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## International banking and cross-border effects of regulation: lessons from Germany

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# **Non-technical summary**

## **Research Question**

The recent financial crisis has been followed by the implementation of a new regulatory framework in the financial sector. This includes the introduction of prudential instruments that target the stability of the financial system as a whole. In integrated banking markets, banks can respond to changes in prudential regulation in one country by shifting their activities between countries. This can weaken the effectiveness of national prudential instruments and create cross-border spillovers. Thus, we ask how prudential policies implemented in domestic and foreign markets affect German banks' local and global lending behavior.

## **Contribution**

We use detailed micro-level data on banks' international activities including information on German banks' foreign branches and subsidiaries. We merge this data with a novel cross-country dataset on prudential measures. To the best of our knowledge we are the first to study how regulatory changes affect German banks' domestic and international lending decisions. Our results are used in a cross-country analysis of the International Banking Research Network (IBRN). Thereby we inform the current policy discussions about cross-border spillovers of prudential regulation.

## **Results**

We find evidence for cross-border spillovers of prudential regulation. However, the results are heterogeneous depending on the direction of spillovers, the type of banks and prudential instruments. For example, we find that German banks increase their domestic loan supply as a response to stricter regulation in countries in which they maintain international activities. In contrast, foreign banks located in Germany reduce their loan supply in Germany if regulation in their home country tightens. This suggests that no general policy conclusions can be drawn but recommends a case-wise analysis when evaluating cross-border spillovers of prudential regulation.

# **Nichttechnische Zusammenfassung**

## **Fragestellung**

Als Antwort auf die letzte Finanzkrise wurden zahlreiche regulatorische Änderungen im Finanzsystem eingeführt. Diese beinhalten die Implementierung von regulatorischen Instrumenten, welche die Stabilisierung des gesamten Finanzsystems zum Ziel haben. In integrierten Finanzmärkten können Banken auf regulatorische Maßnahmen in einem Land reagieren, indem sie ihr Geschäft in andere Länder verlagern. Dies kann die Effektivität nationaler regulatorischer Instrumente einschränken und zu grenzüberschreitenden Effekten führen. Deshalb beschäftigen wir uns mit der Frage, wie regulatorische Maßnahmen im Heimatland und im Ausland die heimische und internationale Kreditvergabe von deutschen Banken beeinflussen.

## **Beitrag**

Unsere Analyse basiert auf detaillierten Mikrodaten zu den Auslandsaktivitäten von deutschen Banken sowie ihrer ausländischen Töchter und Zweigstellen. Diese Daten führen wir mit einem neuen internationalen Datensatz zu regulatorischen Maßnahmen zusammen. Auf dieser Basis analysieren wir die Auswirkungen von Regulierungsänderungen auf die heimische und internationale Kreditvergabe von deutschen Banken. Unsere Ergebnisse fließen in eine länderübergreifende Studie des International Banking Research Network (IBRN) ein. So liefern unsere Ergebnisse einen Beitrag zu der aktuellen politischen Diskussion über grenzüberschreitende Auswirkungen von Regulierung.

## **Ergebnisse**

Die Ergebnisse weisen auf grenzüberschreitende Auswirkungen von Regulierungsänderungen hin. Die Auswirkungen variieren jedoch in Abhängigkeit von der betrachteten Spezifikation, den Eigenschaften der Banken und den regulatorischen Instrumenten. Wir zeigen zum Beispiel, dass deutsche Banken ihr Kreditwachstum in Deutschland erhöhen, wenn im Ausland die Regulierung strenger wird. Im Gegensatz dazu reduzieren ausländische Banken, die in Deutschland vertreten sind, ihr Kreditwachstum in Deutschland, wenn die Regulierung in ihrem Heimatland restriktiver wird. Dies spricht gegen allgemeine Schlussfolgerungen und für eine fallweise Betrachtung der grenzüberschreitenden Auswirkungen von Regulierung.

# International Banking and Cross-Border Effects of Regulation: Lessons from Germany<sup>1</sup>

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## Abstract

We analyze the inward and outward transmission of regulatory changes through German banks' (international) loan portfolio. Overall, our results provide evidence for international spillovers of prudential instruments, these spillovers are however quite heterogeneous between types of banks and can only be observed for some instruments. For instance, foreign banks located in Germany reduce their loan growth to the German economy in response to a tightening of sector-specific capital buffers, local reserve requirements and loan to value ratios in their home country. Furthermore, from the point of view of foreign countries, tightening reserve requirements was effective in reducing lending inflows from German banks. Finally, we find that business and financial cycles matter for lending decisions.

**Keywords:** Cross-border spillovers, prudential regulation, loan supply, German banks

**JEL-Classification:** F30, G01, G21, G28

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## 1. Introduction

In response to the recent financial crisis, numerous and substantial changes have been made to the architecture of the financial system. One key objective is to maintain financial stability by widening the focus of regulation from individual banks to the stability of the financial system as a whole. Prudential instruments can help in achieving this objective. The effectiveness of these instruments for financial stability hinges however on the absence of unintended leakages and spillovers. In integrated financial markets, such as in the German case, this might be a challenge given that banks can circumvent prudential regulation by adapting their global activities.

In this paper, we analyze how prudential policies implemented in domestic and foreign markets affect German banks' local and global lending behavior. Our study relates to the current policy debate on cross-border effects of regulatory policies and reciprocation. For instance, the European Systemic Risk Board (ESRB), which is the European macroprudential authority, has recently issued recommendations which call for an annual assessment of cross-border effects of national macroprudential measures (ESRB 2015). We use detailed micro-level data on German banks to study regulatory spillovers across borders in three different dimensions; inward transmission of foreign regulation into Germany due to international activities of German banks, inward transmission through foreign affiliates located in Germany, and outward transmission to foreign countries through foreign lending of German banks and their affiliates.

This analysis is part of the International Banking Research Network (IBRN) project on cross-border regulatory spillovers and follows the methodology described in Buch and Goldberg (2016).<sup>2</sup> The IBRN is a network of several national central banks (NCBs), the Bank for International Settlements (BIS), the European Central Bank (ECB) and the International Monetary Fund (IMF) which seeks to analyze questions regarding global banks' activities.<sup>3</sup> The key advantage of the IBRN is the access to NCBs' high-quality micro-level data combined with the use of up-to date empirical methods and the availability of expert knowledge on the characteristics of national banking systems. The IBRN's work thus yields, first, relevant results from single-country studies based on a common methodology and performed by the country teams within the network (a list of the other country studies on

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<sup>2</sup> Following Buch and Goldberg (2016), the term spillovers is used to analyze whether changes in regulation in one country affect banks' decisions in another country. We do not make explicit statements about regulatory arbitrage or about the welfare effects of spillovers.

<sup>3</sup> For more information on the IBRN please see <https://www.newyorkfed.org/IBRN/index.html>.

regulatory spillovers can be found at the end of the references section). Second, these country-specific results can be compared and analyzed in a meta-analysis. For example, another IBRN project focused on the transmission of liquidity risk through banks' international exposures; a summary of the results can be found in Buch and Goldberg (2015).

The issue of regulatory spillovers through global banks is analyzed by various country teams; this study looks at the German perspective. We use the Deutsche Bundesbank's External Position Report, which gives us detailed micro-level information on German banks' international activities. Data on changes in prudential policies is obtained from the IBRN. The newly established database on "IBRN Prudential Instruments Database" includes information on prudential instruments, e.g. reserve requirements or concentration limits, for more than 60 countries over the 2000-2014 period (Cerutti et al. 2015). Furthermore, given that regulatory changes are likely to interact with economic conditions, we control for the business and financial cycles using data provided by the BIS.

The German case is interesting because of the high degree of international activity of German banks. We analyze international lending growth of German-owned banks to 52 foreign countries. These foreign claims amount to 33% of total claims of German banks. Also, Germany hosts 72 affiliates of foreign banks which hold 9% of all German claims. From a German policy perspective, it is important to understand whether and how these foreign-owned banks transmit regulatory changes from their home country into the German market. Finally, German banks enter foreign markets not only through cross-border lending but also through both, foreign branches and foreign subsidiaries. Besides following the common IBRN methodology, our data allow us to test whether foreign branches and subsidiaries behave differentially to changes in regulation.

While our results provide evidence for international spillovers of prudential instruments, we document that these spillovers are heterogeneous between types of instruments and types of banks. First, analyzing the inward transmission of regulatory changes abroad due to foreign exposures of German banks, we find for the average bank that domestic lending growth increases if foreign regulation tightens. This holds specifically for a tightening in capital requirements and loan to value ratios.

Second, foreign-owned affiliates located in Germany contract their lending growth in Germany in response to a policy tightening in their home country. This finding is surprising as one might expect that foreign-owned banks respond to stricter regulation in their home

country by increasing lending activities of their foreign affiliates that are not subject to the regulation. However, regulatory pressure can have indirect effects on foreign affiliates located in Germany if their parent bank draws resources from them in order to fulfill tighter requirements in the home country. While there is a substantial heterogeneity between different types of foreign-owned banks, the impact of bank characteristics depends on the regulatory instrument. Overall, the retrenchment from the German lending market is less pronounced for larger banks that are better capitalized and with a higher ratio of illiquid assets to total assets.

Third, for the outward transmission exercise, we find evidence that international lending growth by German banks is negatively affected by stricter regulation in the destination country. However, for most prudential instruments we only find short-run effects that vanish after one quarter. Only in the case of local reserve requirements, we find that a tightening in this instrument significantly reduces loan growth over a longer time horizon. This suggests that reserve requirements, which have been used mainly by emerging markets in our sample, have been successful in controlling capital inflows from German banks.

Furthermore, we study whether foreign branches and subsidiaries of German banks differ in their responses to changes in the prudential regulation in their host country. Institution-based regulation in the host country usually applies to foreign subsidiaries, while foreign branches are subject to home country regulation. These differences in the treatment of branches compared to subsidiaries in the host country may facilitate regulatory leakages. Our results suggest that foreign subsidiaries are constrained by host country regulation as they reduce lending growth after a tightening in the host country prudential index (as well as in sector-specific capital buffers, loan-to-value-ratios and foreign reserve requirements). Foreign branches, however, do not change their lending growth significantly after a change in host country regulation (except for a negative effect of concentration ratios and a positive contemporaneous effect of the prudential index). In contrast to foreign subsidiaries, marginal effects of a tightening in prudential instruments are positive in the foreign branch sub-sample, but they lack significance.

Finally, we find that business and financial cycles matter for lending decisions. For example, foreign-owned banks located in Germany increase lending growth when the financial cycle in their home country undergoes an upturn. Similarly, German banks increase lending growth to destination countries which experience an upturn in the financial and business cycles. This

procyclicality to destination country cycles, however, cannot be found for loan growth by German banks' foreign affiliates that are hosted in these countries.

Our study adds to research on the pattern of German banks' international activities and cross-border spillovers. Buch et al. (2014), for example, find that more productive German banks are more likely to maintain cross-border activities. In contrast, the propensity to maintain cross-border loans decreases with risk aversion (Düwel et al. 2011). Besides productivity and risk aversion, bank size matters. While a large percentage of German banks are active abroad, only large banks maintain foreign affiliates (Buch et al. 2011a). We include a set of bank control variables based on this literature.

The recent financial crisis has affected banks' international activities.<sup>4</sup> Banks have withdrawn from international markets, with one reason being changes in funding conditions or government interventions (Buch et al. 2013, Kerl and Koch 2015). Internal capital markets have been one tool to stabilize foreign affiliates' lending activities after the crisis depending on parent banks' characteristics (Frey and Kerl 2015). Regarding international spillovers, Buch et al. (2011b) look at the effect of rescue measures implemented in response to the recent financial crisis in the US and Germany and find evidence of spillover effects through foreign affiliates.

Our paper sets itself apart from these studies by focusing on the effects of changes in prudential regulation on German banks' (international) lending activity. We address this issue by exploiting a novel dataset on regulatory changes obtained from Cerutti et al. (2015), thereby contributing to a relatively new strand of the literature (e.g. Jiménez et al. 2012, Aiyar et al. 2014). However, studies that evaluate the use and effectiveness of prudential instruments are mostly based on country-level data (IMF 2011, Claessens et al. 2013). Cerutti et al. (2016) study the outcome of a new survey on prudential instruments conducted by the IMF. They find that these instruments tend to be used more in emerging market economies, that their use is linked to the state of the credit and housing markets, and, importantly, that there is evidence for avoidance of these policies by relying more on cross-border borrowing. Evidence at the micro level is scarce and often limited to domestic markets or single instruments (Jiménez et al. 2012, Aiyar et al. 2014). Overall, we find a withdrawal from foreign markets when regulation in the home or foreign market tightens.

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<sup>4</sup> For studies on the transmission of shocks through international banks, see, for example, Cetorelli and Goldberg (2011). Bremus and Fratzscher (2015) look at the factors that caused changes in the structure of cross-border capital flows after the recent crisis.

The paper is structured as follows. The following part describes the data and stylized facts regarding international activities of German banks. The third part presents regression results for the analysis of inward and outward transmission of prudential instruments. In addition to the common methodology, we analyze whether adjustments differ for foreign branches and subsidiaries of German banks. The final part concludes the paper.

## **2. Data and Stylized Facts for Germany**

### 2.1 Bank-Level Data

We use confidential data collected by the Deutsche Bundesbank for the Monthly Balance Sheet Statistics of banks (BISTA).<sup>5</sup> The sample covers the period from 2002Q1 to 2013Q4. Data is available for (i) all banks located in Germany, including foreign-owned subsidiaries, and (ii) German banks' branches and subsidiaries operating abroad. Data on German banks' international activities by destination country is obtained from the Deutsche Bundesbank's External Position Report. The analysis is conducted at quarterly frequency in order to match the frequency of the regulatory dataset. To aggregate monthly data to quarterly frequency, we use quarter-end values.

#### Dependent variables

For the dependent variable, we use the change in log loans multiplied by 100. In the baseline specification, we use total loans; in robustness tests, we exploit the sectoral breakdown and analyze the effect on loans to banks, non-bank private sector, and the public sector separately.

For the inward transmission exercise, we refer to total domestic loans as provided by the monthly balance sheet statistics. This data is available for domestic (German) banks and foreign affiliates located in Germany.<sup>6</sup> For the latter, we can identify the country of the parent bank. For the outward transmission exercise, we make use of data from the External Position Report. All German banks, including their foreign affiliates (branches and subsidiaries), are required to report foreign asset positions, broken down by destination country. While foreign subsidiaries of German banks have to report their foreign claims

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<sup>5</sup> For more information on the Deutsche Bundesbank's Monthly Balance Sheet Statistics of banks please see [https://www.bundesbank.de/Redaktion/EN/Standardartikel/Service/Reporting\\_systems/monthly\\_balance\\_sheet\\_statistics.html?https=1](https://www.bundesbank.de/Redaktion/EN/Standardartikel/Service/Reporting_systems/monthly_balance_sheet_statistics.html?https=1)

<sup>6</sup> Please note that foreign affiliates located in Germany are not included in the outward transmission exercise due to data restrictions. In the inward transmission exercise, these banks are only included when specifically analyzing inward transmission through foreign banks located in Germany. We can not differentiate between branches and subsidiaries due to data limitations.

individually, foreign branches are aggregated for each German parent bank and host country.

<sup>7</sup> Our analysis includes the 52 largest destination countries (in terms of overall claims of the German banking system) and the 92 largest banks (plus their foreign affiliates) in terms of foreign assets. In this way, we cover more than 90% of the German banking system's total foreign loans as of December 2013. Our analysis focuses on the intensive margin, i.e. on lending growth, not on adjustments along the extensive margin. In order to reduce the cases of entries into and exits out of foreign markets in our dataset, we exclude small banks and less relevant destination countries. As a result, 84% of all bank-destination country combinations exist in at least 75% of all quarters.

Regarding the level of consolidation, we proceed as follows. When studying the lending responses of German-owned banks, we use consolidated (parent plus foreign branch) data if a German bank owns foreign affiliates but include also banks that lend directly cross-border without having a foreign affiliate. This is the case for the inward transmission through international activities of German banks and the outward transmission exercise. This consolidation choice accounts for the fact that parents and their foreign branches are often subject to home country regulation, whereas subsidiaries are subject to host country regulation. We approximate consolidated exposures at the parent-foreign branch level by using the unconsolidated positions of the parent and its foreign branches and a proxy for intrabank flows. This proxy has been used in previous studies with this data (Frey and Kerl 2015). For the inward transmission specification through foreign affiliates located in Germany, we use unconsolidated data due to data constraints but control for internal capital market positions.

To account for outliers we drop observations where log changes of lending exceed 100% in absolute terms. We keep only series for which at least two consecutive observations and at least eight observations in total are available. Qualitatively, our main regression results are not affected by the data cleaning. Summary statistics are provided in Table 1.

### Balance sheet characteristics

The balance sheet characteristics are taken from the monthly balance sheet statistics (BISTA). To clean the data, we drop observations for which the ratios described below are less than zero or greater than 100%.<sup>8</sup> The balance sheet variables include the illiquid assets

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<sup>7</sup> For a comprehensive description of the External Position Report, see Fiorentino et al. (2010).

<sup>8</sup> The variable capturing internal capital market positions can also be less than zero; we therefore drop values that exceed 100% in absolute terms.

ratio, core deposits ratio, capital ratio, net intragroup funding ratio, log of total assets, and international activities ratio. Detailed information on the construction of these variables can be found in Appendix Table 1. The balance sheet variables are defined as follows, with corresponding summary statistics provided in Table 1:

- percentage of a bank's portfolio of assets that is illiquid ( $IlliquidAssetsRatio_{b,t-1}$ )
- percentage of a bank's balance sheet financed with core deposits ( $CoreDepositsRatio_{b,t-1}$ )
- percentage of a bank's equity-to-asset ratio ( $CapitalRatio_{b,t-1}$ )
- percentage of a bank's net intragroup funding position of headquarters relative to total liabilities ( $NetIntragroupFunding_{b,t-1}$ )
- log of total assets ( $LogTotalAssets_{b,t-1}$ )
- percentage of a bank's foreign assets plus foreign liabilities relative to total assets plus total liabilities ( $InternationalRatio_{b,t-1}$ )

## 2.2 Data on prudential instruments

To analyze spillovers of regulatory policies, this study draws on the “IBRN Prudential Instruments Database” developed by Cerutti et al. (2015) which provides quarterly information on changes in prudential instruments plus a composite index for more than 60 countries over the 2000-2014 period. The prudential variables provide information on tightening (coded by 1) and loosening (coded by -1) of a specific instrument in the specific quarter when the change came into effect, and zero otherwise. In this study, we focus on six out of seven instruments to study spillovers of prudential policies: general capital requirements, sector-specific capital requirements, loan-to-value ratio limits, reserve requirements (in local and foreign currency), concentration limits. We exclude interbank exposures limits from our analysis due to the small number of changes for this instrument in our sample (see Table 2).

We use this information in our analysis to control for individual changes in prudential instruments in the home country of foreign banks located in Germany and in the destination country of lending by German banks. We are not analyzing the effects of regulatory changes in Germany on bank lending because we do not observe enough changes in regulatory instruments in Germany over the sample period. Instead, we control for German regulation

through time fixed effects. See Buch and Goldberg (2016) for more details on the construction of regulatory measures. The variables are defined as follows:

Regulation weighted by foreign exposures (= all exposures of the banks *outside* the home country)

$\text{ExpP}_{b,t-l}$  (where  $l = 0, 1, 2$ ) = Foreign exposure-weighted regulation

Home country regulation (home country = country of the foreign parent bank)

$\text{HomeP}_{j,t-l}$  (where  $l = 0, 1, 2$ ) = Home country regulation with 0, 1, and 2 lags

Destination country regulation (destination country = country to which the loan goes)

$\text{DestP}_{j,t-l}$  (where  $l = 0, 1, 2$ ) = Destination country regulation with 0, 1, and 2 lags

Table 2 provides summary statistics for changes in these instruments. We see that most changes occur for reserve requirements on local and foreign currency deposits followed by capital requirements. A tightening of standards occurred more often than a loosening.

Our sample is rather dominated by advanced economies (60% of the underlying observations in the Inward A and Outward specification, 90% of the underlying observations in the Inward B specification). However, we observe relatively more regulatory changes in emerging market economies for the regulatory instruments that are significant in the regression analysis. This holds particularly true for foreign and local reserve requirements.

### 2.3 Data on the business and financial cycles

The second database focuses on macroeconomic conditions and was provided by the BIS. It allows us to control for the current state of the business (output gap) and financial (credit-to-GDP gap) cycles when assessing regulatory spillovers (BIS 2014, Drehmann et al. 2011). This is important given that changes in regulation often take place in response to economic and financial conditions while their implementation might, in turn, affect economic outcomes. For example, Cerutti et al. (2016) analyze a new IMF database on prudential policies for a sample of 119 countries over the 2000-2013 period and establish that the use of these policies is linked to developments in credit and housing markets.

### 2.4 Stylized facts

*[Fact 1: The degree of internationalization is heterogeneous across German banks.]*

A large percentage of German banks maintain international activities (Buch et al. 2011a). Figure 1 shows that German banks have recently increased their foreign loan supply relative

to assets (lower left panel), whereas this cannot be observed for domestic lending (upper right panel). On average, German banks are net lenders regarding their intragroup positions (lower right panel). Hence, on average, they distribute liquidity to their foreign subsidiaries rather than absorbing liquidity from them.

The size of international activities of German banks and thus presumably their potential to generate cross-border spillovers of regulation varies with the banks' business models: notably, large German banks conduct a relatively high amount of their business abroad (Fiorentino et al. 2010). Table 3 shows correlations of banks' total, domestic, and foreign loan shares with balance sheet characteristics. Besides the relevance of bank size, it can be seen that German banks' capital and core deposits ratios correlate positively with the share of domestic loans to assets, whereas this finding is less pronounced or even reversed for the share of foreign loans to assets. We will therefore test whether banks' balance sheet characteristics affect their responses to regulatory changes abroad and at home (Section 3.1).

Heterogeneity in international activities also comes into play if we look at foreign loans by bank group relative to total foreign lending by German banks. For example, in 2013Q4, around 60% of foreign loans granted by German banks can be attributed to the "large commercial banks", around 20% to the "head institutes of savings banks and credit unions", but only 6% to "other commercial banks" and less than 1% to "savings banks and credit unions" (Table 4). The average bank size in the latter two banking groups is significantly smaller compared to the former two banking groups, such that the result is consistent with the relevance of bank size for the conduct of international activities (Table 5). Furthermore, comparing large commercial banks and head institutes of savings banks and credit unions to banks in the other banking groups reveals that they have, on average, a lower capital ratio and illiquid assets ratio, they are net lenders regarding their intragroup positions and financed to a lower degree by core deposits. These differences in exposure to foreign activities as well as business models might thus impact the transmission of prudential changes.

*[Fact 2: (Inter)national activities of German banks include loans to different sectors.]*

Heterogeneity also exists regarding the sectoral breakdown of lending. For example, German banks' domestic loan supply comprises 56 percent of total assets: 14 percent directed to banks, 37 percent to the non-bank private sector (i.e. non-financial firms and households), and 5 percent to the public sector (Table 6). If changes in prudential regulation occur, banks' responses might vary depending on the loan type. We analyze this issue further in robustness

tests (Section 3.1). Also, the sectoral composition of loans differs between types of German banks' foreign affiliates. A relatively high share of local (=foreign) lending by foreign branches is directed toward the non-bank private sector. In contrast, foreign subsidiaries have similar shares of local lending exposures to banks and the non-bank private sector. Both foreign branches and subsidiaries maintain a relatively high share of home country (=domestic) loans to banks, most likely reflecting internal capital market activities.

*[Fact 3: Foreign affiliates of German banks include both branches and subsidiaries.]*

German banks maintain both foreign subsidiaries and foreign branches in a large number of different counterparty countries. In an extended analysis on the impact of the organizational structure, we cover around 40 destination countries with approximately 170 subsidiaries and 190 aggregates of branches.<sup>9</sup> Foreign subsidiaries are assumed to respond differently to host country regulation than foreign branches. For example, German banks' foreign branches, which are under home country regulation, can expand/reduce their activities compared to domestic banks in the host country if the latter face a tighter/looser regulatory environment. In Section 3.2, we thus analyze whether foreign branches respond differently to a tightening or loosening of host country policies compared to foreign subsidiaries of German banks.

### **3. Empirical Method and Regression Results**

This section presents the baseline estimations for inward and outward transmission of prudential instruments (Section 3.1). We extend our analysis and ask whether banks adjust their lending growth differently depending on their organizational form (Section 3.2).

#### **3.1 Baseline analysis of inward and outward transmission of prudential policies**

In the following, we provide a description of the baseline empirical model to study inward and outward transmission and comment on the results. The analysis closely follows the approach described in Buch and Goldberg (2016).

In each specification 1 to 3, we include our variable of interest, a prudential policy change, both contemporaneously as well as its two lags. Furthermore, the prudential policy is interacted with banks' balance sheet characteristics showing how banks with different

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<sup>9</sup> Note that, as described in the data section, we do not have data on individual branches but the aggregate of branches per German parent bank and host country. For example, if the German parent bank A has two branches in the US, we have information on the sum of these two branches.

(structural) balance sheet characteristics adjust their loan growth in response to changes in regulation. In regression tables 7 to 14, for the sake of brevity, the reported coefficients are the sum of the contemporaneous term and its two lags, with the corresponding p-value of the F-statistics for joint significance in square brackets.

As the prudential instrument enters individually as well as in the interaction effects with bank variables, we calculate a marginal effect (at the average) for both, the contemporaneous changes as well as for the sum of contemporaneous and lagged changes. These marginal effects give the effects of regulation for the average bank and are reported at the bottom of each table. Baseline regression models include time and bank fixed effects.

**Specification 1:** Exposure-weighted inward transmission of regulation (Table 7).

$$\Delta Y_{b,t} = \alpha_0 + (\alpha_1 \text{ExpP}_{b,t} + \alpha_2 \text{ExpP}_{b,t-1} + \alpha_3 \text{ExpP}_{b,t-2}) + a_4 X_{b,t-1} + (\beta_1 \text{ExpP}_{b,t} \cdot X_{b,t-1} + \beta_2 \text{ExpP}_{b,t-1} \cdot X_{b,t-1} + \beta_3 \text{ExpP}_{b,t-2} \cdot X_{b,t-1}) + f_b + f_t + \epsilon_{b,t} \quad (1)$$

where  $\Delta Y_{b,t}$  is the log change in the domestic lending of bank  $b$  at time  $t$ .  $X_{b,t-1}$  is a vector of control variables that captures the degree to which a bank is exposed to changes in regulation through ex ante balance sheet composition as described in Section 2.1. The prudential policy changes are captured by  $\text{ExpP}$ , that is an index of exposure-weighted prudential policies outside the home country. We control for time-invariant heterogeneity at the bank level by including bank fixed effects  $f_b$ . Time fixed effects  $f_t$  capture global developments that affect all banks contemporaneously.

The interaction terms of the prudential instrument with banks' balance sheet characteristics shows how banks with different (structural) balance sheet characteristics adjust their loan growth in response to changes in regulation. As the baseline regression model includes time and bank fixed effects, the coefficient of the interaction term measures how the structure of banks' balance sheets affects the response of bank lending to changes in regulation.

This approach helps for identification in two dimensions. First, we estimate lending responses at the bank-level with respect to a change in regulatory policies at the country-level. Assuming that an individual bank does not drive adjustments in regulatory policies, this reduces endogeneity concerns. Second, we interact changes in regulatory policies with balance sheet characteristics. Like this, we can account for the fact that banks' reactions to regulatory policy can be heterogeneous depending on their business model. For example,

banks' internationalization pattern as well as liquidity and capital buffers might determine to which extent a bank is affected by changes in regulatory instruments.<sup>10</sup>

Results for specification 1 are shown in Table 7; we see that the exposure-weighted index of changes in the overall prudential index increases domestic lending growth for the average bank (see marginal effects at the bottom of Table 7). While this effect is significant contemporaneously, it becomes insignificant in the medium run, if we add the effects for the first and second lag to a joint effect. One reason for the lack of medium-run effects can be that most of the changes in instruments are clustered in 2012 and 2013. The result on the prudential index is driven by two instruments, capital requirements and loan to value ratios. For the latter, we also see a significant effect for the average bank over current and two lags. Also in quantitative terms, the current effect of the loan to value ratio is strongest: Given a tightening of the policy, loan growth rates increase on average by 15.2% which corresponds to an increase of the median loan growth rate (0.27% per quarter) by 0.04 percentage points in that quarter. Loan to value ratios have been used actively by emerging market economies over our sample period and have been both tightened and loosened. This provides a solid ground for the empirical analysis.

Differences in bank characteristics do not seem to consistently affect the response to regulatory changes abroad. The positive effect in case of the prudential index is weakened for banks with higher net intragroup positions; banks' response to a tightening in the instrument is more than four times weaker if the net intragroup funding ratio increases by one standard deviation. This might be because foreign affiliates have less scope to provide intragroup funding to the German parent bank given tighter regulation.

**Specification 2:** Inward transmission of home prudential policy via foreign affiliates (Table 8).

$$\Delta Y_{b,j,t} = \alpha_0 + (\alpha_1 \text{HomeP}_{j,t} + \alpha_2 \text{HomeP}_{j,t-1} + \alpha_3 \text{HomeP}_{j,t-2}) + \alpha_4 X_{b,t-1} + \alpha_5 Z_{j,t} + (\beta_1 \text{HomeP}_{j,t} \cdot X_{b,t-1} + \beta_2 \text{HomeP}_{j,t-1} \cdot X_{b,t-1} + \beta_3 \text{HomeP}_{j,t-2} \cdot X_{b,t-1}) + f_b + f_t + \epsilon_{b,j,t}$$

(2)

where  $\Delta Y_{b,t}$  is the log change in the lending to Germany of a foreign affiliate bank  $b$  located in Germany with a foreign parent from country  $j$  at time  $t$ .<sup>11</sup> The vector of bank control

<sup>10</sup> For a more detailed discussion about identification issues, see Buch and Goldberg (2016).

<sup>11</sup> Ideally, we would like to distinguish between foreign-owned affiliates that are subject to German (i.e. host) country regulation and those that are subject to home country regulation. Unfortunately, our data do not allow us

variables  $X_{b,t-1}$  is the same as above. The prudential policy changes are captured by HomeP, reflecting prudential policy in the home country, that is the country of the parent bank of the foreign-owned affiliate located in Germany.  $Z_{j,t}$  represents the cycle variables for home country  $j$ .

Results on specification (2) are shown in Table 8. For the average foreign bank (see marginal effects at the bottom of the table), home country policy is of importance for sector-specific capital buffers, loan to value ratios and reserve requirements on local currency deposits. The latter two instruments have been used mainly by emerging market countries in our sample. An increase in these instruments reduces the host (i.e. German) lending growth by foreign affiliates located in Germany. The economic magnitude of the current effect is strongest for sector-specific capital buffers: Given a tightening of the policy, on average loan growth rates decrease by 17.4% which corresponds to a decrease in the median loan growth rate (1.43% per quarter) by 0.25 percentage points.

This decrease in loan growth can be caused by foreign parents drawing on resources of their foreign affiliates to fulfill higher reserve or capital requirements and to maintain lending at home. The effect is, for example, less pronounced for illiquid banks which might have less scope to transfer liquidity to their parent bank. Also larger and better-capitalized banks are affected less severely, possibly due to higher buffers which allow them to maintain lending growth. Two conclusions can be drawn from these results. First, especially reductions in lending growth in response to activity based measures like loan to value ratios might be problematic from the perspective of the German regulator in case domestic and foreign financial cycles do not coincide. Second, a foreign affiliate located in Germany is not independent from home country regulation, in particular tighter regulation in its parent bank's country does not make it more attractive to increase lending growth in Germany.<sup>12</sup>

Regarding the financial and business cycle, we find that an upswing in the financial cycle of the home country has positive effects on lending growth of foreign affiliates located in Germany. In sum, this suggests that foreign affiliates are not independent of developments in

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to do so. However, regulatory changes in the home country might be important for both types of foreign affiliates due to the internal capital market and the influence of the parent bank.

<sup>12</sup> Interestingly, a tightening in concentration ratios in the home market has the opposite effect, namely an increase in lending growth to the host (i.e. German) market. With tighter concentration ratios, banks might seek to increase diversification across regions. However, changes in this instrument go back to only two countries (the Netherlands and France) such that these results should be taken with care.

the country in which their parent bank is located. Regulatory changes and macroeconomic developments alike are mirrored in their lending activities within the host country.

**Specification 3:** Outward transmission of destination country prudential policy (Table 9).

$$\Delta Y_{b,j,t} = \alpha_0 + (\alpha_1 \text{DestP}_{j,t} + \alpha_2 \text{DestP}_{j,t-1} + \alpha_3 \text{DestP}_{j,t-2}) + \alpha_4 X_{b,t-1} + \alpha_5 Z_{j,t} + (\beta_1 \text{DestP}_{j,t} \cdot X_{b,t-1} + \beta_2 \text{DestP}_{j,t-1} \cdot X_{b,t-1} + \beta_3 \text{DestP}_{j,t-2} \cdot X_{b,t-1}) + f_j + f_t + f_b + \varepsilon_{b,j,t} \quad (3)$$

Where  $\Delta Y_{b,j,t}$  is the log change in the lending of a German bank  $b$  to a foreign country  $j$  at time  $t$ . The prudential policy changes are captured by  $\text{DestP}$ , reflecting prudential changes in the destination country  $j$  of the loan by bank  $b$ . All other variables are defined in parallel to specifications (2) and (3). Again we interpret the effect of the regulatory index by computing its marginal effect for the average bank.

Results in Table 9 reveal that a tightening in the prudential index of the destination country reduces lending growth of the average German bank to this country. Hence, stricter policies in the destination country spill over to German banks even though these are not always directly subject to the change in regulation. The significant result for the prudential index is driven in particular by changes in reserve requirements. For local reserve requirements, banks do not only react in the short-run as can be observed for the prudential index, the concentration ratio or foreign reserve requirements. Also, the cumulated effect over the current and following two quarters is negative and significant. Our results thus suggest that reserve requirements which have been used mostly by emerging countries, have indeed been successful in dampening lending inflows.<sup>13</sup> A tightening of local reserve requirements relates on average to a short-run decline in loan growth rates by 0.41 percentage points. The negative effect is smaller for banks with more liquid assets, possibly because holding the required reserves may be less costly for these banks, but reinforced for banks that obtain higher net intragroup funding.

Finally, macroeconomic developments in the destination country matter for German banks' international loan portfolio. An upturn in the business and financial cycles causes a positive response in loan growth. This suggests that German banks expand across borders during economic and financial upswings in the respective destination country.

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<sup>13</sup> An increase in reserve requirements imposes additional costs on funding, which might in turn be passed on to borrowers by increasing loan rates and hence dampening credit growth. To simultaneously reduce the country's attractiveness for foreign capital inflows, an increase in reserve requirements can be accompanied by expansive monetary policy, which translates into lower returns for foreign investors.

### Robustness tests

We test the robustness of our results by exploiting the granularity of our data and conducting regressions in which the dependent variable is broken down by loans to banks, the non-bank private sector, and the public sector. The sector breakdown shows that responses to prudential measures vary across loan sectors and specifications which might explain why we observe only few significant results for total loan growth. For inward transmission through foreign exposures, our results are strongest for lending growth to banks and less pronounced to the non-bank private sector (Tables 10-11). For outward transmission, the negative effect of a tightening in local-currency reserve requirements on German banks' total international lending is confirmed contemporaneously and in the medium run for loan growth towards the non-bank sector, as well as in the short-run towards the bank sector (Tables 12-13).<sup>14</sup>

We further test the robustness of our results to excluding small exposures of a bank to a foreign country as this might reflect idiosyncratic business outside the scope of our model. Results remain robust if we exclude the 1% or 5% smallest destination country-bank positions. Finally, we alternate the set of fixed effects, for instance by including country-time fixed effects controlling for demand factors, and the clustering of the standard errors which does not cause major changes to our results.<sup>15</sup>

### 3.2 Exploration of organizational structure

This section explores whether foreign affiliates differ in their lending behavior in response to prudential instruments due to their organizational form. We focus on outward transmission and distinguish between lending by foreign subsidiaries and by foreign branches of German banks. This reduces our sample size relative to Table 9 as we exclude all banks that do not own foreign affiliates but only lend cross-border. Foreign branches and subsidiaries might be affected differently by changes in prudential instruments in the home and the host country (Danisewicz et al. 2015). For institution-based instruments, such as capital requirements or concentration limits, branches tend to be subject to home country regulation whereas subsidiaries have to comply with host country regulation. We use this variation across bank and instrument types to analyze banks' differential responses.

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<sup>14</sup> For brevity, results for loans to the public sector are not reported but can be obtained upon request.

<sup>15</sup> These tables are available upon request.

Our approach is similar to specification (3) but the sample pools across foreign branches and foreign subsidiaries of German banks. We allow for heterogeneous effects of cycle variables, of regulation and of the interaction of regulation with bank variables by interacting them with an indicator variable that equals one in case of a foreign subsidiary. At the bottom of Table 14, we report the marginal effects of the prudential instruments for branches and subsidiaries, where the latter consists of the joint effect of the baseline category (=branch) plus the interaction effect.

We find that the average foreign subsidiary reduces lending growth contemporaneously following a tightening in the prudential index, sector-specific capital buffers and loan to value ratios. A tightening in foreign reserve requirements leads to a reduction in lending growth of foreign subsidiaries in the medium run. While foreign subsidiaries are thus constrained by host country regulation, we only find weaker evidence for foreign branches. A tightening in concentration ratios leads to a reduction in lending growth in the short run, while a tightening in the prudential index leads to an increase in lending growth in the medium run (finding significant at 10% level only). Bank characteristics other than the organizational structure seem to play a less important role in the response of foreign affiliates to regulatory changes. Overall, we find that foreign subsidiaries react more strongly to host country regulation. Foreign branches do not generate regulatory leakages by increasing lending growth after a tightening in host country regulation.

#### **4. Concluding Remarks**

Global banks may generate cross-border spillovers of the regulatory stance if they adjust their international loan portfolio in response to foreign and domestic regulation. While prudential instruments like reserve requirements or loan to value ratios have mostly been implemented by emerging market countries, in recent times also advanced countries increase their macroprudential toolkit to target financial stability. For countries like Germany with a highly internationalized banking system, concerns about regulatory spillovers are a topic of utmost importance. Therefore policy discussions and coordination are conducted at the European level at the ESRB. This macroprudential body has recently recommended monitoring cross-border effects of macroprudential instruments on an annual basis (ESRB 2015). Our study may inform this current policy debate by analyzing the inward and outward transmission of regulation for German banks.

Overall, while we find evidence for cross-border spillovers of regulation, there is no general conclusion that holds for all types of policy instruments and banks. Instead, heterogeneity between banks, loan types and specification matters.

Foreign regulatory changes spill over to lending growth in Germany through both, foreign-owned banks located in Germany as well as German-owned banks which maintain international activities. Foreign-owned banks located in Germany reduce their local loan growth following a tightening of sector-specific capital buffers, local reserve requirements and loan to value ratios in their parent bank's country. This finding suggests that regulatory pressure can have indirect effects on foreign affiliates located in Germany if their parent bank draws resources from them in order to fulfill tighter requirements in the home country. German-owned banks also transmit changes in foreign countries' regulatory stance to German borrowers. A tightening of foreign regulation leads to an increase in domestic lending growth.

Furthermore, we find that German banks reduce foreign lending growth given a tightening in prudential instruments in the destination country. However, these negative responses abate rather quickly, except for local reserve requirements. Thus, our results suggest that reserve requirements have been effective in dampening lending inflows by German banks into foreign economies.

Finally, transmission occurs not only because of regulatory changes but also because of economic developments. This is reflected by the fact that business and financial cycles matter for lending decisions: foreign subsidiaries located in Germany increase lending growth in the host country in response to an upturn in the financial cycle of their home country. Also, German banks' international lending behavior is procyclical in the sense that loan growth increases in response to an upturn in the financial and business cycles of the destination country.

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### **Other Individual Paper Contributions in the International Banking Research Network**

- Auer, Simone, Maja Ganarin and Pascal Towbin (2016), “International Banking and Cross-border Effects of Regulation: Lessons from Switzerland”.
- Avdjiev, Stefan, Cathérine Koch, Patrick McGuire, and Goetz von Peter (2016), “International Prudential Policy Spillovers: A Global Perspective”.
- Başkaya, Yusuf Soner, Mahir Binici, Şebnem Kalemli-Özcan, and Turalay Kenç (2016), “International Banking and Cross-Border Effects of Regulation: Lessons from Turkey”.
- Berrospide, Jose, Ricardo Correa, Linda Goldberg and Friederike Niepmann (2016), “International Banking and Cross-border Effects of Regulation: Lessons from the United States”.
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- Bussière, Matthieu, Julia Schmidt and Frédéric Vinas (2016), “International Banking and Cross-Border Effects of Regulation: Lessons from France”.

- Caccavaio, Marianna, Luisa Carpinelli and Giuseppe Marinelli (2016), “International Banking and Cross-border Effects of Regulation: Lessons from Italy”.
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- Park, Hyunggeun, Jungyeoun Lee (2016), “International Banking and Cross-border effects of regulation: Lessons from Korea”.

## **Data Description**

To analyze the effect of changes in prudential instruments on banks' international activities, we use three main data sources. First, bank-specific data is obtained from the Deutsche Bundesbank. Second, information on prudential instruments come from the "IBRN Prudential Instruments Database" introduced in Cerutti et al. (2015). Variables on the business and financial cycle are provided by the Bank for International Settlements (BIS).

### **External position report**

Since 2003, all German banks have been required to report their foreign assets and liabilities (in thousands of euro) on a monthly basis and broken down by sector, destination country, and asset class. Foreign subsidiaries of German banks provide a report on their external positions by entity whereas foreign branches of German banks located in the same host country provide a joint report. A detailed description of the reporting can be found in Fiorentino et al. (2010). Table 1 in the Appendix provides information on the variables used in this paper.

### **Macroeconomic variables**

*Prudential instruments:* Data is obtained from Cerutti et al. (2015) and available for more than 60 countries over the period 2000-2014. The instruments in the database include sector-specific capital requirements (i.e. real state credit, consumer credit, and other), countercyclical capital buffers, interbank exposure limits, concentration limits, loan-to-value ratio limits, general capital requirements, and reserve requirements. A tightening is coded by 1, a loosening by -1, and zero otherwise.

*Business cycle:* The state of the business cycle is approximated by the output gap (BIS 2014).

*Financial cycle:* The state of the financial cycle is estimated by the credit-to-GDP gap (BIS 2014).

**Table 1: Summary Statistics on Bank Characteristics and Loan Growth**

This table provides summary statistics for bank balance sheet and lending data for the inward and outward transmission data set. For Inward A and B we report log changes of domestic loans, i.e. to Germany, on an aggregate basis as well as split by counterparty sector. For Outward transmission, we report log changes of loans in each destination country, again on an aggregate basis as well as split by counterparty sector. Data is observed quarterly from 2002Q1-2013Q4. Banking data comes from the monthly balance sheet statistics and the External Position Report of the Deutsche Bundesbank and is reported at the group level (inward A and outward sample) as well as at the level of the individual bank (inward B sample). The net intragroup funding variable measures, from the perspective of a bank's head office, total net internal borrowing vis-à-vis all its related domestic and international offices.

Variable	All Banks (Inward A) (bank-quarter obs=3852)			All Banks (Inward B) (bank-quarter obs=2591)			All Banks (Outward) (bank-quarter-destinationcountry obs=182379)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
<b>Balance sheet data</b>									
<i>Dependent Variables</i>									
Δ Domestic Loans	0.18	0.14	10.51	1.25	0.64	26.11			
Δ Destination Country Loans							-0.58	0.00	21.13
Δ Loans to banks	-0.23	-0.13	26.66	-0.51	0.00	38.76	-0.19	0.00	19.12
Δ Loans to non-bank private sector	0.20	0.21	9.74	0.69	0.35	20.93	-0.49	0.00	16.29
Δ Loans to public sector	-0.80	-0.35	20.07	-0.01	-0.01	0.59	0.00	0.00	0.18
<i>Independent Variables</i>									
Log Total Assets	23.49	23.60	1.87	21.99	21.96	1.55	23.44	23.54	1.89
Capital Ratio (%)	4.38	3.90	3.00	6.51	4.97	6.98	4.53	3.86	4.41
Illiquid Assets Ratio (%)	68.85	70.19	15.89	81.52	89.69	20.04	68.39	70.10	16.43
International Activity (%)	6.48	3.30	7.46	na	na	na	6.16	2.98	7.38
Net Intragroup Funding/Liabilities (%)	-0.22	0.00	3.30	0.00	0.00	1.00	-0.24	0.00	3.32
Core Deposits Ratio (%)	23.55	15.11	24.18	19.77	8.48	24.20	24.75	15.15	25.55

**Table 2: Summary Statistics on Changes in Prudential Instruments**

This table shows summary statistics on changes in prudential instruments for banks located in Germany over the 2002-2013 period. Data on the eight instruments comes from the “Prudential Instruments Database” developed by Cerutti et al. (2015) and is on the quarter level. The number of changes in prudential instruments is reported on several dimensions, i.e. on the country-time level and on the bank-time level. The last column of each table shows the ratio of prudential changes to total observations (i.e. the share of nonzero observations). The column “Exposure weighted observations” is based on the underlying data on prudential changes in foreign countries (columns “base data”). The reported data is based on the regression sample. “na” indicates that no data was available for this instrument. Source: IBRN.

**Inward: Specification A**

Instrument	Base Data (Before Aggregating to Exposure-Weighted Measures)					Exposure-Weighted Observations
	# of Country-Time Changes	# of Country-Time Changes (Tightening)	# of Country-Time Changes (Loosening)	# of Bank-Time Changes	Proportion Base-MPP Nonzero	Proportion ExpP_t Nonzero
Prudential index	441	305	136	3,623	0.166	0.952
General capital requirements	66	66	0	880	0.024	0.209
Sector specific capital buffer	62	47	15	2,299	0.023	0.526
Loan-to-value ratio limits	83	62	21	2,833	0.031	0.657
Reserve requirements: Foreign	121	79	42	3,623	0.046	0.778
Reserve requirements: Local	215	104	111	3,623	0.081	0.871
Interbank exposure limit	18	17	1	838	0.007	0.193
Concentration ratio	28	26	2	1,623	0.011	0.368

**Inwards: Specification B**

Instrument	Policy Changes in Home Country				
	# of Country-Time Changes	# of Country-Time Changes (Tightening)	# of Country-Time Changes (Loosening)	# of Bank-Time Changes	Proportion HomeP_t Nonzero
Prudential index	131	102	29	304	0.120
General capital requirements	24	24	0	69	0.027
Sector specific capital buffer	17	16	1	24	0.009
Loan-to-value ratio limits	28	22	6	68	0.027
Reserve requirements: Foreign	32	25	7	48	0.019
Reserve requirements: Local	73	39	34	144	0.057
Interbank exposure limit	9	9	0	18	0.007
Concentration ratio	10	10	0	42	0.017

## Outward Transmission of Policy to Destination Country

Instrument	Policy Changes in Destination Country				Proportion Base-MPP Nonzero
	# of Country-Time Changes	# of Country-Time Changes (Tightening)	# of Country-Time Changes (Loosening)	# of Bank-Country-Time Changes	
Prudential index	390	267	123	29,347	0.161
General capital requirements	61	61	0	4,393	0.024
Sector specific capital buffer	58	43	15	4,331	0.024
Loan-to-value ratio limits	80	60	20	5,898	0.032
Reserve requirements: Foreign	99	62	37	7,615	0.042
Reserve requirements: Local	185	82	103	14,136	0.078
Interbank exposure limit	17	16	1	1,264	0.007
Concentration ratio	26	23	3	1,959	0.011

**Table 3: Correlations Between Loan Shares and Balance Sheet Characteristics**

This table shows correlations between banks' loan-to-asset ratios and balance sheet data. Data is observed quarterly from 2002Q1-2013Q4. Banking data comes from the Deutsche Bundesbank's monthly balance sheet statistics and is reported at the (consolidated) group level. Descriptive statistics are shown for banks' loan-to-asset ratios (in %) and the breakdown into domestic versus foreign loans to assets (in %). Balance sheet characteristics are as defined in Table 1 in the Appendix.

All Banks (Inward A)			
(n=3852)			
Variable	Loans/Assets (%)	Domestic Loans/Assets (%)	Foreign Loans/Assets (%)
Correlation with balance sheet variable (for each bank b and quarter t)			
<i>Independent Variables</i>			
Total Assets (thd Euro)	-0.24	-0.38	0.31
Capital Ratio (%)	0.20	0.16	-0.01
Illiquid Assets Ratio (%)	0.93	0.68	0.06
International Activity (%)	-0.02	-0.59	0.94
Net Intragroup Funding/Liabilities (%)	-0.09	0.12	-0.31
Core Deposits Ratio (%)	-0.10	0.14	-0.35

**Table 4: Shares of Banking Groups in Lending**

This table provides summary statistics for lending data by banking group. Data is shown for the period 2013Q4. Banking data comes from the monthly balance sheet statistics of the Deutsche Bundesbank. Column (1) shows the banking group's total loans relative to total loans of all banks in the sample (in %). Column (2) shows the ratio of the banking group's domestic loans in total domestic loans of all banks in the sample (in %). Column (3) shows the ratio of the banking group's foreign loans in total foreign loans of all banks in the sample (in %). The last column shows the percentage share of observations attributed to each banking group.

Variable	All Banks (Inward A)			Observations
	by banking group in 2013Q4			
	Total loans	Domestic loans	Foreign loans	
Loans by banking group to total loans, by loan type (%)				% of total
<i>Share of Each Banking group</i>				
Large commercial banks	37.37	22.78	60.95	5.71
Other commercial banks	7.82	8.77	6.30	32.86
Head institutes of savings banks and credit unions	29.01	33.23	22.20	15.71
Savings banks	2.22	3.47	0.19	10.00
Credit unions	1.69	2.69	0.07	17.14
Mortgage banks	8.98	10.18	7.05	12.86
Building societies	3.43	5.26	0.48	5.71
All banking groups	100%	100%	100%	100%

**Table 5: Bank Characteristics by Banking Group**

This table provides summary statistics by banking group. Data is shown for the period 2013Q4. Banking data comes from the monthly balance sheet statistics of the Deutsche Bundesbank and is reported at the level of the individual bank. We depict the mean for various variables as specified in the column head across all banks in a banking group.

Variable	All Banks (Inward A)							
	mean, by banking group in 2013Q4							
	Assets (billion Euro)	Foreign loan share	Domestic loan share	Capital Ratio (%)	Illiquid Assets Ratio (%)	International Activity (%)	Net Intragroup Funding/Liabilities (%)	Core Deposits Ratio (%)
<i>Banking group</i>								
Large commercial banks	611.00	21.58	30.19	3.33	51.94	14.95	-1.93	29.66
Other commercial banks	11.40	16.39	50.26	11.18	66.65	11.87	-0.31	36.33
Head institutes of savings banks and credit unions	128.00	17.61	44.97	4.12	62.60	11.19	-0.39	9.40
Savings banks	13.40	1.81	66.73	4.95	68.56	0.92	0.01	62.56
Credit unions	6.07	2.59	63.70	5.07	66.29	1.49	0.17	63.74

**Table 6: Domestic and Foreign Loan Shares and Sectoral Breakdown**

This table provides summary statistics for lending data. Data is observed quarterly from 2002Q1-2013Q4. Banking data comes from the Deutsche Bundesbank's monthly balance sheet statistics and is reported at the (consolidated) group level (inward A sample). For German banks' foreign branches, data is not reported by individual branch but aggregated by destination country and parent bank. For foreign subsidiaries, data is reported at the level of the individual subsidiary. Descriptive statistics are shown for banks' loan-to-asset ratios (in %) and the breakdown into domestic versus foreign loans to assets (in %) as well as the sectoral split differentiating between loans to banks, to non-bank private sector and to the public sector.

Variable	All Banks (Inward A) (n=3852)			Foreign Branches (n=9615)			Foreign Subsidiaries (n=6263)		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
<b>Balance sheet data</b>									
<i>Dependent Variables</i>									
Total Loans/Assets (%)	66.19	66.25	16.60	65.87	75.05	31.40	66.05	74.04	29.19
Domestic Loans/Assets (%)	56.00	56.83	21.59	20.31	6.80	28.10	16.07	4.01	24.22
Foreign Loans/Assets (%)	10.19	4.71	13.26	45.56	40.92	35.19	49.98	50.03	32.98
Domestic Loans/Assets (%) by sector									
to banks	14.03	10.21	13.72	20.37	6.20	28.06	12.33	1.83	22.01
to non-bank private sector	36.66	34.47	24.10	1.77	0.00	7.69	3.84	0.02	10.27
to public sector	5.10	2.24	6.93	0.23	0.00	1.83	0.15	0.00	1.04
Foreign Loans/Assets (%) by sector									
to banks	2.29	0.28	5.09	6.90	0.00	17.93	23.70	13.69	26.17
to non-bank private sector	7.40	1.96	11.17	41.82	34.22	34.02	26.89	13.24	28.99
to public sector	0.51	0.00	1.73	1.18	0.00	6.71	1.15	0.00	4.23

**Table 7: Inward Transmission of Policy Through Domestic Banks' International Exposures**

This table reports the effects of changes in regulation and bank characteristics and their interactions on log changes in total loans. The data is quarterly from 2002Q1 to 2013Q4 for a panel of domestic bank holding companies whereas we use consolidated data. Foreign-exposure-weighted regulation ExpP is calculated as the weighted average of changes in foreign regulation where the weights are the total assets and liabilities of the bank in the respective foreign country. For ExpP and its interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Standard errors are clustered by bank. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ExpP= Prudential IndexC	ExpP= Capital Requirements	ExpP= Sector- Specific Capital Buffer	ExpP= Loan To Value Ratio	ExpP= Reserve Requirement Foreign	ExpP= Reserve Requirement Local	ExpP= Concentrati on Ratios
Foreign-Exposure-Weighted Regulation (ExpP)	-4.417	73.107	-145.850	132.524	-260.478	-64.081	62.442
	[0.909]	[0.258]	[0.170]	[0.139]	[0.431]	[0.272]	[0.423]
Log Total Assets_t-1	-5.922***	-5.634***	-5.632***	-5.637***	-5.466***	-5.634***	-5.803***
	[0.001]	[0.003]	[0.001]	[0.002]	[0.003]	[0.002]	[0.002]
Capital Ratio_t-1	-0.591**	-0.475*	-0.488*	-0.473*	-0.409*	-0.472*	-0.595**
	[0.035]	[0.086]	[0.073]	[0.097]	[0.097]	[0.085]	[0.034]
Illiquid Assets Ratio_t-1	-0.189***	-0.182***	-0.192***	-0.193***	-0.187***	-0.172***	-0.190***
	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.001]	[0.001]
International Activity_t-1	0.142*	0.121	0.179**	0.114	0.131*	0.124*	0.143*
	[0.056]	[0.139]	[0.017]	[0.170]	[0.053]	[0.088]	[0.050]
Net Intragroup Funding_t-1	-0.311	-0.398**	-0.386	-0.365	-0.419*	-0.380*	-0.327
	[0.158]	[0.047]	[0.115]	[0.108]	[0.064]	[0.080]	[0.125]
Core Deposits Ratio_t-1	-0.032	-0.026	-0.029	-0.005	-0.017	-0.023	-0.024
	[0.510]	[0.588]	[0.529]	[0.901]	[0.716]	[0.616]	[0.614]
Log Total Assets * ExpP	0.133	-2.111	4.534	-2.528	12.148	0.616	-1.900
	[0.919]	[0.390]	[0.267]	[0.376]	[0.396]	[0.778]	[0.534]
Capital Ratio * ExpP	3.105	-0.719	2.091	-3.811	17.859*	4.391	4.602**
	[0.155]	[0.772]	[0.484]	[0.203]	[0.051]	[0.175]	[0.011]
Illiquid Assets Ratio * ExpP	-0.170	-0.313	0.478	-0.641	-2.032	0.383*	-0.531
	[0.357]	[0.248]	[0.355]	[0.223]	[0.115]	[0.077]	[0.108]
International Activity* ExpP	-0.260	0.268	-2.095***	0.662	0.675	-0.396	-0.350
	[0.468]	[0.685]	[0.005]	[0.428]	[0.767]	[0.207]	[0.455]
Net Intragroup Funding * ExpP	-1.383***	-0.402	3.542	-1.034	22.045*	0.919	-5.552***
	[0.005]	[0.721]	[0.220]	[0.355]	[0.054]	[0.573]	[0.000]
Core Deposits Ratio * ExpP	0.053	0.090	0.166	-0.089	-0.264	-0.034	-0.263
	[0.594]	[0.467]	[0.345]	[0.708]	[0.756]	[0.814]	[0.211]
Observations	3,757	3,757	3,757	3,757	3,757	3,757	3,757
R-squared	0.062	0.070	0.057	0.064	0.086	0.063	0.054
Adjusted R-squared	0.043	0.052	0.038	0.045	0.068	0.045	0.035
Number of Banks	96	96	96	96	96	96	96
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of ExpP (Contemporaneous and Lagged Indicator)	0.405	2.722	-7.636	14.785**	-44.407	-7.674	-5.984
	[0.874]	[0.446]	[0.217]	[0.012]	[0.141]	[0.206]	[0.364]
Contemporaneous Marginal Effect of ExpP	3.754**	5.523***	-5.078	15.173***	-21.458	1.745	-0.163
	[0.014]	[0.002]	[0.232]	[0.001]	[0.244]	[0.604]	[0.966]

**Table 8: Inward Transmission of Policy via Foreign-Owned Affiliates**

This table reports the effects of changes in regulation and bank characteristics and their interactions on log changes in total loans. The data is quarterly from 2002Q1 to 2013Q4 for a panel for foreign-owned affiliates located in Germany. HomeP refers to changes in regulation in the home (i.e. parent bank) country of foreign affiliates located in Germany. For the marginal effect of HomeP as well as HomeP interaction effects the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Standard errors are clustered by home country. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	HomeP= Prudential IndexC	HomeP= Capital Requiremen ts	HomeP= Sector- Specific Capital Buffer	HomeP= Loan To Value Ratio	HomeP= Reserve Requiremen t Foreign	HomeP= Reserve Requiremen t Local	HomeP= Concentrati on Ratios
Home Country Regulation HomeP_t	-41.624 [0.563]	22.788 [0.579]	-286.785** [0.012]	-64.058 [0.293]	193.626 [0.294]	-10.774 [0.810]	-11.312 [0.938]
Home Country Regulation HomeP_t-1	-48.934** [0.028]	-14.234 [0.771]	129.751 [0.481]	93.210* [0.072]	-253.897*** [0.004]	-121.710*** [0.006]	-11.289 [0.869]
Home Country Regulation HomeP_t-2	-11.523 [0.675]	-3.113 [0.932]	-116.128 [0.366]	-83.172*** [0.006]	-56.095 [0.267]	37.359 [0.346]	3.800 [0.871]
Log Total Assets_t-1	-5.309*** [0.002]	-4.731*** [0.002]	-5.057*** [0.001]	-5.064*** [0.001]	-4.768*** [0.002]	-4.939*** [0.002]	-4.665*** [0.001]
Capital Ratio_t-1	0.143 [0.233]	0.224** [0.041]	0.207** [0.047]	0.184* [0.098]	0.206* [0.067]	0.186* [0.094]	0.207** [0.046]
Illiquid Assets Ratio_t-1	-0.126* [0.055]	-0.083 [0.163]	-0.103* [0.079]	-0.095 [0.119]	-0.105* [0.061]	-0.111** [0.042]	-0.094* [0.088]
Net Intragroup Funding_t-1	-0.143 [0.663]	-0.131 [0.684]	-0.189 [0.532]	-0.266 [0.359]	-0.294 [0.253]	-0.266 [0.332]	-0.271 [0.312]
Core Deposits Ratio_t-1	0.020 [0.808]	0.034 [0.663]	0.035 [0.655]	0.022 [0.773]	0.039 [0.609]	0.028 [0.714]	0.035 [0.656]
BIS Financial Cycle (Home country)	0.094** [0.046]	0.098** [0.032]	0.093* [0.056]	0.094** [0.020]	0.081* [0.088]	0.086* [0.053]	0.090** [0.044]
BIS Business Cycle (Home country)	0.650 [0.302]	0.582 [0.343]	0.713 [0.230]	0.780 [0.227]	0.451 [0.462]	0.523 [0.410]	0.561 [0.358]
Log Total Assets * HomeP	3.593*** [0.234]	0.853*** [0.732]	5.225*** [0.258]	0.730*** [0.777]	2.212*** [0.611]	2.452*** [0.033]	2.797*** [0.396]
Capital Ratio * HomeP	0.783*** [0.115]	-0.599*** [0.542]	1.709*** [0.375]	1.156*** [0.454]	-0.128*** [0.922]	0.904*** [0.034]	-1.049*** [0.158]
Illiquid Assets Ratio * HomeP	0.117*** [0.542]	-0.264*** [0.187]	1.648*** [0.052]	0.058*** [0.867]	0.843*** [0.110]	0.373*** [0.016]	-0.481*** [0.145]
Net Intragroup Funding * HomeP	-4.497*** [0.015]	-7.707*** [0.099]	11.750*** [0.524]	-5.000*** [0.098]	-19.778*** [0.686]	7.533*** [0.267]	4.072*** [0.243]
Core Deposits Ratio * HomeP	0.160*** [0.170]	0.188*** [0.238]	-1.439*** [0.001]	0.638*** [0.061]	0.340*** [0.586]	-0.129*** [0.472]	0.129*** [0.022]
Observations	2,466	2,466	2,466	2,466	2,466	2,466	2,466
R-squared	0.091	0.081	0.084	0.094	0.084	0.094	0.080
Adjusted R-squared	0.035	0.025	0.029	0.039	0.029	0.039	0.024
Number of Banks	72	72	72	72	72	72	72
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of HomeP (Contemporaneous and Lagged Indicator)	-5.334* [0.069]	2.510 [0.746]	-41.154*** [0.000]	-13.187* [0.075]	6.892 [0.442]	-7.485 [0.145]	-0.814 [0.837]
Contemporaneous Marginal Effect of HomeP	-3.886 [0.233]	0.469 [0.901]	-17.384** [0.011]	-9.863 [0.101]	-9.303 [0.523]	-8.850* [0.083]	5.191*** [0.004]

**Table 9: Outward Transmission of Policy to Destination Country**

This table reports the effects of changes in destination country regulation and bank characteristics on log changes in total loans by destination country. The data is quarterly from 2002Q1 to 2013Q4 for a panel of bank holding companies whereas we use consolidated data. DestP refers to the changes in regulation in the destination country of the loan. For the marginal effect of DestP as well as DestP interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Standard errors are clustered by destination country. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	DestP= Prudential IndexC	DestP= Capital Requirements	DestP= Sector- Specific Capital Buffer	DestP= Loan To Value Ratio	DestP= Reserve Requirements Foreign	DestP= Reserve Requirements Local	DestP= Concentrati on Ratios
Destination Country Regulation DestP_t	6.609*** [0.007]	28.453*** [0.000]	2.199 [0.692]	8.388 [0.227]	2.940 [0.345]	2.842 [0.293]	-2.739 [0.446]
Destination Country Regulation DestP_t-1	-5.333** [0.038]	4.961 [0.504]	-3.519 [0.273]	-4.265 [0.557]	-3.742 [0.157]	-5.977* [0.053]	3.078 [0.562]
Destination Country Regulation DestP_t-2	-2.903 [0.204]	17.253*** [0.004]	-12.359*** [0.005]	-4.044 [0.555]	-4.829 [0.114]	-1.215 [0.588]	-7.128 [0.459]
Log Total Assets_t-1	-0.187 [0.263]	-0.171 [0.318]	-0.191 [0.257]	-0.188 [0.261]	-0.187 [0.270]	-0.180 [0.287]	-0.184 [0.274]
Capital Ratio_t-1	-0.012 [0.543]	-0.013 [0.517]	-0.011 [0.546]	-0.012 [0.514]	-0.010 [0.563]	-0.010 [0.594]	-0.010 [0.568]
Illiquid Assets Ratio_t-1	-0.004 [0.557]	-0.006 [0.408]	-0.005 [0.496]	-0.004 [0.561]	-0.004 [0.552]	-0.005 [0.477]	-0.004 [0.542]
International Activity_t-1	-0.043** [0.034]	-0.034* [0.080]	-0.040** [0.043]	-0.038* [0.054]	-0.039** [0.044]	-0.037* [0.056]	-0.038* [0.054]
Net Intragroup Funding_t-1	0.072 [0.120]	0.051 [0.255]	0.074 [0.111]	0.066 [0.156]	0.073 [0.116]	0.070 [0.131]	0.074 [0.114]
Core Deposits Ratio_t-1	0.008 [0.358]	0.007 [0.447]	0.008 [0.363]	0.008 [0.361]	0.008 [0.365]	0.008 [0.339]	0.007 [0.382]
BIS Financial Cycle (Destination country)	0.012*** [0.004]	0.012*** [0.003]	0.012*** [0.004]	0.012*** [0.004]	0.012*** [0.004]	0.012*** [0.004]	0.012*** [0.004]
BIS Business Cycle (Destination country)	0.081** [0.024]	0.082** [0.022]	0.082** [0.024]	0.079** [0.026]	0.083** [0.023]	0.082** [0.020]	0.082** [0.022]
Log Total Assets * DestP	0.069 [0.721]	-1.996*** [0.000]	0.460** [0.014]	0.038 [0.948]	0.277 [0.162]	0.223 [0.310]	0.305 [0.488]
Capital Ratio * DestP	0.023 [0.575]	-0.151** [0.028]	0.046 [0.472]	0.027 [0.805]	0.018 [0.593]	0.060 [0.260]	0.091 [0.748]
Illiquid Assets Ratio * DestP	-0.006 [0.468]	-0.024 [0.549]	0.033 [0.290]	-0.011 [0.611]	-0.026* [0.077]	-0.027*** [0.001]	-0.026 [0.659]
International Activity * DestP	0.042 [0.144]	-0.019 [0.804]	0.087* [0.096]	0.047 [0.505]	0.054 [0.183]	0.048 [0.148]	0.011 [0.932]
Net Intragroup Funding * DestP	0.014 [0.751]	0.096 [0.531]	0.001 [0.994]	0.334** [0.042]	-0.004 [0.891]	-0.094** [0.026]	0.037 [0.831]
Core Deposits Ratio * DestP	0.004 [0.697]	-0.043 [0.172]	0.012 [0.452]	0.004 [0.906]	0.020** [0.012]	0.004 [0.756]	0.041 [0.155]
Observations	177,777	177,777	177,777	177,777	177,777	177,777	177,777
R-squared	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Adjusted R-squared	0.004	0.004	0.004	0.004	0.004	0.004	0.004
Number of Destination Countries	52	52	52	52	52	52	52
Number of Banks	96	96	96	96	96	96	96
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Destination Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of DestP (Contemporaneous and Lagged Indicator)	0.060 [0.749]	0.350 [0.560]	0.371 [0.290]	0.628 [0.230]	0.011 [0.975]	-0.293** [0.042]	0.043 [0.962]
Contemporaneous Marginal Effect of DestP	-0.269** [0.039]	0.176 [0.581]	-0.110 [0.742]	0.129 [0.675]	-0.326* [0.060]	-0.407** [0.013]	-0.667* [0.063]

**Table 10: Inward Transmission of Policy Through Domestic Banks' International Exposures – Loans to Banks**

This table reports the effects of changes in regulation and bank characteristics and their interactions on log changes in loans to banks. The data is quarterly from 2002Q1 to 2013Q4 for a panel of domestic bank holding companies whereas we use consolidated data. Foreign-exposure-weighted regulation ExpP is calculated as the weighted average of changes in foreign regulation where the weights are the total assets and liabilities of the bank in the respective foreign country. For ExpP and its interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Standard errors are clustered by bank. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ExpP= Prudential IndexC	ExpP= Capital Requirements	ExpP= Sector- Specific Capital Buffer	ExpP= Loan To Value Ratio	ExpP= Reserve Requirements t Foreign	ExpP= Reserve Requirements t Local	ExpP= Concentrati on Ratios
Foreign exposure weighted regulation (ExpP)	-116.369*	-123.038	-183.879	80.562	-319.768	42.987	-667.961**
	[0.065]	[0.235]	[0.639]	[0.738]	[0.471]	[0.711]	[0.035]
Log Total Assets_t-1	-10.484***	-10.606***	-10.363***	-10.346***	-10.462***	-10.387***	-10.709***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Capital Ratio_t-1	-0.728	-0.724*	-0.646	-0.657	-0.636	-0.700	-0.774
	[0.126]	[0.090]	[0.152]	[0.147]	[0.124]	[0.105]	[0.114]
Illiquid Assets Ratio_t-1	-0.376***	-0.345***	-0.358***	-0.363***	-0.367***	-0.344***	-0.369***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
International Activity_t-1	-0.071	-0.066	0.005	-0.022	-0.028	-0.037	-0.071
	[0.602]	[0.641]	[0.973]	[0.878]	[0.843]	[0.811]	[0.638]
Net Intragroup Funding_t-1	-0.649	-0.720*	-0.618	-0.549	-0.550	-0.536	-0.580
	[0.246]	[0.087]	[0.251]	[0.201]	[0.246]	[0.149]	[0.241]
Core Deposits Ratio_t-1	0.094	0.085	0.079	0.105	0.092	0.085	0.074
	[0.275]	[0.347]	[0.376]	[0.207]	[0.291]	[0.351]	[0.392]
Log Total Assets * ExpP	3.584	3.901	6.038	-4.911	6.492	-4.868	22.131**
	[0.171]	[0.315]	[0.703]	[0.620]	[0.687]	[0.282]	[0.043]
Capital Ratio * ExpP	-1.074	-1.142	-4.098	-6.316	9.056	-0.612	7.874*
	[0.706]	[0.769]	[0.561]	[0.546]	[0.562]	[0.837]	[0.054]
Illiquid Assets Ratio * ExpP	0.534*	0.274	0.897	1.389	0.809	0.842*	1.423
	[0.096]	[0.558]	[0.351]	[0.184]	[0.716]	[0.056]	[0.321]
International Activity* ExpP	0.984*	1.906**	-1.903	1.979	2.220	0.093	3.295**
	[0.090]	[0.044]	[0.279]	[0.296]	[0.334]	[0.880]	[0.017]
Net Intragroup Funding * ExpP	1.882	3.834**	6.001	3.390	4.933	2.803	2.301
	[0.387]	[0.035]	[0.194]	[0.510]	[0.880]	[0.420]	[0.604]
Core Deposits Ratio * ExpP	0.299	0.384	0.352	-0.309	1.736	0.035	1.157
	[0.135]	[0.204]	[0.507]	[0.578]	[0.245]	[0.894]	[0.127]
Observations	3,525	3,525	3,525	3,525	3,525	3,525	3,525
R-squared	0.039	0.036	0.036	0.045	0.041	0.038	0.036
Adjusted R-squared	0.019	0.016	0.016	0.025	0.021	0.018	0.016
Number of Banks	96	96	96	96	96	96	96
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of ExpP (Contemporaneous and Lagged Indicator)	12.778*	2.898	-1.616	37.808***	-19.701	-15.483	30.699
	[0.062]	[0.786]	[0.906]	[0.004]	[0.598]	[0.202]	[0.225]
Contemporaneous Marginal Effect of ExpP	14.457***	2.781	12.492	39.451***	7.424	12.389	22.135**
	[0.006]	[0.745]	[0.205]	[0.000]	[0.778]	[0.203]	[0.027]

**Table 11: Inward Transmission of Policy Through Domestic Banks' International Exposures – Loans to Non-bank Private Sector**

This table reports the effects of changes in regulation and bank characteristics and their interactions on log changes in loans to the Non-bank Private Sector. The data is quarterly from 2002Q1 to 2013Q4 for a panel of domestic bank holding companies whereas we use consolidated data. Foreign-exposure-weighted regulation ExpP is calculated as the weighted average of changes in foreign regulation where the weights are the total assets and liabilities of the bank in the respective foreign country. For ExpP and its interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Standard errors are clustered by bank. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ExpP= Prudential IndexC	ExpP= Capital Requirements	ExpP= Sector- Specific Capital Buffer	ExpP= Loan To Value Ratio	ExpP= Reserve Requirement Foreign	ExpP= Reserve Requirement Local	ExpP= Concentration Ratios
Foreign exposure weighted regulation (ExpP)	67.950*** [0.009]	104.942*** [0.006]	299.331** [0.046]	87.659 [0.151]	22.765 [0.911]	40.687 [0.340]	-92.970 [0.269]
Log Total Assets_t-1	-0.217 [0.863]	-0.369 [0.767]	-0.132 [0.926]	-0.209 [0.873]	0.031 [0.982]	-0.003 [0.998]	-0.048 [0.972]
Capital Ratio_t-1	0.628 [0.160]	0.487 [0.279]	0.513 [0.261]	0.472 [0.301]	0.513 [0.229]	0.499 [0.281]	0.640 [0.172]
Illiquid Assets Ratio_t-1	-0.085** [0.019]	-0.080** [0.031]	-0.087** [0.032]	-0.084** [0.030]	-0.084** [0.030]	-0.076** [0.044]	-0.070* [0.057]
International Activity_t-1	-0.020 [0.844]	-0.037 [0.736]	-0.045 [0.679]	-0.004 [0.970]	-0.027 [0.779]	-0.025 [0.807]	-0.015 [0.874]
Net Intragroup Funding_t-1	0.018 [0.912]	-0.100 [0.569]	-0.046 [0.813]	-0.022 [0.903]	-0.072 [0.688]	-0.087 [0.627]	0.013 [0.937]
Core Deposits Ratio_t-1	-0.011 [0.760]	-0.006 [0.870]	-0.004 [0.907]	-0.005 [0.902]	-0.001 [0.977]	-0.003 [0.934]	-0.005 [0.883]
Log Total Assets * ExpP	-2.959** [0.014]	-3.961** [0.015]	-13.430** [0.040]	-1.087 [0.634]	-1.117 [0.897]	-2.934 [0.108]	5.306 [0.173]
Capital Ratio * ExpP	-2.306 [0.118]	-2.699 [0.216]	-5.217 [0.137]	-4.640* [0.057]	-11.522 [0.258]	1.525 [0.287]	-1.896 [0.322]
Illiquid Assets Ratio * ExpP	0.155 [0.229]	-0.016 [0.940]	0.698* [0.089]	-0.405 [0.232]	0.193 [0.603]	0.306*** [0.001]	-0.425 [0.115]
International Activity* ExpP	-0.079 [0.689]	0.510 [0.285]	1.265 [0.333]	-1.727** [0.016]	1.890** [0.044]	0.291 [0.294]	-0.491 [0.496]
Net Intragroup Funding * ExpP	-0.318 [0.457]	0.748 [0.284]	0.185 [0.909]	-2.503** [0.025]	25.440** [0.020]	-0.896 [0.114]	-1.765** [0.021]
Core Deposits Ratio * ExpP	0.056 [0.516]	0.074 [0.519]	-0.143 [0.517]	-0.052 [0.759]	0.687 [0.301]	-0.125 [0.300]	0.497* [0.082]
Observations	3,742	3,742	3,742	3,742	3,742	3,742	3,742
R-squared	0.042	0.037	0.040	0.050	0.048	0.040	0.042
Adjusted R-squared	0.023	0.019	0.021	0.031	0.029	0.021	0.023
Number of Banks	96	96	96	96	96	96	96
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of ExpP (Contemporaneous and Lagged Indicator)	-0.004 [0.999]	3.905 [0.336]	13.987* [0.068]	2.273 [0.628]	-17.863 [0.341]	-1.389 [0.670]	3.058 [0.641]
Contemporaneous Marginal Effect of ExpP	-1.269 [0.298]	4.425* [0.065]	-1.650 [0.664]	-2.741 [0.330]	-15.135* [0.083]	-1.803 [0.446]	0.076 [0.978]

**Table 12: Outward Transmission of Policy to Destination Country – Loans to Banks**

This table reports the effects of changes in destination country regulation and bank characteristics on log changes in loans to banks by destination country. The data is quarterly from 2002Q1 to 2013Q4 for a panel of bank holding companies whereas we use consolidated data. DestP refers to the changes in regulation in the destination country of the loan. For the marginal effect of DestP as well as DestP interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Standard errors are clustered by destination country. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	DestP= Prudential IndexC	DestP= Capital Requirements	DestP= Sector- Specific Capital Buffer	DestP= Loan To Value Ratio	DestP= Reserve Requirement Foreign	DestP= Reserve Requirement Local	DestP= Concentration Ratios
Destination Country Regulation DestP_t	2.762 [0.172]	9.205* [0.080]	7.705** [0.036]	4.950 [0.298]	0.142 [0.944]	1.569 [0.433]	-9.874 [0.159]
Destination Country Regulation DestP_t-1	-2.965 [0.190]	0.271 [0.963]	-5.965* [0.066]	-3.069 [0.596]	-0.437 [0.852]	-5.808** [0.038]	5.885 [0.472]
Destination Country Regulation DestP_t-2	-1.708 [0.376]	6.975 [0.155]	-2.735 [0.474]	2.006 [0.712]	-2.526 [0.280]	-1.206 [0.498]	-7.485 [0.293]
Log Total Assets_t-1	-0.065 [0.569]	-0.050 [0.666]	-0.064 [0.584]	-0.061 [0.600]	-0.065 [0.574]	-0.060 [0.607]	-0.065 [0.577]
Capital Ratio_t-1	-0.016 [0.143]	-0.017 [0.138]	-0.018* [0.095]	-0.016 [0.128]	-0.017 [0.101]	-0.018* [0.097]	-0.018* [0.093]
Illiquid Assets Ratio_t-1	0.005 [0.457]	0.003 [0.555]	0.005 [0.438]	0.005 [0.466]	0.005 [0.443]	0.004 [0.490]	0.004 [0.466]
International Activity_t-1	-0.005 [0.756]	0.005 [0.771]	-0.001 [0.954]	-0.000 [0.982]	0.000 [0.987]	0.003 [0.869]	0.003 [0.862]
Net Intragroup Funding_t-1	0.133*** [0.008]	0.124** [0.012]	0.135*** [0.007]	0.131*** [0.008]	0.137*** [0.006]	0.136*** [0.006]	0.138*** [0.006]
Core Deposits Ratio_t-1	0.005 [0.371]	0.005 [0.413]	0.005 [0.376]	0.005 [0.337]	0.005 [0.340]	0.005 [0.330]	0.005 [0.364]
BIS Financial Cycle (Destination country)	0.009*** [0.001]	0.009*** [0.001]	0.010*** [0.001]	0.009*** [0.001]	0.010*** [0.001]	0.010*** [0.001]	0.010*** [0.001]
BIS Business Cycle (Destination country)	0.056* [0.078]	0.059* [0.062]	0.059* [0.059]	0.057* [0.069]	0.060* [0.060]	0.059* [0.060]	0.059* [0.060]
Log Total Assets * DestP	0.063 [0.618]	-0.687 [0.101]	-0.004 [0.984]	-0.168 [0.660]	0.142 [0.433]	0.227 [0.173]	0.413 [0.431]
Capital Ratio * DestP	-0.014 [0.555]	-0.060 [0.226]	-0.009 [0.779]	-0.094 [0.248]	-0.012 [0.637]	0.014 [0.595]	0.146 [0.248]
Illiquid Assets Ratio * DestP	0.002 [0.854]	0.021 [0.512]	-0.008 [0.769]	0.006 [0.815]	-0.015 [0.117]	-0.008 [0.355]	0.020 [0.639]
International Activity * DestP	0.063* [0.085]	0.175 [0.161]	0.123 [0.308]	0.251* [0.085]	-0.038* [0.093]	0.012 [0.690]	-0.128 [0.437]
Net Intragroup Funding * DestP	0.007 [0.145]	-0.013 [0.402]	0.028** [0.036]	0.000 [0.995]	0.007 [0.369]	0.009 [0.163]	0.014 [0.603]
Core Deposits Ratio * DestP	0.064*** [0.009]	-0.012 [0.877]	0.157*** [0.003]	0.096 [0.198]	0.074* [0.063]	0.064** [0.020]	-0.093 [0.271]
Observations	171,216	171,216	171,216	171,216	171,216	171,216	171,216
R-squared	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Adjusted R-squared	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Number of Destination Countries	52	52	52	52	52	52	52
Number of Banks	96	96	96	96	96	96	96
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Destination Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of DestP (Contemporaneous and Lagged Indicator)	0.148 [0.341]	1.080** [0.016]	-0.061 [0.883]	0.432 [0.277]	0.065 [0.789]	-0.013 [0.927]	0.029 [0.964]
Contemporaneous Marginal Effect of DestP	-0.100 [0.381]	0.355 [0.230]	-0.157 [0.556]	0.086 [0.709]	-0.193 [0.131]	-0.222* [0.058]	-0.597 [0.114]

**Table 13: Outward Transmission of Policy– Loans to The Non-bank Private Sector**

This table reports the effects of changes in destination country regulation and bank characteristics on log changes in loans to the Non-bank Private Sector by destination country. The data is quarterly from 2002Q1 to 2013Q4 for a panel of bank holding companies whereas we use consolidated data. DestP refers to the changes in regulation in the destination country of the loan. For the marginal effect of DestP as well as DestP interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Standard errors are clustered by destination country. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	DestP= Prudential IndexC	DestP= Capital Requirements	DestP= Sector- Specific Capital Buffer	DestP= Loan To Value Ratio	DestP= Reserve Requirement Foreign	DestP= Reserve Requirement Local	DestP= Concentration Ratios
Destination Country Regulation DestP_t	3.803*	13.116**	0.660	4.332	2.766	2.669	1.567
	[0.073]	[0.010]	[0.869]	[0.250]	[0.406]	[0.383]	[0.640]
Destination Country Regulation DestP_t-1	-3.647*	3.475	-3.489	-2.011	-5.629**	-4.580*	3.581
	[0.060]	[0.540]	[0.369]	[0.622]	[0.027]	[0.087]	[0.405]
Destination Country Regulation DestP_t-2	-0.778	15.508***	-8.780**	-7.435	-2.388	0.294	-3.633
	[0.713]	[0.005]	[0.010]	[0.132]	[0.331]	[0.893]	[0.656]
Log Total Assets_t-1	-0.203	-0.208	-0.210	-0.206	-0.204	-0.201	-0.201
	[0.139]	[0.142]	[0.131]	[0.135]	[0.141]	[0.149]	[0.149]
Capital Ratio_t-1	-0.013	-0.015	-0.012	-0.013	-0.011	-0.011	-0.012
	[0.387]	[0.341]	[0.426]	[0.377]	[0.437]	[0.474]	[0.435]
Illiquid Assets Ratio_t-1	-0.008	-0.008	-0.009*	-0.008	-0.008*	-0.009*	-0.008
	[0.116]	[0.123]	[0.087]	[0.105]	[0.098]	[0.083]	[0.103]
International Activity_t-1	-0.040**	-0.038**	-0.040**	-0.038**	-0.040**	-0.040**	-0.040**
	[0.023]	[0.022]	[0.018]	[0.026]	[0.018]	[0.018]	[0.020]
Net Intragroup Funding_t-1	-0.014	-0.021	-0.016	-0.021	-0.017	-0.020	-0.017
	[0.613]	[0.433]	[0.556]	[0.461]	[0.528]	[0.463]	[0.543]
Core Deposits Ratio_t-1	0.003	0.001	0.002	0.002	0.002	0.002	0.002
	[0.735]	[0.856]	[0.737]	[0.785]	[0.780]	[0.750]	[0.796]
BIS Financial Cycle (Destination country)	0.010*	0.010*	0.009*	0.009*	0.009*	0.010*	0.010*
	[0.072]	[0.067]	[0.075]	[0.072]	[0.075]	[0.077]	[0.074]
BIS Business Cycle (Destination country)	0.029	0.028	0.027	0.027	0.027	0.028	0.028
	[0.156]	[0.186]	[0.195]	[0.190]	[0.190]	[0.187]	[0.186]
Log Total Assets * DestP	0.048	-1.141***	0.453***	0.225	0.241	0.103	-0.037
	[0.762]	[0.003]	[0.007]	[0.556]	[0.122]	[0.613]	[0.936]
Capital Ratio * DestP	0.037	-0.056	0.042	0.083	0.044	0.067	0.119
	[0.357]	[0.336]	[0.515]	[0.421]	[0.137]	[0.257]	[0.556]
Illiquid Assets Ratio * DestP	-0.010	-0.075**	0.023	-0.004	-0.011	-0.021**	-0.015
	[0.191]	[0.032]	[0.291]	[0.819]	[0.332]	[0.012]	[0.623]
International Activity * DestP	-0.053	-0.189	-0.043	0.162*	-0.027	-0.077**	-0.069
	[0.112]	[0.121]	[0.651]	[0.069]	[0.487]	[0.012]	[0.662]
Net Intragroup Funding * DestP	-0.002	-0.021	-0.013	0.006	0.011*	-0.004	0.017
	[0.837]	[0.396]	[0.454]	[0.821]	[0.063]	[0.736]	[0.691]
Core Deposits Ratio * DestP	-0.012	-0.033	-0.012	-0.043	-0.040*	0.025	-0.069
	[0.650]	[0.511]	[0.826]	[0.390]	[0.067]	[0.416]	[0.559]
Observations	176,099	176,099	176,099	176,099	176,099	176,099	176,099
R-squared	0.006	0.006	0.006	0.006	0.006	0.006	0.006
Adjusted R-squared	0.005	0.005	0.005	0.005	0.005	0.005	0.005
Number of Destination Countries	52	52	52	52	52	52	52
Number of Banks	96	96	96	96	96	96	96
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Destination Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of DestP (Contemporaneous and Lagged Indicator)	-0.101	-0.729	0.356	0.110	-0.140	-0.267*	0.160
	[0.522]	[0.110]	[0.197]	[0.813]	[0.628]	[0.091]	[0.778]
Contemporaneous Marginal Effect of DestP	-0.196**	0.000	-0.028	0.001	-0.288	-0.337***	-0.324
	[0.041]	[1.000]	[0.897]	[0.998]	[0.134]	[0.003]	[0.343]

**Table 14: Outward Transmission of Policy to Destination Country – Foreign Branches vs. Subsidiaries**

This table reports the effects of changes in host country regulation and bank characteristics on log changes in local lending of German banks' foreign branches and subsidiaries. The data is quarterly from 2002Q1 to 2013Q4 for a panel of foreign affiliates of German banks. Branch-level data is aggregated across all branches of one parent bank per destination country. Coefficients referring to subsidiaries show the total effect by aggregating the coefficients of the baseline category (Branches) and the subsidiary specific interaction effect and reporting their joint significance. DestP refers to the changes in regulation in the destination country of the loan, which is the host country in this specification. For the marginal effect of DestP as well as DestP interaction effects, the reported coefficient is the sum of the contemporaneous term and two lags, with the corresponding p-value of the F-statistic for joint significance reported below. For more details on the variables see Appendix, Table 1. Each column gives the result for the regulatory measure specified in the column headline. All specifications include fixed effects as specified in the lower part of the table. Bank explanatory variables, cycle variables, prudential instruments are included in the regressions but not reported. Standard errors are clustered at the host country level. P-values are reported in square brackets. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	DestP= Prudential IndexC	DestP= Capital Requirements	DestP= Sector- Specific Capital Buffer	DestP= Loan To Value Ratio	DestP= Reserve Requirement Foreign	DestP= Reserve Requirement Local	DestP= Concentra- tion Ratios
Log Total Assets * DestP (Branches)	-5.848** [0.042]	-9.772 [0.230]	-2.097 [0.827]	-1.138 [0.836]	5.093 [0.583]	2.902 [0.404]	-15.680* [0.062]
Capital Ratio * DestP (Branches)	-1.448** [0.043]	-1.133 [0.555]	-0.796 [0.737]	-0.117 [0.910]	2.546 [0.110]	-0.446 [0.596]	-2.930*** [0.003]
Illiquid Assets Ratio * DestP (Branches)	0.229 [0.249]	-0.195 [0.484]	0.410 [0.602]	0.470 [0.107]	-1.995*** [0.001]	0.735** [0.038]	0.778 [0.184]
International Activity * DestP (Branches)	-0.097 [0.615]	-0.014 [0.982]	-0.733 [0.573]	-0.163 [0.559]	0.239 [0.616]	-0.096 [0.708]	-1.951 [0.301]
Net Intragroup Funding * DestP (Branches)	-0.119 [0.351]	-0.287 [0.193]	0.228 [0.298]	-0.073 [0.615]	0.368* [0.072]	-0.203 [0.510]	0.065 [0.888]
Core Deposits Ratio * DestP (Branches)	-0.341 [0.281]	-0.348 [0.562]	-0.223 [0.844]	-0.930 [0.171]	-0.974*** [0.008]	-0.054 [0.898]	-2.501*** [0.000]
Log Total Assets * DestP (Subsidiaries)	0.236 [0.895]	-1.592 [0.774]	-0.181 [0.927]	-1.962 [0.761]	2.053 [0.504]	-1.669 [0.558]	12.099 [0.243]
Capital Ratio * DestP (Subsidiaries)	0.294 [0.367]	0.117 [0.838]	-0.308 [0.756]	0.809 [0.515]	0.882 [0.290]	0.485 [0.474]	1.969 [0.112]
Illiquid Assets Ratio * DestP (Subsidiaries)	0.329 [0.253]	-0.786 [0.366]	-0.043 [0.807]	0.794 [0.456]	-0.343 [0.129]	0.850 [0.149]	0.876 [0.537]
International Activity * DestP (Subsidiaries)	-0.023 [0.928]	1.213 [0.321]	-0.352* [0.084]	0.029 [0.972]	0.960** [0.012]	-0.572 [0.344]	1.583 [0.215]
Net Intragroup Funding * DestP (Subsidiaries)	0.253 [0.182]	0.392 [0.218]	0.298 [0.320]	0.252 [0.390]	0.601** [0.018]	0.023 [0.925]	0.848 [0.376]
Core Deposits Ratio * DestP (Subsidiaries)	0.314 [0.147]	0.353 [0.692]	0.250* [0.083]	-0.111 [0.813]	0.047 [0.824]	0.245 [0.491]	1.200* [0.090]
Observations	9,273	9,273	9,273	9,273	9,273	9,273	9,273
R-squared	0.024	0.023	0.021	0.021	0.020	0.021	0.023
Adjusted R-squared	0.014	0.012	0.011	0.011	0.010	0.011	0.013
Number of Host Countries	49	49	49	49	49	49	49
Number of Banks	349	349	349	349	349	349	349
Time Period	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4	2002Q1- 2013Q4
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Marginal Effect of DestP (Contemporaneous and Lagged Indicator) (Branches)	11.209* [0.092]	12.910 [0.176]	10.439 [0.604]	0.856 [0.927]	14.393 [0.533]	11.649 [0.230]	-2.724 [0.782]
Contemporaneous Marginal Effect of DestP (Branches)	2.523 [0.468]	6.508 [0.112]	3.360 [0.660]	4.876 [0.335]	21.345 [0.150]	3.151 [0.490]	-19.115*** [0.000]
Marginal Effect of DestP (Contemporaneous and Lagged Indicator) (Subsidiaries)	-6.495 [0.358]	-27.280 [0.206]	6.958 [0.305]	-13.781 [0.557]	-31.083** [0.015]	5.997 [0.714]	-74.528 [0.116]
Contemporaneous Marginal Effect of DestP (Subsidiaries)	-12.384*** [0.000]	-16.168 [0.149]	-11.815*** [0.005]	-27.211** [0.020]	-19.162 [0.140]	2.026 [0.810]	-7.676 [0.316]

### Figure 1: Domestic and Foreign Lending Activities of German Banks

This figure shows the evolution of German banks' loan supply. Data is observed quarterly from 2002Q1-2013Q4. The figure shows unweighted averages across the sample of German bank holding companies. Banking data comes from the monthly balance sheet statistics of the Deutsche Bundesbank and is reported at the group level of the individual bank. Descriptive statistics are shown for banks' loan-to-asset ratios (in %), the breakdown into domestic versus foreign loans to assets (in %) as well as the net intragroup funding (net due) variable that measures, from the perspective of a bank's headquarters, total net internal borrowing, that is liabilities minus claims of the parent bank vis-à-vis all foreign affiliates of the parent bank relative to total liabilities (in %).



### Appendix Table 1: Construction of Balance Sheet Variables

<i>Independent Variables</i>		
<b>Variable Name</b>	<b>Description</b>	<b>Data Source</b>
Illiquid Assets Ratio	(Loans and advances to banks + loans and advances to non-banks, including received bills)/Assets (in %)	Monthly balance sheet statistics (Deutsche Bundesbank)
Core Deposits Ratio	Savings deposits/Assets (in %)	Monthly balance sheet statistics (Deutsche Bundesbank)
Capital Ratio	Equity capital/Assets (in %)	Monthly balance sheet statistics (Deutsche Bundesbank)
Net Intragroup Funding	(Liabilities minus claims of the parent bank vis-à-vis foreign affiliates, summed across all affiliates per parent bank)/Liabilities (in %)	Monthly balance sheet statistics (Deutsche Bundesbank)
Log Total Assets	Log (balance sheet total)	Monthly balance sheet statistics (Deutsche Bundesbank)
International Activity Ratio	Ratio of foreign assets plus foreign liabilities to total assets plus total liabilities (in %)	Monthly balance sheet statistics (Deutsche Bundesbank)