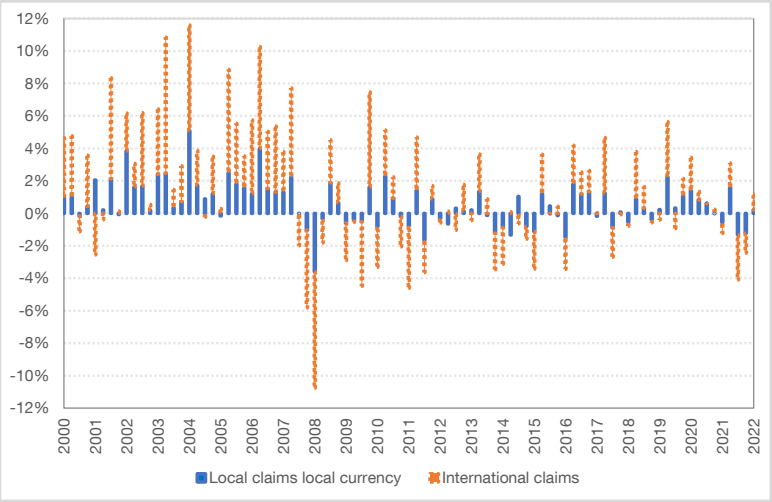
Source: Aldasoro et al. (2022)

In a similar vein to Chart 2, Chart 3 breaks down the quarterly variation in total foreign claims in its two components, namely international claims and local claims in local currency. Using publicly available information from the BIS, Chart 3 shows that the contribution of international claims to the quarterly variation of foreign claims is way more pronounced than the contribution of local claims, confirming that, at this level of

[3] See Casanova et al. (2021), Demirguc-Kunt et al. (2021) and Hardy and Takáts (2020) to a complete description of the policy measures enacted by policy makers and the behavior of international banks during the Covid-19 crisis.

aggregation, local claims are more stable over time than international claims. For each quarter, the contribution of the international claims to the quarterly variation of foreign claims is way higher than the contribution of local claims in local currency.

Chart 3: Contributors to the quarterly variation of Foreign Claims



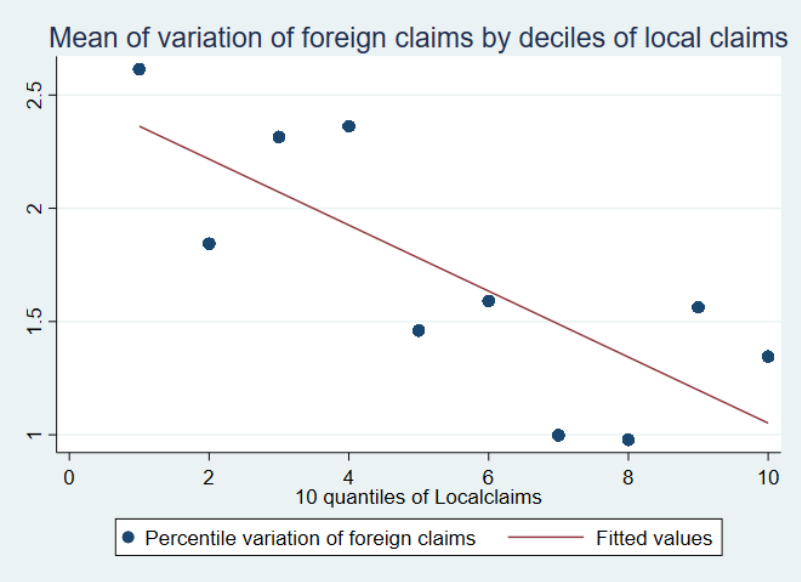
Note: The graph shows the quarterly variation of total Foreign Claims by its components (i.e. local claims denominated in local currency and international claims). The graph displays the quarterly variation since 2000Q2 until 2022Q4.
Source: BIS Consolidated Banking Statistics and own elaboration

Further, Chart 4 shows the relationship between the variation of foreign claims and the importance of local claims in banks' foreign activities. The figure classifies country-year observations of foreign claims within the ten deciles of the variable capturing the share of local claims in foreign claims, and reports the average quarterly variation of foreign claims in each decile. The clearly negative slope on the figure reveals that higher values of local claims are associated with lower quarterly variations of foreign claims.

In this paper we pay singular attention to the Cross-jurisdictional indicators of the G-SIB methodology. Using country-level data over the period 2000-2022, we analyze the evolution of the international expansion of global banking groups, and study how local claims in local currency impact the evolution of foreign claims. Based on our initially stated hypothesis and the motivating evidence provided above, we expect foreign claims made up primarily by local claims in local currency to be more robust and less volatile than other components of foreign claims. Our aim is, therefore, to test whether local claims in local currency play a stabilizing role on the evolution of foreign claims.

The expected greater stability of such foreign claims is based, firstly, on the fact that foreign offices' balance sheet would be more shielded from external shocks than otherwise, allowing banks to stabilize their lending over time. In other words, banks will be more reliant on local economic conditions to define their lending strategy. Secondly, closer proximity to customers might contribute to reduce information costs (Portes (2005)) resulting in a better understanding of the market and favoring that banks hold significantly more assets in nearby markets (Buch (2005)). Economic proximity

Chart 4: Relation between variation of Foreign Claims and Local Claims in local currency



Source: BIS Consolidated Banking Statistics and own elaboration

significantly more assets in nearby markets (Buch (2005)). Economic proximity contribute that banks exhibit more favorable behavior towards regional borrowers during a crisis (Cerutti et al. (2014) and Park and Shin (2020)) probably due to having more lending experience and more local presence (De Haas and Van Horen (2013)). This would also be in line with the argument in Gambacorta et al. (2019) that when banks engage in local operations they tend to do so with the idea of keeping a long-term relationship along which to recover the high costs of establishing such a business model, since local operations cannot be adjusted as fast nor as easy as cross-border operations.

We also explore whether international banking groups expand abroad primarily through branches or subsidiaries and how the number of these foreign affiliates have evolved over time[4].

We base our main empirical analysis on Cerutti (2015). Cerutti (2015) uses Bank of International Settlements (BIS) Consolidated Banking Statistics (CBS) data combined with an extensive bank-level database to measure banking systems' foreign credit exposure, and concludes that foreign credit exposures depend both on the creditor's and borrower's economic characteristics as well as on global financial conditions. The paper shows that a systemic banking crisis in a creditor banking system is linked to a reduction on foreign credit exposures.

We extend the empirical contribution of Cerutti (2015) by studying how the proportion of local claims in local currency over total foreign claims affects the evolution of foreign claims. In particular, using country level data, we are interested in analyzing whether

[4] See Brei and Winograd (2018), Cerutti et al. (2007), Fillat et al. (2018) and for detailed differences between the regulatory treatment of branches and subsidiaries and related literature.

having a relatively high proportion of local claims in local currency relative to cross-border claims helps stabilize the evolution of foreign claims. Moreover, we also study how some relevant home and host countries' economic characteristics other than bank characteristics affect banks' foreign claims.

The primary message of the paper is that a high ratio of local claims in local currency to total foreign claims mitigates the reduction of a banking system's foreign claims following a systemic crisis. We study the impact of both the Covid-19 crisis and the Great Financial Crisis using a global database. The paper also demonstrates that a high proportion of local claims in local currency reduces the variation in foreign claims during periods of economic growth or stock market volatility in the banking system's home country.

This paper is organized as follows. Section 2 presents the related literature review, Section 3 describes the economic data the paper is based on, Section 4 introduces the empirical strategy followed, Section 5 provides the results and Section 6 concludes.

2. Literature review

There is an extensive literature describing international banking models and their impact on financial stability. Basically, global banking business models can be distinguished between multinational and international, as classified by McCauley et al. (2012). Multinational banks expand mainly on an international scale through financially autonomous offices located in different jurisdictions, where local claims represent a very significant share of their total foreign claims. In contrast, international banks expand mainly through cross-border investments (i.e. vis-à-vis non-residents) booked by the headquarters or by branches and subsidiaries located in major financial centers. In this model, cross-border claims are very sizeable.

Global banks also differ in how they obtain and manage their funding. Banks may use cross-border funding sources managed from the headquarters or their offices in international financial centers. These funds will be distributed throughout the banking group through intra-group transactions and finally invested in various jurisdictions. This model is known as a centralized funding model, and under this structure, there is no relationship between the sources of funding and the destination of investments. Alternatively, banks can directly raise funds in the countries where they invest; an approach called decentralized funding model. This model is characterized by greater financial autonomy of its foreign offices, and as a result, the volume of local claims and liabilities is very similar and intra-group positions are smaller.

During the GFC, global banks played an important role in transmitting funding shocks across the globe. But not all funding models had the same impact. Gambacorta et al. (2019) argue that the decentralized model showed greater stability than the centralized one. They also find evidence that, since the GFC, global banking has seen a decline in cross-border operations in favor of local ones. Similarly, Park and Shin (2020) investigate financial contagion from advanced to emerging countries though cross-border banking

flows during the GFC and conclude that lenders are less likely to withdraw funds from borrowers during periods of financial stress if both belong to the same region.

Further, McCauley et al. (2012) document how local claims in local currency were on aggregate more stable during the GFC than cross-border claims across six regions, including the euro area. Recently, Argimón et al. (2020) also show that the international exposure of European banks declined less for banking groups with higher reliance on local liabilities, focusing on Euro Area banks belonging to 10 different countries and studying the average stock of total claims across two different (pre- and post- GFC) periods, 2005 – 2007 and 2014 – 2016.

Further, Cetorelli and Goldberg (2012a) show that, during the 2007-2009 crisis, global banks' internal capital markets contributed to domestic liquidity shocks' international propagation, which ultimately affected their foreign branches' lending. Besides, Cetorelli and Goldberg (2012b) rely on data on US-based foreign bank branches to quantify the effect of the international shock transmission on different bank affiliates, stating that the reduction in lending depends negatively on branch's size and its commitment to the local market before the shock.

In line with the above, several authors find a differentiated pattern in the reduction of foreign lending depending on whether the banking expansion model is mainly based on subsidiaries or branches. Albertazzi and Bottero (2014) present evidence that the reduction is driven almost exclusively by the reduction of lending granted by foreign banks' branches. Along these lines, De Haas and Van Horen (2013) also show that foreign banks reduce credit more where they operate through branches, and that they also reduce credit less during downturns when they are geographically, culturally, and institutionally close to the host country. This means that foreign subsidiaries which have forged lending relationships with local borrowers and banks are more stable providing credit. This conclusion is consistent with Claessens (2017), who states that foreign banks' closer relationship with the foreign market makes them provide more finance and share risks in a better way.

Further, several authors argue that subsidiaries limit contagion to their parent company, and vice versa, given that subsidiaries are more isolated from the rest of the banking group than branches are, which reduces the risk of foreign operations (see Brei and Winograd (2018) and Fillat et al. (2018)). In the same vein, Cerutti et al. (2007) propose that setting up a subsidiary structure instead of a branch one is particularly preferable in countries with relatively riskier business environments, due in part to the dissimilar degree of legal responsibility associated with establishing a branch or a subsidiary. In fact, the mode of entry of banks into foreign markets can play a major stabilization or destabilization role in the market, depending on the bank's structure (Allen et al. (2003), Cao et al. (2021) and Danisewicz et al. (2017)).

The credit granted by a foreign branch or a subsidiary may also be affected by regulatory factors, as foreign banks are not detached from their home countries' regulation (Mili et al. (2017)). Danisewicz et al. (2017) estimate the impact of regulatory changes at the home market on loans granted by foreign offices. In particular, they state that a capital tightening in the UK implies that UK foreign branches reduce their interbank lending

growth by 5.7 percent points more than UK foreign subsidiaries. The authors argue that this is due to the fact that parent companies hold more control over their foreign branches compared to subsidiaries, so subsidiaries enjoy more autonomy and are less affected by home regulatory changes than branches are.

Ongena et al. (2013) also show that conditions at home affect banks' behavior abroad. As such, they show that higher restrictions on banking activities and higher capital requirements are linked to lower lending standards applied abroad. Recently, Barrell and Nahhas (2020) considering a subset of advanced countries' cross-border investment in the European Union, show that banks' investment abroad depends positively on the available returns abroad and negatively on returns at home. Further, it concludes that domestic regulation has an impact on determining lenders' cross-border lending, overall when lending is directed to countries that are considered risky. Morais et al. (2019) also document how domestic characteristics influence foreign lending, by showing that foreign banks in Mexico which parent company is in the United States, the United Kingdom or the Euro zone, increase their lending volumes in Mexico when their respective home countries soften their monetary policy conditions.

Recently, the COVID-19 crisis has also provided good insights into the impact of home and host country conditions on cross-border banking flows. In particular, home countries with better capitalized banking systems appear to have lent more, especially to countries with stronger economic activity and lower financial vulnerabilities, as evidenced by Hardy and Takáts (2020).

3. Data

We focus our study on the countries of the top 76 banking groups that participated in the end-2020 G-SIB exercise and obtain information about them mainly from the BIS Consolidated Banking Statistics[5]. We disregard 2 banking groups that had no offices abroad so our final sample consists of 74 banking groups. These banking groups are headquartered in 18 different countries, identified as home countries. Since cross-jurisdictional activity (i.e. cross-border claims and liabilities and local claims and liabilities in local currency) is one of the main indicators of the G-SIB assessment exercise, banks participating in this exercise are those that incur mainly in foreign banking activity. In fact, our sample represents 83% of the total foreign claims reported by all countries included in the BIS Consolidated Banking Statistics (CBS) in 2020. We know the number and country of location of these banks' branches and subsidiaries abroad and the countries where they are located are denominated host countries. We have country-level quarterly data on foreign claims since 2000 Q1 until 2022 Q1 and also

[5] The sample includes all banks used in the end-2020 G-SIB assessment exercise to calculate the denominators that determine the total scores. In particular, the sample includes the 75 largest banks in terms of total exposures at end-2020, along with all banks that were identified as G-SIB in the previous year. The remaining participating banks, not included in the sample, are those with a leverage exposure measure exceeding EUR 200 billion at the end of 2019, but which are neither among the top 75 banks nor designated as G-SIB in the end-2019 G-SIB exercise.

obtain country-level yearly data on the number of foreign branches and subsidiaries for the period 2012-2020 from the BIS.

In order to compare the number of subsidiaries and branches across countries and over time we compute the subsidiaries' ratio for each year, which is the number of subsidiaries of a home (or host) country banking system over the total number of foreign offices (branches and subsidiaries) of the home (or host) country banking system between 2012 and 2020.

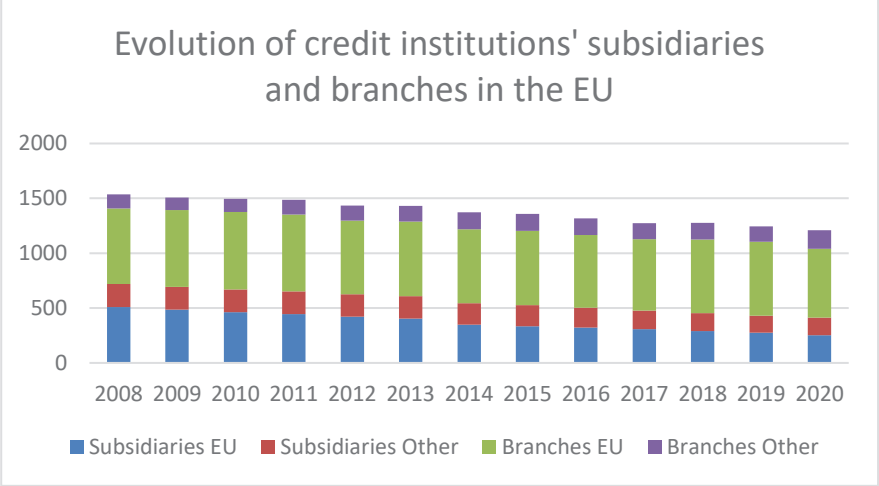
A ratio equal to one implies that banking groups of a given home country have uniquely subsidiaries abroad and no branches, and a ratio equal to zero implies the contrary. According to the data[6], we observe that the majority of home banks have a subsidiaries' ratio lower than 0.5 over the years, implying that they have more branches than subsidiaries abroad. On average and considering every home country, the subsidiaries' ratio over the period 2012-2020 is 34.8%. Even in those countries where in some years the ratio was over 0.5, there were at least more years where the ratio was lower than 0.5. Besides, the ratio has largely decreased over the period. On average, the subsidiary ratio has decreased 8.6% since 2012 and 2020, equivalent to 2.8 percentage points. While both the number of branches and subsidiaries have decreased, the number of subsidiaries has decreased in a higher proportion during this period (the number of branches has decreased around 9.3% while the number of subsidiaries has decreased around 24.4%).

The decreasing trend of both the number of branches and subsidiaries over time is notorious and is not only limited to the sample of main banks that participated in the end-2020 G-SIB assessment exercise. The trend is similar if we focus, for example, in the number of offices in the European Union (EU), both from other EU home countries and non-EU home countries. The European Banking Federation (EBF) publishes the number of credit institutions that are subsidiaries or branches present in the EU, both from other EU countries or from outside the EU, as shown in Chart 5. Even if it is a different sample from ours and covers different aspects, it is useful to see -and in line with our data- that the number of subsidiaries has been monotonically falling over the last years in the EU and in a higher proportion than the number of branches (the number of subsidiaries has fallen by 42% between 2008 and 2020, while the number of branches has fallen 13% over the same period).

Chart 5 further disentangles the number of branches and subsidiaries in the EU by the location (in or outside the EU) of its parent company. It can be observed that the number of subsidiaries whose parent company is located in another EU country has fallen more pronouncedly than the number of subsidiaries in the EU from a parent company outside the EU (which also falls). This trend can partly be explained by bank consolidation. According to European Banking Federation (2022), the number of banks in the EU has decreased over the last years in part due to mergers in the banking sector. Specifically, the number of banks in the EU has decreased 33% since 2009.

[6] The confidentiality of the data prevents us to publish individual countries' number of branches, subsidiaries or their ratio in a given year, but we provide across countries and over the 2012-2020 period averages.

Chart 5: Evolution of the number of subsidiaries and branches in the EU



Source: Banking in Europe: European Banking Federation (2022) and own elaboration

As aforementioned, we perform the analytical study mainly using data from the BIS Consolidated Banking Statistics (CBS), only available at country level. We focus on the banking systems which are home to the main banks that participated in the 2020 G-SIB assessment exercise, which represent 83% of the total foreign claims reported by all countries included in the BIS Consolidated Banking Statistics (CBS) in 2020.[7] Our aim is to study the change of a banking system's foreign claims depending on the banking system's observable characteristics together with some global determinants.

We compute the quarterly change of a banking system's foreign claims using information from the BIS Consolidated Banking Statistics (CBS). We also use information from the BIS to calculate the ratio of local claims in local currency over foreign claims.

We use the systemic crisis database of Laeven and Valencia (2018) to identify the years in which countries suffered a systemic crisis and to summarize this information into a dummy variable. Given that their database covers up to 2018, we expand it until 2021 by setting that no country suffered a systemic crisis in 2019, all of them in 2020 and only those with two consecutive GDP contractions or a quarter with a higher than 1% contraction with respect to the previous quarter in 2021. The following Table i shows the years during which each country went under a systemic crisis.

We employ the DataStream service to obtain the monthly values of the European Euro Stoxx 50 volatility index and compute the quarter average, as a proxy for investor uncertainty and risk aversion.

Last, we use the World Banks' Global Financial Development data to obtain banks' credit to deposits ratio, the national stock price volatility index and GDP at market prices, for every country.

[7] The total foreign claims of main banks participating in the G-SIB assessment exercise is highly representative of the total foreign claims reported by all countries to the BIS CBS every year. On average, the total foreign claims of the main banks that have participated in the G-SIB assessment exercise between 2000 and 2022 represent 80% of the total foreign claims reported by all countries to the BIS CBS.

Table i. Years during which each country had a systemic crisis

Country	Crises years
Australia	2020, 2021
Brasil	1998, 2020
Canada	2020
Switzerland	2008, 2009, 2020
Germany	2008, 2009, 2020, 2021
Denmark	2008, 2009,2020
Spain	2008-2012, 2020
Finland	2020
France	2008, 2009,2020
Great Britain	2007-2011, 2020
India	2020, 2021
Italy	2008, 2009,2020
Japan	2000, 2001, 2020, 2021
Korea	2020
The Netherlands	2008, 2009,2020
Sweden	2008, 2009,2020
Singapore	2020
United States	2007-2011, 2020

Table ii: Description and summary statistics of the variables used in the analysis

Variable	Definition	Obs	Mean	Std Dev	25th percentile	75th percentile
Dependent variable:						
△ Foreign Claims$_{it}$	Quarterly growth of home country *i* 's banking system's foreign claims in all its counterparty countries at time *t*	1468	1.74	6.12	-1.65	4.93
Independent variables:						
LL Claims/ Foreign Claims$_{it-1}$	Ratio of local claims in local currency over foreign claims (local claims+cross border claims), for home country	1435	0.41	0.19	0.24	0.55
LL Liabilities/ LL Claims$_{it-1}$	Ratio of local liabilities in local currency over local claims in local currency, for home country	1395	0.86	0.64	0.62	0.89
△ Counterparty GDP$_{ijt-1}$	Banking system i counterparty countries'j weigthed average quarterly GDP growth rate. The variable is weighted using the weight of foreign claims in each counterparty country over total foreign claims. Counterparty countries in which the exposure is less than 1% of the total foreign claims are eliminated	1345	0.48	1.79	0.29	0.79
Counterparty Credit/ Deposits$_{ijt-}$	Banking system i counterparty countries'j weigthed average quarterly credit to deposits. The variable is weighted using the weight of foreign claims in each counterparty country over total foreign claims. Counterparty countries in which the exposure is less than 1% of the total foreign claims are eliminated	1305	104.86	35.66	79.60	121.28
Systemic crisis dummy$_{it-1}$	A dummy indicating whether home country i suffered a systemic crisis at each time	1593	0.13	0.34	0.00	0.00
△ Home country GDP$_{it-1}$	Home country quarterly GDP growth	1455	0.50	2.09	0.11	0.96
Stock volatility$_{it-1}$	Average of the 360-day volatility of the national stock market index in banking system i	1569	21.06	8.35	14.44	24.91
VSTOXXI$_{t-1}$	Quarterly volatility of the EURO STOXX 50 financial index	1629	23.79	8.34	17.54	27.12

In Table ii the description and summary statistics of the variables used for the analysis are presented.

4. Empirical strategy

We estimate the following baseline equation using a panel Ordinary Least Squares (OLS) method:

$$\Delta Foreign\ Claims_{it}$$
$$= \beta_0 + \beta_1 systemic\ crisis\ dummy_{i,t-1} + \beta_2 \left(\frac{LL\ Claims}{Foreign\ Claims}\right)_{i,t-1}$$
$$+ \beta_3 \left(\frac{LL\ Claims}{Foreign\ Claims}\right)_{i,t-1} * systemic\ crisis\ dummy_{i,t-1}$$
$$+ \beta_4 VSTOXXI_{t-1} + \overrightarrow{\beta_5}\ Home\ country\ variables_{i,t-1}$$
$$+ \overrightarrow{\beta_6}\ Weighted\ Counterparty\ variables_{i,t-1} + \gamma_i + \delta_t + \epsilon_{it}$$

Where the dependent variable $\Delta\ foreign\ claims_{it}$ stands for the quarterly change of a banking system's foreign claims in all its counterparty countries, measured as the percentage change between two consecutive periods.

Our main key variable of interest is the interaction between the ratio of local claims in local currency over foreign claims of banking system *i* and a dummy variable indicating whether the home country of the banking system *i* was under a systemic crisis dummy in time *t-1*. This interaction indicates whether banking systems with different levels of the local claims ratio behave differently in terms of the evolution of their foreign claims under normal and systemic crises times.

We expect that the higher the ratio of local claims the lower the retrenchment of foreign claims during systemic crises, in line with the stabilizing role of local claims described in Aldasoro et al. (2022), Gambacorta et al. (2019), McCauley et al. (2012) and Muñoz de la Peña and Van Rixtel (2015)).

The previous reasoning stands over the fact that cross-border claims are more volatile and higher in volume than local claims, as it is seen in Chart 2. Hence, as foreign claims are composed of cross border and local claims, cross border claims would be the main factor determining the volatility of foreign claims. In periods of economic expansion, both the cross border and local claims increase, but as cross border claims are expected to increase in a higher proportion, the ratio of local claims over foreign claims would decrease, leading to a negative relationship between the ratio of local claims over foreign claims and the variation of foreign claims. On the contrary, in crises periods, both the cross border and local claims are expected to decrease, leading to a fall of total foreign claims, but as cross border claims are expected to fall in a higher proportion than local claims, the ratio of local claims over foreign claims would increase.

Second, while interacting the local claims ratio with the systemic crisis dummy we can observe whether the negative expected relationship between the local claims ratio and the variation of foreign claims is exacerbated or lessened if the home country is going through a systemic crisis. In principle and in line with the literature review, having a high ratio of local claims helps to stabilize the variation of foreign claims, specially under a crisis scenario or when shocks emerge, so we would expect the negative effect the local claims ratio might have on the variation of foreign claims to get reduced under a systemic crisis, making them in fact more stable or less volatile.

Focusing on the dummy capturing whether the home country was going through a systemic crisis the previous quarter, since this fact may by itself capture the evolution

and the shrinkage of its foreign claims, we expect it to be negatively related to the variation of foreign claims. Moreover, given that our time frame covers both the period of the Great Financial Crisis (GFC) and the Covid-19 pandemic years, the systemic crisis variable captures any systemic crisis aroused in a country over both crises. Nevertheless, given the heterogeneous nature of both crises –the GFC was endogenously built due to excessive weak lending while the Covid-19-driven crisis was an exogenous shock to the global economy– we do consider both crises separately as well.

The GFC was characterized as a financial crisis, partly originated by incorrect valuation of portfolio risks, while the Covid-19 crisis, started as a health crisis, quickly became an economic crisis. Many countries collaborated during the GFC to maintain global financial stability, and new and stricter regulation was internationally agreed and adopted following it, while governments took different responses to the Covid-19 crisis, so the financial stability and the banking sector were differently affected during both crises (Batten et al. (2023)). A notorious difference between both crises was the fact that during Covid-19, compared to the GFC, households' deposits surged, and central banks injected massive amounts of liquidity (Gounopoulos et al. (2021)). Besides, banks held higher levels of capital and liquidity buffers at the onset of the Covid-19 crisis than at the onset of the GFC, making them more resilient to the Covid-19 crisis (European Banking Authority (2020)).

Studying volatility impacts on global banks, Batten et al. (2023) show that higher value-at-risk (VaR) average levels occurred in the GFC compared to the Covid-19 crisis for the US banking system, while for the European banking system, during Covid-19 they experienced higher VaR levels than during the GFC. Both during the GFC and the Covid-19 period, Asian banks had the lowest VaR levels compared to their US and European counterparts, providing evidence of crises' heterogenous impact on geographically different banking groups.

Besides, analyzing banks' resilience through the GFC and Covid-19 crises, Ikeda et al. (2021) show that the largest banking institutions around the world exhibited a greater resilience during the Covid-19 crisis than during the GFC, arguing that market valuations recovered faster, and recently, Agoraki et al. (2024), analyzing the performance of 16 banking groups operating in the euro area, state that the euro area's banking industry was not negatively impacted on an aggregate level during the Covid-19 crisis.

Consequently, for completeness, we separately study both time periods to capture the possible heterogeneity of the GFC and the Covid-19 crises' impact on banking systems' foreign claims. Against this background, in the Annex we provide replication of every result presented in the paper using two different systemic crisis variables: a variable capturing whether during the GFC (years 2007-2011) a country went through a systemic crisis, and another variable capturing whether during the Covid-19 pandemic (years 2020-2021) a country went through a systemic crisis. This exercise complements the one presented in the main text, where, as aforementioned, a unique variable is considered to capture whether during both crises a country suffered a systemic crisis.

The global financial volatility and uncertainty plays a substantial role determining banks' appetite for foreign claims, so we take the VSTOXXI volatility index into account in our

specification. The VSTOXXI volatility index (also known as VIX) proxies the investor sentiment and overall economic uncertainty by measuring the volatility of the EURO STOXX 50 financial index. We expect the coefficient to have a negative sign since the higher the global volatility the more likely it is the foreign claims to get reduced since in a high volatility period, banks are more reluctant to invest and find it more difficult to obtain funding given that investors are warier to provide it, contributing both cases to a retrenchment of foreign claims.

As further explanatory variables we use both the home banking system's as well as its counterparty countries' indicators to control for both the home and host economies' macro-financial context. In order to control for home countries' economic situation, other than considering the aforementioned systemic crisis dummy, we consider the country's stock price volatility and its GDP's growth rate which are included in the β_5 vector.

The stock price volatility captures the average of the 360-day volatility of the national stock market index for each home country, and it is a measure of each country's economy's volatility. Contrary to the VSTOXXI volatility index, we expect the home country's volatility to favorably affect the country's banking system's foreign claims, since a higher local volatility might incentivize the banking system to invest abroad where a most stable economic environment might be found. By using each home country's economic volatility besides the overall economic uncertainty captured by the VIX variable, we can control for both the domestic and international volatility that may affect the evolution of foreign claims in opposite ways.

We also include each home banking country's GDP's growth rate to measure the state of the economy along the cycle. The expected sign of the coefficient is negative since a higher GDP growth rate might favor a stronger focus on the home market and thus a lower implication on foreign ones.

Regarding the counterparty countries' economic and financial situation we use two relevant variables: the banking system *i*'s counterparty countries' weighted average quarterly GDP growth rate and the weighted average of the banking system's counterparty countries' bank credit to bank deposits ratio. Both variables are captured by the vector β_6. Given that a banking system may have claims of different magnitude vis-à-vis different countries, we weight these two variables regarding counterparty countries by the banking system's exposition to them. This is, with J_i being the set of country *i*'s counterparty countries, we weight the two counterparty variables we control for (GDP and credit to deposits ratio) through the following expression:

$$\mathrm{w}_{it} = \sum_{j \in J_i} p_{jt} \times w_{ijt}$$

Where p_{jt} is the value of the GDP or the credit to deposits ratio on country *j* in period *t,* and w_{ijt} is the proportion of total foreign claims the banking system of country *i* has on country *j* in period t.

We expect the counterparty countries' weighted average quarterly GDP growth rate's sign to be positive, since the better the performance of the host countries' economies

the likelier it is the home country's investment in them to increase, as opposed to the negative sign expected for the home country's GDP growth.

Regarding the weighted average of the home banking system's counterparty countries' bank credit to bank deposits ratio, this is a proxy for the banking system's counterparty countries' dependence on the funding from their customers. We expect a positive relationship with the change of foreign claims since the higher the dependence on deposits, the lower the ratio, and the lower the need to tap on foreign claims to grant credit.

Last, we include γ_i and δ_t as home country and quarter fixed effects, to control for unobserved time-invariant heterogeneity at country level and to control for seasonal effects, respectively, as in Cerutti (2015). In the most saturated model of each specifications and to broaden the scope, we also use home country and quarter fixed effects multiplicatively instead of additively to control for quarterly-varying unobserved heterogeneity at country level.

Further, we are also interested to see whether there are heterogeneous effects, that is, whether the ratio of local claims in local currency has a higher or lower impact on the change of foreign claims when some other variables other than the systemic crisis dummy such as the home country's GDP, takes a high or low value, or when there is a high volatility in the national stock market. In order to study this heterogeneity, we estimate the double interactions of the home country's GDP and its stock volatility measure with the ratio of local claims in local currency over foreign claims, alternatively and jointly. Given that we cannot cluster the standard errors at borrower country level as done in Cerutti (2015) due to the low and not sufficient number of different countries in our sample, we cluster them at country and time level.

5. Results

In this section we show estimation results of different variations of Eq. (1), where separate specifications are tested. We start showing in Table 1 the cumulative impact of each explanatory variable on the quarter variation of foreign claims, to end up saturating the model with every regressor. Then, Table 2 shows the estimation results of Eq. (1) where the interaction of the ratio of local claims and the systemic crisis dummy is considered. Table 2, as it is done in Table 1, shows the cumulative impact of every explanatory variable in order to show the consistency of the results, and specifically the consistency of the statistical significance of the interaction term, which will remain highly significant across every specification. Table 3 shows further interactions of the ratio of local claims with other variables, and considers the interactions separately and jointly in distinct specifications.

Table 1 shows the determinants of the variation of foreign claims in a cumulative way, showing the cumulative effects of the variables when they are added to a regression where some variables are already estimated, until the model is saturated. As such, we estimate in Model 1 the effect of the ratio of local claims in local currency on the variation of foreign claims, and from Model 2 to Model 7 we add gradually the other

variables. Model 8 replicates the previous Model 7 using the quarter fixed effects and the creditor banking system fixed effects multiplicatively instead of additively, in order to account for quarterly varying banking systems' characteristics. In each estimation we use all the observations available to estimate the specification[8].

The ratio of local claims in local currency over foreign claims is robust to the inclusion of all controls, maintaining its statistically significant coefficient and its magnitude over all models. The rest of the variables maintain their statistical significance and sign as well across all models.

The ratio of local claims in local currency over foreign claims remains highly statistically significant in every specification with a negative sign, as expected, underlining the negative relationship with the variation of foreign claims, implying that a higher proportion of local claims in local currency over the total foreign claims has a negative impact on the variation of foreign claims.

The volatility index VSTOXXI comes up statistically significant at 1% level in every specification as well, and with a negative sign, implying that in high market volatility periods, the foreign claims tend to decrease, since the banking system reduces its exposure to foreign markets by reducing its claims abroad. Once the systemic crisis dummy is introduced in Model 3, we observe that the variable follows a similar intuition to the volatility index, since its negative sign indicates that during the years in which a systemic crisis occurs, foreign claims tend to decrease. Therefore, as it would be expected, there is evidence that banks do decrease their foreign claim holdings both during high volatility periods and when systemic crises occur. On the contrary, the national stock market index's volatility is positively-signed with a robust statistical significance once it is included from Model 5 on, which implies that the higher the home country's economic volatility the higher its banking systems foreign claims. This result, together with the negative sign of the volatility index, provide evidence that banking systems tend to lower their exposure to volatile situations, either reducing their foreign exposure when facing high international volatility and reducing relatively their home exposure when facing domestic economic volatility.

Further, we observe that there is a positive relation between a foreign country's economic evolution and the foreign claims this country receives, so when a banking system invests in a foreign country which GDP is booming, the amount of foreign claims the banking system invests in this foreign country increases. Similarly, the more the home country in which the banking system is headquartered grows, the lower the banking system's foreign claims. Moreover, the higher the gap between the credit granted in the counterparty countries and the deposits raised in those countries, the higher the exposure of a banking system's foreign claims to those countries.

Last, Model 7 presents the fully saturated model using additively quarter and creditor banking system fixed effects, while Model (8) presents the estimation results of the same specification using both fixed effects multiplicatively, in order to capture time

[8] We have also replicated every specification using the most restrictive sample in each of the results' table as a robustness exercise. Results are qualitatively identical.

varying unobserved heterogeneity at country level. We note that the R-squared almost doubles and that results remain qualitatively and quantitatively almost identical.

Table 1: Baseline regression. Impact of variables saturating the model.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ratio Local Claims over Foreign Claims	-5.525***	-6.731***	-6.191***	-6.462***	-5.430***	-5.427***	-5.421***	-5.445***
	(1.742)	(1.740)	(1.751)	(1.842)	(1.841)	(1.864)	(1.913)	(1.844)
VSTOXXI		-0.109***	-0.100***	-0.095***	-0.130***	-0.132***	-0.144***	-0.143***
		(0.018)	(0.019)	(0.020)	(0.021)	(0.022)	(0.022)	(0.021)
Systemic crisis dummy			-1.144**	-1.182**	-2.021***	-2.166***	-1.974***	-1.961***
			(0.481)	(0.498)	(0.526)	(0.547)	(0.546)	(0.525)
Home country GDP growth rate				0.037	0.037	-0.283	-0.280	-0.248
				(0.099)	(0.098)	(0.178)	(0.177)	(0.174)
Stock volatility					0.125***	0.131***	0.121***	0.121***
					(0.027)	(0.028)	(0.028)	(0.027)
Counterparty countries' weighted GDP growth						0.392**	0.395**	0.394**
						(0.180)	(0.180)	(0.176)
Counterparty countries' weighted bank credit to bank deposits							0.030**	0.029**
							(0.014)	(0.013)
Constant	3.963***	7.000***	6.722***	6.627***	4.544***	4.510***	1.876	1.936
	(0.739)	(0.892)	(0.898)	(0.955)	(1.048)	(1.094)	(1.714)	(1.651)
Observations	1,409	1,395	1,395	1,290	1,290	1,224	1,188	1,188
R-squared	0.078	0.101	0.105	0.105	0.120	0.135	0.148	0.246
Quarter FE	YES	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	No	YES

Note. This table reports estimates from an Ordinary Least Squares model from 2000:Q1 to 2022:Q1. The dependent variable is the quarterly percent change of foreign claims exposure, which measures a reporting bank's nationality's foreign claims. Quarterly dummies and borrower fixed effects are included in every Model. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are in the adjacent column. *** Significant at 1%, ** significant at 5%, * significant at 10%.

In Table 2 we replicate every specification of Table 1 introducing an interaction term between the ratio of local claims in local currency over foreign claims and the systemic crisis dummy. By doing so, we estimate Eq. (1) and present one of the key messages of the present study in Table 2. We aim to observe whether the effect of a systemic crisis on foreign claims differs depending on the ratio of local claims. The positive-signed interaction between the ratio and the systemic crisis dummy implies a lower fall of the foreign claims during the systemic crisis years. In other words, it implies that during the years in which the parent banking system is going through a systemic crisis, having a higher ratio of local claims in local currency over foreign claims helps reduce the fall of foreign claims, stabilizing the variation of foreign claims. In other words, the effect of the ratio of local claims in local currency over foreign claims softens the decline of the variation of foreign claims during systemic crisis periods, implying more stable foreign claims during crisis periods when the parent banking systems has a high proportion of local claims in local currency.

The stabilization of the variation of foreign claims achieved through a high proportion of local claims in local currency is observed through the two most notorious crises happened over the last two decades, namely the GFC and the crisis emerged with the Covid-19 pandemic. Although similarly devastating in economic terms, both crises differed in their origin, the former being the consequence of endogenous erratic economic behaviors and the latter being the consequence of a worldwide exogenous health pandemic. With the aim of distinguishing the possible heterogeneous stabilizing role of the ratio of local claims in local currency over the two different crises, we

separately study the interaction between the ratio and the two different crises, by replicating the specifications presented in Table 2. Regression results are shown in the Annex as a complement to the main specifications shown in the main text. These results show that the stabilization effect also occurred during both crises when studied separately, and that this effect is significant across different econometric specifications.

This stabilizing factor is robust across all specifications in Table 2 as well. Specifically, interpreting the results displayed in the most saturated Model 7, one standard deviation increase of the ratio of local claims implies a reduction of 0.18 standard deviations of foreign claims when there is no systemic crisis, while it implies a reduction of just 0.07 standard deviations when the country is going through a systemic crisis, that is, a 0.11 standard deviation lower fall. Hence, even if the relationship of the ratio of local claims over foreign claims and the variation of foreign claims is negative on average, we observe that it is less negative and around two thirds lower during crises times, implying a lower reduction of foreign claims during crises the higher the relative amount of local claims in local currency a banking system has.

Further, we note that on average, systemic crises or international volatility have a negative impact on the variation of foreign claims, while the stock volatility of the home country has a positive impact on it.

Table 2: Baseline regression including interaction between the ratio of local claims over foreign claims and the systemic crisis dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ratio Local Claims over Foreign Claims	-5.090**	-6.444***	-6.860***	-5.938**	-5.906**	-5.783**	-5.801**
	(1.992)	(2.176)	(2.305)	(2.515)	(2.515)	(2.488)	(2.475)
Systemic crisis dummy	-2.848***	-2.417***	-3.237***	-3.785***	-3.794***	-3.752***	-3.707**
	(0.832)	(0.787)	(1.074)	(1.113)	(1.137)	(1.101)	(1.353)
Ratio Local Claims over Foreign Claims * Systemic crisis dummy	2.503***	2.737***	4.623***	3.951***	4.016***	3.700***	3.632***
	(0.513)	(0.602)	(0.716)	(0.786)	(0.812)	(0.757)	(1.214)
VSTOXXI		-0.100**	-0.120**	-0.150***	-0.148***	-0.144***	-0.142**
		(0.047)	(0.050)	(0.048)	(0.049)	(0.048)	(0.049)
Counterparty countries' weighted bank credit to bank deposits			0.037	0.027	0.031	0.031	0.030
			(0.025)	(0.025)	(0.026)	(0.027)	(0.027)
Stock volatility				0.119**	0.116**	0.120**	0.120**
				(0.047)	(0.048)	(0.047)	(0.048)
Home country GDP growth rate					0.046	-0.270***	-0.237*
					(0.101)	(0.087)	(0.112)
Counterparty countries' weighted GDP growth						0.386**	0.386**
						(0.157)	(0.170)
Constant	4.004***	6.826***	3.651*	2.664	2.212	2.011	2.069
	(0.873)	(1.489)	(1.923)	(1.918)	(1.968)	(1.999)	(2.198)
Observations	1,409	1,395	1,231	1,231	1,191	1,188	1,188
R-squared	0.087	0.105	0.130	0.143	0.145	0.149	0.247
Quarter FE	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	YES

Note. This table reports estimates from an Ordinary Least Squares model from 2000:Q1 to 2022:Q1. The dependent variable is the quarterly percent change of foreign claims exposure, which measures a reporting bank's nationality's foreign claims. Quarterly dummies and borrower fixed effects are included in every Model. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are in the adjacent column. *** Significant at 1%, ** significant at 5%, * significant at 10%.

Table 3 presents further evidence of the heterogeneous effect of the national stock market index volatility and the home country's GDP growth on the variation in foreign claims depending on the ratio of local claims. That is, we study whether the home

country's characteristics have a heterogeneous impact on the banking system's variation of foreign claims depending on the value the ratio of local claims might take. These interactions are first separately studied and then simultaneously with the interactions between the systemic crisis dummy and the ratio of local claims as well. Model 1 in Table 3 considers uniquely the interaction between the ratio of local claims and the home country's GDP growth rate, while Model 2 considers uniquely the interaction of the ratio with the home country's national stock volatility index. No Model is presented with just the interaction between the ratio of local claims and the systemic crisis dummy because this specification is studied and shown in Table 2. Therefore, from Model 3 to Model 5 of Table 3 double combinations of the three interactions are presented, and Model 6 presents the estimation results when all the three interactions are jointly considered. Last, Model 7 replicates the estimation of Model 6 considering the fixed effects multiplicatively instead of additively. Results are consistent across every specification.

First, note that the statistical and economic significance of the interaction between the ratio of local claims and the systemic crisis dummy remains robust to the inclusion of the other two interactions of the ratio with the national stock volatility index and with the home country's GDP. This implies that the heterogeneous effect of the systemic crisis depending on the ratio of local claims holds when controlling for the potential heterogeneous effect of the ratio during high national economic volatility periods and during economic growth or retrenchment.

During high economic periods, the banking systems focus relatively more on their home market retrenching their foreign claims, but the positively-signed interaction term between the ratio of local claims and the home country's GDP indicates that foreign claims' retrenchment is lower when the ratio of local claims is higher. That is, when a banking system has a relatively high presence of local claims in local currency in a host market, the diminution of foreign claims that would follow an economic boom in the home country is lower compared to the retrenchment that would follow if the banking system had relatively low local claims in the host country, i.e. a high ratio of local claims stabilizes the amount of foreign claims a banking system has abroad since it decreases the retrenchment that occurs on average when the home country is booming. Therefore, when the home country's GDP is increasing, the banking system invests more in the home market in detriment of investing abroad, i.e., a shift of funds occurs from foreign markets to the home market, but if the ratio of local claims in local currency is higher, the shift of funds is lower so the banking system keeps more claims abroad than if it had a lower ratio of local claims. Hence, keeping a higher ratio of local claims allows banking systems to maintain a durable relationship with their foreign markets, even when their home country's economy is booming, reinforcing their presence and strengthening interconnections with the societies they operate in, as stated in Gambacorta et al. (2019).

Regarding the volatility of the national stock market index, as it is also seen in Table 1 and in Table 2, the higher the national economic volatility the higher the increase of foreign claims, but it is now seen in Table 3 that this positive relation is less positive when the banking system has a higher ratio of local claims. That is, a higher ratio of local

claims prevents the banking system to increase more its foreign claims when there is a high economic volatility in the country. As a consequence, foreign claims do not suffer huge variations and are kept more stable under a high national economic volatility when the banking system has a higher ratio of local claims.

Table 3: Heterogeneity results. Analysis of the determinants of the percent variation of foreign claims using quarter fixed effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ratio Local Claims over Foreign Claims	-5.445**	-2.735	-5.848**	-2.120	-3.158	-2.572	-2.967
	(2.553)	(3.002)	(2.605)	(2.961)	(3.183)	(3.124)	(3.240)
Systemic crisis dummy	-2.259**	-2.126**	-4.080***	-4.331***	-2.127**	-4.424***	-4.321***
	(0.814)	(0.816)	(1.083)	(1.215)	(0.820)	(1.184)	(1.452)
Home country GDP growth rate	-0.547***	-0.288***	-0.571***	-0.280***	-0.532**	-0.556**	-0.473*
	(0.183)	(0.094)	(0.191)	(0.094)	(0.191)	(0.203)	(0.262)
Stock volatility	0.173***	0.209***	0.172***	0.224***	0.208***	0.222***	0.218***
	(0.047)	(0.039)	(0.048)	(0.039)	(0.038)	(0.038)	(0.045)
Ratio Local Claims over Foreign Claims * Systemic crisis dummy			3.792***	4.718***		4.915***	4.628*
			(1.102)	(1.568)		(1.678)	(2.198)
Ratio Local Claims over Foreign Claims * Home country GDP	0.594		0.669		0.538	0.609	0.499
	(0.415)		(0.418)		(0.432)	(0.432)	(0.488)
Ratio Local Claims over Foreign Claims * Stock volatility		-0.111*		-0.159*	-0.102	-0.152*	-0.131
		(0.058)		(0.076)	(0.063)	(0.079)	(0.094)
VSTOXXI	-0.179***	-0.175***	-0.179***	-0.173***	-0.177***	-0.175***	-0.174***
	(0.046)	(0.047)	(0.046)	(0.047)	(0.047)	(0.047)	(0.047)
Counterparty countries' weighted GDP growth	0.404**	0.416**	0.394**	0.409**	0.411**	0.402**	0.402**
	(0.156)	(0.168)	(0.156)	(0.169)	(0.164)	(0.165)	(0.177)
Counterparty countries' weighted bank credit to bank deposits	0.031	0.032	0.031	0.033	0.032	0.033	0.032
	(0.025)	(0.025)	(0.025)	(0.026)	(0.025)	(0.026)	(0.026)
Constant	1.640	0.400	1.794	0.083	0.596	0.291	0.525
	(1.990)	(2.477)	(1.915)	(2.587)	(2.438)	(2.532)	(2.618)
Observations	1,188	1,188	1,188	1,188	1,188	1,188	1,188
R-squared	0.158	0.158	0.159	0.160	0.159	0.160	0.258
Quarter FE	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	YES

Note. This table reports estimates from an Ordinary Least Squares model from 2001:Q1 to 2022:Q1. The dependent variable is the quarterly percent change of foreign claims exposure, which measures a reporting bank's nationality's foreign claims. Quarterly dummies and borrower fixed effects are included in every Model. Coefficients are listed in the first row, robust standard errors are reported in the row below, and the corresponding significance levels are in the adjacent column. *** Significant at 1%, ** significant at 5%, * significant at 10%.

6. Conclusions

We have utilized data from the BIS Consolidated Banking Statistics (CBS) to analyze the evolution of foreign claims within major international banking systems. Our findings indicate that banking systems with a higher ratio of local claims in local currency to total foreign claims experience a smaller decline in foreign claims during crises, thereby stabilizing foreign claims during such periods. Specifically, an increase of one standard deviation in the ratio of local claims results in a reduction of 0.18 standard deviations in foreign claims in the absence of a systemic crisis, and a reduction of only 0.07 standard deviations during a systemic crisis. This evidence underscores the importance of local claims in local currency in supporting the self-sufficiency of foreign offices and mitigating the sensitivity of foreign claims to systemic crises.

Furthermore, our analysis reveals that the contraction of foreign claims following an economic boom in the home country is mitigated by a higher ratio of local claims in local currency to foreign claims. Similarly, the increase in foreign claims following periods of high economic uncertainty in the home country is also counteracted by a higher ratio of local claims to foreign claims. Thus, a higher proportion of local claims in local currency contributes to stabilizing the volatility of foreign claims under conditions where foreign claims are generally more volatile.

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ANNEX

Results presented throughout the paper in Table 1, Table 2 and Table 3, where a systemic crisis dummy identifying whether the home country is going through a systemic crisis at each time during the period 2000-2022 is considered, are replicated in this Annex considering two different systemic crisis dummies.

We re-estimate every model presented in the main text using separately a variable identifying whether during the GFC (years 2007-2011) a country went through a systemic crisis, and another variable capturing whether during the Covid-19 pandemic (years 2020-2021) a country went through a systemic crisis. These two variables' mean is, respectively, 0.07 with a standard deviation of 0.25, and 0.05 with a standard deviation of 0.21.

Every result is consistent and in line with the results presented in the main text, specially the interaction between the local claims over foreign claims and the systemic crisis dummy presented in Table 2 and Table 3, where its positive coefficient is highly statistically significant either at 1% or 5% statistical level in every model, supporting the key message of the paper that banking systems which foreign claims rely more heavily on local claims in local currency experience a much lower fall of foreign claims during a systemic crisis, be it endogenously (GFC) or exogenously (Covid-19) driven.

Table A1.1: Re-estimation of specifications shown in Table 1 using a variable capturing whether a country suffered a systemic crisis uniquely during the GFC.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ratio Local Claims over Foreign Claims	-5.525***	-6.731***	-6.565***	-6.843***	-6.106***	-6.138***	-5.936***	-5.962***
	(1.742)	(1.740)	(1.743)	(1.835)	(1.831)	(1.856)	(1.906)	(1.838)
VSTOXXI		-0.109***	-0.102***	-0.098***	-0.127***	-0.129***	-0.142***	-0.140***
		(0.018)	(0.019)	(0.020)	(0.021)	(0.022)	(0.022)	(0.021)
Systemic crisis during GFC dummy			-0.843	-0.851	-1.725***	-1.753***	-1.792***	-1.756***
			(0.618)	(0.630)	(0.659)	(0.663)	(0.658)	(0.633)
Home country GDP growth rate				0.030	0.023	-0.272	-0.272	-0.238
				(0.099)	(0.098)	(0.178)	(0.178)	(0.175)
Stock volatility					0.112***	0.114***	0.106***	0.106***
					(0.027)	(0.027)	(0.027)	(0.026)
Counterparty countries' weighted GDP growth						0.361**	0.366**	0.364**
						(0.180)	(0.180)	(0.176)
Counterparty countries' weighted bank credit to bank deposits							0.039***	0.038***
							(0.014)	(0.013)
Constant	3.963***	7.000***	6.836***	6.758***	4.919***	4.955***	1.394	1.466
	(0.739)	(0.892)	(0.899)	(0.956)	(1.046)	(1.091)	(1.748)	(1.685)
Observations	1,409	1,395	1,395	1,290	1,290	1,224	1,188	1,188
R-squared	0.078	0.101	0.102	0.103	0.115	0.129	0.144	0.242
Quarter FE	YES	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	No	YES

Table A1.2: Re-estimation of specifications shown in Table 1 using a variable capturing whether a country suffered a systemic crisis uniquely during the Covid-19 crisis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ratio Local Claims over Foreign Claims	-5.525***	-6.731***	-6.383***	-6.631***	-6.002***	-6.072***	-6.048***	-6.060***
	(1.742)	(1.740)	(1.747)	(1.841)	(1.838)	(1.859)	(1.910)	(1.842)
VSTOXXI		-0.109***	-0.110***	-0.106***	-0.139***	-0.142***	-0.152***	-0.151***
		(0.018)	(0.018)	(0.019)	(0.021)	(0.022)	(0.022)	(0.021)
Systemic crisis during Covid dummy			-1.528*	-1.557*	-2.033**	-2.122**	-1.671*	-1.701**
			(0.794)	(0.837)	(0.842)	(0.845)	(0.869)	(0.835)
Home country GDP growth rate				0.048	0.052	-0.245	-0.244	-0.211
				(0.099)	(0.098)	(0.178)	(0.178)	(0.175)
Stock volatility					0.099***	0.101***	0.093***	0.093***
					(0.026)	(0.026)	(0.027)	(0.026)
Counterparty countries' weighted GDP growth						0.365**	0.366**	0.365**
						(0.180)	(0.180)	(0.176)
Counterparty countries' weighted bank credit to bank deposits							0.029**	0.027**
							(0.014)	(0.014)
Constant	3.963***	7.000***	6.953***	6.844***	5.338***	5.419***	2.887*	2.953*
	(0.739)	(0.892)	(0.891)	(0.949)	(1.021)	(1.063)	(1.739)	(1.676)
Observations	1,409	1,395	1,395	1,290	1,290	1,224	1,188	1,188
R-squared	0.078	0.101	0.104	0.104	0.114	0.129	0.141	0.239
Quarter FE	YES	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	No	YES

Table A2.1: Re-estimation of specifications shown in Table 2 using a variable capturing whether a country suffered a systemic crisis uniquely during the GFC.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ratio Local Claims over Foreign Claims	-5.689**	-6.931***	-7.117***	-6.498**	-6.442**	-6.331**	-6.346**
	(2.025)	(2.224)	(2.292)	(2.449)	(2.449)	(2.440)	(2.443)
Systemic crisis during GFC dummy	-4.160**	-3.319*	-3.755*	-4.390**	-4.412**	-4.215**	-4.112*
	(1.927)	(1.757)	(1.963)	(2.003)	(2.019)	(1.987)	(2.027)
Ratio LC over FC * Systemic crisis during GFC dummy	4.936**	5.055**	5.810**	5.477**	5.522**	4.964**	4.824**
	(1.796)	(1.753)	(2.102)	(2.203)	(2.239)	(2.202)	(2.118)
VSTOXXI		-0.102**	-0.121**	-0.147***	-0.146***	-0.142**	-0.140**
		(0.046)	(0.049)	(0.048)	(0.050)	(0.049)	(0.049)
Counterparty countries' weighted bank credit to bank deposits			0.040	0.034	0.039	0.039	0.038
			(0.026)	(0.026)	(0.027)	(0.027)	(0.028)
Stock volatility				0.105**	0.103**	0.106**	0.105**
				(0.045)	(0.046)	(0.045)	(0.046)
Home country GDP growth rate					0.032	-0.256***	-0.222**
					(0.112)	(0.080)	(0.100)
Counterparty countries' weighted GDP growth						0.352**	0.350**
						(0.149)	(0.158)
Constant	4.167***	6.989***	3.414*	2.287	1.800	1.579	1.645
	(0.894)	(1.516)	(1.958)	(1.983)	(2.018)	(2.052)	(2.256)
Observations	1,409	1,395	1,231	1,231	1,191	1,188	1,188
R-squared	0.084	0.103	0.128	0.139	0.142	0.145	0.243
Quarter FE	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	YES

Table A2.2: Re-estimation of specifications shown in Table 2 using a variable capturing whether a country suffered a systemic crisis uniquely during the Covid-19 crisis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ratio Local Claims over Foreign Claims	-5.190**	-6.386***	-6.661**	-6.165**	-6.121**	-6.063**	-6.076**
	(1.943)	(2.111)	(2.308)	(2.496)	(2.511)	(2.483)	(2.477)
Systemic crisis during GFC dummy	-2.352***	-2.757***	-2.641***	-2.823***	-2.817***	-3.118***	-3.156***
	(0.219)	(0.214)	(0.220)	(0.266)	(0.254)	(0.401)	(0.916)
Ratio LC over FC * Systemic crisis during Covid dummy	2.097***	2.660***	3.539***	2.676***	2.758***	3.173***	3.191***
	(0.349)	(0.312)	(0.699)	(0.785)	(0.836)	(0.815)	(0.956)
VSTOXXI		-0.110**	-0.129**	-0.158***	-0.156***	-0.152***	-0.151***
		(0.047)	(0.050)	(0.049)	(0.050)	(0.049)	(0.050)
Counterparty countries' weighted bank credit to bank deposits			0.035	0.025	0.030	0.029	0.028
			(0.027)	(0.027)	(0.028)	(0.028)	(0.029)
Stock volatility				0.093*	0.090*	0.092*	0.093*
				(0.049)	(0.050)	(0.049)	(0.051)
Home country GDP growth rate					0.053	-0.248***	-0.215*
					(0.111)	(0.073)	(0.105)
Counterparty countries' weighted GDP growth						0.369**	0.369*
						(0.163)	(0.176)
Constant	3.883***	6.953***	3.884*	3.431	2.946	2.815	2.881
	(0.868)	(1.484)	(2.134)	(2.102)	(2.172)	(2.209)	(2.386)
Observations	1,409	1,395	1,231	1,231	1,191	1,188	1,188
R-squared	0.080	0.104	0.127	0.136	0.138	0.141	0.239
Quarter FE	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	YES

Table A3.1: Re-estimation of specifications shown in Table 3 using a variable capturing whether a country suffered a systemic crisis uniquely during the GFC.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ratio Local Claims over Foreign Claims	-6.025**	-2.293	-6.502**	-1.694	-2.679	-2.143	-2.519
	(2.501)	(2.994)	(2.581)	(2.892)	(3.183)	(3.060)	(3.171)
Systemic crisis during GFC dummy	-2.047	-1.861	-4.657**	-5.051**	-1.853	-5.227**	-5.044**
	(1.186)	(1.197)	(2.001)	(2.134)	(1.211)	(2.100)	(2.143)
Home country GDP growth rate	-0.531***	-0.284***	-0.568***	-0.269***	-0.511**	-0.552**	-0.468*
	(0.175)	(0.077)	(0.184)	(0.079)	(0.184)	(0.197)	(0.252)
Stock volatility	-0.173***	-0.169***	-0.173***	-0.168***	-0.170***	-0.169***	-0.169***
	(0.047)	(0.047)	(0.046)	(0.048)	(0.048)	(0.048)	(0.048)
Ratio Local Claims over Foreign Claims * Systemic crisis during GFC dummy			5.355**	6.672**		7.061**	6.662**
			(2.505)	(2.973)		(2.907)	(3.064)
Ratio Local Claims over Foreign Claims * Home country GDP	0.578		0.695		0.500	0.626	0.516
	(0.411)		(0.418)		(0.426)	(0.416)	(0.494)
Ratio Local Claims over Foreign Claims * Stock volatility		-0.155**		-0.206***	-0.148**	-0.199**	-0.180*
		(0.062)		(0.070)	(0.067)	(0.074)	(0.090)
VSTOXXI	0.154***	0.207***	0.154***	0.223***	0.205***	0.222***	0.217***
	(0.046)	(0.040)	(0.047)	(0.039)	(0.039)	(0.038)	(0.045)
Counterparty countries' weighted GDP growth	0.370**	0.388**	0.353**	0.373**	0.383**	0.365**	0.364**
	(0.148)	(0.161)	(0.154)	(0.160)	(0.157)	(0.157)	(0.167)
Counterparty countries' weighted bank credit to bank deposits	0.040	0.041	0.040	0.042	0.041	0.042	0.040
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.027)
Constant	1.096	-0.535	1.321	-0.775	-0.353	-0.561	-0.346
	(2.021)	(2.419)	(1.954)	(2.504)	(2.389)	(2.451)	(2.566)
Observations	1,188	1,188	1,188	1,188	1,188	1,188	1,188
R-squared	0.153	0.154	0.154	0.156	0.154	0.156	0.254
Quarter FE	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	YES

Table A3.2: Re-estimation of specifications shown in Table 3 using a variable capturing whether a country suffered a systemic crisis uniquely during the Covid-19 crisis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ratio Local Claims over Foreign Claims	-6.199**	-1.291	-6.204**	-1.141	-1.753	-1.592	-1.937
	(2.569)	(3.016)	(2.565)	(3.755)	(3.213)	(3.924)	(3.278)
Systemic crisis during Covid dummy	-1.927***	-1.733***	-3.105***	-3.511***	-1.761***	-3.404***	-3.441***
	(0.577)	(0.563)	(0.426)	(1.080)	(0.570)	(1.072)	(1.054)
Home country GDP growth rate	-0.557***	-0.263***	-0.553***	-0.268	-0.528**	-0.521	-0.438
	(0.174)	(0.085)	(0.176)	(0.166)	(0.186)	(0.423)	(0.258)
Stock volatility	0.138**	0.209***	0.137**	0.211***	0.208***	0.210***	0.206***
	(0.047)	(0.040)	(0.048)	(0.072)	(0.039)	(0.071)	(0.044)
Ratio Local Claims over Foreign Claims * Systemic crisis during Covid dummy			2.587***	3.914**		3.620**	3.576**
			(0.780)	(1.647)		(1.770)	(1.420)
Ratio Local Claims over Foreign Claims * Home country GDP	0.703*		0.686*		0.585	0.557	0.451
	(0.380)		(0.384)		(0.399)	(0.735)	(0.471)
Ratio Local Claims over Foreign Claims * Stock volatility		-0.204***		-0.212*	-0.195**	-0.202	-0.185*
		(0.066)		(0.125)	(0.072)	(0.129)	(0.089)
VSTOXXI	-0.183***	-0.177***	-0.183***	-0.176***	-0.178***	-0.178***	-0.177***
	(0.046)	(0.047)	(0.046)	(0.049)	(0.047)	(0.049)	(0.048)
Counterparty countries' weighted GDP growth	0.368**	0.392**	0.371**	0.397*	0.386**	0.391*	0.390**
	(0.154)	(0.171)	(0.160)	(0.207)	(0.166)	(0.201)	(0.183)
Counterparty countries' weighted bank credit to bank deposits	0.028	0.031	0.029	0.032	0.031	0.032	0.030
	(0.026)	(0.027)	(0.027)	(0.026)	(0.026)	(0.026)	(0.027)
Constant	2.838	0.509	2.775	0.340	0.735	0.568	0.802
	(2.115)	(2.495)	(2.144)	(2.758)	(2.457)	(2.827)	(2.613)
Observations	1,188	1,188	1,188	1,188	1,188	1,188	1,188
R-squared	0.149	0.151	0.150	0.151	0.152	0.152	0.250
Quarter FE	YES	YES	YES	YES	YES	YES	-
Creditor Banking System FE	YES	YES	YES	YES	YES	YES	-
Quarterly * Creditor Banking System FE	No	No	No	No	No	No	YES

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