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Multinational Banking in Europe: Financial Stability and Regulatory Implications: Lessons from the Financial Crisis*

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Abstract

This paper examines whether multinational banks have a stabilising or a destabilising role during times of financial distress. With a focus on Europe, it looks at how these banks' foreign affiliates have been faring during the recent financial crisis. It finds that retail and corporate lending of these foreign affiliates has been stable and even increasing between 2007 and 2009. This pattern is related to the functioning of the internal capital market through which these banks funnel funds across their units. The internal capital market has been an effective tool to support foreign affiliates in distress and to isolate their lending from the local availability of financial resources, notwithstanding the systemic nature of the recent crisis. This effect has been particularly large within the EU integrated financial market and for the EMU countries, thus showing complementarity between economic integration and multinational banks' internal capital markets. In light of these findings, this paper supports the call for an integration of the European supervisory and regulatory framework overseeing multinational banks. The analysis is based on an analytical framework which derives the main conditions under which the internal capital market can perform this support function under idiosyncratic and systemic stresses. The empirical evidence uses both aggregate evidence on foreign claims worldwide, and firm-level evidence on the behaviour of banking groups' affiliates, compared to standing alone national banks.

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1. Introduction

Multinational banks (MNBs) have been growing fast, especially within the EU. The size and the global interconnectedness of their activities have risen serious concerns on their potential systemic effects. They have been considered among the main culprits of the present financial crisis. Many of the financial institutions that had to be bailed out or supported with public funds in 2008 and 2009 in Europe and in the US were MNBs.[1] Special supervisory mechanisms and prudential requirements for these banks are at the core of most reform proposals of regulation and supervision of financial markets.[2]

However, these concerns often rest on a superficial assessment of the role and the activities of MNBs. The aim of this paper is providing a comprehensive assessment of the behaviour of MNBs in the last decade and during the recent crisis. The analysis will be based on an in-depth theoretical evaluation of the functioning of the *internal capital market* (ICM henceforth), through which MNBs funnel funds across their global operations, and on macro and firm level evidence. We will address the question of whether MNBs have a stabilizing or destabilizing role during times of financial distress. There are several well grounded economic arguments supporting the claim that this type of banks can rather have a stabilising effect on global financial markets and on the economies of the host countries where they operate. Also, the empirical evidence, including the period of the recent financial crisis, shows that these banks have kept being a substantial and stable source of financial resources for host economies.

The analysis is especially focussed on the operations that MNBs carry out in the host countries, where they have foreign affiliates. Indeed, these banks have increasingly been competing with domestic institutions in activities which are to a large extent non tradable, like retail banking and corporate loans to small businesses, and which imply a high degree of local intermediation of funds through affiliates based in host countries (Mc Cauley et al. 2010). Their role has been growing especially fast within the integrated financial market of the EU and in emerging economies, where domestic institutions are weak. The financial claims towards residents in host countries held by MNBs through their affiliates account today for more than half of the total foreign claims of the banking system worldwide (which also include the cross-country operations of national, stand alone banks).

This type of banking is of course similar to what domestic institutions do and inherently less volatile and more intertwined to the real economy than wholesale cross border activities. However, it is also quite clear that MNBs have greater ease than domestic banks in channelling funds across their units world-wide, because of their role in the wholesale market and through internal transfers of liquidity and assets, indeed the ICM. In this respect, precisely their deep involvement in the retail and corporate market of local economies, associated with a high potential for mobilising activities cross border, has risen

[1] For example the Royal Bank of Scotland, Lloyds, ING, Fortis, Dexia, Merril Lynch, Citigroup and several others.
[2] See for example the proposal for the European Banking Authority by the EU, Turner (2009) and FSA (2009).

concerns that these financial institutions might be a cause of volatility and instability in the countries where they operate.[3]

The availability of a global ICM can indeed affect stability in both directions: MNBs can either support foreign affiliates in distress or, rather, funnel resources away thereby creating potential distress. The theoretical framework we develop here, though, shows that it is possible to identify clearly the conditions under which the bright side of ICMs (i.e. their ability to support affiliates in distress and to allocate resources efficiently on the basis of global returns) is more likely to emerge.

The empirical analysis we carry out on a large panel of banks in the EU27 countries between 2000 and 2008 provides robust evidence that foreign affiliates of MNBs, compared to standalone domestic banks and domestic banking groups, actively use the ICM to isolate the rate of growth of loans in host countries from available local resources (measured by the rate of growth of local deposits). During this period ICMs have indeed been functioning so as to isolate lending activities of foreign affiliates from *idiosyncratic* shocks in the local availability of funding. But our evidence of the limited volatility of aggregate claims during the recent financial crisis supports the view that MNBs can enhance financial stability also in times of *systemic* financial distress. Indeed, even in 2007 and 2008 ICMs helped to isolate lending activities of foreign affiliates from the local availability of funding.

Both the analytical framework and the empirical analyses developed in this paper are consistent with the claim that the activities carried out by MNBs through their affiliates have not been a source of financial instability in host economies. Rather, they have enhanced the supply of resources in those local markets.

Although it provides a general framework for analysis and evidence on worldwide trends in multinational banking, this paper focuses mostly on the European Union. Our results show that the ICM is particularly effective when banks operate within the integrated EU financial market. This is not surprising, since retail activities and corporate lending and support to local businesses are non tradable, and in this domain, market integration can only be fostered through the activities of MNBs. To this extent the ICMs and the external capital markets are to some degree *complementary*. When the external capital markets are less integrated, for regulations or because they involve different currencies, then the ICMs of MNBs are *de facto* operating to a very limited extent or even inactive, with no differences with respect to domestic banks. Consequently, even though some of the top MNBs in the world are non European, the largest share of multinational banking activities are carried out within the European Union and by European banks.

Within an integrated financial market our results also imply that there is a special urgency for reforming regulations and supervision, so as to deal with groups operating cross-border. Based on our analysis on the working of ICMs, in the final Section we then discuss how a reformed European regulatory framework could enhance the stabilising role of MNBs. We support the call for an integrated European supervision of MNBs and for an increased harmonisation of national regulatory frameworks.

[3] For example Ostry et al. (2010) have recently argued that FDI in the financial sector in emerging economies may be disguising a build up of intragroup debt in the financial sector and increase the riskiness of local financial systems.

European countries should contemplate a new and specific framework for European MNBs that would allow these banks to set-up truly integrated organizations with well functioning ICMs. This framework would define the responsibilities and the powers of the parent company and its foreign affiliates, providing due protections to minorities and creditors. A specific treatment for MNBs in terms of regulation and supervision should be contemplated, along the lines of the proposals that have already been discussed in Europe (i.e., enhancing coordination among countries through strengthened colleges of supervisors overseen by a newly created European Banking Authority and also possibly defining rules for the allocation of the costs of rescuing those banks in case of distress). A sensible revision of the current framework should seriously keep into account the organizational format that MNBs adopt for their ICMs. And also, that the effectiveness of any regulatory reform strictly depends on the level of financial integration between the countries where the bank is active.

Several other works have been looking at the functioning of the ICM for global corporations in general and specifically for banks (see for example Houston et al. 1997, Houston and James 1998, Morgan et al. 2004, Kroszner and Strahan 2006 and Kroszner 2008, de Haas and van Lelyveld 2010). These works are discussed in Sections 3 and 4. Also, a very large number of recent contributions have discussed regulatory and supervisory reforms to deal with MNBs (see for example Eisenbeis and Kaufman 2006, Dermine 2005, Freixas 2009). The novelty of this paper is combining the analytical insights on the functioning of the ICM with empirical evidence which compares the performance of MNBs to the one of standalone national banks, and thus delivering some insights for policy reforms

The reminder of this paper is organized as follows. The next Section sets the scene and provides aggregate descriptive evidence on worldwide trends in multinational banking. Section 3 outlines an analytical framework for the functioning of the ICM, highlighting several testable implications on the conditions under which the “bright side” of ICMs (e.g., their ability to support affiliates in distress) is more likely to emerge and taking them to the data. Section 4 is devoted to the assessment of the effects of the crisis on the behaviour of MNBs with particular reference (although not only) to Europe. Finally, Section 5 concludes and develops some policy implications of our analysis that may be useful in particular for the current debate in Europe.

2. Key facts on multinational banks

This Section examines the key facts of the main global trends in the activities of MNBs since 2000, as emerging from aggregate statistics. It sets the scene for the subsequent analysis of the behaviour of these banks during the crisis. We examine how large these activities are with respect to the size of host countries’ economies and how fast they have been growing in the last decade. In particular, we look at the patterns of the assets and liabilities of foreign affiliates (for a precise definition see note 9), as these are the distinctive activities of MNBs, those likely to have a larger long-term impact on the economies of the host countries. We defer to Section 4 the assessment of how these activities have been faring since the outset of the financial crisis.

Two key facts emerge from the data. *First,* total claims of foreign affiliates[4] of banks have been rising worldwide, in absolute terms and with respect to the total banking assets and the GDP of host economies. *Second,* the rise has been especially large in the EU and particularly within the Euro area.

The rise of multinational banking. The activities of MNBs' affiliates in host countries differ from cross border financial transactions, which could also be undertaken by non MNBs. These activities are mostly non tradable, as they include retail banking and loans towards local businesses. As argued by Mc Cauley et al. (2010), international banking has evolved for many countries from a model essentially based on centralised patterns of resource allocation (involving a large share of cross border transactions), whereby headquarters pool funds and then reallocate them within the group, to a more decentralised pattern, where affiliates are allowed to raise funds locally to finance assets in each location. As we will discuss extensively in the next Section, both models of multinational banking can be more or less efficiently supported by an ICM channelling funds across countries within the group. However, the decentralised model implies that a larger share of funds is directly intermediated by foreign affiliates.

The increasing role of foreign affiliates in local markets indeed emerges from the aggregate cross-country data provided by the Bank for International Settlements' (BIS) Banking Statistics, discussed in details in Box 1. These statistics provide data on the claims of foreign affiliates in *host countries vis à vis* local residents (families, firms and other financial institutions) – defined as local claims – denominated in local and foreign currency.[5] These include loans, but also securities such as stocks and bonds. BIS statistics also provide data on total foreign claims, which include all the foreign assets held abroad by banks (domestic and MNBs), i.e., summing up the local claims held through local affiliates with those held through cross-border transactions.

BOX 1: The Consolidated Banking Statistics of the Bank for International Settlements (BIS)

- The BIS Banking Statistics report financial claims and liabilities of banks towards the rest of the world.
- *Claims* comprise financial assets (on balance sheet items only) including, as a minimum, deposits and balances with other banks, loans and advances to non-banks as well as banks, and holdings of debt securities. It excludes derivatives and off balance sheet transactions.
- Data are compiled on a consolidated (*Consolidated Statistics*) and on an unconsolidated basis (*Locational Statistics*).

4 See Box 1 for a definition.

5 The BIS Banking Statistics report separate statistics for local claims in local currency only, whereas local claims in foreign currency are summed up with cross border claims, and thus are not immediately identifiable. Following Mc Cauley et al. (2010) they can be estimated starting from March 2005 as the difference between total international claims on an immediate borrower basis and cross border claims on an ultimate risk basis (further details and a discussion on the bias introduced by this estimation in Box 1).

-The *Consolidated Statistics* cover claims and liabilities reported by domestic bank headquarters, including the exposures of their foreign affiliates *vis-à-vis* individual host countries, and are collected on a consolidated basis by nationality of reporting bank and with inter-affiliate positions being netted out. The statistics also provide separate data on international claims of foreign affiliates whose headquarters are located outside the reporting countries on an unconsolidated basis (defined as "*Local Claims*", see below).

-The *Locational Statistics* cover international claims and liabilities by residence of the reporting banks, hence they include both domestic and foreign-owned affiliates in the reporting countries and on an unconsolidated basis, including those vis-à-vis own affiliates. As locational statistics combine foreign activities of both national and multinational banks, it is not possible to disentangle separate data belonging to foreign affiliates.

- From a risk reallocation perspective, BIS provides information either on an *immediate borrower basis* or on an *ultimate risk basis*. Within the former, the claim is allocated directly to the country of immediate risk; the latter reallocates claims to the country of ultimate risk which is defined as the country where the guarantor of a claim resides. The use of derivative transactions for instance often imply a mismatch between risk allocated on a borrower or on an ultimate risk basis: suppose an Italian bank acquires a bond issued by a German issuer but guaranteed by a US insurance company on the basis of a derivative transaction written on the top of the bond; in this case, Germany is the country of the immediate guarantor, while US the country where the ultimate risk resides.
- Most of the data used in Section 2 are derived from the Consolidated Statistics and expressed on an immediate borrower basis, as per the following definitions:

-*Foreign Claims*: defined as the sum of cross-border claims of domestic banks plus the local claims in all currencies of domestic banks' foreign affiliates. This category can be calculated as the sum of international claims (A + B) and local claims in local currency (C). For instance, these would include all the cross border claims of a multinational bank on a consolidated basis plus the local claims of its foreign affiliates *vis-à-vis* local residents.

-*International Claims* (A + B) are defined as banks' cross-border claims (A) plus local claims of foreign affiliates in foreign currencies (B).

-*Local Claims* (C) refer to the claims denominated in local currency of foreign affiliates (branches and subsidiaries, see below for the distinction) on the residents of the host country (i.e., country of residence of affiliates).

[Figure with the 5 boxes here no numbering needed]

- Local Claims of foreign affiliates are the key variable used in the analysis of this paper, as it measures the claims of foreign affiliates towards residents in the host country. However, consolidated statistics on an immediate borrower basis provide separate data only on local claims in local currency and not on local claims in foreign

currencies. Therefore, local claims in foreign currency are estimated as the difference between total international claims on an immediate borrower basis (Table 9AA BIS Statistics) and cross border claims on an ultimate risk basis (Table 9CT BIS Statistics). Estimates for local claims in foreign currency at the country level include therefore a bias which is higher the higher the ultimate transfer risk is.

- *Local Liabilities* refer to liabilities of foreign affiliates of domestic banks in local currency *vis-à-vis* local residents

[End of Box 1]

Trends in local and foreign claims are reported in figures 1A and 1B below. Local claims in local currency (measured in current US $) rose in absolute terms to a value of more than 10 trillion dollars and almost doubled between 2000 and 2009 with respect to world GDP (from roughly 10% to 20%). Also local claims in foreign currency followed a similar pattern, although they can only be estimated as of March 2005. Both types of local claims summed up to 17 trillion dollars in 2009, accounting for more than 55% of total foreign claims, also reported. Notice that in the last two years (Dec2007-Dec2009) total foreign claims experienced a more pronounced decline compared to local claims. We will further discuss this point in Section 4, which deals specifically with the crisis.

[Figure 1 A and Figure 1 B]

The rise of multinational banking has been especially fast within the EU single market. Decomposing the BIS data by regions of destination, we notice that the value of local claims of foreign affiliates denominated in local currency (converted in current US $ in the BIS statistics) have been rising especially fast in the EU, particularly among the EMU12 countries (Figure 2), reaching the other advanced economies, including US and Japan by the end of the period.[6]

[Figure 2]

These trends are also the outcome of severe exchange rate fluctuations in the period analysed. The yen roughly devalued by 30% with respect to the Euro between 2000 and 2009 and the dollar by almost 50%. To better gauge the increasing role of multinational banking it is therefore necessary to relate local claims to the value of total banking assets in the countries of destination. This is done in Table 1.

The especially important role of foreign affiliates in the EU stands out clearly when the size of their assets is normalised with the total banking assets of each country. By mid 2009 these were 16.9% with respect to total assets, compared to a mere 5.9% for the other industrialised economies. The ratio for the EU has also risen considerably (and at a faster pace than for other advanced economies) from the early 2000, when it was lower than 10%. The picture is pretty heterogeneous within the Union. Foreign affiliates have an especially large role in the UK and in the new member states (NMSs), particularly in those that have adopted the Euro, where they account for a very large share of total assets. These particularly high shares reflect of course the role of the UK as an international financial center and, for the NMSs, their relatively weak local financial institutions which were

6 Here we restrict our analysis to claims denominated in local currency, as the bias in the estimates of those in foreign currency is particularly severe at the level of a country or a group of countries.

acquired by large European banks during the transition years. As for the EMU12, the share of assets held by foreign banks is lower than for the EU average. However, given the size of this area, in nominal values the EMU12 countries account collectively for the largest amount of local claims held by foreign affiliates.

The evidence that MNBs have become increasingly active within the EU, particularly through mergers and acquisitions, requires some qualifications.[7] In principle, an integrated financial market should provide an ideal ground for cross border market transactions, reducing the need to rely on the ICM to move resources across countries, as it would be the case with MNBs. Yet, we know that retail activities are non tradable even within integrated markets. Therefore, tapping the European retail market requires having local operations in foreign countries anyway. But within an integrated financial area and particularly with a single currency, those local operations can likely benefit from easier and smoother intra-bank cross border transactions, taking place through the ICM. We will discuss extensively these results also in Sections 3 and 4.

[Table 1]

The argument that the ICM is likely to work more smoothly within integrated financial areas is also supported by the evidence that most foreign banking activity in the Union is intra-European. This can be gauged by ECB data, where total banking assets of member countries are decomposed by the nationality of ownership of the bank and by whether foreign affiliates are independent subsidiaries or branches.[8] As we will further discuss below, the distinction between subsidiaries and branches is important both from the point of view of the organisation of the internal capital market and of the regulatory framework in the EU (see Calzolari and Loranth 2010 for an analysis of regulation of MNBs in terms of their organization).[9] This decomposition is reported in Figure 3. Differences in definitions of asset categories explain why the ECB figures do not match precisely the BIS figures reported above.[10]

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7 M&A activity within the EU banking sector experienced a boom at the beginning of the new century. In 2000 there were approximately 140 M&A transactions in EU, of which intra EU 25 M&A deals involving a non domestic acquirer represented almost 30% of the total (EU Banking Structures, 2006)

8 Assets of credit institutions under the ECB definition comprise any asset that is (i) cash; or (ii) a contractual right to receive cash or another financial instrument from another enterprise; or (iii) a contractual right to exchange financial instruments with another enterprise under conditions that are potentially favourable; or (iv) an equity instrument of another enterprise. Total assets are calculated on a residential basis, meaning that for each Member State the credit institutions under the law of that Member State are included (regardless of whether or not they are a subsidiary of a foreign bank). However, the activity of the foreign branches of these credit institutions is not included, as this is reported by the host country. Credit institutions include any institution covered by the definition contained in Article 4(1) of Directive 2006/48/EC (recast). Accordingly, a credit institution is "(i) an undertaking whose business is to receive deposits or other repayable funds from the public and to grant credits for its own account; or (ii) an electronic money institution within the meaning of Directive 2000/46/EC. The most common types of credit institutions are banks and savings banks".

9 Foreign affiliates set-up as subsidiaries are stand alone companies, where local management has a high degree of decisional autonomy within the group. In the current European regulatory framework they are subject to host country supervisory authorities. Branches instead are part of the foreign group and not stand alone companies, normally with less decisional autonomy than subsidiaries. They are subject to the home country supervisory authorities. Branches are used more frequently by MNBs to carry out wholesale activities. Subsidiaries are normally used to carry out retail activities, given that they collect deposits and that a large part of their transactions have to be carried out face to face with local customers. The largest share of foreign assets is held by EU banks through subsidiaries. This reflects the recent spur of cross-border acquisitions, where acquired banks become autonomous foreign subsidiaries and also the fact that within Europe foreign affiliates are generally used to carry out non tradable activities like retail.

10 Note that the share of the assets held by foreign banks (29%) is larger than the share of local claims on total assets (15%) and smaller than the share of foreign claims (60%) reported in table 1A and 1B. The reason is that the definitions of assets are different for the two institutions. Foreign assets under the ECB include claims towards residents and non residents in the host country held by foreign subsidiaries and branches based in a given EU host country (but not those held through other foreign subsidiaries or

[Figure 3]

If we consider the aggregate of the EU countries, we notice that foreign banks account for roughly 29% of total assets, held through either subsidiaries or branches. Foreign banks' assets can further be decomposed into EU and extra-EU institutions. Notice that by far the largest share of these assets are owned by EU banks. This share is especially large within the EMU aggregate.

The EU is therefore an especially interesting case to look at for assessing the role of MNBs and the functioning of their ICMs, particularly during the financial crisis. This justifies our focus on the EU in the micro analysis of the following Sections.

3. Multinational banks and internal capital markets: implication for efficiency and financial stability

This Section examines how the availability of an *internal capital market* (ICM) affects the behaviour of MNBs, and their possible reactions during a crisis. It is indeed the ICM that makes the activities of foreign affiliates in host economies distinctly different from those of standing alone national banks. Large corporations can establish ICMs that allocate scarce capital, liquidity and risk across the many units belonging to the holding (Box 2 below briefly describes the functioning of ICMs and summarizes the literature in finance and economics that have analyzed their working, both theoretically and empirically).

This analysis is important to our aims since MNBs have the possibility to diversify risk internationally, to optimally allocate funds across their network of international affiliates in search of higher returns, and to efficiently share liquidity. We are also particularly interested in understanding whether ICMs in cross-border banks have stabilizing or destabilizing effects in home and host countries, in normal times and in times of crisis. In particular, as for the effects of shocks affecting banks and host countries, in this Section we will deal with *idiosyncratic* ones, whilst the next Section will be devoted to the *systemic* shocks of the present crisis. Here we will develop a theoretical framework for MNBs and their ICMs which will deliver a number of "claims". Considering the set of all these claims we will then derive some testable implications that will be explicitly verified with the empirical analysis in the next Section.

BOX 2: Internal Capital Markets: the Bright and the Dark Side

Financial and non-financial institutions are often organized in divisions or affiliated units, by product or by location. Consider, for example, a bank with its parent company P and two affiliates A1 and A2, each with some internal funding, collaterals, pledgeable income and investment opportunities (see the next Figure for a graphical representation). A1 can be financed as a stand-alone entity using funds internal to A1 or raised directly by A1 in the external credit market. Alternatively, in the absence of constraining regulation, A1 can be financed in an ICM in which A1 approaches P for funding. The

branches based abroad). Local claims under the BIS has a strictly host country perspective and only includes claims of foreign branches and subsidiaries vis a vis residents in the host country. Foreign claims in BIS statistics also include cross-border transactions.

parent P in turn can directly raise external funds against its own and the combined collateral of affiliates A1 and A2 centralize the funds individually raised by the affiliates and, finally, allocate them to A1, A2 and P according to some criteria. In the end, this allocation is similar to the task performed by the credit market, although it takes place within the "internal" capital market of the bank. The central question for ICMs is whether this internal process is more or less efficient and profitable for the bank than an external market for credit. Clearly, if the capital market were fully efficient, ICMs would be irrelevant, but we know this is almost never the case. *First*, raising external funds in a centralized way may allow increasing the total amount of funds (the "**more-money effect"** of ICMs). *Second*, funds may be allocated more efficiently and profitably to all investment opportunities when the process is centralized and information asymmetries are overcome (the "**smarter-money effect"** of ICMs). Clearly the two effects, which are known as the "**bright side**" of ICMs, are related (smarter money may lead to more money) and depend on ICM's organization. In particular, more-money may take place since the control power attributed to the internal capital market should induce more screening and monitoring of the projects to be financed. Furthermore, an ICM may create value in financially constrained firms, since affiliates' projects compete for scarce internal funds and are jointly screened within the ICM. However, badly organized ICMs may show up with a "**dark side**": competition for funding may turn out to be wasteful rent-seeking, funds may be spread among affiliates with no reference to relative merit, thus dampening incentives and with affiliates' manager feeling expropriated. The empirical literature has shown that ICMs do operate in large corporations since one observes that shocks in one affiliate affect investments in other affiliates and investments in small units are positively related to cash flow of other units. ICMs have been also shown to deliver more and smarter money when the external capital market is less developed (e.g. for weak legal enforcement, inadequate accounting and disclosure practices); when divisions have not sharply divergent investment prospects; when the firm is able to control the agency issues intrinsic to ICMs using high powered incentives such as management ownership. These results have been shown by a significant theoretical and empirical academic literature whilst that on ICMs for banks is instead less developed and that on MNBs even less so, as discussed in the main text.[11]

[End of Box 2 here]

Affiliates of an MNB located in different countries may well face different costs of external funds. These banks may thus collect deposits, say in country 1 and 2, and finance a project in country 2 by pooling deposits in an ICM. In addition, by pooling liquidity from affiliates in different countries, when affiliates' liquidity shocks are not positively correlated, an MNB may then be able to keep lower liquidity to take care of the duration mismatch of assets and liabilities typical of the transformation activity of banks. For given

11 Some relevant theoretical papers related to the more-money and smarter-money effects are Williamson (1975), Gertner et al. (1994), Stein (1997 and 2002), and Carletti et al. (2007). Scharfstein and Stein (2000), Rajan et al. (2000), Hart and Holmstrom (2010), and Brusco and Panunzi (2005) have studied the dark side of ICMs For empirical analyses see, among others, Lamont (1997), Scharfstein (1998), Shin and Stulz (1998), Rajan et al. (2000), Chevalier (2004), Khanna and Tice (2001), Whited (2001), Billett and Mauer (2003), Ozbas and Scharfstein (2008).

regulatory constraints that national authorities impose to banks on liquidity, this possibility allows an MNB to reduce overall costs. Although diversification can also be obtained in a large national group, it is clear that cross-border activities may well increase diversification. On the other hand, one should also consider that the functioning of an ICM operating across countries may be hindered by factors such as limited economic and regulatory integration, differences in (business) culture, in languages and by distance among the units belonging to the ICM, as we will further illustrate.

From these arguments it is possible to derive some important consequences of an ICM in a banking group and, in particular, for an MNB. As explained in Box 2, the organization of an ICM and its functioning are responsible for the possible realization of "smarter money", according to which funds, risk and liquidity are allocated to the MNB's affiliates that are better at managing them. This process of relocation leads to a **support** effect and a **substitution** effect which are described next (this useful taxonomy is due to Morgan et al. 2004).

[Figure 4]

Consider Figure 4 and a shock that is local in country 1, deteriorating capital (assets or loans) or reducing funds availability (with a reduction of deposits) of affiliate A1 of the MNB. This negative shock may force the affiliate either to obtain new equity, to satisfy its capital adequacy ratio and/or its strategies, or to reduce its loans. This would certainly be the case were the bank a single entity. When belonging to an MNB, instead, the shock may be reduced by the capital and the liquidity provided by home or other affiliates in foreign countries, through the ICM. An MNB may then be able and willing to **support** its affiliates in cases of country-specific shocks, thus watering down the effect of these local shocks: *the support effect makes an affiliate's lending capacity less responsive to local shocks on capital and deposits, i.e. on the availability of local funds* (**Claim 1**).

In addition to the support effect, an ICM determines capital and liquidity movements looking for the best remuneration within the MNB (the "smarter money"), that might lead to a **substitution** effect. Consider now a real shock hitting the economy in the country of an affiliate (say country 1 in the previous figure), thus reducing the returns of investments in that country. Then, the ICM would substitute the activities of that affiliate relocating funds towards the parent bank and other affiliates with better investment opportunities. This makes an affiliate's lending in a banking group more responsive to shocks affecting the returns of its investments. *Hence, the substitution effect weakens the link between funds availability and lending. This is more so for banking groups operating in countries with little correlated real shocks and it is definitely less relevant for domestic banking groups operating in a single country* (**Claim 2**).

The support and substitution effects emerge from the "smarter money" of an ICM (which ultimately may enhance efficiency and profitability of an MNB). We are now interested to see the role of "more money" that a banking group may generate if its ICM works properly (see again Box 2). If this is the case, then an ICM has much more information and control on a troubled affiliate than the external capital market which, instead, may be completely impaired due to lack of information. On a similar vein, the functioning and the effects of ICMs are closely related to the organization and the incentives that are used in setting up an

MNB's ICM. On the one hand, affiliates may be tightly integrated to form a unique ICM, such as for branches of a bank which are *de facto* (and *de jure*) parts of the holding company. Alternatively, even though they take part in an ICM, affiliates may keep some independence and responsibility in their decisions, as it is often the case for MNBs' subsidiaries (which are *de jure* independent legal entities controlled by the holding). We are mainly interested in the organization of groups with subsidiaries, which are the predominant form of foreign affiliates in Europe (with the exception of the UK), also because, as explained in the sequel, data on single affiliates are only available for subsidiaries. It has been emphasized (Shah and Thakor 1986, Kahn and Winton 2004, Boot and Schmeits 2000) that a subsidiary structure may allow external investors to better evaluate the different projects in the holding by clearly associating projects to single units so that higher transparency translates into smaller cost for external funding. Hence, *a well organized ICM of domestic and international banking groups may generate "more money" available to address any kind of shock, thus smoothening the link between funds and lending* (**Claim 3**).

Overall Claims 1-3 all point to a reduction of correlation between available funds and bank's lending capacity.

As explained in Box 2, however, an ICM can deliver its desirable properties that lead to Claims 1-3 when showing its bright side. Support/substitution are strictly related to the information that is made available within the organization, since an ICM involves a decision process that requires information.[12] Hence, a more integrated ICM with intense information sharing may lead to more substitution and support effects. However, for an ICM to smoothly work there must not be impediments which can emerge as external constraints. These constraints may emerge because of an inadequate organization and incentive mechanism of the ICM, but also by the regulatory and economic environment. Pooling resources into an ICM and relocating internationally to the affiliate in need of support requires that the MNB satisfies a set of rules imposed by possibly many different countries (since a fully harmonized or integrated regulatory authority is still missing in the international banking sector) thus leading to a "regulatory risk". Pooling resources also exposes the MNB to a "transfer risk", for example associated with the exchange rate swings of the currencies in use in the different countries. On a similar vein, the literature on the ICM has shown that this should operate better when the participating units have not sharply divergent investment prospects, as it is the case in related economies. Thus *MBNs operating in an integrated area, both in terms of regulations and in terms of currencies, may make a more intense use of their ICMs* (**Claim 4**). Furthermore, one may expect that *units that are located in distant countries with different languages or different cultural environments may find it difficult to actively take part into a cross-border ICM of an MNB* (**Claim 5**).

In light of Claims 2, 4 and 5, it will be particularly interesting to understand whether the ICMs are substitutes or complements of the process of market integration taking place at different stages in Europe. On the one hand, as illustrated above, the need for an ICM may

12 A decentralized MNB with more independent units still belonging to the ICM (i.e. a flatter organization) is most likely to be an attractive option when information about individual projects is "soft" and cannot be easily and credibly transmitted upstream through the hierarchy. In contrast, a large and hierarchical MNB with multiple layers composed of units of limited independence and a strongly integrated ICM is best when information can be "hardened" and passed along the hierarchy.

be limited in very well integrated economies with correlated real shocks, since the external and the integrated internal capital markets may function as substitutes and the scope for the substitution effect is limited. On the other hand, differences in terms of cultures, languages, banks' regulations and currencies may obstacle the kind of integration within the MNB that is needed for an ICM to work smoothly.

That ICMs operate in large banks is a documented fact. It has been shown that loan growth of an affiliate of domestic holdings is more sensitive to the parent's cash flow and capital than the affiliate's own capital (Houston et al. 1997, Houston and James 1998, Morgan et al. 2004, Kroszner and Strahan 2006 and Kroszner 2008 and Carlson and Mitchener 2009).[13] As for cross-border banks, de Haas and van Lelyveld (2010) have recently documented the functioning of ICMs in top 45 MNBs around the world (see also Chan-Lau et al. 2008), showing that they are more active (in terms of support and substitution effects) in foreign units that are less independent (e.g. that have been established with green field investment instead of takeover).[14] In this case, they find evidence that the substitution effects is at play, since foreign lending is negatively related to the business cycle of the home country of the parent holding, and that the support effect shows up mainly for dependent units of MNBs, that reduce lending less than independent banks when the foreign economy is hit by a negative shock.[15]

3.1. Empirical evidence on the functioning of internal capital markets: a European perspective

Following the five claims we identified above, we now turn to an empirical analysis of the effects of ICMs on the link between bank lending and funds availability in Europe. To do so, we consider how, in a given bank, deposits co-vary with loans, focusing therefore on one specific effect of the availability of an ICM, its impact on the correlation between funding and the use of resources. The advantage of using this simple index is that it requires no assumptions on the direction of causality between deposit and loan growth. We focus instead on the possible differences in their correlation between banks that do have internal capital markets and banks that do not. Clearly, this exercise is only possible by retaining a control group of standalone units, which represents our benchmark for banks that have no access to ICMs.

The existing empirical literature has not explicitly considered domestic banks and domestic banking groups as controls for a direct comparison for the effects of national and international ICMs. Our strategy is therefore complementary to that of de Haas and van Lelyveld (2010), who show that the lending behavior of bank affiliates is affected by their

13 Carletti et al. (2007) set-up a theoretical model of banks merging in different regions and explicitly account for their liquidity decisions. They show that merged banks have lower liquidity risk and financing costs and are more efficient but also that merges may have adverse macro effects reducing liquidity of the interbank market.

14 Havrylchyk and Jurzyk (2006) show that greenfield banks are much more embedded in a MNB group's internal capital market, whereas acquired banks within the group seem to be organized as rather independent capital units.

15 On anecdotal evidence, during the 2003 crisis of Norvegian banks, it has been observed that Noredea Norway, although hit by significant losses (accounting for 1.17% of its gross lending in 2003), was able to limit the reduction of its capital by borrowing from the Nordea Group. Looking at the crisis of Japanese banks in the early 1990s, units in the US experienced reduction of lending in case they were units more dependent from the parent banks but they were almost unaffected when they were more independent (Peek and Rosengren 1997).

parents' financial conditions, but only control for the contemporaneous behavior of very large standalone units, that might not be fully comparable with typically smaller foreign affiliates.

Comparing the correlation between loans and deposit of MNBs and a counterfactual of national banks is also justified by the fact that we are focusing our analysis on Europe, where the number of country specific crises is very limited. Consequently, in our case, contrary to de Haas and van Lelyveld (2010), we cannot test for the existence of the ICM by looking at how national banking crises affect the lending strategies of affiliates based in other countries.[16]

Finally, since we will concentrate on banks operating in Europe, we have the possibility to consider banks active in an economic area with a significant level of integration both for the real economy, thus being characterized by correlated real shocks, and for the financial sector. We will then study the interplay between international integration and the functioning of ICMs. As explained above, a priori the relationship could be one of complements or substitutes. Discriminating between the two cases is critical in particular in the current period of revision of the European environment for supervision and regulation of MNBs.

Our analysis is based on balance sheet information of a large sample of European banks, collected by the commercial data provider Bureau Van Dijk, in its Bankscope data base. We started by considering all affiliates in the EU27 countries of the 100 largest European banks (that are likely to be those that will be more directly supervised by European colleges of supervisors) between 2000 and 2008, distinguishing between domestic and foreign affiliates (i.e. dependent subsidiary banks that operate, respectively, in the same country and in a different one from that of incorporation of the parent bank), on the basis of their ownership structure.[17] In addition, we have checked the shareholding structure of all other banks in our sample, that includes all institutions in EU27 countries with total assets above 100 US$ million, to identify additional affiliates of domestic or foreign institutions. Summary statistics for our sample are presented in Table 2.

[Table 2]

We have 7,326 banks, 637 affiliates of which 529 foreign, 213 parent banks of which 148 MNBs.[18] The average size of the banks in our sample, measured by their total assets, is 17 US$ billions, while the median is less than 1 US$ billion, suggesting a significant skewness, as it is quite common when using company data. Affiliates and parent banks are larger (31.3 US$ billions and 204.0 US$ billions, respectively). The average yearly rate of growth of nominal customer loans in our sample period is 20%, and it is smaller than average for parent banks (18%) and larger for affiliates (26%). Similarly, the average rate of growth of demand deposits is 19% (22% for affiliates and 15% for parent banks). Affiliates are also

16 According to the reliable and updated dataset on banking crisis by Laeven and Valencia (2008) – the one used for example in de Haas and van Lelyveld (2010) – there are no national crisis in our sample, except for the crisis hitting UK in 2007, which is however the first year of a global crisis.

17 As it is common in this literature, we have not been able to extend our analysis to the behavior of foreign branches, because with very few exceptions their activities are recorded only in confidential supervisory data, and not by all countries.

18 The largest number of banks in our sample is from Germany, Italy and France; the largest number of affiliates is from Luxemburg, Poland and Spain.

more profitable and are more leveraged than both parents and standalones. Finally, foreign affiliates within EMU and EU15 are larger than average, less leveraged and less profitable.

[Table 3]

As a preliminary step, we have calculated the total correlations between the rate of growth of customer loans and of deposits, distinguishing between standalone banks, domestic and multinational parent banks and domestic and foreign affiliates. Table 3 shows that the average correlation between the loan and deposit growth is 0.54, and it is statistically significant at the 1 per cent level. Consistent with our Claim 1 (*the support effect makes an affiliate's lending capacity less responsive to local shocks on capital and deposits, i.e. on the availability of local funds*) and Claim 2 (*the substitution effect weakens the link between funds availability and lending. This is more so for banking groups operating in countries with little correlated real shocks and definitely less relevant for domestic banking groups operating in a single country*), the correlation is slightly smaller than average for affiliates, and it is even smaller for foreign affiliates. Further, the correlation is even smaller for foreign affiliates located within more integrated areas, such as EMU and EU15, providing convincing evidence to Claim 4 (*MBNs operating in an integrated area, both in terms of regulations and in terms of currencies, may make a more intense use of their ICMs*). Only in the case of foreign affiliates located in the NMSs of Central and Eastern Europe and of the few foreign banks in Malta and Cyprus (non-EU15 countries), the correlation is significantly higher, consistent with the hypothesis that regulatory and monetary integration is an important ingredient fostering the functioning of ICMs. The correlation is higher than average also for parents, both domestic and MNBs, although it is smaller for the latter. A possible explanation is that parents are themselves very large banks composed with several dependent units (e.g. branches) and since they normally organize the ICM of the group, they smooth out the balance between loans and deposit of their affiliates, but keep on average stable their own relation between loans and deposits.

The indications of the simple correlations are that banks that may use ICMs can afford a more independent management of their assets and liabilities, thus smoothing the effects of potential idiosyncratic shocks. Furthermore, this is even more the case for those banks operating an internal capital market internationally.[19] To strengthen this preliminary evidence, in the following we will present the results of a more robust econometric analysis, capable of providing further support of our previous claims.

Our econometric framework exploits thoroughly the information contained in the correlations between each bank's growth of deposits and customer loans, using a two step procedure. First, we estimate the time series correlation between each bank's rates of growth of deposits and of customer loans. Due to the frictions in our data set, we lose information for about 2,000 banks, obtaining a sample of 5,665 bank specific correlations. Second, we use the bank specific correlations as a dependent variable in a standard regression model, where the explanatory variables are: a set of dummies for foreign affiliates, in some specifications distinguishing those located within EMU and EU15; a set of bank specific

19 It might be argued that MNBs are better at insuring idiosyncratic shocks because they are more efficient than domestic banks. Indeed, our results can be interpreted as showing that MNBs are more efficient precisely in the sense that they have an organization that allows them to make a better use of ICMs.

characteristics; and country dummies.[20] In practice, our most general specification is the following:

$$\Delta\ Correl_{ij} = a_1 + a_2\ DUM\_DomS_{ij} + a_3\ DUM\_ForS_{ij} + a_4\ DUM\_ForS\_EMU_{ij} + a_5\ DUM\_For\_EU15nEMU_{ij} + a_6\ Char_{ij} + a_7\ Country_j + \varepsilon_{ij} \quad (1)$$

where: $\Delta\ Correl_{ij}$ is the correlation between the rate of growth (calculated as the annual change of the natural logarithm) of customer loans and of customer deposits of bank *i* in country *j* between 2000 and 2008; DUM_DomS_{ij} is a dummy variable for domestic affiliates; DUM_ForS_{ij} is a dummy variable for foreign affiliates; $DUM\_ForS\_EMU_{ij}$, $DUM\_For\_EU15_{ij}$, and $DUM\_For\_EU15NEMU_{ij}$ are dummies for foreign affiliates operating in EMU, in EU15 and in EU15 countries that are not EMU members, respectively;[21] $Char_{ij}$ are average characteristics of bank *i* of country *j* between 2000 and 2000; $Country_j$ is a set of country dummies; and ε_{ij} is a standard error term. The model is estimated using weighted least squares, to account for the different time span over which bank specific correlations have been calculated. As bank characteristics we have considered a measure of specialization (the share of customer loans over total assets), since banks active in traditional activities are more likely to have a strong matching between retail funding and lending; a measure of interbank liquidity (the share of bank deposits over total assets), because easier access to the interbank market reduces the need for a strict matching of customer deposits and loans; leverage (the equity to total assets ratio), because more leveraged banks are typically those with better access to funding in capital markets; and size (the logarithm of total assets). To limit the effect of outliers we have run the estimates excluding observations below the 1st and above the 99th percentile of the sample distribution.

The tests of our earlier claims are based on the signs and significance of the coefficients a_2 to a_5, associated with the dummies for the domestic affiliates and for the foreign affiliates in the different groups of countries. In particular, Claims 1-3 are generically consistent with a negative coefficient for the dummies of domestic and of foreign affiliates (a_2 and a_3); Claims 5 and 6 imply negative coefficients of the dummies for EMU and possibly non-EMU-EU15 affiliates (a_4 and a_5), consistent with an even lower correlation in the case of foreign affiliates, the more so if they operate within more integrated areas.

Table 4 presents the results of different specifications of model (1).

[Table 4]

In Panel 1 we have included among the explanatory variables only the dummies for domestic and foreign affiliates, and the country dummies. As expected, both coefficients are negative, although only the coefficient of foreign affiliates, that is larger in absolute value, is statistically significant. Although the difference between the two is statistically insignificant, this provides some evidence consistent with the hypothesis of stronger incentives to use ICMs within a multinational group. Indeed, the aggregate result is likely to be the outcome

20 We have chosen to focus on affiliates because, in a number of unreported regressions we have verified that the behavior of holding companies is not too dissimilar from that of average standalones, giving insignificant coefficients of the associated dummies.

21 We considered banks that changed their status during the sample period as different institutions.

of two opposing forces. In the case of domestic affiliates, ICMs may operate more smoothly, but they are used only when support is needed, since substitution is much less relevant within banks operating in the same country. In the case of foreign affiliates, both the support and the substitution effects are at work. Recall that both effects when at work should reduce the correlation between deposits and loans. But their relative magnitude is likely to vary, depending on the degree of market integration. Among highly integrated economies, on the one hand funds can be transferred more smoothly, but on the other hand business cycles are more correlated. Depending which of the two forces prevail, the support and the substitution functions are stronger or weaker within integrated areas. Panels 2 to 4 test precisely this hypothesis.

In Panel 2 we have included an additional dummy for MNBs operating within EMU. Consistent with Claim 5, we find strong evidence that foreign affiliates of EMU holding companies operating in another EMU country have an economic and statistically significant lower correlation between the rates of growth of deposits and of customer loans, with a coefficient of -0.197. Controlling for this effect, the coefficient of foreign affiliates becomes positive (0.007), although not statistically significant. For EMU foreign subsidiaries, the cumulative effect obtained summing the two coefficients of the dummy for foreign subsidiaries and of the interaction term is negative and it is statistically significant at the 1% level.

This first evidence is further strengthened by the results reported in Panel 3, showing that also MNBs operating within the larger group of EU15 countries (that includes EMU members) benefit significantly from the functioning of ICMs. The coefficient for the dummy of EU15 foreign affiliates is -0.266 and it is statistically significant at the 1% level; as in the case of EMU, the cumulative effect obtained summing the two coefficients of the dummy for EU15 foreign subsidiaries and of the interaction term is negative and statistically significant. The coefficient of foreign affiliates remains positive (0.067) and it becomes statistically significant, suggesting that for the foreign affiliates operating in countries outside EU15, mainly the NMSs of Central and Eastern Europe, the correlation between the rates of growth of deposits and of customer loans is even stronger than that of standalones. In this case, therefore, ICMs do work less smoothly, dampening the impact of potential support and substitution effects. This is not entirely surprising, since non-EU15 countries in our sample include mostly those recently admitted to the EU, that have typically higher cultural, linguistic and institutional barriers, as well as less developed financial markets.

In Panel 4 we have distinguished between affiliates within EMU and affiliates within other EU15 countries, but outside EMU, with the aim of verifying the role of the monetary union in facilitating the functioning of internal capital markets for MNBs. On one hand, sharing a common monetary policy and a common currency should facilitate intra-group fund transfers; on the other hand, it is possible that the support and substitution effects are in this case less relevant, due to the higher synchronization of the business cycles within EMU. The evidence of Panel 4 suggests that the two effects compensate each other, and the coefficients of the dummies for foreign affiliates in EMU and in the other EU15 countries are both economically and statistically significant, and very similar in size (-0.264 and -0.265, respectively). Again, the cumulative effects obtained summing the two coefficients of the

dummy for foreign subsidiaries and of the interaction terms are economically and statistically significant.

In Panel 5 we have further distinguished between foreign affiliates operating in UK and those operating in the other EU15 countries that are not members of EMU. UK has a key role as a major financial center, and its financial institutions have a large share of transactions denominated in the common European currency. Fund transfers with foreign affiliates operating in UK might therefore be much smoother than with other non-EMU European countries, and therefore be the drivers of the coefficient of the dummy for the non-EMU-EU15 countries in the previous specification. Indeed, the results provide evidence in favor of this: the coefficient of the dummy for UK affiliates is negative and larger than that for EMU in absolute size (-0.355), while that for the other non-EMU-EU15 affiliates remains negative, but it becomes statistically insignificant.[22]

Finally, in Panel 6 we have added to our previous specification some bank specific controls. Our previous findings on the smoothness of the functioning of ICMs for foreign affiliates operating in different economic areas are substantially confirmed. As expected, we also find that the correlation between the rate of growth of deposits and of customer loans is on average higher for banks specialized in traditional lending activities, less leveraged, and less active in interbank markets. Bank size has a positive but negligible effect.

The evidence presented in Table 4 provides strong support to our claims on the functioning of ICMs for MNBs operating within well integrated areas. In Table 5 we have further analyzed the role of integration, including among the explanatory variables some measures of economic and institutional proximity, to test our earlier Claim 5, that *units that are located in distant countries with different languages or different cultural environment may find more difficulties in actively taking part into a cross-border ICM of an MNB.*

[Table 5]

In Panels 1 and 2 we have included a dummy for foreign affiliates operating in countries sharing a border with that of the holding company, or where the same language is spoken. In both cases the estimated coefficient is positive, suggesting that stronger proximity has mainly the effect of reducing the impact of the substitution effect, but only in the case of countries sharing a border. These cases are statistically significant.

In Panel 3 we have disentangled the effect for foreign affiliates operating in the countries that have a distance from that of the holding company that is below the median of the sample distribution. Closer countries are typically more integrated and have more synchronous business cycles, therefore reducing the scope for the substitution effect, but they are also more likely to permit a smoother working of ICMs, for example by facilitating personal contacts. It turns out that the first effect prevails, since foreign affiliates operating in geographically closer countries have a higher correlation between the rates of growth of deposits and of customer loans.

Finally, to test the second part of our earlier Claim 2, that *the substitution effect weakens the link between funds availability and lending especially for banking groups operating in*

22 Indeed, our sample includes very few instances of foreign affiliates operating in non-EMU-EU15 countries other than UK. In unreported regressions we have also analyzed separately the role of Luxemburg, another important banking center, finding that it also has no significant impact on our results.

countries with less correlated real shocks, in Panel 4 we have analyzed the effect of the synchronization of the business cycles, disentangling the average effect of ICMs for affiliates operating in countries that have a bilateral correlation of the rate of growth of GDP with the country of the holding company that is below the sample median. Consistent with our expectation, the larger scope for the substitution effect in the case of less synchronized countries increases the role of ICMs, determining a reduction in the correlation between the rates of growth of deposits and of customer loans, although the effect is only statistically significant at the 40% level. Reassuringly, even when we include these controls, the EMU and EU dummies, which capture the degree of integration of financial markets, keep their negative and significant sign.[23]

4. MNBs and the systemic crisis

In the previous Section we have analysed how ICMs are expected to function under idiosyncratic financial distress and we have shown empirically that they have indeed been functioning so as to isolate lending activities of foreign affiliates from the local availability of funding. This finding is in line with the claim that ICMs may be used to support and stabilise financial markets, but it is not a direct test of how they have functioned in times of distress. Of particular concern is how they behaved during the current crisis, given its pervasiveness and that it impacted all players in the financial sector in Europe and all over the world.

In this Section we turn precisely to the assessment of the effects of the recent crisis. We first discuss how the claims outlined in Section 3 hold in the case of a systemic crisis and then analyse empirically how the lending policies of foreign affiliates have been faring during the crisis. We do so, first by using aggregate BIS world data and then our sample of European banks. Clearly, in this setting it is not our intention to provide an interpretation of the causes and consequences of the crisis itself, that have been and are being extensively analyzed elsewhere (see, e.g., Acharya et al., 2009).

Previous studies have shown that the presence of MNBs tend to increase stability in host developing countries during times of financial distress since domestic lending dropped during crises much more for domestic banks than for affiliates of MNBs (see, for example, Clarke et al. 2003, Detragiache et al. 2006). Referring to the US, Morgan et al. (2004) and Kroszner and Strahan (2006) have shown that when in a State there is a significant activity of a banking group that operates across-states, then important macro variables in the State (e.g. growth and employment) tend to be less volatile, the size of the business cycle tends to be reduced and at the micro level loan availability becomes less related to the local banks' capital.

But all what these works do is showing that banking groups seem to have a stabilizing role during *idiosyncratic* shocks. Our aim in this Section is instead to verify the behavior of

23 Following the suggestion of one of the panelists, Martin Brown, we have also verified if the correlation between customer deposits and loans diminishes when a previously independent bank is acquired and becomes a foreign affiliate. Unfortunately, there are only 19 such operations in our sample with a time span before and after the acquisition sufficiently long to allow for the estimation of the correlations. Despite some weak evidence in favor of our hypothesis of a reduction in the correlation, we were unable to detect any statistically significant effect.

MNBs in the current *systemic* crisis, in which the shocks are highly correlated among the countries in which the MNBs are active. To our knowledge, only two papers have focused on the behavior of MNBs during the recent crisis. Using aggregate BIS and IMF data, Cetorelli and Goldberg (2010) show that foreign banks reduced the rate of growth of loans with respect to the pre-crisis period more than domestic banks. However, since their lending activity was much more buoyant than that of domestic intermediaries, their evidence confirms that the rate of growth of loans granted by foreign banks remained positive and stronger than that of domestic banks also after the crisis. Udell and Popov (2010) analyze instead a sample of medium and small firms in Eastern European countries, showing that firms that are located in provinces with a stronger presence of foreign intermediaries have a higher probability of being denied credit or to have renounced applying for bank loans because they feared to be denied. However, their data (based on a questionnaire) do not allow linking each firm to a potential lender, and the results are also consistent with the alternative hypothesis that MNBs are more efficient to screen troubled borrowers than domestic banks (thus relating to the "smarter money" effect discussed above).

Despite the lack of analytical research, a well shared perception during the crisis was that MNBs were heavily contributing to a credit crunch. The argument was that, by operating across borders, MNBs had quickly spread a dramatic drop in lending in all countries where they were active, notwithstanding (substantially) stable deposits.

However, a deeper investigation of the functioning of ICMs reveals that this is a simplistic view. Two contradictory claims can emerge here. First, *if the shock is systemic, then one may expect that being an MNB may not help that much since the ICM cannot activate the support and substitution effect* (**Claim 6**). Second, if ICMs are well organized and functioning, they may attract more external funds relatively to standalone banks (i.e., the "more money" effect described in Box 2). Depositors, for example, may behave differently when the bank belongs to an MNB: the "more money" effect may significantly reduce the negative impact of the shock since the MNB may still be considered a safe harbor.[24] Hence, *if ICMs make the allocation of resources more efficient within MNBs, they may help relaxing the nexus between local lending and funds also during a systemic crisis. MNBs would then have a stabilizing effect* (**Claim 7**).

4.1. Aggregate evidence on the effects of the crisis on the activities of MNBs.

A first test of claims 6 and 7 can be performed by extending the analysis of Section 2 and looking at the aggregate trends in the activities of MNBs. Specifically, we focus on how local claims of these banks have behaved during the recent financial crisis, from the last term of 2007 to the fourth term of 2009. The key question is whether during the crisis MNBs have been unwinding their assets held through their foreign affiliates in host countries, or, in contrast, whether they have been channelling liquidity to their subsidiaries to support them.

24 Indeed, de Haas and van Lelyveld (2010) illustrate this effect showing that in crisis affecting a national banking system, foreign subsidiaries increase their deposits, contrary to domestic banks.

We argued in Section 2 that local claims had been more stable than total foreign claims in 2008 and 2009. If we consider the EU27, the total value of local claims denominated in local currency, once converted in US Dollars (as reported above in Figure 2 of Section 2) amounted roughly to 4.500 billion dollars at the end of 2007, it declined by about 450 billion dollars by the end of 2008, but was already at 4.370 billion dollars by the end of 2009. This pattern is consistent in all subgroups of EU countries, including the UK. In the NMS the absolute value of local claims by mid 2009 is even larger than at the end of 2007. This trend is also similar in the non-EU advanced economies like the US.

The stability of local claims stands out even more clearly if we adjust for exchange rate fluctuations, by constructing index numbers measured in national currencies for the EMU12 aggregate and for the most significant NMS in terms of absolute values of foreign claims (Figure 5A). In all the country groups the value of local claims measured in local currency was higher at the end of 2009 than at the beginning of 2007. This is also true for Hungary and Poland, countries where foreign banks were the major players in the financial crisis and which have been through a particularly severe recession in 2008 and 2009.

[Figure 5A]

In Figure 5B we also report local claims denominated in foreign currency. These figures should be taken as proxies for likely trends, because, as mentioned above, they are estimated and their allocation to individual countries is likely to be biased. Moreover, since the currency basket of these claims is not reported, we keep them in current US Dollars (as BIS does). Also in this case, claims are higher at the end of 2009 than at the beginning of 2007 in the EMU12 countries, Hungary and Poland.[25]

[Figure 5B]

To better understand investment policies of foreign banks during the crisis, and particularly whether these banks have been instrumental in channelling financial resources towards host countries rather than the opposite, it is useful to relate trends in assets to trends in liabilities in local currency towards local residents (see Box 1 above for the definitions). The issue here is understanding, *first* how much claims in local currency are strictly funded by local deposits and other liabilities and, *second*, whether during the crisis resources acquired in a given country have been transferred to affiliates based in other countries or to headquarters. Figure 6 reports the ratio between these assets and liabilities for the EMU12 and the other countries reported in Figure 5 from the first term of 2007 to the fourth term of 2009. The evidence is particularly interesting and in line with hypothesis that foreign banks have been supporting local assets through cross border funding.

Indeed it stands out that this ratio is always larger than one. In Hungary it is the highest, almost at 1.8. Also, this ratio is stable and even increasing for most countries. Now local assets not funded by local liabilities in local currency can either be funded by local liabilities in foreign currency (not reported in the BIS' statistics but likely to be pretty small) or by cross border funds, channelled either through the global market or through the ICM. In other words, during the crisis an increasing share of the local assets of foreign subsidiaries have been funded by cross border financial flows.

25 Figures for the Czech Republic are negligible and therefore have not been reported.

[Figure 6]

This preliminary descriptive evidence that lending and investment policies of MNBs have been stable, if not rising, during the period of the crisis is now tested econometrically. Using the same quarterly data described above for the period between 1999 and 2009 and for a sample of 49 developed and developing countries, we look at whether the time trends of local claims denominated in domestic currencies of foreign affiliates is affected by the crisis, taking them as a ratio of local liabilities denominated in domestic currencies, or of total financial assets in the country, obtained from IMF data.

The results are reported in Table 6. Since both ratios show a high cross-country dispersion, we used a quantile regression technique evaluated at the median, also including country fixed effects. Panel 1 shows that on average the ratio of local claims to local liabilities has increased since 1999, as shown by the positive and significant coefficient of a linear time trend. Moreover, the growth has accelerated in the post-crisis period, as shown by the positive and statistically significant coefficient of the post crisis dummy, that takes the value of one from the fourth quarter of 2007 (Panel 2). In Panel 3 we have further specialised our analysis, interacting the post-crisis dummy with a set of dummies for different grouping of countries, to see if the effect of the crisis has been heterogeneous across regions. The results show that the ratio of local claims to local liabilities has increased in all geographic areas, with the only exception of other non-European developed countries. The effect has been stronger in the NMSs and in the main developing countries, smaller and not statistically significant in the EU countries that are not EMU members neither NMSs.

[Table 6]

These results are substantially confirmed by the analysis of the evolution of the local claims of foreign affiliates as a ratio of total financial assets in the country. Also this ratio has been increasing since 1999, as shown by the positive and statistically significant of the coefficient of the time trend, in Panel 4. However, the crisis has not significantly altered its evolution, as shown by the insignificant coefficient of the post-crisis dummy in Panel 5. Finally, analyzing separately the effect of the crisis across different groups of countries shows that this ratio has significantly raised within EMU affiliates.

The role played by MNBs in NMSs during the recent crisis, and in particular the decisions of the parent companies to support their foreign affiliates, might have been influenced by the international initiatives of financial support decided at the multilateral level and by the ring fencing policies that some of these countries might have put in place. Indeed, it is legitimate to question whether foreign parent companies have stabilised and even increased local lending because of: a) ring fencing policies decided by host governments; b) indirect resources provided by multilateral institutions to some NMSs. However, the evidence is controversial. On one hand, there is no evidence of a tightening of formal regulatory ring fencing in NMSs during the crisis. On the other hand, it is true that a coordinated international effort to financially support the regions provided resources to banks with a local presence.[26] But although these interventions had effects that cannot be disentangled in

26 During the crisis the IMF and the EU committed to extensive balance of payments support packages of over 50 billion euro (the commitment has been sealed at the end of March 2009). In addition, on the basis of a joint agreement (the so called IFI Action Plan)

our data, a number of facts suggest that they cannot be the sole explanation of our findings. First, they do not explain the increase in the lending to deposit ratio of foreign affiliates relative to that of domestic banks, which were all the same entitled to receive part of the financial resources provided on the basis of these multilateral agreements. Second, the financial support only became operative in the first quarter of 2009, and our evidence does not show a substantial reduction in the lending to the deposit ratio in the previous quarters. Third, all the main support measures undertaken in favour of Central and Eastern European countries are not legally binding agreements, but they are made on a voluntary basis, including the so called Vienna Initiative.[27] Finally, our data show that also in other European markets, where such measures were not implemented, foreign banks have neither reduced lending nor behaved differently from domestic banks.

4.2. Micro effects of the crisis

Since our bank specific micro-data cover the period from 2000 to 2008, we have also investigated the effects of the financial crisis on the relationship between deposits and customer loans. Unfortunately, the empirical model of equation (1) is unsuitable to analyze the effects of the crisis, because it is impossible to calculate the correlation between the rates of growth of deposits and loans at the bank level, with only two years observations since the summer of 2007. For this reason, we have chosen a specification similar to the one adopted for the analysis at the aggregate level, verifying if the bank specific ratio of customer loans to deposits has changed significantly during the crisis, and in particular if these changes have been different for foreign affiliates operating in different areas (which we couldn't test with aggregate data). In practice, we have estimated the following specification of a difference in difference model around the event of the crisis:

$$ratio_{ijt} = a_1 + a_2\ DUM\_Crisis * DUM\_ForS\_EMU_{ij} + a_3\ DUM\_Crisis * DUM\_For\_EU15nEMU_{ij} + + a_4\ DUM\_Crisis * DUM\_For\_nEU15_{ij} + a_5\ DUM\_ForS\_EMU_{ij} + a_6\ DUM\_For\_EU15nEMU_{ij} + a_7\ DUM\_For\_nEU15_{ij} + a_5\ Char_{ijt-1} + a_6\ Year_t + a_7\ Country_j + \varepsilon_{ijt} \quad (2)$$

where: $ratio_{ijt}$ is the ratio between customer loans and customer deposits of bank *i* in country *j* at time *t*; *DUM_Crisis* is a dummy taking the value of one in 2007 and 2008; $DUM\_ForS\_EMU_{ij}$, $DUM\_For\_EU15nEMU_{ij}$ and $DUM\_For\_nEU15_{ij}$ are dummy variables that take the value of one if bank *i* of country *j* at time *t* is a foreign subsidiary of a holding company located, respectively, in EMU, in EU15 countries that are not EMU members, and in the remaining EU27 countries; $Char_{ijt-1}$ are characteristics of bank *i* of country *j* at time *t-1* (the logarithm of total assets and leverage); $Year_t$ is an yearly time dummy; $Country_j$ is a

the European Bank for Reconstruction and Development, the European Investment Bank and the World Bank committed to make available up to 25 billion dollars on a 2 year horizon program to support banking sector stability and lending to the real economy. 19 billion dollars have been already delivered (the commitment has been sealed on February 2009).

27 Following the IFI Action Plan (see previous footnote), country based policy coordination has evolved in voluntary agreements (known as the Vienna Initiative) according to which the parent banks of affiliates operating in countries that have received support from IMF programs (co-financed by the EC in the case of EU members) committed to maintain constant their exposures in the host nations and to recapitalize their subsidiaries as long as IMF/EC programs are on track. So far, such agreements have been reached in Romania, Hungary, Serbia, Bosnia Herzegovina, and most recently in Latvia.

country dummy; and ε_{ijt} is a standard error term. Due to the extremely high kurtosis of the dependent variable, we have run the estimates excluding observations below the 10th and above the 90th percentile of the sample distribution.

The test of the effect of the financial crisis on the functioning of ICMs for cross-border groups is based on the sign and significance of coefficients a_2 to a_4. A positive and significant value would imply that foreign banks with access to ICMs reduced their loans-deposits ratio less than the control group of banks, and therefore had a stabilizing effect after the shock induced by the financial crisis. Clearly, a negative coefficient would imply the opposite.

Table 7 presents the results of the estimation of equation (2). Panel 1 presents the estimates obtained using an OLS specification, including unreported country dummies. The negative values of the coefficients for the year dummies in 2007 and 2008 show that the ratio between customer loans and customer deposits have been shrinking on average since the beginning of the crisis. However, all the coefficients of the interaction terms between the crisis and foreign affiliates are positive, and those for affiliates located in non-EMU-EU15 countries and in the NMSs of Central and Eastern Europe, Malta and Cyprus (non-EU15) are statistically significant at the 1% level, showing that the impact of the crisis has been in these areas lower for foreign affiliates than for domestic banks.

[Table 7]

Since, despite the trimming, our data might be affected by the presence of outliers, in Panel 2 we report the results obtained using a more robust quantile regression technique, evaluated at the median. The results substantially confirm the previous findings: the coefficient of the dummy for foreign affiliates located in EU15 is negative but statistically insignificant, while that of the dummies for the non-EMU-EU15 countries and for the NMSs are positive and statistically significant, respectively at the 10% and at the 1% level. The only remarkable difference with respect to Panel 1 is that the dummy for affiliates located in EMU becomes negative, although it remains statistically insignificant. Finally, in Panel 3 we have estimated a model with fixed bank effects, which once again confirms the robustness of the previous findings.[28]

These results can be interpreted in light of Claims 6 and 7 above. Foreign banks had a stabilizing effect during the crisis in Eastern Europe's NMSs and in non-EMU-EU15 countries, which is in line with claim 7 that these banks can be effective providers of funds locally even during a systemic distress. This result is also probably driven by the fact that in the NMSs, MNBs are by far the dominant players, and domestic banking is extremely weak. However, in other areas these banks have essentially been behaving like national banks, showing that they had been equally affected by the pervasiveness of the crisis. This is in line with Claim 6.[29]

28 Moreover, in the specifications of Panels 2 and 3, the average value of the coefficients of the year dummies before the crisis is significantly higher than that after the crisis.

29 Indeed, an increase in the ratio of claims to deposits is not necessarily evidence of the functioning of ICMs. For a fixed level of loans, such ratio would increase also in case customers withdraw their deposits and the bank matches such reduction in its aggregate liabilities by selling bonds. However, in unreported regression we found no evidence of a reduction in customer deposits for the sample of banks analyzed above. We thank Nicola Cetorelli for pointing this out to us.

In summary, these results based on bank specific data during the crisis show that foreign affiliates certainly had not a destabilizing effect, since their loan-deposit ratio has either remained constant or increased. Contrary to a diffused misperception, we find no evidence that these banks have been funnelling resources away from any of their host countries. That the working of ICMs did not allow foreign affiliates to have a significant stabilizing effect within EMU is not entirely surprising, due to the systemic nature of the recent crisis, which has made nearly impossible to smooth the shocks within a group of similar economies. If all banks are simultaneously hit by an identical shock, there is no benefit in transferring funds from one unit to the other. In fact, we find that ICMs had indeed a stabilizing effect precisely in the case of affiliates located in NMSs, where the impact of the shock was more diverse, because of the lower economic integration.[30]

5. Concluding remarks: insights for a better regulatory design of MNBs in Europe

We conclude this section answering to the following question: What are the policy implications that can be delivered by our results?

In Europe, multiple national authorities are involved in the supervision of a single MNB, often in an uncoordinated way and operating with often dissimilar regulatory frameworks. This current regime has several shortcomings. Supervisors tend to operate only in the interest of their own country, without taking in due account the cross-border spillover implications of their own decisions. Under several scenarios, this framework is unable to produce the relevant and timely information for prompt supervision and regulation. The shortfalls of the current regulatory and supervisory frameworks are already evident in ordinary times, but they become even more compelling in times of distress. As highlighted by the recent crisis, cooperation and coordination between national supervisors often proved ineffective, since the impact of the crisis was assessed mainly at the national level, and remedial actions were defined almost exclusively at the country level.

Given this suboptimal environment for regulation of MBNs in Europe, in this concluding Section we illustrate a number of policy implications stemming from our findings, which may help fine-tuning regulatory reforms.

(i) *Multinational banks are not a source of instability.* In the aftermath of the financial crisis, MNBs have been perceived as an important cause for systemic risk and a source of global volatility. However, we have shown that these conclusions are driven by a non adequate understanding of what these banks do and how they function, particularly for what concerns retail banking activities.

As shown by the econometric results of Section 3.1, affiliates of MNBs use extensively their ICMs, and this has a significant impact on the correlation between the rates of growth of customer loans and deposits. In normal times (before 2007), MNBs have been able to use

30 As pointed out by our discussant at the Panel Meeting in Madrid, Dalia Marin, this result for NMSs contrasts with the evidence that during the Nineties foreign affiliates in Eastern European countries did not rely on parental liquidity to finance their activities. Indeed, we also showed in Section 3.1 that the correlation between customer deposits and loans for affiliates in NMSs have been particularly high even during the last decade. Taken together, these results suggest that MNBs might indeed have changed their behavior during the recent financial crisis.

the ICM to isolate local lending from the availability of local funds. In fact, the correlation of the rate of growth of local loans and deposits is lower for foreign subsidiaries of MNBs than for standing alone domestic banks. Hence, MNBs through their ICMs can exert a stabilizing role in the presence of idiosyncratic shocks.

In times of systemic distress the evidence of Section 4.2 supports the view that MNBs did not weaken financial stability in local markets. During the crisis the ratio of local bank claims to liabilities did not decline, and it even increased in some groups of countries (for example the NMSs, where foreign banks account for the dominant share of total banking activities). This aggregate pattern is further confirmed by the micro-evidence based on the sample of the largest European banks, showing that, compared to self standalone domestic banks and domestic banking groups, subsidiaries of MNBs have been able to isolate their lending activities from fluctuations in funds, and that they have been better able to profit from positive upswings in lending conditions. The evidence also supports the view that this has been done through the ICM.

We can therefore conclude that our results do not provide support to the argument that a world with only small and domestic banks is safer. Rather, we show that the size and the global extensions of the activities of MNBs contributed positively to hedging the downturns of the crisis, even in transition economies like the NMSs.

(ii) *ICMs are especially effective within integrated financial markets.* We have also shown that the degree of market integration between the countries where foreign activities of MNBs are based influences the functioning of the ICM. In fact, ICMs appear to be especially at work within better integrated financial areas, like the EU, and less so across markets with severe regulatory and market barriers. In particular, our empirical findings of Section 3.1, based on bank level data, clearly illustrate that also in normal times the correlation between the rates of growth of loans and deposits of foreign affiliates is lower than that of domestic banks, especially for those affiliates that belong either to EMU or to the restricted set of countries that are more integrated in Europe (i.e., the EU15 group). To this extent, our evidence shows that ICMs and the external capital markets are by large complementary. When the external capital markets are less integrated, due to regulatory constraints or because they involve different currencies, then MNBs' affiliates are *de facto* using the ICMs to a very limited extent, and therefore show no relevant differences with respect to domestic banks.[31]

At first sight this is not fully intuitive, as market integration imposes a trade-off on the ICM: easier movement of resources (due to more harmonized regulations and common currency), but highly correlated business cycles and returns, that reduce the scope for the global diversification of investments. The evidence supports the view that the first component of the trade off prevails: ICMs function better if markets are more integrated. Indeed the fast rise of multinational banking in the last ten years has taken place mostly

31 Although further scrutiny on the causes of this effect is needed, since the effect related to the Euro seems to be stronger, a possible interpretation is that an ICM that operates across countries with different currencies incurs in the additional cost of exchange rate risk. Indeed, anecdotal evidence illustrates that activities of ICMs across countries almost always involve currency swaps. Furthermore, transfers of liquid assets within ICMs are often used in the country of destination as collaterals with the local central bank to obtain liquidity. Since the central banks tend to associate lower volatility to local treasury bills, limited integration (e.g. outside EU15) may involve significant impediments to ICMs.

within the EU, even though there are still considerable regulatory barriers between member countries.

(iii) *Harmonising the European regulatory framework*. Since the ICM functions well especially within integrated markets, reducing the inconsistencies and differences in the regulatory framework across member states and coordinating bank supervision within the EU would provide better supervision on global activities of MNBs. This should be a priority, since it would be instrumental in fostering the efficiency of the ICM and market integration in retail and corporate banking.

(iv) *Neutrality of rules with respect to the organisational mode.*

In Section 3.1 we have illustrated that different types of foreign incorporation (branches and subsidiaries) give rise to different liability structures between the bank's units within the group, and hence different incentives to the functioning of ICMs. We have seen that an ICMs works well and shows its "bright side" if: a) liquidity and capital are really free to flow among units, b) the information is free to flow within the organization without impediments, c) the incentives within the organization and its units are well designed.

Although the "single banking license scheme" was introduced in Europe with the purpose of facilitating free access within the Single European Market and of ensuring a level playing field, the current regulatory framework in Europe shows a bias in favour of structuring MNBs with branches (with the single passport). In particular, regulatory approaches strongly differ if banks are organised with independently incorporated subsidiaries or with foreign branches.[32] However, branches may not be the best organization to address the internal incentive issues of point c). In principle, with subsidiaries one could identify clear responsibilities of local managers and units and thus give them the right incentives.[33] Independent local managers are in a better position to make use of "soft information" that would instead be very difficult if not impossible to transmit for the functioning of a fully centralized ICM.[34] With an organization based on branches, instead, local managers in foreign countries may be exposed to and feel that the ICM actually expropriates the capital and liquidity that has been produced locally by their branches.

Clearly, one could argue that in the current environment branches are to be preferred since, to some extent, they allow a consolidated supervision of the MNB. However, it is also clear that this is simply the suboptimal consequence of the current state of affairs in regulation and supervision of MNBs. Along the same line of reasoning, reform proposals meant at ring fencing subsidiaries in host countries and forcing systemically relevant branches to be transformed into subsidiaries, like those put forward within the FSB Standing Committee on Supervision and Regulatory Cooperation (Turner, 2009), may restrict considerably the optimal functioning of the ICM.

32 The single license applies to branches of an MNB that are subject to the regulation and supervision of the authority regulating the parent company. Subsidiaries instead are considered independent despite their being part of a group and each of them is under the regime of the authority of the country in which they are based. Thus, rules applied to affiliates of the same group often differ and conflict.

33 It is also worth mentioning that a subsidiary structure may be preferred and rewarded by markets in time of distress since it naturally allows identifying units and cross-liabilities among them.

34 Currently, national regulations on privacy limit the possibility for units to exchange information on their activities with their partners that are independent entities of the same group. This is another undesirable bias of regulation that affects the internal organization of MNBs.

The reform of the European regulatory and supervisory should not ignore these organizational issues and introduce a neutral regime between branches and subsidiaries. Choosing the best organization for banks is the task of managers, and regulation should not impose a preference.

(v) *The 28th regime.* Finally, we think that to achieve a coordinated and neutral regulatory framework, European countries should contemplate a new and specific framework for European MNBs, allowing these banks to set-up a truly integrated organization with its well functioning ICM, as illustrated in the previous pages. This framework would define the responsibilities and the powers of the parent company, the branches and independent subsidiaries, provided due protections to minorities and creditors are granted. In this respect, some commentators have referred to this proposal as a 28th regime for MNBs, in addition to those available to banks in the 27 Member States belonging to the European Union. This regime should contemplate a specific treatment for MNBs in terms of regulation and supervision, along the line of the proposals that have already been discussed in Europe (i.e., enhancing coordination among countries through strengthened colleges of supervisors overseen by a newly created European Banking Authority, and possibly defining rules for the allocation of the costs of rescuing those banks in case of distress).[35] Banks should be then left free to choose whether to opt for this regime, which would guarantee the best functioning of ICMs.

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35 To some extent this new regime for truly European players is close to the dual system that is in place in the US according to which banks active at the level of the entire nation are under the federal scrutiny (with a federal charter, associated federal laws and a federal supervisor).

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Annex 1 – List of Figures and Tables

Diagram inserted in BOX 1: The Consolidated Banking Statistics of the Bank for International Settlements (BIS)

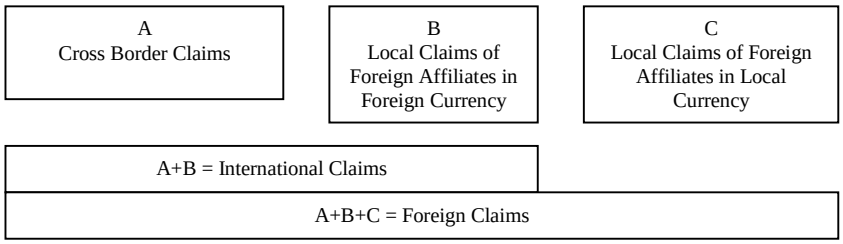
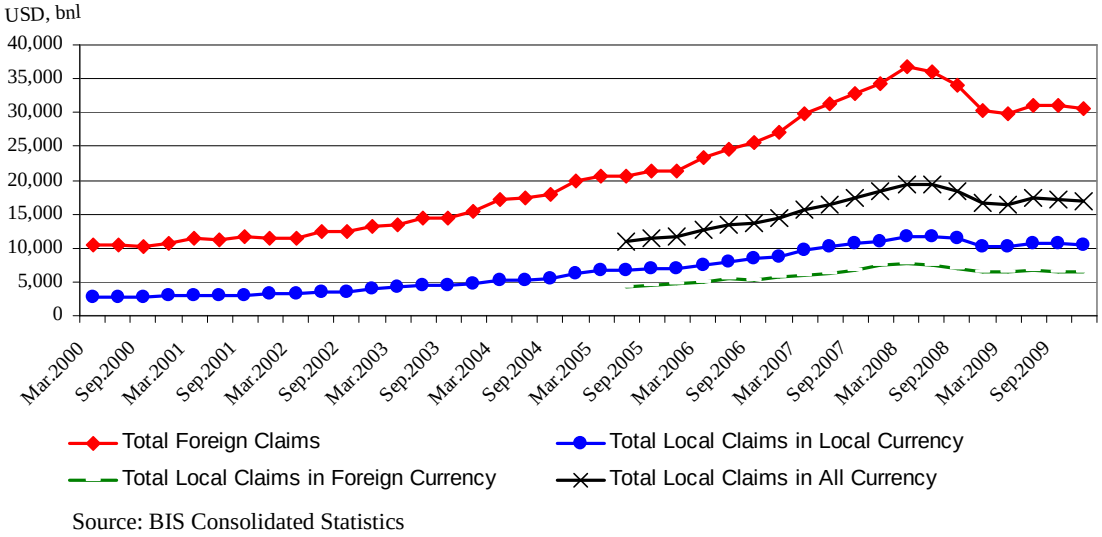
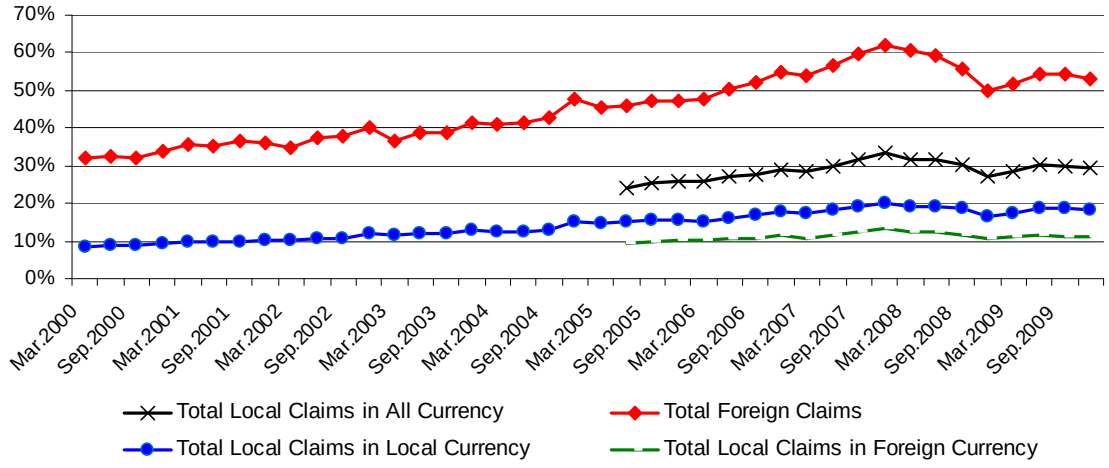


Figure 1A
Total Foreign and Local Claims in Nominal Values



Source: BIS Consolidated Statistics

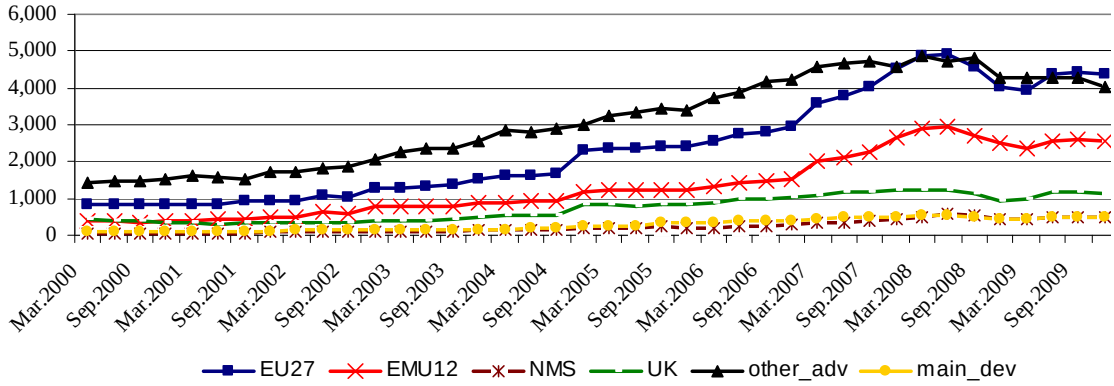
Figure 1B
Total Foreign and Local Claims in % of GDP



Source: BIS Consolidated Statistics for Claims and World Bank Statistics for GDP

Figure 2
Nominal Total Local Claims of Foreign Affiliates by Host Region

USD, bln



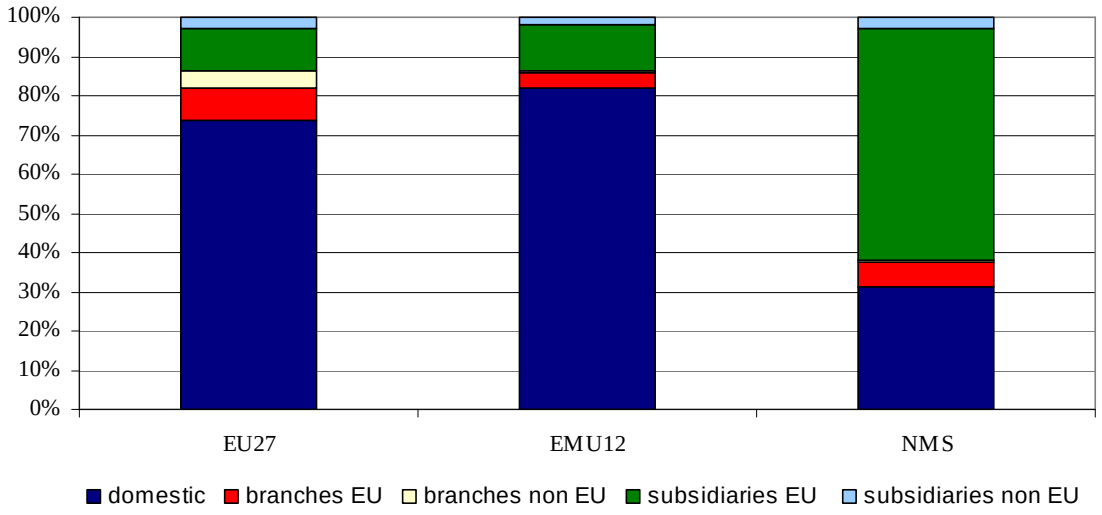
Source: BIS Consolidated Statistics
Note:
Other advanced: US, Canada, Japan, Australia, New Zealand, Switzerland
NMS: Bulgaria, Cyprus Czech Republic, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak, Slovenia
Main Developing: China, India, Malaysia, South Korea, South Africa, Singapore, United Arab Emirates

Table 1: Total Local Claims in Local Currency on Total Assets

	avg 2001-2003	avg 2004-2006	2007	2008-I	2008-II	2008-III	2008-IV	2009-I	2009-II
EU27	9,8%	13,3%	17,9%	17,8%	17,7%	17,8%	16,4%	16,6%	16,9%
EMU12	7,5%	9,9%	15,1%	15,4%	15,2%	15,2%	14,1%	13,8%	13,8%
UK	16,5%	21,7%	23,0%	21,7%	21,3%	21,5%	21,0%	22,9%	23,4%
NMS	35,7%	43,1%	50,2%	49,4%	50,6%	48,9%	44,7%	46,6%	47,4%
other_adv	4,1%	5,1%	6,0%	6,3%	6,0%	6,3%	5,6%	5,9%	5,9%

Source: BIS Consolidated Statistics for Local Claims in Local Currency. IMF, International financial Statistics for Total assets
Note: - Other advanced: US, Canada, Japan, Australia, New Zealand, Switzerland
- NMS: Bulgaria, Cyprus, Czech Republic, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak, Slovenia
- Main developing: China, India, Malaysia, South Korea, South Africa, Singapore, United Arab Emirates

Figure 3
Distribution of Total Banking Assets EU27 (2008)



Source: ECB Statistics
Note: NMS: Bulgaria, Cyprus, Czech Republic, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovak, Slovenia

Figure 4: Functioning of ICM of an MNB when affiliate A1 is hit by shock on capital

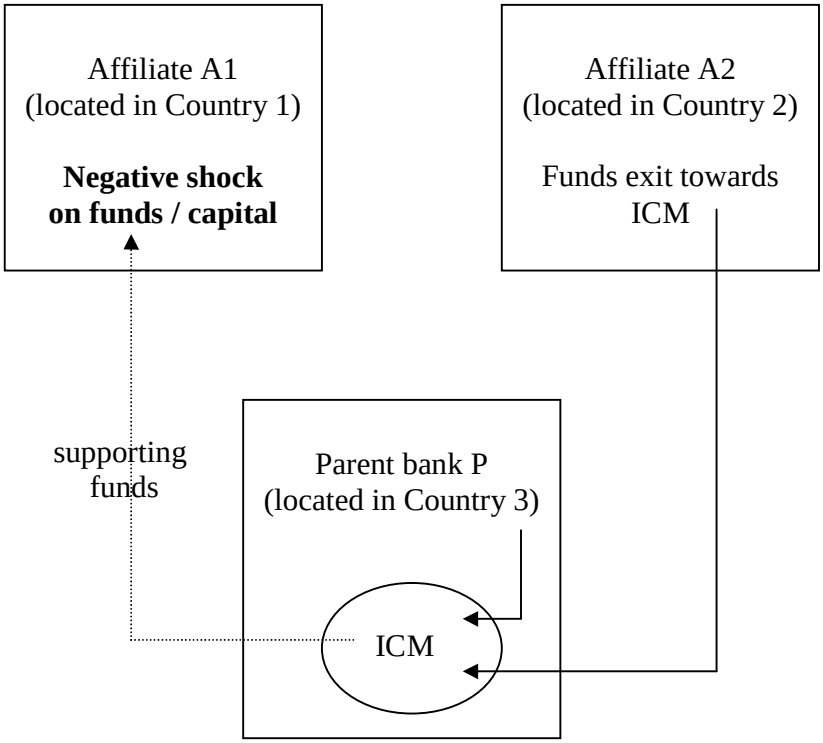


Table 2: Summary Statistics

Data are from Bankscope

Variables	Observations	Mean	Coefficient of variation	Median
		Full sample		
Total assets (US$ bn.)	7326	17.00	5.76	0.79
Customer loans (%)	6732	0.20	1.61	0.18
Demand deposits (%)	6584	0.19	1.53	0.17
Bank total assets - Country (%)	9239	0.17	0.44	0.18
Returns on assets (%)	7311	0.58	4.05	0.47
Customer loans / total assets	7263	0.58	0.38	0.62
Bank deposits / total assets	7058	0.18	1.08	0.12
Equity / total assets (%)	7316	10.27	1.51	7.26
Loan loss prov. / Net int. margin	7311	0.58	4.05	0.47
Net interest margin (%)	6862	0.17	4.91	0.14
GDP (%)	7201	2.85	1.99	2.70
		Affiliates		
Total assets	637	31.30	4.29	32.79
Customer loans (%)	570	0.26	1.28	0.25
Demand deposits (%)	556	0.22	1.43	-0.22
Bank total assets - Country (%)	633	0.23	0.53	-0.21
Returns on assets (%)	634	0.70	2.76	0.69
Customer loans / total assets	630	0.50	0.50	0.53
Bank deposits / total assets	621	0.29	0.79	0.23
Equity / total assets (%)	637	10.53	0.96	7.64
Loan loss prov. / Net int. margin	634	0.70	2.76	0.69
Net interest margin (%)	574	0.17	1.97	-0.12
		Parent banks		
Total assets	213	204.00	2.00	37.70
Customer loans (%)	192	0.18	1.11	0.18
Demand deposits (%)	191	0.15	1.67	0.13
Bank total assets - Country (%)	219	0.19	0.64	0.18
Returns on assets (%)	213	0.66	1.04	0.57
Customer loans / total assets	213	0.53	0.40	0.57
Bank deposits / total assets	211	0.20	0.80	0.16
Equity / total assets (%)	213	7.04	0.98	5.85
Loan loss prov. / Net int. margin	213	0.66	1.04	0.57
Net interest margin (%)	210	0.16	1.14	0.14
		Foreign affiliates		
Total assets	529	21.40	5.08	2.95
Customer loans (Δ%)	483	0.26	1.27	0.27
Demand deposits (Δ%)	471	0.22	1.45	0.23
Bank total assets – Country (Δ%)	530	0.24	0.52	0.23
Returns on assets (%)	527	0.67	2.52	0.67
Customer loans / total assets	522	0.50	0.49	0.53
Bank deposits / total assets	520	0.29	0.80	0.23
Equity / total assets (%)	529	10.76	1.00	7.60
Loan loss prov. / Net int. margin	527	0.67	2.52	0.67
Net interest margin (%)	475	0.17	2.07	0.12
		Foreign parent banks		

Total assets	148	251.00	1.80	52.30
Customer loans (Δ%)	135	0.16	1.11	0.17
Demand deposits (Δ%)	134	0.13	1.68	0.13
Bank total assets – Country (Δ%)	153	0.18	0.70	0.18
Returns on assets (%)	148	0.66	1.04	0.56
Customer loans / total assets	148	0.51	0.41	0.54
Bank deposits / total assets	148	0.22	0.77	0.17
Equity / total assets (%)	148	6.37	0.78	5.50
Loan loss prov. / Net int. margin	148	0.66	1.04	0.56
Net interest margin (%)	146	0.16	1.12	0.14
		Banks chartered in EMU		
Total assets	6087	15.40	6.05	0.74
Customer loans (Δ%)	5614	0.19	1.59	0.18
Demand deposits (Δ%)	5515	0.18	1.52	0.17
Bank total assets – Country (Δ%)	7629	0.16	0.34	0.18
Returns on assets (%)	6082	0.53	3.82	0.43
Customer loans / total assets	6040	0.58	0.37	0.62
Bank deposits / total assets	5914	0.18	1.08	0.12
Equity / total assets (%)	6077	10.07	1.12	6.97
Loan loss prov. / Net int. margin	6082	0.53	3.82	0.43
Net interest margin (%)	5826	0.18	4.93	0.15
		Banks chartered in EU15		
Total assets	6826	18.10	5.62	0.78
Customer loans (Δ%)	6283	0.19	1.66	0.18
Demand deposits (Δ%)	6142	0.18	1.55	0.17
Bank total assets – Country (Δ%)	8654	0.16	0.35	0.18
Returns on assets (%)	6812	0.58	3.58	0.45
Customer loans / total assets	6764	0.58	0.38	0.63
Bank deposits / total assets	6576	0.18	1.09	0.12
Equity / total assets (%)	6816	10.11	1.57	7.05
Loan loss prov. / Net int. margin	6812	0.58	3.58	0.45
Net interest margin (%)	6406	0.17	4.99	0.14
		Foreign subsidiaries in EMU		
Total assets	283	33.00	4.41	5.49
Customer loans (Δ%)	258	0.22	1.57	0.22
Demand deposits (Δ%)	247	0.19	1.71	0.19
Bank total assets – Country (Δ%)	291	0.20	0.52	0.20
Returns on assets (%)	282	0.49	2.83	0.51
Customer loans / total assets	278	0.48	0.59	0.50
Bank deposits / total assets	281	0.34	0.74	0.28
Equity / total assets (%)	283	9.01	1.14	5.94
Loan loss prov. / Net int. margin	282	0.49	2.83	0.51
Net interest margin (%)	256	0.19	2.30	0.13
		Foreign subsidiaries in EU15		
Total assets	314	33.40	4.19	5.28
Customer loans (Δ%)	284	0.21	1.62	0.21
Demand deposits (Δ%)	274	0.18	1.91	0.18
Bank total assets – Country (Δ%)	325	0.19	0.55	0.19
Returns on assets (%)	312	0.52	2.55	0.53
Customer loans / total assets	308	0.46	0.61	0.47
Bank deposits / total assets	309	0.33	0.74	0.28
Equity / total assets (%)	314	9.52	1.17	5.94
Loan loss prov. / Net int. margin	312	0.52	2.55	0.53
Net interest margin (%)	275	0.18	2.39	0.12

Table 3: Correlations between the rate of growth of customer loans and of demand deposits
Loan and deposit growth – correlations

Data are from Bankscope. EMU and EU15 foreign affiliates are defined as those with their parent company within EMU and EU15, respectively. Non-EU15 foreign affiliates can have their parent company in any other EU27 country. All correlations are statistically significant at the 99 per cent level.

Sample	Correlations
All banks	0.54
Standalones	0.54
Affiliates	0.42
Domestic affiliates	0.46
Foreign affiliates	0.42
Foreign affiliates (EMU)	0.26
Foreign affiliates (EU15)	0.26
Foreign affiliates (non-EU15)	0.66
Parent companies	0.82
Domestic parent companies	0.83
Multinational parent companies	0.82

Table 4: Correlation between loan and deposit growth - baseline specification

The dependent variable is the correlation between the annual percentage change of loans to customers and demand deposits at the bank level. Estimates are made using weighted least squares, using the number of years used to calculate the correlations as weights. The source of data is Bankscope for balance sheet information. All regressions include country dummies. Standard errors are reported in parenthesis. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

	(1)	(2)	(3)	(4)	(5)	(6)
Domestic affiliate (dummy)	-0.035	-0.036	-0.037	-0.037	-0.037	0.018
	-0.038	-0.038	-0.038	-0.038	-0.038	-0.035
Foreign affiliate (dummy)	-0,070***	0.007	0,067**	0,067**	0,067**	0,084***
	-0.021	-0.027	-0.03	-0.031	-0.031	-0.029
EMU foreign affiliate (dummy)		-0,197***		-0,264***	-0,258***	-0,193***
		-0.042		-0.045	-0.045	-0.042
EU15 foreign affiliate (dummy)			-0,266***			
			-0.042			
EU15 non-EMU foreign affiliate (dummy)				-0,265***		
				-0.064		
EU15 non-EMU non-UK foreign affiliate (dummy)					-0.091	-0.083
					-0.101	-0.093
UK foreign affiliate (dummy)					-0,355***	-0,233***
					-0.076	-0.07
Loans / total assets						0,364***
						-0.018
Interbank deposits						-0,462***
						-0.022
Leverage						-0,006***
						-0.001
Total assets (log)						0,006**
						-0.002
Observations	5.665	5.665	5.665	5.665	5.665	5.539
R^2	0.119	0.122	0.125	0.125	0.126	0.258

Table 5: Correlation between loan and deposit growth - The role of proximity

The dependent variable is the correlation between the annual percentage change of loans to customers and demand deposits at the bank level. Estimates are obtained from weighted least squares, using the number of years used to calculate the correlations as weights. The source of data is Bankscope for balance sheet information, IFS for GDP growth. Low distance and low GDP correlation is defined as below the median of the sample distribution. All regressions include country dummies. Standard errors are reported in parenthesis. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

	(1)	(2)	(3)	(4)
Domestic affiliate (dummy)	0.018	0.018	0.018	0.018
	(0.035)	(0.035)	(0.035)	(0.035)
Foreign affiliate (dummy)	0.060	0.084**	0.097**	0.070*
	(0.031)	(0.029)	(0.029)	(0.033)
EMU foreign affiliate (dummy)	-0.210***	-0.206***	-0.192***	-0.210***
	(0.043)	(0.043)	(0.042)	(0.046)
EU15 non-EMU non-UK	-0.056	-0.087	-0.049	-0.105
affiliate (dummy)	(0.094)	(0.093)	(0.095)	(0.097)
UK foreign affiliate (dummy)	-0.226**	-0.277***	-0.236***	-0.251***
	(0.070)	(0.076)	(0.070)	(0.073)
Loans / total assets	0.363***	0.363***	0.364***	0.364***
	(0.018)	(0.018)	(0.018)	(0.018)
Interbank deposits	-0.462***	-0.461***	-0.464***	-0.462***
	(0.022)	(0.022)	(0.022)	(0.022)
Leverage	-0.006***	-0.006***	-0.006***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)
Total assets (log)	0.006**	0.006**	0.006**	0.006**
	(0.002)	(0.002)	(0.002)	(0.002)
Common border (dummy)	0.072*			
	(0.037)			
Common language (dummy)		0.084027778		
		(0.079)		
Low distance countries (dummy)			0.092*	
			(0.050)	
Low GDP correlation (dummy)				-0.037
				(0.043)
Observations	5.539	5.539	5.539	5.539
R2	0.18	0.18	0.18	0.18

Figure 5A
Total Local Claims in Local Currency expressed in national currencies
EMU12 and specific countries. I-2007=100

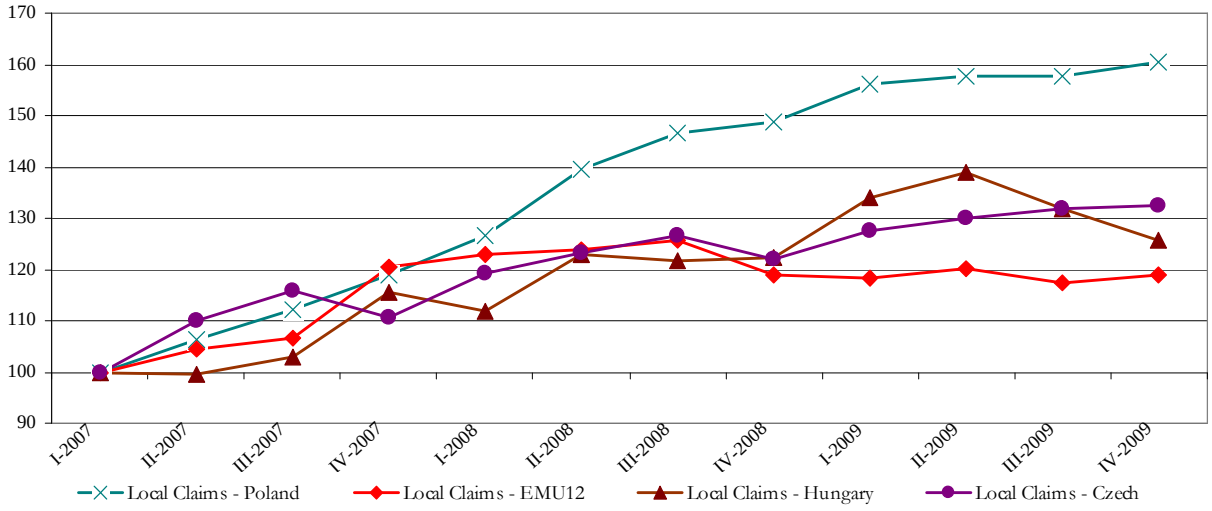
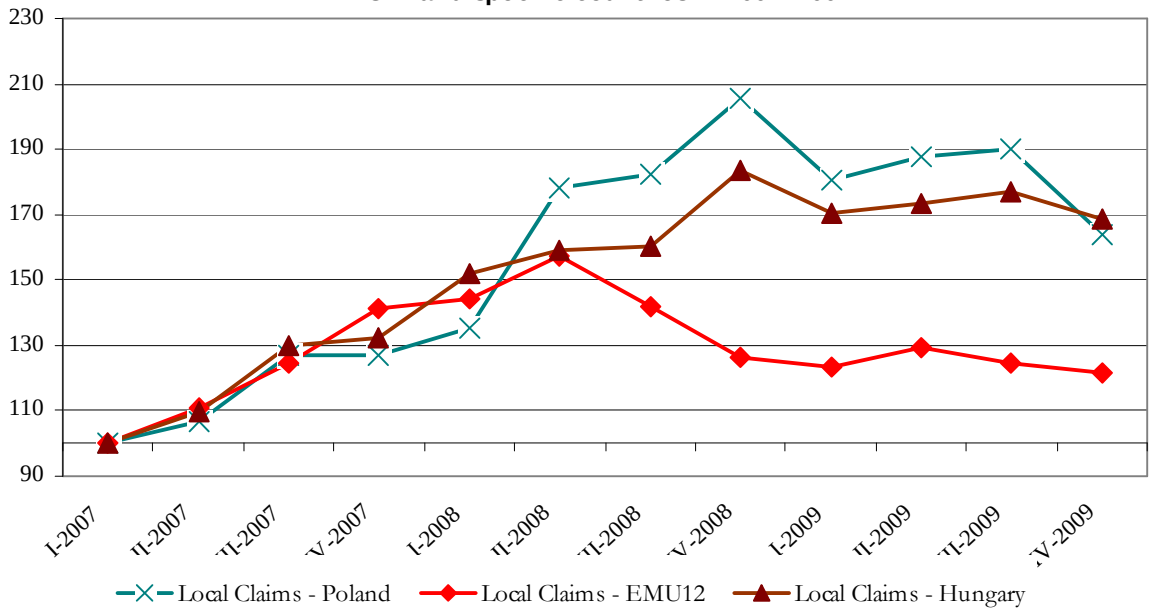


Figure 5B
Total Local Claims in Foreign Currency
EMU12 and specific countries. I-2007=100



Source: BIS Consolidated Statistics

Figure 6
Ratio Total Claims over Total Liabilities in Local Currency

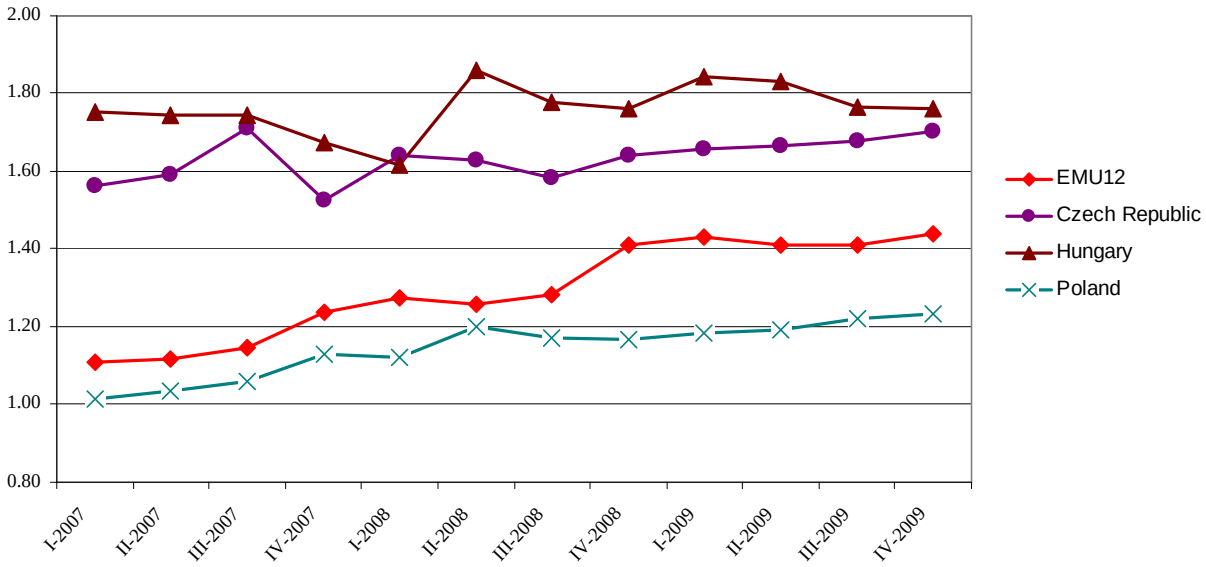


Table 6: Claims-liabilities ratio. The effect of the crisis

In Panels 1-3, the dependent variable is the ratio between total claims and total liabilities denominated in local currencies, of foreign affiliates; in Panel 4-7 is the ratio between total claims by foreign affiliates and total credit to the private sector in the country. The source of data is BIS for claims and liabilities, IMF for private credit. All estimates are conducted using quantile regression technique, evaluated at the median, and include country dummies. NMS countries include Bulgaria, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania; EMU countries include: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Slovenia; Main developing countries include China, India, Malaysia, South Korea, South Africa, Singapore, United Arab Emirates; other are all remaining countries in the sample. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

	Claims / total liabilities			Claims / total assets		
	(1)	(2)	(3)	(4)	(5)	(6)
Time trend	0,003***	0,001**	0,001*	0,004***	0,004***	0,004***
	-0.001	-0.001	-0.001	0.000	0.000	0.000
Post crisis (dummy)		0,061***			0.004	
		-0.019			-0.008	
Post crisis * EMU countries			0,073**			0,089***
			-0.031			-0.009
Post crisis * EU-no-EMU-no-NMS countries			0.046			-0.022
			-0.047			-0.013
Post crisis * NMS countries			0,312***			-0.006
			-0.033			-0.027
Post crisis *Main developing countries			0,140***			-0.007
			-0.036			-0.012
Post crisis * Other countries			-0.058			0.015
			-0.043			-0.012
Observations	1804	1804	1804	1197	1197	1197
Pseudo R2	0.24	0.24	0.24	0.63	0.63	0.63

Table 7: Loan-deposit ratio at the bank level. The effect of the crisis

The dependent variable is ratio between customer loans and deposits. The source of data is Bankscope. All regressions include time dummies; the regression in Panel 3 includes bank specific fixed effects. Panel 1 reports estimates obtained using OLS; Panel 2 estimates obtained using quantile regression methods, evaluated at the median; Panel 3 is a fixed effect panel. In Panel 1, robust standard errors adjusted for clustering at the bank level are reported in parenthesis; standard errors in Panels 2 and 3 are unadjusted. The symbol *** indicates a significance level of 1 per cent or less; ** between 1 and 5 per cent; * between 5 and 10 per cent.

	OLS	Median regression	Fixed effects
	(1)	(2)	(3)
Post crisis * EMU subsidiaries	0.008	-0.053	-0.007
	-0.044	-0.05	-0.026
Post crisis * EU15-non-EMU subsidiaries	0,223***	0,264*	0.058
	-0.037	-0.114	-0.049
Post crisis * non-EU15 subsidiaries	0,248***	0,308***	0,202***
	-0.078	-0.039	-0.018
EMU subsidiaries (dummy)	0,191***	0,206***	
	-0.061	-0.032	
EU15-non-EMU subsidiaries (dummy)	0,081***	0.048	
	-0.007	-0.064	
non-EU15 subsidiaries (dummy)	0.066	0.036	
	-0.07	-0.027	
Lagged leverage	0,055***	0,051***	0,167***
	-0.006	-0.001	-0.006
Lagged total assets (ln,)	0,399***	0,493***	-1,233***
	-0.105	-0.058	-0.076
Year 2002	0.001	-0.004	0,007*
	-0.009	-0.008	-0.003
Year 2003	-0.003	-0.013	-0,020***
	-0.016	-0.008	-0.004
Year 2004	-0.018	-0,025***	-0,052***
	-0.022	-0.008	-0.004
Year 2005	-0.015	-0,021**	-0,075***
	-0.032	-0.009	-0.005
Year 2006	-0.002	-0.011	-0,075***
	-0.039	-0.008	-0.005
Year 2007	-0.007	-0,024***	-0,097***
	-0.05	-0.008	-0.005
Year 2008	-0.024	-0,039***	-0,131***
	-0.057	-0.009	-0.006
Observations	23.595	23.595	23.595
R2 (Pseudo R2 in Panel 2)	0.30	0.14	0.06