The mix of international banks' foreign claims:
Determinants and implications

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Abstract:

We analyze the cross-country determinants and financial stability implications of the mix of international banks' foreign claims. We distinguish between local claims -extended by host country affiliates- and cross-border claims -booked outside the receiving country. Using data on Italian, Spanish, and U.S. banks' foreign claims, we find that the share of local claims is driven by restrictions on banking sector openness and by local scale economies/business opportunities. The impact of limits on property rights, entry requirements, start-up and informational costs is less robust. Finally, foreign claim volatility is lower in countries with a larger share of local claims.

1- Introduction

After a decade of financial repression and stagnant international financial flows, the 1990s saw a resurgence in financial globalization. As part of this process, multinational banking gained momentum once again and international banks' foreign claims—those extended on residents outside the country in which these banks are headquartered—took off. These claims consist of financial assets such as loans, debt securities, and equities, including equity participations in subsidiaries. According to statistics from the Bank for International Settlements (BIS), which monitor foreign claims held by banks from OECD countries vis-à-vis the rest of the world, these claims rose from 1.3 trillion dollars in 1990 to close to 3 trillion dollars in 2002.[1]

International banks may grow their foreign claims portfolio in two ways. First, they may establish affiliates in different countries and extend claims locally through their branches and subsidiaries in these countries. Second, international banks may also extend cross-border claims by financing and booking the claims from outside the recipient or host countries. In particular, cross-border claims are typically extended from the banks' headquarters. While local claims involve some form of foreign direct investment in the host country's financial sector, cross-border claims do not. In practice, we observe significant disparities in how international banks conduct their business across countries. In some instance, like in the case of Albania, Burundi, Bhutan, Cambodia, and Moldova, foreign banks only extend cross-border claims. While in other instances, such as in Brazil and Hong Kong, foreign banks' exposure is largely local.

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[1] BIS-reporting countries over this period include: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and U.S.

This paper empirically investigates the determinants of the mix of foreign bank claims and studies its implications for financial stability. Our analysis is based on a new dataset of foreign bank claims, both cross-border and local, extended by Italian, Spanish, and U.S. banks to over 100 countries around the world during the period 1997-2002. Banks from these three countries are dominant players in the international banking market and they jointly account for approximately 30 percent of all outstanding foreign claims vis-à-vis the countries in our sample.

To study the mix of claims extended by international banks across countries, we rely on the conceptual/theoretical framework applied in the trade/multinational firm literature to the choice between exporting goods (the equivalent to cross-border lending) and producing them abroad for foreign markets (the equivalent to FDI or local claims). In particular, studies such as Brainard (1997) and Helpman et al. (2003) discuss the tradeoff faced by multinational firms between paying the higher sunk costs of establishing affiliates overseas vis-à-vis confronting the transportation costs and trade barriers that arise from exporting their goods instead. We use new survey data on the minimum capital requirements for opening banks across countries, as well as recently available information on the general costs (fees, costs of procedures and forms, fiscal stamps, legal and notary charges, etc.) of starting up a business to study their importance in driving the share of local to total foreign claims. Furthermore, since banking is an informationally intensive industry, we reinterpret the role of transportation costs in the manufacturing trade/multinational firm literature as information costs that arise in the international banking context. We proxy for information costs by including measures of 'proximity' (i.e., legal and economic) between the host or recipient country and the country of origin of the foreign bank. Finally, we also examine the impact of banking policies (in particular

the extent of banking sector openness), measures of economies of scale/business opportunities, as well as, default, price and expropriation risks.

Our results on the determinants of the mix of foreign bank claims reveal that the share of local claims is driven primarily by the degree of openness in the host banking sector and by local scale economies/business opportunities. Other factors such as bank entry requirements, start-up and informational costs, and limits on property rights are also significant, but their impact is less consistent across international banks and also varies depending on the specification.

With respect to the implications of the mix of foreign bank claims, we focus exclusively on the impact of the composition of these claims on the overall volatility of foreign bank financing, while controlling for other factors that might affect the variability of foreign claims.[2] Because FDI or local claims require paying higher fixed and irreversible costs, it seems reasonable to expect these flows to be more stable and less responsive to bad news than cross-border claims. Also, economic fixed costs aside, banks trying to shrink the size or close down their overseas operations will have to pay the reputational costs of doing so and, therefore, may be less likely "to run" when conditions deteriorate. At the same time, while in the face of good economic conditions foreign banks can relatively quickly and, perhaps cheaply, extend cross-border financing, augmenting their local claims might require lumpy investments that are often decided on the basis of long-term rather than short-term profit opportunities.

Our results on the stability of foreign financing indicate that countries with a higher share of local foreign claims experience lower total foreign claims volatility. This result, which is robust to controlling for a number of other factors that might affect foreign claims volatility,

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[2] There may be other implications from the mix of foreign bank claims, such as the impact on the balance of payments, which we ignore here and leave for future research.

helps us confirm in a systematic manner some of the descriptive evidence offered by other studies favoring local foreign claims to cross-border bank financing (see de Haas and Lelyveld, 2002; Palmer, 2000; Peek and Rosengren, 2000).

Even though the literature on international banking is quite vast, our study is to our knowledge the first to formally analyze the determinants of the mix of foreign bank financing and its consequences on the stability of such flows. Existing studies on the factors driving financial FDI (or local claims) and cross-border claims have explored the determinants of these flows in isolation. An early strand of the literature on FDI by international banks focused on the experience of developed countries (especially the U.S.) with foreign bank entry and bank internationalization during the 1970s and 1980s (see Clarke et al., 2003 for a review). More recently, several authors have examined the decision of international banks to establish operations overseas during the 1990s, especially in developing countries (e.g., Buch, 2000; Claessens et al., 2000; Guillen and Tschoegl, 2000; Focarelli and Pozzolo, 2001, 2006; Buch and DeLong, 2001; Moshirian, 2001; Buch, 2003; Galindo, Micco and Serra, 2003; Buch and Lipponer, 2004; Wezel, 2004).[3] A smaller number of papers have examined the determinants and behavior of cross-border claims (e.g., Dahl and Shrieves, 1999; Buch, 2000; Jeanneau and Micu, 2002; Kawai and Liu, 2002; and Buch and Lipponer, 2004).

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[3] A growing literature has examined the implications of foreign bank presence in developing countries. See Clarke et al. (2003) for a review of this literature. Among others, Claessens et al. (2000), Barajas et al. (2000), Denizer (2000), and Martínez Pería and Mody (2004) discuss the implications on competition and efficiency in the banking sector. Dages et al. (2000), Peek and Rosengren (2000), de Haas and Levyveld (2002, 2004), Detragiache and Gupta (2004) compare the lending behavior of foreign and domestic banks during crises. Berger et al. (2001), Mian (2006), and Clarke et al. (2005) address the consequences on access to financing by small and opaque borrowers.

The rest of the paper is organized as follows. Section 2 discusses the data on Italian, Spanish, and U.S. foreign claims. Section 3 presents the empirical methodology pursued. Section 4 discusses the empirical results. Section 5 concludes.

2- Data on foreign bank claims

Perhaps one of the reasons why there has not been much research on the cross-country mix of international banks' foreign claims has to do with the fact that data are not readily available. The main source of international banking data available today is the Bank for International Settlements. The BIS' *Consolidated Banking Statistics* contain country-level information on the foreign claims extended by international banks from more than 20, primarily OECD, countries (referred to as BIS-reporting countries). However, BIS data do not adequately discriminate between cross-border and local foreign claims. BIS statistics on local claims only capture those denominated in local currency. Foreign currency denominated local claims are combined with cross-border claims and reported under what the BIS calls "international claims". Thus, BIS data are largely ill-suited for an analysis of the determinants and the implications of the mix of cross-border versus local international bank claims.

Due to the limitations of the existing BIS information, the data used in our analysis had to be specially requested from the Italian and Spanish central banks. The exception was the U.S., which is the only country that since 1997 reports separate information on cross-border and local claims (both in local and foreign currency) to the BIS. For all three countries, the data available to us aggregates claims held by all banks vis-à-vis each host country. Thus, like in the case of the BIS data, the information we have is not bank, but rather country level data. For the U.S., we have information for the period 1997-2002. In the case of Italy, the data cover the period 1998-2002, while for Spain the sample spans 1999-2002. None of these countries collected separate

information on local and cross-border claims prior to this period. For all three countries, the information we have nets intra-bank positions.[4]

Table 1 presents information on Italian, Spanish, and U.S. banks' foreign claims in 105 countries. In the case of Italian banks, the share of local claims cannot be calculated for 9 countries (Bhutan, Botswana, Burkina Faso, Burundi, Cambodia, Honduras, Niger, Papua New Guinea and Rwanda), where both local and cross-border claims are zero. For the remaining countries, the average share of local claims is 16.01 percent. The share of local claims is zero (meaning claims are exclusively cross-border) in 59 countries or approximately 60 percent of the sample. Countries where the share of Italian banks local claims is zero include both developed and developing economies across all regions. Italian banks hold local claims in 35 percent of the countries in our sample. These include primarily developed economies or countries in Eastern Europe and Latin America. However, among these countries, the share of local claims is never 100 percent (the largest share of local claims, hovering around 90 percent, is observed for countries such as Croatia, Poland, and Peru). This indicates that Italian banks do not substitute entirely local claims for cross-border lending. Even in countries where most of the banking business is conducted through the local affiliates, there is still some cross-border financing taking place.

Spanish banks are not active in anyway in 14 countries in the sample —Armenia, Bangladesh, Bhutan, Botswana, Burkina Faso, Burundi, Cambodia, Jamaica, Lesotho, Nepal, Niger, Rwanda, Sri Lanka, and Zambia—, half of which are in Africa. Obviously, for these

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[4] This is an important advantage of this dataset since it allows us to measure net exposure to a country. On the other hand, bank level data from sources such as Bankscope do not disclose information on intragroup positions nor do they provide data on cross-border lending to specific hosts.

countries, the share of local claims cannot be calculated. For the remaining countries, the average local share is 17.73 percent. The share of local claims is zero in 48 countries or 47 percent of the sample. Like in the case of Italian banks, the list includes developed (mostly Nordic) and developing countries across all regions. Spanish banks tend to have local operations in developed countries and in emerging economies. The extent of local presence is particularly high in Latin America, where in many countries the share of local presence exceeds 75 percent, but never reaches 100.

U.S. banks are active in one way or the other in all but 5 countries in our sample (i.e., Armenia, Burkina Faso, Burundi, Madagascar, and Rwanda). Furthermore, contrary to the case of Spanish and Italian banks, U.S. banks have some form of local presence in more than three-quarters of the sample and those countries where the share of U.S. local claims is zero are mainly small developing economies (with the exception of Saudi Arabia). Finally, relative to Spain and Italy, it is harder to detect any regional pattern in the share of U.S. bank local foreign claims, since countries with high shares include both developed and developing countries in almost every region. The average share of local claims for U.S. banks is 34.75 percent.

3 - Empirical Methodology

The empirical analysis conducted in this paper has two objectives: (1) to study the determinants of the mix of foreign claims and (2) to examine the implications of this mix for the stability of foreign bank financing. Below, we discuss the empirical strategies pursued to accomplish these objectives. Because the time span covered by the data is relatively short and since many of the variables of interest do not vary over time, we focus on explaining differences across countries. Therefore, we consider only the average share of local foreign claims across

countries and, for each country, the volatility of total foreign claims over the entire sample period. Table 2 provides a detailed description of the data and sources used in our study.

Taking into account the existing empirical international banking literature and borrowing from the theoretical framework used in related trade and multinational firm studies, we model the average share of local to total foreign claims held by Italian, Spanish, and U.S. banks overseas as a function of the following factors[5]:

Share of local foreign claims$_{i,j}$= f(Minimum capital requirements$_j$, Non-capital bank

entry requirements & start-up costs$_j$, Informational costs$_{i,j,}$ Restrictions to Bank

Openness$_{j,}$ Taxes$_j$, Scale & business opportunities$_{j,}$ Risks$_j$)   (1)

Equation (1) is a reduced form model that tries to capture the underlying preferences of foreign banks and of governments and private agents in the host countries, where i indicates the international banks' country of origin (Italy, Spain, or U.S.) and j refers to the host or claim recipient country.[6] We estimate separate cross-country equations for Italian, Spanish, and U.S. banks' foreign claims. The *share of local foreign claims* refers to the ratio of local foreign claims extended, respectively, by Italian, Spanish, and U.S. banks to each host, expressed as a percentage of the total foreign claims extended by these banks to each host.

According to the trade/multinational firm literature, one of the main differences between exports and FDI, is that the latter involves paying sunk costs, typically associated with entry requirements and start-up costs. Similarly, in banking, sunk costs can be an important

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[5] Note that the number of factors mentioned in equation (1) is smaller than the number of regressors in Tables 4-6 because as explained below in equation (1), to keep things simple, we include many variables under one name. For example, *informational costs* are proxied by bilateral trade, common legal origin and internet hosts.

[6] Because we only have aggregate data for foreign banks from three countries, we cannot examine the role of home country factors and the importance of certain bank specific characteristics.

consideration for banks in deciding the type of presence to have in a country. If significant, we expect to find that sunk costs have an adverse effect on the share of local claims held by foreign banks. We collected and combined a number of measures of the sunk costs associated with entering the market and starting up a business. First, we collected data on the minimum capital requirements (expressed in dollars) banks need to comply with to begin operations in the countries in our sample. Second, we also take into account the regulations in each country as to what may constitute bank capital. In particular, we build an index of initial capital stringency that can take values from 0 to 3, with higher number indicating greater stringency.[7] Both this index and the dollar measure come from a worldwide survey of bank regulators summarized in Barth, Caprio, and Levine (2001). In the estimations, we combine the dollar measure with the index of initial capital stringency by obtaining the first principal component of the two series. We refer to the first principal component of the two series as *Minimum capital requirements.*[8] Third, we assembled data on the procedures required to open banks across countries from Barth, Caprio, and Levine (2001). This variable, labeled *Non-capital bank entry requirements,* is an index that takes values from 0 to 8, with higher numbers indicating a larger number of procedures.[9] In the

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[7] This index comes from summing up responses to the questions below in the following way: (1) Can initial and subsequent infusions of regulatory capital include assets other than cash or government securities? 1 if no. (2) Can the initial infusion of capital be based on borrowed funds? 1 if no. (3) Are the sources of funds that count as regulatory capital verified by the regulatory or supervisory authorities? 1 if yes.

[8] It should be noted that cross-border lending also requires capital for the head office and that it will generally be higher for more vulnerable host countries, for the same loan size. While the two needs (the minimum capital requirement to operate locally and the capital needed for cross-border lending) are not easily comparable, minimum capital requirements should generally involve larger costs when a bank starts to operate locally.

[9] The index varies from 0 to 8 depending on whether banks are required to submit none, some, or all of the following to issue a bank license: (1) draft by-laws, (2) intended organizational chart, (3) first 3-year financial

estimations, we combined this index using the method of principal components with two other measures of the costs of starting a business that come from the World Bank *Doing Business Indicators.* In particular, we include survey estimates of the actual monetary costs (in dollars) and, separately, the time (in number of days) involved in opening a business across countries. The first measures all identifiable official expenses in setting up any business (not necessarily banking), namely fees, costs of procedures and forms, fiscal stamps, legal and notary charges, etc.[10] The second, the time variable, captures the number of days to satisfy all procedures that need to be completed before a business license is issued. We refer to the first principal component of the bank entry requirement index, the costs, and time to start a business as *Non-capital bank entry requirements and start-up costs*.

In the export vs. FDI literature, the higher sunk costs involved in the latter are traded off against the higher transport costs involved in the former. In banking, physical transportation

projections, (4) financial information on main potential shareholders, (5) background/experience of future directors, (6) background/experience of future managers, (7) sources of funds to be used to capitalize the new bank, (8) intended differentiation of new bank from other banks.

[10] As stated in the Doing Business Report "the text of the Company Law, the Commercial Code, and specific regulations and fee schedules are used to calculate the costs [of starting a business]. If there are conflicting sources and the laws are not clear, the most authoritative source is used. The constitution supersedes the company law, and the law prevails over regulations and decrees. If conflicting sources are of the same rank, the source indicating the most costly procedure is used, since an entrepreneur never second-guesses a government official. In the absence of fee schedules, a governmental officer's estimate is taken as an official source. In the absence of a government officer's estimates, estimates of incorporation lawyers are used. If several incorporation lawyers provide different estimates, the median reported value is applied. In all cases, the cost excludes bribes." A list of all procedures considered in estimating the costs of starting a business can be found in:

 http://rru.worldbank.org/Documents/DoingBusiness/Methodology/StartingBusiness/StartingBusiness.pdf

costs are not likely to be as important. Instead, the literature has discussed the role of *informational costs* (see for example Buch, 2003 and Galindo et al., 2003). There are two main types of informational costs in the international banking business. On the one hand, there are the costs of screening and monitoring borrowers. These costs will tend to increase the larger the distance between the bank and its customers. On the other hand, there are the costs to banks' CEO and shareholders of monitoring the affiliates' managers and loan officers on the ground. These costs will also increase the larger the distance between the CEO and the manager/loan officer. In extending bank claims overseas, the informational costs of monitoring borrowers decline when banks decide to extend claims locally to foreign countries via their affiliates in these countries. But, at the same time, by growing the share of foreign claims they extend locally, international banks increase the costs of monitoring loan officers and affiliate managers. Thus, the net impact of informational costs on the share of local lending is an empirical question.

Testing the importance of informational costs in international banking decisions is complicated further by the fact that these cannot be measured directly. Instead, they are often captured by indicators of geographic, cultural, legal and economic "distance" between countries that are expected to affect information costs. As distance between an international bank and a country increases, both, the costs of monitoring foreign clients and bank managers or loan officers in bank affiliates rise. The discussion above suggests that the distance between the bank and its customers increases the comparative advantage to international banks of extending claims locally, since local presence helps to overcome some of these informational costs. Therefore, on the basis of the costs of monitoring borrowers, distance measures should have a positive impact on the share of local claims. On the other hand, as distance measures increase, the rising costs of monitoring loan officers and affiliate managers suggest that distance might have a negative

impact on the share of local claims. Thus, a priori the sign of distance measures on the share of local claims is unclear.

We measure "economic" proximity between the home and the host country by including a measure of bilateral trade between these economies. We label this variable *bilateral trade*. This information comes from the IMF *Direction of Trade Statistics*.[11] We measure home-host country "institutional" distance by including a dummy that equals one if countries share a common legal origin (which will then result in similar institutions). We label this dummy *common legal origin*. Data on legal origin come from Glick and Rose (2002) and the CIA *World Factbook*. Finally, we also take into account that, nowadays, instant methods of communications like phones and internet connections can help bridge physical distances, making project and management oversight and access to information possible from far away places. In our regressions, we use the number of internet hosts per 1000 people (labeled *internet hosts*) in each recipient country as measures of access to communications, which are likely to affect monitoring and informational costs.[12] These data come from the World Bank *World Development Indicators*. We expect that lending cross-border is easier to countries with better communications, allowing project monitoring and information gathering to be done "offsite". Thus, we foresee that this variable will have a negative impact on the share of local to total foreign claims.

Restrictions on bank activities and regulations that affect foreign entry and foreign ownership of banks are expected to have a negative impact on the share of local claims. To

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[11] Ideally, we would have liked to control as well for the share of non-financial FDI from the home to the host country, however, this information was missing for many of the countries in our sample.

[12] In estimations that we do not report here, we also included measures of the number of phone lines in each claim recipient country. The results are not significantly different. Therefore, to save space we only report results using the number of internet hosts.

control for these factors we include the index of banking and finance produced by the Heritage Foundation. This index measures the relative openness of a country's banking system by taking into account whether foreign banks and financial services firms are able to operate freely, how difficult is it to open banks and other financial services, how heavily regulated the financial system is, the presence of state-owned banks, whether the government influences the allocation of credit, and whether banks are free to offer all types of financial services. This index takes values from 1 to 5, where higher values represent less openness and greater restrictions in the banking sector. For the sake of clarity, in the estimations, we label this variable *Restrictions on bank openness and activities.*[13]

Bank profits arising from cross-border activities are taxed at the rate prevalent in the banks' country of origin, while taxes on their FDI activities or local claims depend on the hosts' tax rates. Other things equal, we expect to find relatively lower levels of FDI activity or a smaller share of local claims in countries with higher corporate taxes. In our study, *taxes* refer to the top corporate income taxes in each country as reported by the Heritage Foundation.

Studies on both, cross-border claims and financial FDI, document that economies of scale, business opportunities, and risks might also affect banks' decisions to expand internationally. Thus, the degree to which each of these factors might affect the share of local claims is an empirical question. However, a priori we could speculate that since the returns from cross-border lending are limited to the initial claims extended plus an interest rate, while extending local claims often implies an equity participation in a local affiliate (bringing the

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[13] We also conducted estimations replacing this variable with a general index on restrictions on foreign capital (also developed by the Heritage Foundation) and using data on the share of foreign bank applications denied as reported by Barth, Caprio and Levine (2001). Results are very similar when we use these alternative measures of restrictions and, hence, we do not report them in the interest of space.

potential for unbounded gains and losses), scale economies, business opportunities, and risks might be more important in driving FDI or local claims relative to cross-border loans.

Following existing international banking studies, we capture the potential for *scale economies and business opportunities* in two ways. First, we include the *log of population*. Second, we include *GDP growth*. Economic growth may also be interpreted as a measure of default risk, since in countries that do not grow, borrowers might have a harder time repaying their obligations to banks. Data on both of these variables come from the World Bank *World Development Indicators* or the IMF *International Financial Statistics*, depending on the country.

In international banking, pricing risks materialize when the value of the claims or return on the claims held by foreign banks decline as a result of exchange rate or other price changes. We measure price risk by controlling for inflation in our estimations.[14] Data on inflation comes from the *World Development Indicators.*

While both cross-border and local foreign claims are exposed to price and default risks, local claims are also subject to expropriation risks. We capture the extent of expropriation risks by including a measure of limits on property rights in the host countries. This measure is an index compiled by the Heritage Foundation and reported as part of the Index of Economic Freedom. The index scores the degree to which a country's laws protect private property and the extent to which its government enforces those laws. It also assesses the likelihood that private property will be expropriated and analyzes the independence of the judiciary and the ability of individuals and businesses to enforce contracts. This index takes values from 1 to 5, with higher numbers indicating worse property rights protection. In our estimations, we label this variable *limits on property rights.*

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[14] Results remain unchanged if we used the change in the exchange rate instead.

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We estimate equation (2) below to investigate the implications of the mix of foreign bank financing for the volatility of foreign claims:

Foreign claims volatility$_{i,j}$=g(*Share of local claims$_{i,j}$*, *Additional controls$_j$*) (2)

As before, *i* indicates the lender country and *j* refers to the borrowing country. Once again, we estimate separate cross-country equations for Italian, Spanish and U.S. bank claims. In each of these equations, *Foreign claims volatility* refers to the standard deviation of respectively, Italian, Spanish and U.S. banks total foreign claims vis-à-vis each host over the sample period divided by the average level of foreign claims for each bank to that country. In other words, we measure volatility with the coefficient of variation of total foreign claims.

The purpose of estimating model (2) is to uncover whether, as some have argued but not proven empirically (see de Haas and Levyled 2002, Peek and Rosengren 2000, and Palmer 2000), the volatility of foreign claims is lower for countries where foreign claims are predominantly local (i.e., extended through the overseas affiliates of international banks). Thus, we are primarily interested in the coefficient on the share of local claims. However, in order to obtain consistent estimates of this coefficient, it is important to adequately control for other factors that might influence the volatility of foreign claims. We estimate a number of different specifications. Specifically, we control for the volatility of growth and inflation in the host economy, banking crisis episodes over the period of study, the volatility of foreign claims to countries other than the hosts, the size of the host country, the extent of property rights protection, and the perceived country risk in the host.

Growth and inflation volatilities (labeled respectively, *growth volatility* and *inflation volatility*) are captured by the standard deviation of GDP growth and inflation. The *banking crisis* variable is a dummy that equals one for those host countries that experienced a banking

crisis over the period of study. These episodes are identified based on Caprio and Klingebiel (2003). The variable labeled *volatility of claims to other countries* is the standard deviation of claims from banks from country *i* to countries other than host *j* divided by the average level of foreign claims to countries other than *j*. The idea behind this variable is that the volatility of claims to a specific host might be influenced by what foreign banks do and experience in other host countries or even in their home countries (which affect all hosts simultaneously). Country size is measured by the log of population. The limits on property rights protection are captured by the index from the Heritage Foundation described above. *Country risk* is an index compiled by the International Country Risk Guide (ICRG).[15]

4- Empirical Results

We first discuss the results on the determinants of the mix of foreign bank claims. Because in many cases the share of local claims is zero, we report Tobit estimations to take this censoring into account.[16] To avoid endogeneity concerns, regressors are lagged relative to the start of the sample for the share of local claims.[17] Finally, given that regressors are measured in

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[15] This index is defined by ICRG so that higher values mean less risk, but in our estimations we reverse the sign on this variable to give it the more intuitive interpretation that higher values mean more risk.

[16] We also tried to estimate a Heckman model to take into account the possibility of selection bias, but estimations did not converge because there are too few cases when total claims are 0 (i.e., when the share of local claims is not observed).

[17] In the regressions using Italian bank claims, regressors are averages for the period 1996-97, while the share of local claims is measured as the average over 1998-2002. In the regressions using Spanish bank claims, regressors correspond to the period 1997-98 and the share of local claims is the average between 1999 and 2002. In the U.S. regressions, the share of local claims is averaged over the period 1997-2002, while regressors are expressed as

different units, to allow for an easy comparison of coefficient magnitudes across variables, we report x-standardized coefficients. These are coefficients obtained from regressing the share of local claims on normalized regressors with zero mean and unit standard deviation.[18] They measure the change in the share of local claims (expressed in percentage points) for a one standard deviation change in the regressor.

Table 3 presents the results for the share of local foreign bank claims held by Italian, Spanish, and U.S. banks. In the case of Italy, we find that scale economies/business opportunities (as proxied by the log of population), restrictions on bank openness, taxes, and a measure of informational costs (i.e., the degree of bilateral trade) are all important determinants of the share of local claims for Italian banks. As expected, restrictions on bank openness and activities and taxation have a negative impact on the share of local claims. Among these two variables, restrictions on bank openness has the largest effect. A one standard deviation change in this variable produces between a 17.5 and an 18.1 percentage point drop in the share of local claims. On the other hand, a similar increase in taxes leads to at most a 15 percentage points decline in the share of local claims. The log of population and the share of bilateral trade are positively associated with the share of Italian local claims, but the effect of population size far outweighs that of bilateral trade. A one standard deviation change in population size increases the share of local claims by between 18.2 and 22.3 percentage points, while a similar change in the ratio of bilateral trade to GDP increases the share of local claims by up to 7.6 percentages points.

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averages for 1995-1996. The only variables that cannot be lagged are the minimum capital requirements and start-up costs since these data are only available at one point in time.

[18] These are obtained by subtracting from each regressor the mean and by dividing each de-meaned variable by its standard deviation.

The share of Spanish local claims is driven by the extent of scale economies/business opportunities in the host market, restrictions on bank openness, limits on property rights protection and the minimum capital requirements for bank entry. Also, two proxies for informational costs – a dummy indicating whether the host country shares the same legal origin as Spain and the number of internet hosts in the claim recipient country- are also significant, albeit with opposite signs. As expected, restrictions on bank openness, limits on property rights protection, and the minimum capital requirements for bank entry have a negative impact on the share of local claims. The impact of the first two is very similar, while the effect of bank capital requirements is almost half that of the other two variables. A one standard deviation change in the measure of restrictions on bank openness and on the variable capturing limits on property rights protection results in approximately a 20 percentage points decline in the share of Spanish local claims, while a similar change in the measure of minimum capital requirements leads to an almost 9 percentage points drop in the share of local claims. The extent of scale economies/business opportunities in the host country – as measured by the log of population – has by far the largest economic impact on the share of local Spanish claims. A one standard deviation change in this variable results in a 36 to 46 percentage points increase in the share of local claims, depending on the specification. The common legal origin variable also has a positive and significant impact on the share of local claims. However, in this case a one standard deviation change in this variable leads to an increase in the share of local claims between 17.3 and 18.1 percentage points, depending on the specification. We interpret the common legal origin variable as a measure of proximity with the host and, hence as a proxy for lower informational costs. Finally, better communications in the claim recipient country, as proxied by the number of internet hosts, facilitates cross border lending and is expected to have a negative

impact on the share of local claims. This is the case in column first specification shown for Spanish claims, where a one standard deviation increase in this variable leads to a 14 percentage point drop in the share of local claims.

Non-capital bank entry requirements and start-up costs, restrictions on bank openness and scale economies/business opportunities have a significant and consistent impact on the share of U.S. banks' local claims. Among these variables, the measure of scale economies/business opportunities has the largest economic impact. A one standard deviation change in the log of population, results in a 25 percentage points increase in the share of local claims. Restrictions on bank openness follow in economic importance, but as expected their impact is negative. A one standard deviation change in this variable leads to between 10 to 13 percentage points decline in the share of local claims. The combined measure of non-capital bank entry requirements and start-up costs also has a negative impact on the share of local claims, but this variable's economic impact is half that of the measure of restrictions on bank openness.

Table 4 presents the OLS results for the volatility of Italian, Spanish and U.S. claims, respectively, measured by the coefficient of variation (the ratio of the standard deviation to the mean). As in the share of local claims regressions, we lagged regressors to minimize endogeneity concerns. Furthermore, we report fully-standardized coefficients that measure standard deviation changes in the dependent variable for every one standard deviation change in the regressors.[19] Depending on the specification, we control for price and growth volatility, banking crisis episodes, the volatility of foreign claims vis-à-vis countries other than the host, the size of the

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[19] We include separate dummies for countries that exhibited extreme volatility due to some unusual event or transaction. This meant adding dummies for Croatia, Poland, and the Slovak Republic in the estimates for Italian banks, since these countries experienced an abrupt change in the share of local Italian claims due to mergers and acquisitions. In the interest of space, coefficients on the dummies are not shown.

country (as measured by the log of population), a measure of limits on property rights protection, and an index of country risk in the host.[20]

The results for the volatility of Italian bank claims indicate that the share of local claims has a consistently significant and negative impact on total claims volatility. Independently of what controls are included, countries with a higher share of Italian bank local claims exhibit lower total claims volatility. The economic impact of this variable ranges from 0.15 – meaning a one standard deviation change in the share results in a 0.15 standard deviation drop in volatility – to 0.17, depending on the controls we include.

The share of Spanish local claims also has a negative impact on total Spanish claim volatility. In this case, a one standard deviation change in the share leads to at most a 0.21 standard deviation drop in the volatility of total claims.

Consistent with what we have found for Italy and Spain, the share of local U.S. claims has a negative and significant impact on the volatility of U.S. total claims. In this case, a one standard deviation change in the share of local claims can result in anywhere from a 0.38 to a 0.40 standard deviation change in total claims' volatility, depending on the specification.

5- Conclusions

While a vast literature exists analyzing the cross-border and local activities of multinational banks across countries, the determinants and implications of the mix of international bank claims had not, to our knowledge, been explored before. Using a new dataset on the Italian, Spanish, and U.S. bank claims vis-à-vis more than 100 countries, this paper

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[20] Because the country risk index captures many of the economic and institutional features of the economy we exclude inflation volatility, growth volatility, and property rights when we include the country risk measure.

offered a first attempt at examining these issues. First, we estimated a reduced form empirical model of the share of local to total foreign claims across host countries. We found that regulatory barriers to banking and measures of business opportunities and scale economies have the most consistently significant impact on the share of local bank claims. Bank entry requirements, start-up and informational costs, as well as limits on property rights also seem to be important determinants of the share of local claims, but their impact is smaller and less robust. Second, we presented evidence that the mix or composition of foreign bank financing affects the stability of foreign bank claims to host countries. Countries where a larger share of foreign claims is extended through the local affiliates of foreign banks rather than through cross-border loans tend to enjoy more stable foreign financing.

While this study is, to our knowledge, the first to examine the determinants and implications of the mix of foreign bank claims, the analysis conducted is not without limitations. In particular, the time series analyzed is short and the number of home countries considered is small. Thus, it would be important that as more data become available, further research is conducted to verify the robustness of our results over more comprehensive datasets. Also, the mix of foreign financing may have effects other than its impact on financial stability that host countries may consider important. For example, host countries may be concerned about the type of financing received, because of their balance of payments needs. Exploring these alternative implications from the mix of foreign bank claims is also left for future research.

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Table 1: Italian, Spanish, and U.S. Banks' Share of Local to Total Foreign Claims

This table shows the share of local claims to total foreign claims held by Italian, Spanish and U.S. banks vis-à-vis over 100 countries. For Italy, the shares are averages for the period 1998-2002. In the case of Spanish banks, the data are averages for 1999-2002, while for the U.S. we report average shares for the period 1997-2002. "N.C." stands for "no claims" and "." means missing data.

Country	Share of local claims held by Italian banks	Share of local claims held by Spanish banks	Share of local claims held by US banks	Country	Share of local claims held by Italian banks	Share of local claims held by Spanish banks	Share of local claims held by US banks
Albania	0.00	0.00	0.00	Lesotho	0.00	NC	.
Algeria	0.00	0.00	40.53	Lithuania	0.00	0.00	0.00
Argentina	66.14	82.13	55.31	Madagascar	0.00	0.00	NC
Armenia	0.00	NC	NC	Malawi	0.00	0.00	2.22
Australia	0.00	0.09	73.45	Malaysia	0.00	0.00	82.79
Austria	2.24	1.14	0.64	Mali	0.00	0.00	0.00
Bangladesh	0.00	NC	61.47	Mexico	0.00	90.51	50.03
Belarus	0.00	0.00	0.00	Moldova	0.00	0.00	0.00
Belgium	9.74	13.40	24.67	Morocco	0.00	26.12	27.98
Bhutan	NC	NC	0.00	Namibia	0.00	0.00	0.00
Bolivia	0.00	92.86	36.70	Nepal	0.00	NC	0.00
Botswana	NC	NC	0.00	Netherlands	2.81	0.57	1.93
Brazil	76.34	85.19	50.90	New Zealand	0.00	0.00	56.47
Bulgaria	42.41	0.00	13.93	Nicaragua	0.00	0.00	0.00
Burkina Faso	NC	NC	NC	Niger	NC	NC	0.00
Burundi	NC	NC	NC	Nigeria	0.00	0.00	52.82
Cambodia	NC	NC	0.00	Norway	0.00	0.00	5.47
Canada	58.89	2.66	61.49	Oman	0.00	0.00	29.84
Chile	28.19	85.68	57.05	Pakistan	0.00	0.00	80.60
China	26.81	0.19	28.65	Panama	15.75	71.84	53.04
Colombia	65.29	75.86	33.40	Papua	NC	0.00	64.91
Congo	0.00	0.00	0.00	Paraguay	91.12	88.11	88.41
Costa Rica	0.00	2.14	25.98	Peru	94.19	87.86	33.13
Cote d'Ivoire	0.00	0.00	79.34	Philippines	0.00	63.63	55.42
Croatia	87.41	0.00	0.00	Poland	89.84	0.04	69.65
Czech Republic	7.91	55.33	73.99	Portugal	0.00	82.89	20.63
Ecuador	0.00	1.07	12.26	Romania	21.22	0.00	51.63
Egypt	0.00	0.00	58.59	Russia	0.00	0.72	18.17
El Salvador	0.00	20.40	22.16	Rwanda	NC	NC	NC
Estonia	0.00	0.00	0.00	Saudi Arabia	0.00	0.00	0.00
Finland	0.00	0.00	1.59	Senegal	0.00	0.00	80.79
France	35.66	27.53	13.34	Singapore	52.90	3.99	76.77
Germany	16.90	22.02	27.55	Slovak Republic	81.09	0.00	56.02
Ghana	0.00	0.00	0.16	Slovenia	1.01	0.00	0.12
Greece	8.83	3.78	54.06	South Africa	0.00	1.55	35.54
Guatemala	0.00	0.00	14.08	Spain	45.68	.	47.50
Honduras	NC	4.46	14.03	Sri Lanka	0.00	NC	64.46
Hong Kong	72.31	82.48	74.41	Sweden	0.00	0.00	7.24
Hungary	79.92	9.45	53.91	Switzerland	14.39	25.91	15.50
India	0.00	68.32	72.97	Taiwan	0.00	0.00	80.00
Indonesia	0.00	0.00	32.28	Thailand	0.00	0.00	70.64
Ireland	10.99	4.82	19.82	Togo	0.00	0.00	0.00
Israel	7.95	0.00	11.67	Tunisia	0.00	0.00	71.89
Italy	.	45.17	18.15	Turkey	3.43	0.32	19.89
Jamaica	0.00	NC	42.52	Ukraine	6.06	0.00	22.52
Japan	76.14	12.33	57.47	United Arab Emirates	42.19	0.00	71.50
Jordan	0.00	0.00	59.61	United Kingdom	30.13	24.19	49.43
Kazakhstan	0.00	0.00	49.31	United States	47.31	62.46	.
Kenya	0.00	0.00	62.94	Uruguay	83.05	76.61	54.58
Korea	0.00	0.34	54.38	Venezuela	0.00	89.60	17.47
Kuwait	0.00	0.00	0.02	Vietnam	0.00	0.00	66.95
Latvia	0.00	.	0.00	Zambia	0.00	NC	89.74
Lebanon	34.29	0.00	50.29	Zimbabwe	0.00	0.00	1.29

Table 2: Variable Definitions and Data Sources

This table provides definitions and data sources for all the variables used in the estimations reported in the paper. Note that in the regressions for Italian claims, independent variables are typically measured over the period 1996-97, while the dependent variables refer to the period 1998-2002. For Spanish claims, independent variables refers to the period 1997-98 and dependent variables are measured over the period 1999-2002. Independent variables in the regressions for U.S. claims are measured over the period 1995-1996, while dependent variables refer to the period 1997-2002.

Variable Name	Definition	Source
Dependent variables		
Banks' share of local to total foreign claims	Banks' local claims vis-à-vis each host divided by banks' total foreign claims to that host. Constructed separately for Italy, Spain and the U.S.	*Consolidated Banking Statistics* - Bank for International Settlements (BIS), Central Bank of Italy, Central Bank of Spain
Banks' total foreign claims volatility	Standard deviation of foreign claims vis-à-vis each host divided by the average foreign claims to that host. Constructed separately for Italy, Spain and the U.S.	*Consolidated Banking Statistics* (BIS), Central Bank of Italy, Central Bank of Spain
Independent variables		
Minimum capital requirements	First principal component of (1) dollar capital requirements to start a bank and (2) an index of initial capital stringency which varies between 0 and 3 depending on whether the country (a) prohibits capital in forms other than cash or government paper, (b) prohibits the use of borrowed funds, and (c) verifies the sources of capital. Larger values indicate greater stringency.	Regulatory survey summarized in Barth, Caprio, and Levine (2001)
Non-capital entry requirements and startup costs	First principal component of (1) index of entry bank requirements a la Barth et al. (2001), (2) all identifiable official expenses in setting up a business (fees, costs of procedures and forms, fiscal stamps, legal and notary charges, etc.) from *Doing Business Indicators* (World Bank) and (3) time it takes to start up a business from the same source.	World Bank *Doing Business Report* and regulatory survey summarized in Barth, Caprio, and Levine (2001)
Bilateral trade	Share of exports plus imports between a host (claim recipient) country and the banks' country of origin (home) relative to home GDP. Constructed separately for Italy, Spain and the U.S.	Export and import data are from *Direction of Trade Statistics* (IMF). GDP is from the *World Development Indicators* (World Bank).
Common legal origin	Dummy equal to 1 if the host (or claim recipient country) and home country (Italy, Spain, and U.S., respectively) share the same legal origin.	*World Factbook* (CIA)
Internet hosts	Internet hosts per 1000 people in host or claim recipient country.	*World Development Indicators* (World Bank)
Corporate tax rate	Top corporate tax rate.	*Index of Economic Freedom* (Heritage Foundation)
Restrictions on bank openness and activities	An index from 1 to 5 with 1 indicating the fewest controls. Index measures the following factors: (a) restrictions on the ability of foreign banks to open branches and subsidiaries, (b) government ownership of banks, (c) government influence over the allocation of credit, (d) government regulations, and (e) restrictions on bank activities.	*Index of Economic Freedom* (Heritage Foundation)
Inflation	Change in host (claim recipient) country GDP deflator.	*World Development Indicators* (World Bank)
GDP growth	Host (claim recipient) GDP growth (annual percentage).	*World Development Indicators* (World Bank)
Limits on property rights	Index of Property Rights from 1 to 5 with 1 being the highest level of protection. The index considers (a) freedom from government influence over the judicial system, (b) commerical code defining contracts, (c) sanctioning of foreign arbitration, (d) government expropriation, (e) delays in the judicial system, (f) legally granted and protected property.	*Index of Economic Freedom* (Heritage Foundation)
Log of population	Logarithm of population	*World Development Indicators* (World Bank)
Inflation volatility	The standard deviation of the change in host (claim recipient) GDP deflator.	*World Development Indicators* (World Bank)
Real growth volatility	The standard deviation of host (claim recipient) GDP growth.	*World Development Indicators* (World Bank)
Bank crisis	Dummy variable that equals one if the host experienced a bank crisis between 1995 and 2002.	Caprio and Klingebiel (2003)
Volatility of banks' claims to other countries	Standard deviation of all banks' foreign claims to countries other than the host divided by the average claims to countries other than the host.	*Consolidated Banking Statistics* (BIS), Italian and Spanish central banks.
Country risk	An index from 1 to 100 that is the composite of twelve variables measuring political, economic and financial risk. Higher values indicate more risk.	International Country Risk Guide

Table 3: Determinants of Banks' Share of Local Claims

Tobit regressions for the share of local to total foreign claims. X-standardized coefficients are reported for all variables other than the constant. X-standardized cofficients measure the change in the share of local claims expressed in percentage points for every one standard deviation change in the regressors. Robust standard errors are in brackets. *,**,*** denote significance at 10, 5, and 1 percent, respectively.

Variables	Italian claims		Spanish claims		U.S. claims	
Minimum capital requirements	12.247		-8.664		-0.998	
	[9.101]		[5.008]*		[3.559]	
Non-capital bank entry req. & start-up costs	6.406	8.22	11.196	8.702	-5.391	-6.697
	[5.554]	[5.671]	[7.352]	[5.922]	[3.210]*	[3.012]**
Bilateral trade	6.061	7.595	0.302	0.45	0.092	0.485
	[3.494]*	[4.014]*	[2.007]	[2.012]	[1.608]	[1.350]
Common legal origin	-1.088	-1.349	17.252	18.122	2.893	3.345
	[5.783]	[5.978]	[4.801]***	[4.660]***	[2.845]	[2.882]
Internet hosts	-6.081	-2.747	-14.385	-4.969	-4.814	-5.581
	[5.887]	[5.413]	[7.568]*	[3.939]	[1.889]**	[1.831]***
Taxes	-13.189	-15.629	-2.922	-8.071	-5.281	-5.398
	[6.052]**	[6.517]**	[6.112]	[5.272]	[4.507]	[4.603]
Restrictions on bank openness & activities	-17.527	-18.106	-20.041	-18.004	-10.164	-13.131
	[7.927]**	[8.216]**	[8.467]**	[8.548]**	[5.080]**	[4.823]***
Inflation	2.707	3.623	-80.031	-84.139	-29.966	-39.873
	[77.527]	[81.666]	[62.524]	[57.618]	[23.791]	[22.108]*
GDP growth	19.214	9.861	21.798	37.233	6.102	1.716
	[19.885]	[20.288]	[14.840]	[15.145]**	[7.715]	[6.447]
Limits on property rights	-11.125	-8.448	-19.704	-18.062	-2.866	-1.691
	[10.528]	[10.260]	[8.388]**	[8.007]**	[5.817]	[5.643]
Log of population	22.265	18.157	36.672	46.018	25.264	24.775
	[11.074]**	[10.731]*	[9.283]***	[8.492]***	[4.534]***	[4.255]***
Constant	-31.494	-39.992	-57.161	-59.367	9.391	7.572
	[14.337]**	[14.886]***	[11.064]***	[10.419]***	[5.794]	[5.429]
Observations	77	87	74	80	79	88
Pseudo R^2	0.047	0.047	0.127	0.117	0.067	0.061

Table 4: The Impact of the Banks' Share of Local Claims on the Volatility of Foreign Bank Claims

OLS regressions of the volatility of banks' foreign claims where volatility is the standard deviation of total claims divided by the mean total claims (i.e., the coefficient of variation of total foreign claims). Coefficients for variables other than the constant are fully-standardized, measuring the standard deviation changes in the dependent variable for every standard deviation change in the regressors. Robust standard errors are in brackets. *,**,*** denote significance at 10, 5, and 1 percent, respectively. Dummy variables for Croatia, Poland and the Slovak Republic are included in the Italian regressions, but not shown.

Variables	Italian claims		Spanish claims		U.S. claims	
Share of local claims	-0.154	-0.168	-0.173	-0.208	-0.401	-0.382
	[0.002]**	[0.001]**	[0.001]**	[0.001]**	[0.001]***	[0.001]***
Inflation volatility		-0.168		-0.119		0.012
		[0.004]**		[0.004]		[0.001]
GDP growth volatility		-0.002		0.218		0.145
		[0.033]		[0.027]		[0.015]
Banking crisis	0.075	0.032	0.006	-0.008	0.116	0.089
	[0.126]	[0.123]	[0.115]	[0.111]	[0.064]	[0.063]
Volatility of claims to other countries	0.019	0.041	-0.097	-0.085	0.126	0.09
	[37.696]	[35.502]	[6.618]	[6.635]	[2.463]	[2.592]
Log of population	-0.213	-0.222	-0.195	-0.162	-0.14	-0.17
	[0.054]	[0.048]*	[0.033]*	[0.027]*	[0.018]	[0.020]*
Limits on property rights		0.372		0.139		0.226
		[0.061]***		[0.052]		[0.036]**
Country risk	0.316		0.15		0.232	
	[0.006]***		[0.006]		[0.004]	
Constant	2.934	1.271	2.086	1.346	1.228	0.831
	[0.811]***	[0.595]**	[1.125]*	[0.545]**	[0.502]**	[0.363]**
Observations	76	87	80	80	76	87
Adjusted R^2	0.2	0.2	0.04	0.05	0.27	0.3