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Abstract

This paper analyzes the impact of geographic diversification on bank value by employing a data set comprising the largest banks across the world, originating from both developed and emerging countries. The findings suggest that the value impact of international diversification depends on a bank's home country: higher levels of diversification are associated with changes in valuations only for banks originating from emerging countries. In addition, the locus of internationalization matters for the direction of effects: while markets respond positively to the intra-regional diversification activities of emerging country banks, they seem to believe that these banks cannot benefit from diversifying into far away areas.

JEL classification: F23; G21; G32; L22
Keywords: multinational banking; geographic diversification; bank value

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1 Introduction

From the mid-1990s and up until the onset of the global financial crisis, the internationalization of financial institutions increased dramatically (Claessens & van Horen, 2012). The main contributing factors to this phenomenon were the liberalization and deregulation of financial markets, the higher demand for international financial services arising from increased economic and financial integration, and the mitigation of geographic distance effects on bank efficiency through technological improvements (Berger *et al.*, 2004). Following these developments, a rich literature has emerged analyzing the determinants and consequences of foreign bank entry and acquisitions, as well as the performance effects of international diversification.[1]

This study seeks to undertake an up-to-date assessment of the evolution of bank-level geographic diversification and examine the relationship between geographic diversification and performance, using data from the largest banks across the world. The global banking system has undergone a major transformation in recent years, which accelerated in the wake of the global financial crisis. As noted by Claessens & van Horen (2014a) and BIS (2014), it now encompasses a larger variety of players, with banks from emerging markets having an increasingly important role, and is characterized by a rising trend towards greater regional activity.[2] While the aforementioned studies examine the ongoing restructuring in global banking at the industry-level, the micro-level adjustments in the geographic diversification of global banks and the performance effects of the recent state of geographic diversification have yet to be considered. Banks from different regions and during different time periods follow different internationalization strategies and the determinants of bank internationalization vary in importance over time (Mulder & Westerhuis, 2015). Therefore, the findings derived from the internationalization patterns of advanced country multinational banks and the performance effects of internationalization in times of financial globalization may not fully apply to the current landscape of global banking - which witnessed a substantial regulatory overhaul subsequent to the crisis and strategic adjustments at multinational giants. More importantly, conclusions derived from advanced country banks may not be supported in the case of emerging country banks which have been aspiring to become regional and global, following the increasing dominance of their countries in the world economy in recent years.

Our paper contributes to the existing literature in three distinct ways. First, while building on previous research on the bank internationalization-performance relationship, this is the first study - to the best of our knowledge - that focuses on the conditionality of this relationship upon the locus of destination of the diversification efforts: regional versus global. There is growing evidence that international strategy formulation may have a strong regional dimension, as regions are made up of countries with physical continuity and proximity, and thus with lower geographic, economic, and institutional distance than at the global level (Rugman & Verbeke, 2007; Arregle *et al.*, 2009). It is therefore imperative to look beyond the global-based internationalization measures, so as to gain a better understanding of the performance implications of geographic diversification and draw insights about the role of such regional specificities. To this end, we employ measures of international diversification that have never been explicitly used in the banking literature, and make a distinction between two types of geographic diversification: intra-regional, referring to diversification within a

[1] See, for instance, Berger *et al.* (2004), Buch & DeLong (2004), Magri *et al.* (2005) and Focarelli & Pozzolo (2005) on determinants of foreign bank entry; Hasan & Marton (2003), Berger *et al.* (2005) and Claessens & van Horen (2012) on the performance impacts of foreign bank entry and acquisitions; and Haselmann (2006), de Haas & van Lelyveld (2006), Maechler *et al.* (2010), Herring & Carmassi (2012), Cetorelli & Goldberg (2014) and de Haas & van Lelyveld (2014) on the stabilizing and destabilizing roles of multinational banks.

[2] Ongoing changes in the global banking industry, particularly the rise of regional banks originating from emerging countries, are also noted by the industry observers in recent years (see, for instance, Cooper, 2013; Caplen, 2016).

single region where the bank is already present, and inter-regional, referring to diversification across different regions (Qian *et al.*, 2013). Second, as opposed to the existing international banking literature which is heavily focused on developed country banks (DC banks), our sample includes a large number of banks originating from emerging countries (EC banks). This allows us to uncover systematic differences in diversification trends between the two bank groups, and to identify the underlying bank- and country-specific characteristics affecting the diversification-performance relationship. Third, our work adds to the ongoing regionalization-versus-globalization debate in the international business literature. Previous empirical studies on this debate have failed to reach a consensus, necessitating more research on the geographic limits of international diversification. Furthermore, they have ignored the banking industry,[3] despite the rapidly increasing internationalization in this industry during the pre-crisis years and its significant differences with the other industries.[4] Our paper aims to fill this gap.

Rather than pursuing an analysis of accounting measures of performance, we investigate whether the diversification activities conducted by banks influence their valuations, as captured by Tobin's Q (the ratio of a bank's market value to the replacement value of its assets).[5] Unlike accounting measures, such as return and risk-proxy ratios, Tobin's Q is forward-looking and can better capture the long term strategy and hence the capacity of banks to generate sustainable earnings (ECB, 2010). As outlined by Lang & Stulz (1994), since a bank's market value is an estimate of the present value of its future cash flows, Tobin's Q can be viewed as a measure of the contribution of the bank's intangible assets to this value, including its management's competence in choosing the right diversification strategies. Furthermore, markets' assessment of value drivers, such as capitalization and size, may change over time depending on economic developments and regulatory changes (Calomiris & Nissim, 2014). Focusing on Tobin's Q is therefore especially appropriate for our research context, since this measure incorporates markets' capitalization of diversification benefits which may have changed dramatically since the onset of the global financial crisis. For instance, while markets may have valued large and globally active banks highly before the crisis, a wide international reach may have been punished by markets after the crisis, given the additional regulatory costs faced by global systemically important banks (which may not be immediately visible on accounting indicators). Although, for all these reasons, our main emphasis is on bank value, our analysis also considers two accounting measures (return on assets and Z-score as proxies for profitability and risk, respectively), which allows us to make additional inferences about the impact of diversification on the overall bank performance.

The empirical approach of this paper involves two stages. In the first stage, we construct measures of intra-regional and inter-regional diversification and document the evolution of their average values over the period 2004-2013, for both DC banks and EC banks. In the second stage, we investigate the impact of these measures on Tobin's Q at the bank-level, and test whether the resulting effects vary with respect to home country attributes. To capture the existence of rich dynamics in bank valuations and correct for potential endogeneity problems stemming from simultaneous relationships between bank value and diversification measures,[6] we use a dynamic econometric framework and employ Generalized Method of Moments (GMM) estimation techniques.

[3]The only exception is the study by Grosser (2005), which describes the globalization strategies of the ten largest financial service providers.

[4]Financial services firms, compared to industrial multinationals, experience additional complexities in their internationalization strategies, due to difficulties in reconciling the strategic requirements of diverse products and national markets (Grant & Venzin, 2009). In addition, banks sometimes face conflicting regulation and supervision that may affect their incentives to diversify (Acharya *et al.*, 2006).

[5]See Laeven & Levine (2007), Deng & Elyasiani (2008) and Goetz *et al.* (2013) for a similar approach.

[6]Endogeneity may arise when highly valued banks are more likely to diversify regionally or globally; for instance, due to lower cost of external finance.

By way of preview, the main findings can be listed as follows. First, during the crisis and post-crisis years, there are significant shifts in international diversification both within and across different regions - even though these shifts are, on average, stronger for EC banks. Second, higher levels of geographic diversification are associated with changes in valuations for EC banks, but not for DC banks. Third, the direction of effects depends on the locus of destination of the diversification efforts: while higher levels of intra-regional diversification lead to large value enhancement, higher levels of inter-regional diversification seem to induce a negative (but statistically unstable) effect on the valuation of EC banks. Our results also reveal potential explanations of these findings. Banks originating from ECs - being small, growing and operating in economies which are less financially and institutionally developed - can derive benefits from pursuing a moderate expansion strategy that is concentrated in their home regions, which, due to country similarities and spatial proximities, entails low adaptation costs and risks. On the other hand, by engaging in greater inter-regional diversification, these banks face extensive challenges and high risks (especially in periods of heightened financial distress), which can eliminate or even outweigh the high profitability gains that can be drawn from having access to an expanded multi-regional network.

The rest of the paper proceeds as follows: Section 2 reviews the relevant literature and develops the main hypotheses to be tested; Section 3 presents the measures of intra-regional and inter-regional diversification, outlines the empirical strategy and describes the data and sampling procedure used; Section 4 reports the empirical results and investigates their robustness; Section 5 provides a discussion of the study's conclusions.

2 Literature Review and Hypotheses Development

2.1 Bank performance and international diversification

Geographic diversification can enhance the valuations of financial institutions through a variety of channels. For instance, higher levels of geographic diversification may reduce the exposure to idiosyncratic local shocks (Diamond, 1984; Deng & Elyasiani, 2008; Goetz *et al.*, 2016), enhance managerial efficiency (or x-efficiency) and scale and scope economies (Berger & DeYoung, 2001), diversify sources of funding, and improve internal capital markets (Houston *et al.*, 1997; de Haas & van Lelyveld, 2010; Cetorelli & Goldberg, 2012). However, geographic diversification can also lead to a discount in the valuation of financial institutions. Efficiency disadvantages may occur when inferior management practices are spread over a larger amount of resources or when transfers of managerial skills to new geographic markets are not possible (Berger & DeYoung, 2001). Difficulties associated with managing a larger and geographically diverse organization may result in scale and scope diseconomies. As the physical distance between bank headquarters and local offices increases, monitoring the local economic environment becomes more challenging and costly. Agency problems can be intensified as well, since geographic spread makes it more difficult for outsiders to monitor and exert effective corporate control (Deng & Elyasiani, 2008; Goetz *et al.*, 2013).[7]

Acknowledging that expanding into foreign markets is an important diversification strategy for banks, a large body of literature has offered insights into the motivations and the performance gains of internationalization. Higher levels of internationalization are found to be motivated by "follow the customer" effects, enhanced diversification benefits, opportunities for regulatory arbitrage, and the desire to access markets with better growth prospects and higher profit margins (Focarelli & Pozzolo, 2005; Magri *et al.*, 2005; Karolyi & Taboada, 2015).

[7]Studies also show that other forms of diversification, such as diversification of asset portfolio and activities, are associated with more risky behavior, scale and scope diseconomies, and intensified agency problems (see, for example, Acharya *et al.*, 2006; Laeven & Levine, 2007).

International expansion, however, also makes financial institutions subject to the 'liability of foreignness' (LOF); that is, "all additional costs a firm operating in a market overseas incurs that a local firm would not incur" (Zaheer, 1995, p.343). Differences in regulations and customer demand characteristics across national markets increase local market adaptation needs which, in turn, limit exploitation of cross-border economies of scope in financial services (Grant & Venzin, 2009). As a result, the international expansion effects can be influenced by geographic, cultural and institutional proximities (in addition to economic links) between the source and the host countries. Indeed, a number of studies (see, for instance, Galindo *et al.*, 2003; Buch & DeLong, 2004; Focarelli & Pozzolo, 2005; Claessens & van Horen, 2014b) show that such proximities are correlated with banks' cross-border expansion activities - and thus their performance - as they reflect informational problems and the learning costs of dealing with different institutional set-ups across countries. Given the needs of local market adaptation, transferring competitive advantages (based on organizational capabilities and resources) from home base to foreign units becomes the primary source of internationalization gains in financial services (Grant & Venzin, 2009).

Testing the LOF in global banking, existing studies offer a rather diverse picture. Miller & Parkhe (2002) find that foreign-owned banks are less x-efficient than host country banks, and that a bank's home environment has a strong impact on its efficiency abroad - as suggested by the national competitive advantage perspective. Berger *et al.* (2000), on the other hand, provide evidence in favor of a 'limited form' of the global advantage hypothesis. According to this variant, some foreign banks can overcome distance-related organizational diseconomies and other cross-border disadvantages and achieve better efficiency compared to domestic banks, due to favorable home-country market, regulatory and supervisory conditions. Studying the extent of diversification gains for the largest international banks from eight developed countries, García-Herrero & Vázquez (2013) obtain two findings: first, risk-adjusted returns increase when the allocation of assets overseas increases; second, regional concentration is detrimental to risk-adjusted returns.

The LOF, together with the foreign exchange risk on foreign assets and other market specific conditions (such as political and economic instability), may render international banks more risky, in line with the market risk hypothesis of Berger *et al.* (2014). Studies investigating the impact of international diversification on risk, however, tend to yield mixed results. For example, Gulamhussen *et al.* (2014) support a positive relationship between risk and international diversification for a cross-country sample of commercial banks, while Berger *et al.* (2014) support a positive relationship between risk and internationalization (measured by a bank's foreign assets to gross total assets) for US commercial banks. The existence of agency costs is possibly, according to the authors, the driving force behind their findings. In contrast, Buch *et al.* (2013) show that international banks headquartered in Germany are not riskier than domestic banks, and that the degree of diversification, rather than the scale of foreign assets, matters for risk. In a different vein, Fang & van Lelyveld (2014) find that the diversification-induced reduction of banks' credit risk depends on the degree of business cycle synchronization between home and host countries.

As the above discussion suggests, the findings on the relationship between international diversification and bank performance are still inconclusive, with empirical studies depicting both positive and negative relationships, or no effects at all.[8] Moreover, despite the importance of the context, the existing literature offers little insights on the performance implications of geographic diversification for banks originating from ECs.[9] Consequently, new research along

[8]Industry characteristics, institutional contexts and firm strategies have been emphasized as important factors moderating the multinationality-performance relationship in financial services (Venzin *et al.*, 2008).

[9]One important exception is a single-country study by Berger *et al.* (2010), which analyses the performance effects of diversification for Chinese banks along four dimensions: loans, deposits, assets and (local) geography.

these lines is needed, which should take into account the recent trends towards greater regional concentration and the heterogeneity of diversification effects across banks headquartered in countries with different levels of financial and institutional development. The present study seeks to do this.

2.2 Regional versus global geographic diversification

Recent advances in the international business literature note that multinational enterprises (MNEs) tend to be more regional than global, in terms of the breadth and depth of their market coverage, and that most of their international activity is conducted within their home regions (Rugman & Verbeke, 2004, 2007; Oh, 2009; Banalieva *et al.*, 2012). According to Rugman & Verbeke (2005), an MNE's tendency for regional concentration has transaction cost-related origins: a broader geographic scope is considered to be costly, since each foreign location requires location specific adaptation investments to link firm-specific advantages with location advantages abroad.

Countries within a region have low spatial distances and exhibit similarities in terms of geography, economics, institutions and politics. At the same time, regions are economically, culturally and geographically different from each other, and individual regions may have different discrimination policies against outsiders. Intra-regional diversification thus confers efficiency benefits, since knowledge and experience of one country can be applied to other countries within the same region (Qian *et al.*, 2010; Banalieva *et al.*, 2012).[10] Expanding into less proximate and dissimilar markets, conversely, increases the complexity and diversity of operations and necessitates higher location-specific investments. Hence, while inter-regional diversification helps firms to maximise market opportunities by improving strategic flexibility due to access to a wider multinational network, it exposes them to liability of *regional* foreignness which reduces efficiency and increases risks (Qian *et al.*, 2010; Banalieva *et al.*, 2012; Qian *et al.*, 2013).

Using data from 123 US-based MNEs, Qian *et al.* (2010) provide evidence in line with the above arguments. Specifically, they show that firm performance (measured by return on assets) has a positive and linear relationship with intra-regional diversification and an inverted U-shaped relationship with inter-regional diversification: while low to moderate levels of inter-regional diversification yield positive returns to MNEs, higher levels of inter-regional diversification result in diminishing returns. As a result, MNEs can maximize their potential returns by investing intra-regionally and by pursuing a moderate path of total geographic diversification. In sum, these findings suggest that the locus of destination of the diversification activities (intra-regional versus inter-regional) must be carefully considered when investigating the performance effects of geographic diversification. As argued by Rugman & Verbeke (2004), failure to do so may be a plausible reason for the mixed results reported in the international business literature.

An increasing regional focus (or home bias) in multinational banks' assets and operations has been recently documented in the banking literature (see, for instance, García-Herrero & Vázquez, 2013; Cetorelli & Goldberg, 2014; Claessens & van Horen, 2014a). There is some evidence that risk diversification benefits are limited when multinational banks concentrate their activities in specific geographic regions, due to similar economic fundamentals and exposures to common risk factors within the regions (García-Herrero & Vázquez, 2013; Fang & van Lelyveld, 2014). However, existing studies consider a very small number of global banks, do not simultaneously account for all potential gains and costs arising from pursuing

The authors report diversification discount for all four dimensions, partly due to inexperienced management and agency problems.

[10] Note that intra-regional diversification can be either home-region based or host-region based.

a regionally-focused strategy, and fail to appreciate the interplay between the regionalization effects and home country attributes. To address these issues, we utilize different diversification measures (capturing the level and intensity of diversification both within and across different regions) and examine their effects on bank valuations using data from banks originating from 56 countries with diverse economic and institutional settings.

2.3 Developed country banks versus emerging country banks

A number of studies have documented an upward trend in the international expansion activities of EC banks, especially since the onset of the global financial crisis (see, among others, Claessens & van Horen, 2014a; BIS, 2014). EC banks are stated to have the same motivations to exploit ownership and internalization advantages as DC banks, but, at the same time, they are found to be smaller, present in fewer countries and with more regional focus. This may suggest that their location choices - and hence their performance - are more sensitive to the cultural, institutional and geographic proximity to target countries (Van Horen, 2007; Petrou, 2007; BIS, 2014).

Theoretical frameworks on EC multinationals postulate that such firms expand internationally not only to exploit their existing competitive advantages, but also to access new markets, strategic assets and knowledge. By internationalizing, they can upgrade their competitive advantages, compete more effectively with global rivals, and avoid institutional voids and market constraints at home (Mathews, 2006; Luo & Tung, 2007). Hence, the international growth for EC banks can be more of a competence-enhancing strategy than a competence-exploiting strategy, as stated by the traditional accounts of bank internationalization (see Mariotti & Piscitello, 2010). In particular, by establishing a limited international presence, EC banks can obtain a more competitive access to financial resources and/or to intangibles (such as information or knowledge resources and reputation benefits), and, by transferring these firm-specific advantages back home, they can strengthen their domestic market positions (Boehe, 2016).[11]

It can be argued that, while EC banks can benefit from diversifying into far away and developed markets in search of strategic assets and capabilities, their ability to compete with DC banks in such markets and globally may be limited; for instance, due to more demanding regulatory requirements in these markets and missing unique firm-specific advantages, such as established brands. As stressed by Claessens & van Horen (2014b), banks from non-advanced countries may not be able to handle the (informational) disadvantages of distance as well as banks from advanced countries. On the other hand, EC banks may have a competitive advantage over DC banks in other EC markets, due to their familiarity with similar (adverse) institutional settings, and in markets which are culturally and geographically close to their home countries (Van Horen, 2007; Cuervo-Cazurra & Genc, 2008). At the same time, a regionally concentrated activity may allow EC banks - which, as already mentioned, are typically smaller and with less internationalization experience - to learn about operating in foreign markets, and thus improve their capabilities and international competitiveness, without facing extensive challenges and high risks. As a result, the marginal benefits that can be derived from further intra-regional diversification can be significantly more pronounced for these banks.

Based on these arguments, we expect the expansion activities of DC banks and EC banks to be assessed differently by the markets,[12] and the overall impact of geographic diversifica-

[11] Value created through the international expansion of EC firms is reported to be higher in the case of targets based in advanced economic and institutional environments (Gubbi *et al.*, 2010; Bhagat *et al.*, 2011).

[12] Rao-Nicholson & Salaber (2015) find that only acquisitions of DC banks by EC banks in the post-global financial crisis period created value for acquirers' shareholders.

tion on valuations for each bank group to be conditioned by the locus of destination of the diversification efforts. We test these hypotheses in the following sections.

3 Empirical Methodology

3.1 Alternative measures of international diversification

Two of the most commonly used measures of internationalization in the banking literature are *international share* and *international concentration* (see García-Herrero & Vázquez, 2013; Berger *et al.*, 2014; Gulamhussen *et al.*, 2014). Based on subsidiary presence, international share can be computed as:

$$\text{International share}_{it} = \frac{fn_{it}}{N_{it}}$$

where fn_{it} is the number of foreign subsidiaries and N_{it} is the total number of subsidiaries of bank i in year t. On the other hand, international concentration can be computed as a transformed Herfindahl index (H_{it}):

$$\text{International concentration}_{it} = 1 - H_{it} = 1 - \sum_{j=1}^{J} \left(\frac{n_{ijt}}{N_{it}} \right)^2 \tag{1}$$

where J is the total number of countries in which bank i has subsidiaries, and n_{ijt} is the number of subsidiaries in host country j in year t. Both measures vary in the interval $[0, 1]$, with values close to 0 indicating low geographic diversification and values close to 1 indicating high geographic diversification. The advantage of the latter measure is that it takes into account both the number of countries in which a bank is present and the share of subsidiaries in each country, and thus it can better assess the geographic dispersion of the bank's operations.

We calculate two versions of the Herfindahl-type measure: the first captures global-level concentration as in Eq. (1) ('International Concentration') and the second captures concentration within the region in which the parent bank is headquartered ('Regional Concentration'). To construct the regional index, we divide the countries into six continent-based regions: Africa, Asia, Europe, North and Central America, Oceania and South America. A continent-based regional classification is preferable to other systems, such as using the broad 'triad' markets of NAFTA, the European Union and Asia as in Rugman & Verbeke (2004), for two reasons: first, it encompasses all the countries in the world; and second, it does not change over time as the regions are defined along geographic rather than political lines. These attributes are critical for our analysis since we consider banks from all countries across the world, including banks headquartered or having subsidiaries in non-triad countries, and focus on exploiting time-series variation in their diversification strategies within and across the same regions.

The international business literature has proposed a wide range of firm-level internationalization measures that explicitly take into account the locus of diversification activities. Aggarwal *et al.* (2011) develop a classification system for the degree of a firm's multinationality based on the extent of geographic spread of operations and the degree of exposure to each geographic unit, whereas Banalieva & Santoro (2009) offer a finer-grained classification of a firm's geographic orientation that distinguishes between its local, regional, and global geographic segments. On the other hand, Qian *et al.* (2010) define total geographic diversification as the sum of two components: intra-regional (diversification across countries within a region) and inter-regional (diversification across different regions) - both measured based on entropy calculations.

Following the Qian *et al.* (2010) approach and utilizing the six continent-based regions, we construct inter-regional diversification ('INTER') as:

$$\text{INTER}_{it} = \sum_{m=1}^{M} s_{imt} \ln\left(\frac{1}{s_{imt}}\right) \qquad s_{imt} = \frac{n_{imt}}{N_{it}} \tag{2}$$

where M is the number of regions in which bank i has subsidiaries in year t, n_{imt} is the number of subsidiaries in region m in year t, and s_{imt} is the proportion of the m^{th} region to the bank's total number of subsidiaries in all regions in year t (N_{it}). Similarly, we construct intra-regional diversification ('INTRA') as:

$$\text{INTRA}_{it} = \sum_{m=1}^{M} s_{imt} \times \underbrace{\left[\sum_{j=1}^{J} w_{ijmt} \ln\left(\frac{1}{w_{ijmt}}\right)\right]}_{\text{INTRA}_{imt}} \qquad w_{ijmt} = \frac{n_{ijmt}}{N_{imt}} \tag{3}$$

where n_{ijmt} is the number of subsidiaries in host country j of region m in year t, and w_{ijmt} is the proportion of the number of subsidiaries in the j^{th} country to the total number of subsidiaries in the m^{th} region in year t (N_{imt}). In other words, INTRA_{it} is the weighted average of the corresponding regional-level entropy values INTRA_{imt}, the weight being previously defined as s_{imt}. We also calculate a modified intra-regional diversification measure, 'INTRA-Home', which accounts for subsidiary presence in the home regions only ($s_{imt} = 0$ if the m^{th} region is not the home region). This allows us to test whether the relationship between 'INTRA' and bank value is driven by diversification within the home region, where the parent banks have the least LOF.

The Qian *et al.* (2010) measures reflect not only the multiplicity of the foreign markets, but also the size of the foreign operations (see also Oh, 2009), as they incorporate information about the number of countries and regions in which a bank is present and the share of subsidiaries in each country (within a region) and in each region. Hence, compared to other approaches, they can more adequately capture the level and intensity of banks' international diversification within and across different regions and account for changes in the corresponding trends over the past years. Based on these arguments, 'INTRA', 'INTER' and 'TOTAL' (the sum of 'INTRA' and 'INTER') are our preferred measures for exploring the bank value effects of international diversification. However, the two Herfindahl-type indices ('International Concentration' and 'Regional Concentration') are also used as a means to address issues related to robustness, and to draw more specific implications about our findings.

3.2 Bank value model specification

To evaluate the impact of international diversification on bank value, we employ an empirical specification that builds on the work of Laeven & Levine (2007), Caprio *et al.* (2007), and Deng & Elyasiani (2008), and takes the following form:

$$Q_{int} = \alpha Q_{int-1} + \beta \text{'ID'}_{int} + \gamma \mathbf{X}_{int} + \delta \mathbf{Y}_{nt} + \xi_n + \lambda_t + u_{int} \tag{M.1}$$

where Q is the Tobin's Q, calculated as

$$Q = \frac{\text{Market Value of Equity} + \text{Book Value of Assets} - \text{Book Value of Equity}}{\text{Book Value of Assets}},$$

'ID' $\in$ {'TOTAL', 'INTRA', 'INTER'} is a measure of international diversification, as defined in Section 3.1; $\mathbf{X}$ is a vector of bank-level control variables; $\mathbf{Y}$ is a vector of country-level

control variables; i, n, t index bank, country, and time, respectively; ξ_n and λ_t represent country-specific[13] and year-specific effects, respectively; and u is an $i.i.d$ error term.

Vector $\mathbf{X}$ contains a broad range of bank-specific traits related to bank value commonly used in previous studies. Specifically, it includes: (i) non-interest income to total operating income ('Income Diversity') to account for differences in the diversity of financial activities that may affect bank risk, margins and value (DeYoung & Rice, 2004; Stiroh & Rumble, 2006; Goetz *et al.*, 2013); (ii) total equity to total assets ('Capitalization') to account for the interactions between capitalization levels and bank value, and as an indirect proxy for bank risk (Buch *et al.*, 2014); (iii) cost to income ('Operational Inefficiency') calculated as total operating expenses to total operating income (Caprio *et al.*, 2007); (iv) non-performing loans to gross loans ('NPL') as a proxy for loan quality and portfolio risk (Berger *et al.*, 2009); and, (v) bank size measured by three binary variables that group banks into total asset quartiles, calculated separately for each region to account for size-level differences across regions.[14]

On the other hand, vector $\mathbf{Y}$ includes the GDP growth rate ('Growth') and the inflation rate ('Inflation') as proxies of macroeconomic fluctuations and institutional effects in the home country of the parent bank (Demirgüç-Kunt & Huizinga, 2010), which are expected to influence not only a bank's market value, but also its capacity to diversify geographically. The previous period's Tobin's Q is also included among the explanatory variables to capture persistence over time.

As discussed in Section 2.3, the market's valuation of EC banks' internationalization strategies may be different than that of DC banks, and this relationship may depend on the locus of international diversification. To test this argument, we re-estimate model (M.1) with 'ID' replaced by the interaction terms 'ID $*$ EC' and 'ID $*$ DC', where 'EC' and 'DC' are binary variables coding banks headquartered in ECs and DCs, respectively. In this way, it is possible to estimate the impact of intra-regional, inter-regional and total diversification on bank value conditional on the origin of the parent bank (headquartered in DCs versus ECs).

Furthermore, as acknowledged in the literature, EC banks are capability constrained and suffer from country-specific disadvantages, such as higher cost of capital and institutional voids (see, for instance, Petrou, 2007; Boehe, 2016). They do not only operate in less financially developed markets compared to DC banks, but are also relatively smaller and late-comers to the internationalization stage. Thus, to examine whether the (potentially) different effects between EC banks and DC banks are driven by certain bank- and country-level characteristics, we implement additional tests based on the following extension of the baseline model:

$$Q_{int} = \alpha Q_{int-1} + \beta_1 \text{'ID'}_{int} + \beta_2 \text{'ID'}_{int} * (W_m)_{in} + \gamma \mathbf{X^s}_{int} + \delta \mathbf{Y}_{nt} + \zeta \mathbf{W}_{in} + \lambda_t + u_{int} \quad \text{(M.2)}$$

where $W_m \in \{\text{'Age}_m\text{'}, \text{'Size}_m\text{'}, \text{'Financial Development}_m\text{'}, \text{'Institutional Development}_m\text{'}\}$, measured in logarithms, with the subscript m representing the median value of bank-level yearly observations over the sample period; $\mathbf{W}$ is a vector that includes all four W_m variables; and, $\mathbf{X}^s$ is a sub-vector of $\mathbf{X}$ which contains the same variables as $\mathbf{X}$ apart from the dummies for bank size. Estimating this equation separately for each W_m and comparing the estimated coefficients β_1 and β_2 allows us to examine whether the diversification effects on bank value are different for older, more experienced banks, for larger banks, as well as for banks that operate in more financially and institutionally developed markets.

We estimate models (M.1) and (M.2) using the system GMM estimator proposed by Blundell & Bond (1998). This estimator is designed for short, wide panels (small T, large

[13] The model includes country dummies for countries with three or more banks and thus sufficient number of bank-year observations.

[14] As suggested by Cole & Gunther (1995) and Laeven & Levine (2007), large banks can diversify risks better and enjoy economies of scale and scope. In addition, if large banks are perceived to be 'too-big-to-fail', then size would be associated with lower cost of funding and higher value (Berger *et al.*, 1999).

N), and to fit linear models with one dynamic dependent variable, additional controls and fixed effects, and hence, it is appropriate for our data and model. In addition, it corrects for the endogeneity of potentially endogenous explanatory variables, like the international diversification measure and the bank-level control variables included in vector $\mathbf{X}$. To improve the precision of the two-step estimators for hypothesis testing, we apply the "Windmeijer finite-sample correction" to the reported standard errors. Furthermore, to reduce the risk of instrument proliferation and make sure that the number of instruments does not exceed the number of groups, we collapse the instrument set using the procedure described in Roodman (2009).[15] The consistency of the GMM estimator depends on the condition of no second-order serial correlation and the validity of instruments. To make sure that these conditions are met, we perform two tests: the Arellano-Bond test for second-order serial correlation of the differenced residuals, and the Hansen test for over-identifying restrictions.

3.3 Data, sampling procedure and sample characteristics

Data are mainly retrieved from two commercial databases provided by Bureau van Dijk: BankScope and Zephyr. To assemble our dataset, we first extract yearly accounting data[16] over the period 2004-2013 on all publicly listed banks in BankScope with total assets exceeding US$50 million.[17] We include commercial, savings, mortgage and cooperative banks, and holding companies and exclude investment and state banks, and non-bank credit institutions, which have no compelling reasons to internationalize their activities (Focarelli & Pozzolo, 2005). We also exclude banks headquartered in off-shore centers, such as Andorra, Bermuda, Bahamas, Cayman Islands, Panama and Saint Lucia, because they typically have less standard business models (Gulamhussen *et al.*, 2014). We then match our initial sample of parent banks with the yearly data of their significant subsidiaries; that is, subsidiaries that are at least 50% owned by the parent and account for at least 0.1% of parent-bank assets in the last available year. For each subsidiary (level 1), we check whether it owns sub-subsidiaries (level 2) that are larger than 0.1% of the ultimate bank owner (level 0) in the last available year.[18] If it does, we include the sub-subsidiaries as separate entities of the parent bank. Since ownership data in BankScope reflects the latest status, we use acquisition data from Zephyr to identify the ownership changes that occurred during the sample period. More precisely, for each subsidiary we trace back in which year t it was acquired and include it in the structure of the parent bank from $t+1$ onwards. Similarly, for each parent bank we trace back which subsidiaries it sold in year t and add these subsidiaries to the structure of the parent bank from $t-1$ backwards.

This procedure results in a final sample of 160 parent banks headquartered in 56 countries (23 DC and 33 EC).[19] The United States, Japan and China have the highest number of bank-

[15] The instruments used are lagged levels of the dependent variable and the endogenous covariates (bank-level controls) for the first differencing equation, and lagged differences of these variables for the level equation. The exogenous covariates (country-level control, year and size dummy variables) are instrumented by themselves in the level equation and by first-differences in the first differencing equation.

[16] All extracted financial variables are winsorized at the 1st and 99th percentiles.

[17] Since the main objective of this study is to investigate how bank valuations are affected by changes in geographic diversification within and across different regions, we focus on very large banks which tend to engage in internationalization strategies. Indeed, as suggested in the literature, small banks are significantly less likely to diversify across borders as they face additional challenges and costs (see, for example, Gulamhussen *et al.*, 2014). A complementary venue for future research would be to consider a much larger sample of banks and explore the bank- and country-level characteristics that determine the propensity to change geographic scope from domestic to international.

[18] To calculate these shares, we use consolidated financial statements for parent banks and unconsolidated financial statements for subsidiaries.

[19] Our EC group includes all the countries that are not classified as 'advanced economies' by the World Economic Outlook Database, October 2014 Edition.

year observations in our sample, with 11%, 8% and 6% of the total number of observations, respectively.[20] Table A.1 in the Appendix provides an overview of the top 30 most diversified parent banks in our sample, based on the maximum value of 'TOTAL'. Even though two EC banks exhibit the highest values of total geographic diversification in our sample (Ecobank Transnational Incorporated in Togo and Standard Bank Group Limited in South Africa), the majority of banks in the top 30 list are headquartered in DCs (21 banks). Furthermore, comparing the characteristics of banks in the top 30 list, we can see that: (i) DC banks are, on average, larger and present in more countries compared to EC banks, and (ii) most of the DC banks are based in Europe, reflecting their relatively small home markets and the European integration process which facilitated cross-border banking.

As a preliminary assessment of the characteristics of the sampled banks in terms of geographic orientation, we classify all bank-year observations into different categories based on the Aggarwal *et al.* (2011)'s scheme.[21] As shown in Table A.2, out of the 1310 bank-year observations, 340 (26%) are classified as domestic (D) and 354 (27%) as regional (R). Within the regional category, nearly all the observations indicate operations in less than one-third of the home-region countries ($R1$). The trans-regional category (T) is the largest one in our sample, with 616 (47%) bank-year observations. The most common types in the latter category are $T2$ and $T3$, indicating operations in two and three regions, respectively. No observations are categorized as type $R3$ or G, suggesting that no banks in our sample operate in more than two-thirds of the home-region countries or have full global reach. Splitting the sampled banks by origin confirms that DC banks are spread more widely across different regions compared to EC banks.

Data on macroeconomic and financial development variables are collected from the World Bank's World Development Indicators (WDI). Data on bilateral geographic, language and institutional distances are obtained from the CEPII's GeoDist Database (Mayer & Zignago, 2011) and the Heritage Foundation's Index of Economic Freedom. Descriptive statistics for all the time-varying regression variables are given in Table A.3, while the cross-correlation matrix for these variables is displayed in Table A.4.

[20] Although our sampling procedure identifies over 200 banks with headquarters in 56 countries, the US banks account for 33 percent of the original bank sample. Thus, to ensure that our results are not driven by a single country and that DC banks are not over-represented in our sample, we consider the 12 largest US banks for our analysis. Additionally, the US banking system is quite special in the sense that it is dominated by non-diversified domestic banks (see also Laeven & Levine, 2007), and, as pointed out by Fang & van Lelyveld (2014), a growing US bank is much less likely to become an international bank (compared, for example, to a European bank) due to the large size of the economy. Indeed, while in ECs and in other DCs, the percentage of non-diversified domestic banks with our sample characteristics is about 25%, in the US, the corresponding percentage reaches 90%. This is also in line with the finding of Mulder & Westerhuis (2015) that US banks have become, on average, much more nationally oriented over time (especially since the late 1990s). Thus, including a large number of US banks in a panel regression with more internationally diversified banks from other countries would lead to selection bias problem and misleading inferences, especially when comparing DC banks and EC banks. It must be stressed that our results hold when we exclude all US banks from our sample (see Section 4.2.3), and when we employ a different sampling procedure where we exclude all banks with no foreign subsidiaries in all years (results available upon request).

[21] According to the Aggarwal *et al.* (2011)'s classification system, a firm whose business activities take place entirely within its home country is defined as domestic (D), a firm that conducts business only in the region in which it is headquartered (home region) is defined as regional (R), and a firm that conducts business in more than one region is defined as trans-regional (T). R is further divided into three categories - $R1$ (less than one-third of the countries in the region), $R2$ (between one-third and two-thirds) and $R3$ (more than two-thirds) - and T is further divided into four categories - $T2$ (two regions), $T3$ (three regions), $T4$ (four regions), and $T5$ (five regions). A firm that conducts business in all six regions is defined as global (G).

4 Empirical Analysis

4.1 Evolution of international diversification

We begin our analysis by considering the evolution of international diversification between the years 2004 and 2013, using the measures described in Section 3.1, for both DC banks and EC banks.

Panels (a) and (b) of Figure 1 display the two Herfindahl-type indices of geographic concentration. Looking at 'International Concentration' (Panel (a)), a number of conclusions come to front. First, DC banks are more internationally diversified than EC banks, which is not surprising given that EC banks are relatively smaller and late-comers to the internationalization stage. Second, the degree of international diversification starts decreasing with the onset of the global financial crisis for both groups of banks. Third, EC banks experience a sharper drop in geographic diversification during the years 2008 to 2011 compared to DC banks, but manage to recover some of this reduction in the two years that follow (2012 and 2013). Focusing now on 'Regional Concentration' (Panel (b)), we can observe similar trends, even though the fluctuations during the crisis years seem to be less pronounced. Moreover, the gap in geographic diversification between the two bank groups is now negligible (compared to Panel (a)), suggesting that EC banks are more dispersed within their home region than internationally.

Panels (c), (d) and (e) of Figure 1 present the three geographic diversification measures of 'TOTAL', 'INTRA' and 'INTER' (our baseline measures), whereas Panel (f) displays the modified intra-regional diversification measure 'INTRA-Home'. As in Panel (a), we can see that the average level of total geographic diversification ('TOTAL') of DC banks is higher than that of EC banks, and this seems to be driven by higher levels of diversification both within regions ('INTRA) and across regions ('INTER'). Furthermore, all three baseline measures show an overall declining trend during the global financial crisis period (for both bank groups), with the most prominent downturn being observed in inter-regional diversification, starting in 2008 and ending in 2011. In the last couple of years, the two bank groups seem to pursue different strategies: while EC banks become intra-regionally and inter-regionally more diversified, DC banks engage in slightly lower levels of diversification. Finally, comparing the two intra-regional diversification measures, 'INTRA' and 'INTRA-Home', we can see that geographic diversification within the home-region accounts for almost all of the intra-regional diversification.

< Insert Figure 1 here >

It is worth noting that DC banks and EC banks exhibit similar within-bank variation in the diversification measures; for instance, the within-bank standard deviation of 'TOTAL' takes an average value of 0.06 for both bank groups. To provide an example of such within-bank variation, we consider the evolution of the three baseline diversification measures for one of the parent banks in our sample: Société Générale, a European multinational banking and financial services company headquartered in France.[22] During the second half of the 2000s, Société Générale grew its subsidiary presence in several European countries (Germany and Poland in 2006, Czech Republic and Croatia in 2007, and Russia in 2009), while, in 2012, following the Greek debt crisis, it sold its only subsidiary in Greece. As shown in Figure 2, these activities are reflected in changes in the value of 'INTRA' in the corresponding years. On the other hand, Société Générale's diversification does not change much over the sample period in terms of inter-regional expansion: the bank's 'INTER' falls in 2005 due to the sale of its Argentinean subsidiary, and follows a slightly declining trend up until 2009 due to enhanced

[22] The within-bank standard deviation of 'TOTAL' for 'Société Générale is 0.13.

regional focus (and thus lower diversification across different regions). Since 'INTRA' exhibits a larger variation compared to 'INTER' over the sample period, the evolution of 'TOTAL' for Société Générale reflects mostly the changes in the bank's intra-regional activities.

< Insert Figure 2 here >

4.2 Bank value and international diversification

4.2.1 Basic findings

We continue our analysis by estimating model (M.1) for the full sample period 2004-2013 (see columns (1) to (6) of Table 1). As a first point, we can see that the coefficient on the previous year's Tobin's Q is positive and statistically significant, indicating the persistence in bank value over time and justifying the use of a dynamic model. Furthermore, we can see that Tobin's Q improves during an economic upturn, as captured by the positive and statistically significant coefficient on 'Growth'. Turning now to our variables of interest, we find evidence that higher levels of total geographic diversification are associated with changes in valuations for EC banks, but not for DC banks: while the coefficient on 'TOTAL $*$ EC' in column (2) is positive and statistically significant, the coefficient on 'TOTAL $*$ DC' fails to reach statistical significance. The latter can explain the absence of diversification-induced value changes in column (1), where we consider the average diversification effect for all sampled banks. Finally, our results indicate that the observed relationship between total diversification and bank value for EC banks is driven by geographic expansion within regions, rather than across regions: the coefficient on 'INTRA $*$ EC' in column (4) is positive, statistically significant, and larger in size than that of 'TOTAL $*$ EC' in column (2), whereas the coefficient on 'INTER $*$ EC' in column (6) has the opposite sign and fails to reach statistical significance. Qualitatively, the results suggest that the steady-state value of Tobin's Q increases by 0.08 units (0.9 standard deviations) when 'TOTAL' increases by 1 unit, and by 0.11 (1.2 standard deviations) when 'INTRA' increases by 1 unit.[23]

Do the reported relationships persist when we focus on the crisis and post-crisis years, which are associated with heightened risk in international financial markets? To answer this question, we restrict our sample to include the period 2007-2013 and re-estimate the same regression set-up as in columns (1) to (6). The corresponding estimates, reported in columns (7) to (12) of Table 1, support the main findings of the previous paragraph: the value of EC banks responds positively to increasing levels of intra-regional diversification, which, in turn, produces an overall positive impact of 'TOTAL' on Tobin's Q. However, we now also find some evidence that greater inter-regional diversification is value-destroying for EC banks, suggesting that a wider multi-regional spread during crisis and post-crisis years is assessed negatively by the markets. More precisely, the long-run effect in column (12) implies that a unit increase in 'INTER' reduces the value of Tobin's Q by 0.15 units (1.7 standard deviations).[24] Concerning the control variables, we can notice that, when we focus on the shorter period, the coefficient on 'NPL' is now statistically significant at conventional levels of significance - with the negative sign indicating that, during periods of financial turmoil, poor asset quality becomes critically important and leads to lower values of Tobin's Q.

Overall, our findings suggest that the value impact of international diversification is conditioned by the home country of the parent bank: higher levels of diversification are associated

[23] The long-run (or steady-state) effect is calculated as $\beta/(1-\alpha)$.

[24] Note that this result is mainly driven by the two years of the global financial crisis, 2007 and 2008: when we restrict the sample to include only the post-crisis years 2009-2013, the estimated coefficient on 'INTER$*$EC' becomes much weaker, both economically and statistically.

with changes in valuations only for banks originating from ECs. At the same time, our findings indicate that the locus of internationalization matters for the direction of effects. While markets respond positively to intra-regional expansion activities, they seem to believe that EC banks cannot benefit from diversifying into far away areas, or that they cannot compete with DC banks at the global level, especially in periods of high risk.

To gain a more thorough understanding of the performance implications of geographic diversification, we further explore its impact on bank profitability and bank risk. Following Berger *et al.* (2010)'s arguments, if higher values of geographic diversification lead to an increase in bank profitability and a decrease in bank risk, then we can conclude that greater levels of diversification improve the overall bank performance. If, on the other hand, geographic diversification is found to be positively related to both bank profitability and bank risk, then the overall performance effects are ambiguous and would depend on what shareholders might perceive as efficient risk-return trade-off. To explore these arguments, we estimate the same regression set-up as in Table 1, but we now use proxies for bank profitability and bank risk as the dependent variable; namely, 'ROA' (return on assets) and 'Z-score' (calculated as the sum of return on assets and equity to assets ratio, scaled by the standard deviation of return on assets over the sample period).[25]

The results, presented in Table 2, indicate that higher values of total diversification boost EC banks' profitability, but, at the same time, translate into higher risk. Qualitatively, the long-run coefficients suggest that a unit increase in 'TOTAL' increases the value of 'ROA' by 0.71 units (0.7 standard deviations) and reduces the value of 'Z-score' by 2.04 units (2 standard deviations). These highly pronounced effects seem to be primarily driven by inter-regional expansion: when EC banks diversify across different regions, they enjoy much higher 'ROA' but are also exposed to much lower values of 'Z-score' (see long-run effects in columns (6) and (12)), leading to ambiguous effects on performance. On the other hand, intra-regional expansion seems to have an overall positive effect on performance: when EC banks follow a more regionally concentrated strategy, they achieve a moderate increase in profitability without being penalized as much in terms of risk (see long-run effects in columns (4) and (10)). These findings can explain, to some extent, markets' valuations of EC bank's intra-regional and inter-regional diversification activities found in Table 1 and discussed in the previous paragraphs. Notably, when we employ accounting measures of performance, the explanatory power of our bank-level control variables improves. More precisely, as shown in Table 2, higher levels of 'Capitalization' and lower values of 'Operational Inefficiency' and 'NPL' are generally associated with higher profitability and lower risk.

< Insert Table 1 and Table 2 here >

4.2.2 Variation across bank and country characteristics

As discussed in the previous sections, EC banks may not have the firm- and country-specific advantages associated with internationalization that DC banks do. To take a closer look at this issue, we compare the two bank groups in our sample across four bank- and country-level variables: 'Age_m' (number of years since establishment), 'Size_m' (total assets in billions of US dollars), '$\text{Financial Development}_m$' (domestic credit to private sector as % of GDP), and '$\text{Institutional Development}_m$' (the Heritage Foundation's Index of Economic Freedom).[26] We can discern that, on average, EC banks are younger, smaller, and originate from countries

[25] Higher 'Z-score' indicates lower probability of default (lower risk). Since the distribution of 'Z-score' is highly skewed, we use its logarithm in our regressions.

[26] Institutional development is based on four aspects of economic freedom (rule of law, government size, regulatory efficiency and market openness) and has been used in several related studies (see, for example, Francis *et al.*, 2008; Gubbi *et al.*, 2010).

with lower levels of financial and institutional development, and that the mean differences in these variables between the two bank groups are very large and statistically significant at the 1% confidence level (see Table 3).

Do the results reported in Table 1 change when we allow for variation in bank value with respect to the aforementioned bank and country characteristics? To answer this question, we augment the baseline specification (M.1) with the aforementioned variables (in logarithms) and omit the size- and country-specific effects. The estimates, presented in Table 4a, lead to the same overall conclusion: greater intra-regional diversification is value-creating for EC banks. However, according to this new specification, the value of EC banks responds negatively to increasing levels of inter-regional diversification, which, in turn, produces an overall negative impact of 'INTER' on Tobin's Q. Among the newly added variables, the coefficient on 'Institutional Development$_m$' enters with a positive sign and is statistically significant, suggesting that banks headquartered in countries with better property rights and higher levels of fiscal, business and trade freedom enjoy higher values of Tobin's Q.

The significant differences in bank- and country-specific characteristics between DC banks and EC banks raise also another important question: Which of these characteristics are driving the observed relationships between bank value and geographic diversification for the two bank groups? We thus take our analysis one step further and re-estimate the regression set-up of Table 4a with 'ID $*$ EC' and 'ID $*$ DC' replaced by the interaction between 'ID' and $W_m \in \{$'Age$_m$', 'Size$_m$', 'Financial Development$_m$', 'Institutional Development$_m$'$\}$; that is, we estimate model (M.2) separately for each W_m.[27] The estimates, displayed in Table 4b, yield two new results which are in line with our previous findings. First, markets respond more positively to increased intra-regional diversification when banks are smaller and originate from countries with lower values of financial and institutional development, with all being characteristics of EC banks. We infer this from the positive estimated long-run coefficients of 'ID' in column (4) of specifications III, IV and V, together with the negative and significant estimated long-run coefficients of 'ID $*$ Size$_m$', 'ID $*$ Financial Development$_m$' and 'ID $*$ Institutional Development$_m$'. Second, markets respond more negatively to a wider multi-regional spread when banks are smaller (which typically characterize ECs) - even though the corroborating evidence is statistically weak.[28] It must be stressed that, due to high correlations between the four variables under consideration, one has to be very cautious in prioritizing and uncovering links among the different sources of variation in the diversification effects. Nevertheless, the analysis in this section clearly indicates that a binary distinction between EC banks and DC banks can serve as a crude measure that may capture a number of these sources simultaneously.

< Insert Table 3, Table 4a and Table 4b here >

4.2.3 Robustness tests

We perform various tests to assess the robustness of the key findings, as discussed in Section 4.2.1. Table 5a and Table 5b display the results of different empirical specifications, where, for brevity and comparability, we focus on the interaction terms 'ID $*$ EC' and 'ID $*$ DC'. First, we check whether our results hold when we use, as dependent variable, alternative proxies of bank value; that is, the ratio of the market value of equity to the book value of equity,

[27] Including all the interaction terms in the same specification generates a great many instruments in the GMM estimation and weakens the Hansen test of the instruments' joint validity. In addition, it leads to collinearity and identification problems, which affects the interpretability of the estimated coefficients.

[28] Specifically, while the estimated long-run coefficients of 'ID' and 'ID $*$ Size$_m$' are opposite in sign, only the former appears to be (marginally) statistically significant.

'MV-to-BV' (columns (1)-(3)), and the ratio of the market value of equity to total assets, 'MV-to-Assets' (columns (4)-(6)).[29] Second, we test whether our results become less pronounced when we replace 'INTRA' with 'INTRA-Home' (columns (7)-(9)). Third, we examine the sensitivity of our results when we adopt subsidiary asset-based (instead of presence-based) measures of total, intra-regional, and inter-regional geographic diversification (columns (10)-(12)).[30] Fourth, we exclude the US banks and the Chinese banks, which constitute the largest country-groups of DC banks and EC banks, respectively, in our sample (columns (13)-(18)). Finally, we experiment by re-defining 'TOTAL', 'INTRA' and 'INTER' to capture geographic diversification within and across five regions, instead of six (columns (19)-(21)).[31] Overall, the estimates obtained are broadly consistent with those reported in the baseline specification: intra-regional diversification, and particularly diversification across the home-region countries, is value-creating for EC banks, which leads to an overall positive impact of 'TOTAL' on Tobin's Q. To further explore whether these effects are asymmetric, in that decreases in geographic diversification have a greater impact on bank value compared to increases, we estimate the baseline specification using weighted regressions, where double weight is assigned to banks that do not exhibit decreases in 'TOTAL' during the sample period. As shown in columns (22) to (24), the results are not much influenced by this exercise, and hence do not provide convincing evidence of such asymmetric effects.

Although our diversification measures implicitly take into account that inter-regional investment involves markets far away from banks' home regions, they do not explicitly utilize a metric for bilateral distance. As argued by Ghemawat (2001), distance has cultural, administrative, geographic and economic dimensions, and results in costs and risks in doing business internationally. To investigate whether the observed 'INTRA' and 'INTER' effects are simply driven by bilateral distance effects between the source and the host countries, we replace our baseline measures with direct metrics of distance; namely, 'Geographic Distance', 'Language Distance' and 'Institutional Distance'. Each indicator is calculated as a weighted average of the distance between the home country of the parent bank and the countries of residence of its subsidiaries, where the weight is the parent bank's share of subsidiaries in each country. For 'Geographic Distance' we use the logarithm of bilateral distances in kilometers, while for 'Institutional Distance' we use the logarithm of bilateral differences in institutional development. 'Language Distance' is based on the CEPII's Common Language Index, re-scaled to reflect distance instead of proximity between countries. The estimates, displayed in columns (1) to (6) of Table 6, fail to uncover strong relationships between bank value and direct measures of distance: the three indicators exert little influence on the dependent variable, and this result persists when we partition the sample into DC banks and EC banks. Interestingly, when we employ instead the two Herfindahl-type indices discussed in Section 3.1, we obtain results that suggest that our previous findings are indeed due to the distinction between global and regional dispersion (see columns (7)-(10) of Table 6). Specifically, while the coefficient on '$\Theta * \text{EC}$' is positive and statistically significant at the 10% confidence level in the regression with 'International Concentration', it becomes larger in magnitude and highly statistically significant in the regression with 'Regional Concentration'.

Overall, the results of Table 6 point to two conclusions. First, the simplicity of the direct

[29] The first measure has been employed in other studies (see, for example, Caprio *et al.*, 2007), whereas the second measure is based on Bankscope's definition for Tobin's Q.

[30] The asset-based measures are constructed using Eqs. (2) and (3), but now incorporate information about the proportion of subsidiary assets instead of the proportion of subsidiaries. Since for a large number of subsidiaries in our sample, the value of assets is available for a limited number of years, we calculate these measures using the median of each subsidiary's assets over the sample period. Therefore, while the asset-based measures take into account the relative size of each subsidiary, they do not vary when a subsidiary becomes larger or smaller over time.

[31] To do that, we merge 'Asia' and 'Oceania' into one region.

metrics of distance, and the fact that the various dimensions of distance may affect different banks in different ways depending on their firm- and country-specific attributes, complicate the estimation of markets' responsiveness to proximity changes between source and host countries. Second, our baseline measures - that take into account the level and intensity of geographic dispersion, both across countries within a region and across different regions, and, at the same time, are correlated with the different dimensions of distance (see correlation matrix in Table A.4) - can more adequately capture diversification-induced value changes.

Additional tests are conducted to further examine the sensitivity of our results, such as using different classifications of DCs and ECs,[32] employing different instrument structures, and considering separate regressions for EC banks and DC banks.[33] Estimates based on these tests are very similar to our baseline estimates and do not change the inferences drawn (results available upon request).

< Insert Table 5a, Table 5b and Table 6 here >

5 Conclusions

The global banking system has now become more heterogeneous than ever before due to the increasingly important role of banks from emerging markets and the rising trend towards greater regional activity. The existing literature on the internationalization - bank performance debate ignores the locus of geographic diversification and fails to appreciate the conditionality of effects upon home country attributes. Our study fills this gap by exploring the valuation impacts of both intra-regional and inter-regional diversification, and by examining whether the resulting effects vary between banks headquartered in ECs and those headquartered in DCs. To this end, we consider data from the largest banks across the world over the period 2004-2013, and employ GMM estimation techniques.

The overall picture that emerges from the comparison of different diversification measures is that the level and intensity of banks' international diversification vary significantly over time, as well as between EC banks and DC banks. In particular, while the degree of international diversification starts decreasing with the onset of the global financial crisis for both groups of banks, EC banks experience a sharper drop in diversification during the years 2008 to 2011. Furthermore, EC banks manage to recover some of this reduction in the two years that follow, mostly due to increased intra-regional expansion. Concerning the valuation impacts, two key results emerge. First, higher levels of geographic diversification are associated with changes in valuations for EC banks, but not for DC banks. Second, while markets respond positively to the intra-regional expansion activities of EC banks, they seem to believe that these banks cannot benefit from diversifying into far away areas or that they cannot compete with DC banks in such areas.

Further analysis in this study sheds light on potential explanations for the aforementioned findings. When EC banks diversify across different regions, they enjoy high profitability gains as they can capitalize on strategic assets, capabilities and markets outside their home region, but, at the same time, they are exposed to much higher levels of risk, leading to ambiguous effects on performance. On the other hand, when they engage in a more regionally-concentrated strategy, they can achieve a moderate increase in profitability without being penalized as much

[32] For instance, treating South Korea as an EC based on the MSCI Market Classification Framework does not alter our findings.

[33] This, of course, reduces the number of banks for each regression and makes the GMM estimation results less reliable. However, the key inferences do not change when we employ (bank) fixed effects and estimate the impact of past changes in diversification on current changes in bank valuations, separately for each bank group. Specifically, when we focus on the sample of EC banks we find, once again, that intra-regional diversification is value-creating for these banks.

in terms of risk. Through intra-regional diversification, it is indeed possible to access different markets and resources embedded in different countries in the region, while, due to geographic proximities and institutional and cultural similarities, adaptation costs and risks remain relatively low. As suggested by Arregle *et al.* (2009), although countries continue to matter, national markets in the same region share similarities that decrease the newness of the problems and the liability of foreignness. Given that a regional focus is becoming increasingly important in global banking, the absence of value gains for DC banks (as observed in this paper) can be attributed, to some extent, to dismal growth prospects and costly regulations in the banking markets of these countries, especially since the onset of the global financial crisis. Furthermore, as showcased here, DC banks do not only operate in more financially and institutionally developed countries, but are also larger, more mature and earlier-comers to the internationalization stage compared to EC banks. Consequently, the marginal benefits and costs of pursuing further geographic diversification (either regionally or globally), as well as markets' responses to diversification strategy changes, can be much weaker for these banks.

The expansion of international financial institutions has been particularly strong since the mid-1990s, reflecting the sharp increase in financial globalization. Given the concerns about global banks serving as a risk transmission channel, the extent of international diversification gains in banking is critically important for investors, bankers and policy-makers. The design of regulatory policies and geographic expansion strategies should take into account that aggregate or total international diversification is not a sufficient indicator of bank multinationality, and that the value gains from international expansion depend on the banks' home country set-ups and the locus of international diversification, as indicated by the results of this paper. In particular, our finding that EC banks' valuations are highly responsive to their internationalization strategies may be of help to policy-makers in ECs, with regards to implementing policies aiming at encouraging the diversification of banking, especially within the same region.

A Appendix

See Table A.1, Table A.2, Table A.3 and Table A.4.

Table A.1: Overview of top 30 most diversified parent banks

Bank Name	Home Country	DC vs EC	Total Assets[a]	Number of Subsidiaries	Host Countries
Ecobank Transnational Incorporated	TG	EC	8	24	BF, BI, BJ, CD, CF, CG, CI, CM, GA, GN, GW, KE, LR, ML, NE, NG, RW, SL, SN, TD, TG, TZ, UG, ZW
Standard Bank Group Limited	ZA	EC	162	18	AO, BW, CD, GB, GH, KE, LS, LU, MU, MW, MZ, NA, RU, SZ, ZA, ZM
Banco Santander SA	ES	DC	1461	19	BE, BO, BR, CH, CL, CO, ES, GB, IT, MX, PL, PT, RU, US, UY, VE
Standard Chartered Plc	GB	DC	437	17	AU, BW, CN, GB, GH, KE, KR, MU, MY, NG, TH, TZ, UG, VN, ZM
BNP Paribas	FR	DC	2516	15	BE, BR, CN, DZ, ES, FR, IT, LU, MG, PL, RU, TR, UA, US
Société Générale	FR	DC	1528	26	AR, BR, CI, CN, CZ, DE, DZ, FR, GR, HR, MA, PL, RO, RS, RU, SI, TN
Bank of Nova Scotia (The) - SCOTIABANK	CA	DC	668	13	AR, CA, CL, CO, CR, GB, JM, MX, PE, SV, TT, US
UniCredit SpA	IT	DC	1223	17	AT, BG, CZ, DE, HR, IT, LU, PL, RO, RS, RU, SI
HSBC Holdings Plc	GB	DC	2410	14	AR, BR, CN, EG, FR, GB, MT, MX, MY, TR, VN
Deutsche Bank AG	DE	DC	2668	16	BR, CN, DE, ES, GB, IT, LU, MY, NL, RU, US
Banco Bilbao Vizcaya Argentaria SA	ES	DC	745	11	AR, BR, CL, CO, ES, MX, PT, PY, US, UY, VE
Citigroup Inc	US	DC	1857	10	BE, CN, IE, JP, KZ, MX, MY, PE, US
Commerzbank AG	DE	DC	758	11	AT, BR, DE, GB, HU, ID, LU, PL, RU
Intesa Sanpaolo	IT	DC	864	11	AL, AR, BR, CL, DE, EG, FR, IE, IT, SI, UY
DnB ASA	NO	DC	315	7	DK, LT, LU, LV, NO, PL, RU
Sumitomo Mitsui Financial Group, Inc	JP	DC	1569	9	BR, CA, CN, GB, ID, JP, US
Credit Suisse Group AG	CH	DC	1014	9	CH, DE, FR, GB, IT, LU, MX
KBC Groep NV/ KBC Groupe SA-KBC Group	BE	DC	429	11	BE, CZ, DE, HU, LU, RS, SK
OTP Bank Plc	HU	EC	46	6	HR, HU, ME, RO, RS, SK
Attijariwafa Bank	MA	EC	37	6	CG, CI, FR, GA, ML, SN
Access Bank Plc	NG	EC	9	6	CD, GB, GH, RW, SL, ZM
Shinhan Financial Group	KR	DC	250	7	CN, DE, JP, KR, US, VN
FirstRand Limited	ZA	EC	101	7	LS, MZ, NA, SZ, ZA, ZM
Mitsubishi UFJ Financial Group Inc-Kabushiki Kaisha Mitsubishi UFJ Financial Group	JP	DC	1824	7	CA, CN, JP, MY, NL, US
Barclays Plc	GB	DC	2283	8	EG, ES, GB, KE, US, ZA
Nordea Bank AB (publ)	SE	DC	731	8	DK, FI, LU, NO, RU, SE
Erste Group Bank AG	AT	DC	272	11	AT, CZ, HR, RO, RS, UA
Byblos Bank S.A.L.	LB	EC	10	5	AM, BE, CD, SD, SY
United Bank for Africa Plc	NG	EC	13	5	BF, CM, GH, TZ, UG
CTBC Financial Holding Co Ltd	CN	EC	73	5	CA, CN, ID, PH, US

[a] Median of total assets over the sample period (in billions of US dollars). Country names are according to ISO 3166-2 classification.

Table A.2: Classifying bank-year observations using Aggarwal *et al.* (2011)' system

	All countries			Developed countries			Emerging countries		
Symbol	Count	Perc	Cum Perc	Count	Perc	Cum Perc	Count	Perc	Cum Perc
D	340	26.0	26.0	213	28.0	28.0	127	23.2	23.2
R1	344	26.3	52.2	174	22.8	50.8	170	31.0	54.2
R2	10	0.8	53.0	0	0.0	50.8	10	1.8	56.0
T2	428	32.7	85.7	202	26.5	77.3	226	41.2	97.3
T3	126	9.6	95.3	111	14.6	91.9	15	2.7	100.0
T4	42	3.2	98.5	42	5.5	97.4	0	0.0	100.0
T5	20	1.5	100.0	20	2.6	100.0	0	0.0	100.0
Total	1310	100.0	100.0	762	100.0	100.0	548	100.0	100.0

D: Banks with subsidiary presence only within their home country in year t; **R1**: Banks with subsidiary presence only in the region in which they are headquartered in year t, and in less than one-third of the countries in that region; **R2**: Banks with subsidiary presence only in the region in which they are headquartered in year t, and in one-third to two-thirds of the countries in that region; **T2**, **T3**, **T4**, and **T5**: Banks with subsidiary presence in two regions, three regions, four regions, and five regions in year t, respectively.

Table A.3: Descriptive statistics and data sources for the time-varying regression variables

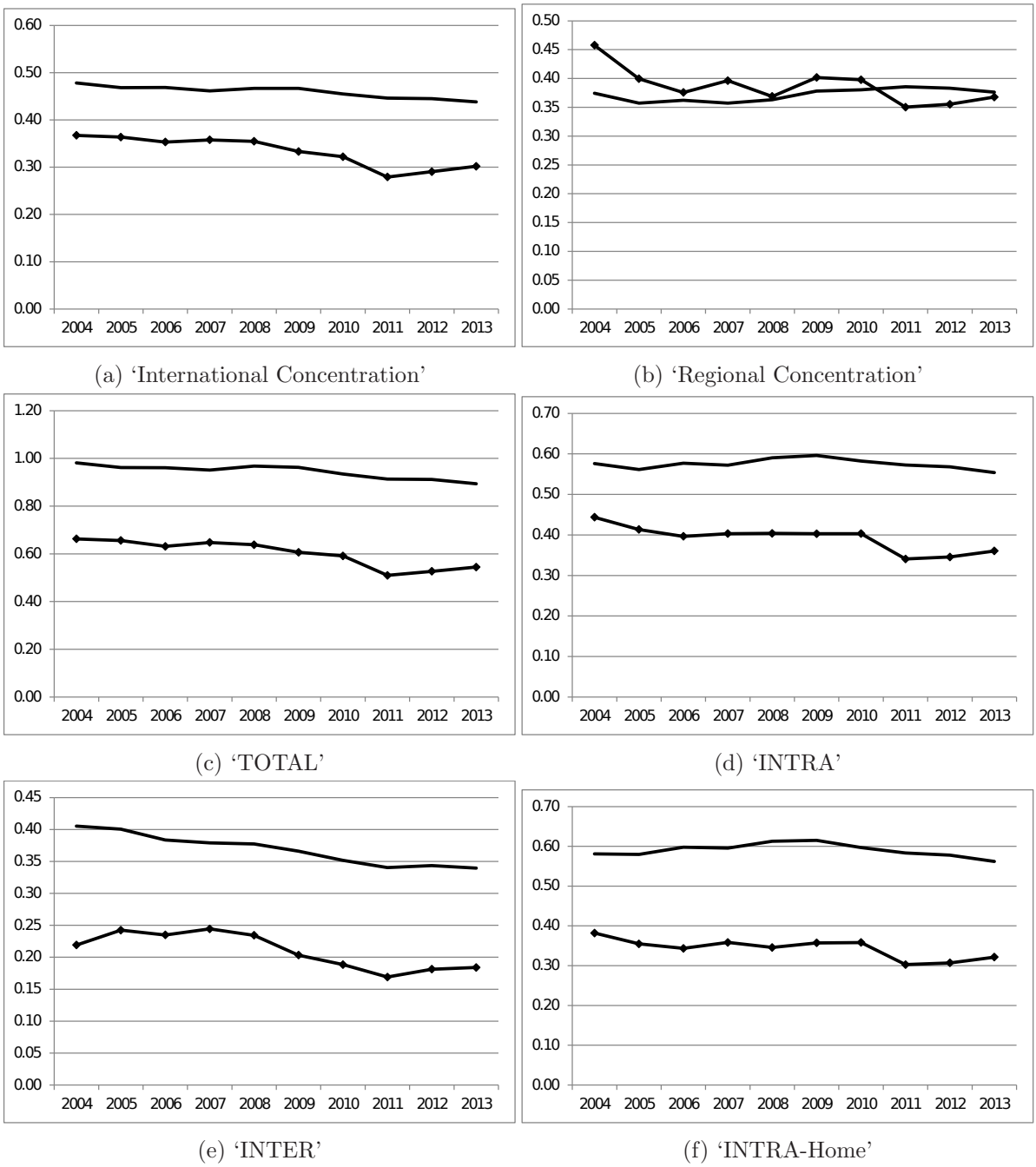
Variable	Obs	Mean	Std Dev	Min	Max	Source
Tobin's Q (Q)	1135	1.03	0.09	0.86	1.47	BankScope
ROA	1109	1.06	1.05	-1.84	5.59	BankScope
Z-score (log)	1102	2.11	1.02	-0.26	5.56	BankScope & OC
Income Diversity	1109	0.42	0.19	-0.06	0.98	BankScope
Capitalization	1135	0.09	0.05	0.01	0.28	BankScope
Operational Inefficiency	1109	0.58	0.14	0.22	1.09	BankScope
NPL	1089	0.02	0.02	0.00	0.11	BankScope
Growth	1135	0.03	0.04	-0.15	0.18	WDI
Inflation	1135	0.04	0.09	-0.28	1.04	WDI
TOTAL	1042	0.80	0.83	0.00	3.18	BankScope & OC
INTRA	1042	0.50	0.66	0.00	3.18	BankScope & OC
INTER	1042	0.30	0.42	0.00	1.43	BankScope & OC
International Concentration	1042	0.40	0.36	0.00	0.96	BankScope & OC
Regional Concentration	1042	0.39	0.40	0.00	1.00	BankScope & OC
Geographic Distance (log)	1042	7.29	1.20	4.36	9.37	CEPII
Language Distance	1042	0.44	0.32	0.00	1.00	CEPII
Institutional Distance (log)	1034	1.58	1.08	0.00	3.41	IEF

WDI: World Bank's World Development Indicators; **OC**: Own Calculations; **CEPII**: CEPII's GeoDist Database (Mayer & Zignago, 2011); **IEF**: The Heritage Foundation's Index of Economic Freedom.

Table A.4: Cross correlation matrix

	Tobin's Q	ROA	Z-score	Income Diversity	Capitalization	Operational Inefficiency	NPL	Growth	Inflation
Tobin's Q	1.00								
ROA	0.57	1.00							
Z-score	0.03	0.13	1.00						
Income Diversity	0.15	0.10	-0.17	1.00					
Capitalization	0.29	0.66	0.15	0.05	1.00				
Operational Inefficiency	-0.27	-0.41	-0.29	0.31	-0.27	1.00			
NPL	0.01	0.03	-0.18	-0.19	0.29	-0.13	1.00		
Growth	0.17	0.32	0.26	-0.06	0.29	-0.21	-0.04	1.00	
Inflation	0.07	0.27	0.00	-0.01	0.30	-0.09	0.15	0.23	1.00
TOTAL	-0.09	-0.20	-0.05	0.06	-0.32	0.04	-0.10	-0.15	-0.04
INTRA	-0.08	-0.16	-0.07	0.02	-0.27	0.02	-0.02	-0.16	-0.03
INTER	-0.05	-0.13	0.01	0.09	-0.21	0.05	-0.17	-0.04	-0.03
International Concentration	-0.05	-0.17	-0.05	0.03	-0.31	0.01	-0.10	-0.11	-0.02
Regional Concentration	-0.01	-0.13	-0.06	0.01	-0.17	-0.04	0.05	-0.05	-0.02
Geographic Distance	0.06	0.00	0.11	0.10	-0.04	-0.09	-0.08	0.18	0.04
Language Distance	0.12	0.08	0.06	-0.11	0.03	-0.18	0.12	0.13	0.12
Institutional Distance	0.04	-0.03	0.06	-0.12	-0.05	-0.20	0.09	0.11	0.08

	TOTAL	INTRA	INTER	International Concentration	Regional Concentration	Geographic Distance	Language Distance	Institutional Distance	
TOTAL	1.00								
INTRA	0.87	1.00							
INTER	0.60	0.13	1.00						
International Concentration	0.95	0.79	0.63	1.00					
Regional Concentration	0.48	0.59	0.00	0.46	1.00				
Geographic Distance	0.36	0.09	0.58	0.39	0.36	1.00			
Language Distance	0.44	0.39	0.26	0.47	0.58	0.59	1.00		
Institutional Distance	0.47	0.34	0.39	0.53	0.57	0.68	0.79	1.00	



(a) 'International Concentration'

(b) 'Regional Concentration'

(c) 'TOTAL'

(d) 'INTRA'

(e) 'INTER'

(f) 'INTRA-Home'

Figure 1: 'International Concentration', 'Regional Concentration', 'TOTAL', 'INTRA', 'INTER' and 'INTRA-Home' for developed countries (solid lines) and emerging countries (marked lines)

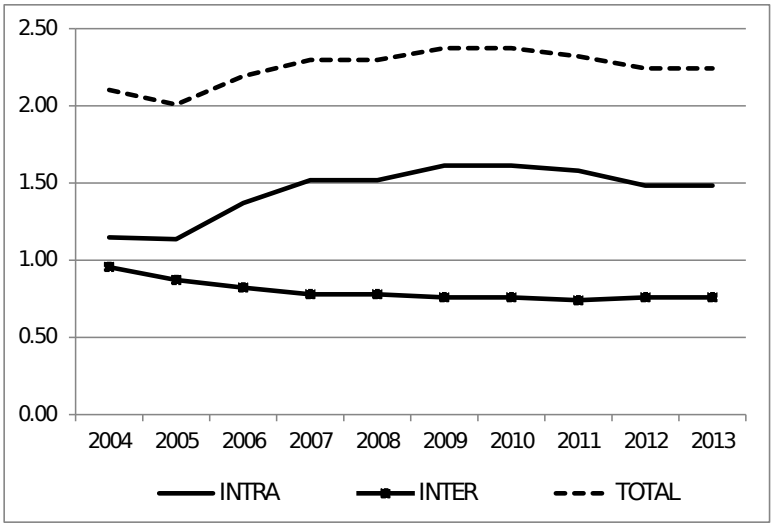


Figure 2: 'TOTAL', 'INTRA' and 'INTER' for Société Générale

Table 1: Diversification and value: basic results

Dependent variable: Tobin's Q. Method: System Generalized Method of Moments.												
	Estimation period: 2004-2013 (baseline specification)						Estimation period: 2007-2013					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lagged Dependent	0.31***	0.34***	0.31***	0.32***	0.28***	0.28***	0.21*	0.24**	0.19	0.26**	0.19	0.21
	(3.32)	(4.02)	(3.06)	(3.38)	(2.96)	(2.87)	(1.74)	(2.33)	(1.47)	(2.34)	(1.37)	(1.57)
TOTAL	0.01						0.01					
	(0.81)						(0.29)					
INTRA			0.02						0.02			
			(1.04)						(0.85)			
INTER					0.01						-0.08	
					(0.01)						(1.32)	
ID $*$ EC[a]		0.05**		0.07**		-0.04		0.05**		0.07***		-0.12
		(2.49)		(2.22)		(0.53)		(2.23)		(3.21)		(1.62)
ID $*$ DC[a]		-0.01		0.01		0.03		-0.01		-0.01		-0.09
		(0.12)		(0.28)		(0.41)		(0.14)		(0.28)		(0.88)
Income Diversity	0.01	0.02	-0.01	0.01	0.03	0.05	-0.01	-0.02	-0.01	-0.02	-0.03	-0.04
	(0.09)	(0.40)	(0.01)	(0.19)	(0.50)	(0.65)	(0.18)	(0.40)	(0.22)	(0.48)	(0.43)	(0.48)
Capitalization	-0.46	-0.43	-0.62*	-0.56	-0.56	-0.46	0.04	-0.05	-0.22	-0.14	-0.13	-0.05
	(1.36)	(1.11)	(1.94)	(1.52)	(1.49)	(1.17)	(0.10)	(0.14)	(0.52)	(0.34)	(0.32)	(0.11)
Operational Inefficiency	-0.04	-0.05	-0.02	-0.03	-0.02	-0.05	-0.01	-0.01	0.01	-0.01	0.02	-0.02
	(0.78)	(0.87)	(0.40)	(0.53)	(0.26)	(0.98)	(0.09)	(0.14)	(0.07)	(0.07)	(0.28)	(0.44)
NPL	-0.49	-0.69*	-0.55	-0.89**	-0.62	-0.59	-0.79*	-1.00**	-0.90**	-1.08**	-0.74*	-0.74*
	(1.35)	(1.95)	(1.38)	(2.17)	(1.61)	(1.57)	(1.79)	(2.09)	(2.05)	(2.44)	(1.89)	(1.85)
Growth	0.52***	0.38*	0.59***	0.49***	0.53***	0.58***	0.38**	0.26	0.46**	0.30	0.31	0.27
	(3.01)	(1.93)	(3.10)	(2.71)	(3.89)	(3.50)	(2.03)	(1.28)	(2.41)	(1.53)	(1.48)	(1.23)
Inflation	0.08	0.03	0.12**	0.08	0.11	0.10*	0.07	0.03	0.13*	0.06	0.12	0.12
	(1.32)	(0.41)	(2.03)	(1.36)	(1.62)	(1.71)	(1.00)	(0.52)	(1.84)	(1.23)	(1.46)	(1.59)
Long-run effect (ID)	0.02		0.03		0.01		0.01		0.03		-0.09	
Long-run effect (ID $*$ EC)		0.08**		0.11**		-0.06		0.07**		0.10***		-0.15*
Long-run effect (ID $*$ DC)		-0.01		0.01		0.04		-0.01		-0.01		-0.11
Year, country, size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	900	900	900	900	900	900	771	771	771	771	771	771
Number of banks	150	150	150	150	150	150	149	149	149	149	149	149
Number of instruments	110	124	110	124	110	124	107	121	107	121	107	121
AR(2) p-value[b]	0.86	0.90	0.92	0.99	0.84	0.85	0.96	0.99	0.97	0.89	0.99	0.95
Hansen p-value[c]	0.35	0.44	0.53	0.45	0.29	0.47	0.26	0.46	0.16	0.25	0.13	0.27

Columns report estimated coefficients ($|z|$-statistics). Equations estimated using Windmeijer WC-robust standard errors. [a] ID $\in$ {'TOTAL', 'INTRA', 'INTER'}. [b] Reports the Arellano-Bond test p-value for serial correlation of order two in the first-differenced residuals, where H_0: no autocorrelation. [c] Reports the Hansen test p-value for over-identifying restrictions, where H_0: over-identifying restrictions are valid. ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.

Table 2: Diversification, profitability and risk

Method: System Generalized Method of Moments. Estimation period: 2004-2013.												
	Dependent variable: ROA						Dependent variable: Z-score					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lagged Dependent	0.22**	0.21*	0.25**	0.23**	0.19**	0.23**	0.89***	0.89***	0.89***	0.90***	0.90***	0.84***
	(2.03)	(1.74)	(2.36)	(2.25)	(2.14)	(2.47)	(20.93)	(23.53)	(21.67)	(21.91)	(18.65)	(14.82)
TOTAL	0.25						-0.13					
	(1.05)						(1.64)					
INTRA			0.10						-0.11			
			(0.37)						(1.42)			
INTER					0.75						-0.31	
					(1.53)						(1.22)	
ID $*$ EC[a]		0.57**		0.42*		1.26*		-0.23***		-0.15**		-0.71**
		(2.03)		(1.70)		(1.87)		(2.66)		(1.96)		(2.39)
ID $*$ DC[a]		0.10		0.11		0.20		-0.08		-0.11		-0.04
		(0.40)		(0.43)		(0.23)		(0.68)		(0.89)		(0.15)
Income Diversity	-0.24	-0.01	-0.27	-0.31	0.08	0.05	-0.05	-0.01	-0.16	-0.03	-0.10	-0.19
	(0.37)	(0.01)	(0.41)	(0.42)	(0.12)	(0.06)	(0.12)	(0.03)	(0.44)	(0.08)	(0.28)	(0.61)
Capitalization	7.54**	5.85*	6.52*	6.19*	7.91***	6.71**	2.05*	2.75***	2.01	2.08**	2.00*	3.24**
	(2.46)	(1.78)	(1.91)	(1.72)	(2.96)	(2.26)	(1.87)	(2.69)	(1.51)	(1.98)	(1.91)	(2.42)
Operational Inefficiency	-3.66***	-2.97***	-3.46***	-3.25***	-3.55***	-3.23***	-0.90***	-0.90***	-0.87***	-0.98***	-0.74***	-0.64**
	(5.18)	(4.34)	(4.20)	(4.94)	(5.85)	(6.39)	(3.32)	(3.63)	(2.66)	(3.39)	(2.75)	(2.41)
NPL	-13.32***	-14.42***	-12.31***	-14.14***	-13.30***	-12.31***	-2.17	-1.26	-1.96	-1.15	-1.92	-2.79
	(2.80)	(3.61)	(3.28)	(3.89)	(3.66)	(3.41)	(1.22)	(0.67)	(1.13)	(0.70)	(1.26)	(1.58)
Growth	0.66	0.44	0.34	0.22	-0.02	-0.51	-2.20***	-2.05**	-1.95**	-2.02**	-1.58**	-1.11
	(0.28)	(0.23)	(0.14)	(0.12)	(0.01)	(0.29)	(3.14)	(2.57)	(2.05)	(2.36)	(2.50)	(1.58)
Inflation	1.03*	0.82	1.07*	1.07**	0.64*	0.32	-0.06	-0.07	-0.08	-0.13	0.03	0.19
	(1.77)	(1.39)	(1.81)	(2.04)	(1.65)	(0.67)	(0.39)	(0.38)	(0.44)	(0.78)	(0.29)	(1.35)
Long-run effect (ID)	0.32		0.14		0.92		-1.19*		-1.04		-3.16*	
Long-run effect (ID $*$ EC)		0.71**		0.55*		1.64*		-2.04**		-1.57		-4.48***
Long-run effect (ID $*$ DC)		0.12		0.14		0.26		-0.73		-1.09		-0.25
Year, country, size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	902	902	902	902	902	902	896	896	896	896	896	896
Number of banks	150	150	150	150	150	150	149	149	149	149	149	149
Number of instruments	112	126	112	126	112	126	112	126	112	126	112	126
AR(2) p-value[b]	0.89	0.89	0.99	0.81	0.89	0.66	0.34	0.34	0.37	0.29	0.38	0.55
Hansen p-value[c]	0.45	0.21	0.24	0.33	0.58	0.42	0.18	0.27	0.15	0.21	0.26	0.19

See notes for Table 1.

Table 3: Developed country vs emerging country banks

	DC banks			EC banks			t-test
Variable	Obs	Mean	Std Dev	Obs	Mean	Std Dev	Mean Diff[a]
Age_m	83	81.00	81.37	77	43.48	38.82	37.52***
Size_m	83	548.80	644.02	77	37.88	61.82	510.92***
$\text{Financial Development}_m$	83	139.36	41.17	77	65.37	41.82	73.99***
$\text{Institutional Development}_m$	83	73.78	6.06	77	58.41	7.81	15.37***

W_m is the median value of bank-level yearly observations of W over the sample period 2004-2013, where $W \in$ {'Age', 'Size', 'Financial Development', 'Institutional Development'}. 'Age' = number of years since establishment (source: Bankscope); 'Size' = total assets in billions of US dollars (source: Bankscope); 'Financial Development' = domestic credit to private sector as % of GDP (source: WDI); 'Institutional Development' = the Heritage Foundation's Index of Economic Freedom (source: IEF). [a] Reports the difference in the mean values between DC and EC banks. *** Statistically significant at the 1% confidence level.

Table 4a: Diversification and value: variation across bank and country characteristics

Dependent variable: Tobin's Q. Method: System Generalized Method of Moments. Estimation period: 2004-2013.						
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged Dependent	0.31***	0.34***	0.31***	0.33***	0.28**	0.30***
	(2.93)	(3.17)	(3.06)	(3.29)	(2.43)	(2.61)
TOTAL	0.01					
	(0.14)					
INTRA			0.03			
			(1.41)			
INTER					-0.07*	
					(1.79)	
ID $*$ EC[a]		0.03		0.07**		-0.11**
		(0.97)		(2.19)		(1.99)
ID $*$ DC[a]		0.01		0.01		-0.03
		(0.38)		(0.74)		(0.72)
Age_m	0.01	0.01	0.01	0.01	0.01	0.01*
	(0.64)	(0.62)	(0.43)	(0.47)	(1.12)	(1.66)
Size_m	-0.01	-0.01	-0.02**	-0.01**	-0.01	-0.01
	(1.45)	(1.44)	(2.46)	(2.34)	(0.77)	(1.20)
$\text{Financial Development}_m$	-0.02	-0.01	-0.01	-0.01	-0.02**	-0.02*
	(1.48)	(0.92)	(0.48)	(0.67)	(2.14)	(1.74)
$\text{Institutional Development}_m$	0.12***	0.12**	0.15***	0.16***	0.12**	0.09
	(3.02)	(2.13)	(2.69)	(2.73)	(2.40)	(1.28)
Growth	0.25	0.16	0.41*	0.29*	0.39***	0.42***
	(1.60)	(1.07)	(1.93)	(1.94)	(3.03)	(3.23)
Inflation	0.09	0.08	0.14*	0.12	0.15**	0.12*
	(1.36)	(1.13)	(1.71)	(1.52)	(2.12)	(1.90)
Long-run effect (ID)	0.01		0.04		-0.10**	
Long-run effect (ID $*$ EC)		0.04		0.11**		-0.15**
Long-run effect (ID $*$ DC)		0.01		0.02		-0.05
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country, size dummies	No	No	No	No	No	No
Number of observations	900	900	900	900	900	900
Number of banks	150	150	150	150	150	150
Number of instruments	98	112	98	112	98	112
AR(2) p-value[b]	0.86	0.89	0.97	0.95	0.94	0.96
Hansen p-value[c]	0.13	0.22	0.29	0.29	0.25	0.61

The variables Age_m, Size_m, $\text{Financial Development}_m$ and $\text{Institutional Development}_m$ are in logs. For brevity, the estimated coefficients on 'Income diversity', 'Capitalization', 'Operational Inefficiency', and 'NPL' are not displayed. See also notes for Tables 1 and 3.

Table 4b: Diversification and value: variation across bank and country characteristics (continued)

	TOTAL		INTRA		INTER	
	(1)	(2)	(3)	(4)	(5)	(6)
Specification I (Table 4a)						
ID	0.01		0.04		-0.10**	
	(0.14)		(1.45)		(2.08)	
ID $*$ EC		0.04		0.11**		-0.15**
		(0.99)		(2.41)		(2.00)
ID $*$ DC		0.01		0.02		-0.05
		(0.37)		(0.72)		(0.76)
Specification II						
ID		0.12		0.13		0.08
		(0.88)		(1.07)		(0.24)
ID $*$ Age_m		-0.03		-0.02		-0.05
		(0.79)		(0.72)		(0.51)
Specification III						
ID		0.07		0.77**		-0.47*
		(0.16)		(2.11)		(1.66)
ID $*$ Size_m		-0.01		-0.04**		0.02
		(0.10)		(2.10)		(1.27)
Specification IV						
ID		0.54		0.70*		0.02
		(1.42)		(1.91)		(0.04)
ID $*$ $\text{Financial Development}_m$		-0.12		-0.15*		-0.03
		(1.39)		(1.84)		(0.23)
Specification V						
ID		0.51		1.71*		-1.27
		(0.56)		(1.90)		(0.85)
ID $*$ $\text{Institutional Development}_m$		-0.12		-0.40*		0.28
		(0.54)		(1.86)		(0.79)

Columns report long-run effects ($|z|$-statistics). ***,**,* Statistically significant at the 1%, 5% and 10% confidence level respectively.

Table 5a: Robustness tests

Dependent variable: MV-to-BV (columns (1)-(3)), MV-to-Assets (columns (4)-(6)), Tobin's Q (columns (7)-(12)). Method: System Generalized Method of Moments. Estimation period: 2004-2013.

	Dependent: 'MV-to-BV'			Dependent: 'MV-to-Assets'			Use 'INTRA-Home'			Use asset-based 'ID'		
	TOTAL	INTRA	INTER	TOTAL	INTRA	INTER	TOTAL	INTRA	INTER	TOTAL	INTRA	INTER
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Lagged Dependent	0.28***	0.28***	0.29***	0.29***	0.29***	0.29***	0.32***	0.32***	0.28***	0.33***	0.32***	0.28***
	(3.41)	(3.45)	(3.56)	(2.79)	(2.79)	(3.17)	(3.81)	(3.63)	(2.87)	(3.49)	(3.60)	(2.80)
ID $*$ EC[a]	0.31*	0.53**	-0.96	0.05**	0.07*	0.04	0.05***	0.07**	-0.04	0.07***	0.07**	-0.03
	(1.91)	(2.04)	(0.99)	(2.47)	(1.91)	(0.47)	(2.58)	(2.43)	(0.53)	(2.67)	(2.20)	(0.27)
ID $*$ DC[a]	-0.23	-0.24	0.17	0.01	0.01	0.02	0.01	0.01	0.03	0.01	0.02	0.04
	(1.02)	(1.24)	(0.23)	(0.29)	(0.58)	(0.26)	(0.19)	(0.20)	(0.41)	(0.36)	(0.65)	(0.52)
Income Diversity	0.22	0.29	0.26	0.02	0.01	0.05	0.01	0.01	0.05	0.01	-0.01	0.03
	(0.45)	(0.58)	(0.43)	(0.34)	(0.19)	(0.61)	(0.11)	(0.02)	(0.65)	(0.12)	(0.26)	(0.41)
Capitalization	-4.00	-4.73	-3.18	0.42	0.22	0.63*	-0.43	-0.57	-0.46	-0.54	-0.54*	-0.54
	(1.15)	(1.38)	(1.09)	(1.05)	(0.49)	(1.66)	(1.09)	(1.40)	(1.17)	(1.64)	(1.67)	(1.19)
Operational Inefficiency	-0.37	-0.43	-0.55	-0.01	0.03	-0.05	-0.06	-0.02	-0.05	-0.04	-0.03	-0.05
	(0.75)	(0.81)	(0.74)	(0.08)	(0.38)	(0.89)	(1.10)	(0.34)	(0.98)	(0.74)	(0.47)	(0.81)
NPL	-7.27***	-9.20***	-7.07**	-0.84**	-0.86**	-0.55	-0.69*	-0.84**	-0.59	-0.82*	-0.86**	-0.70*
	(2.72)	(2.83)	(2.10)	(2.07)	(1.96)	(1.51)	(1.76)	(2.07)	(1.57)	(1.93)	(2.38)	(1.88)
Growth	2.43	3.01*	4.26***	0.36	0.47**	0.34*	0.44**	0.50**	0.58***	0.43***	0.49***	0.55***
	(1.38)	(1.85)	(3.13)	(1.61)	(1.98)	(1.80)	(1.98)	(2.58)	(3.50)	(2.74)	(2.88)	(3.72)
Inflation	0.22	0.33	1.15**	0.02	0.07	-0.01	0.04	0.08	0.10*	0.11*	0.12*	0.09
	(0.52)	(0.72)	(2.02)	(0.23)	(0.93)	(0.01)	(0.53)	(1.22)	(1.71)	(1.81)	(1.86)	(1.42)
Long-run effect (ID $*$ EC)	0.43**	0.74**	-1.35	0.08***	0.09**	0.05	0.07***	0.10**	-0.06	0.11***	0.11**	-0.05
Long-run effect (ID $*$ DC)	-0.33	-0.33	0.24	0.01	0.01	0.03	0.01	0.01	0.04	0.01	0.03	0.05
Year, country, size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	900	900	900	865	865	865	900	900	900	900	900	900
Number of banks	150	150	150	147	147	147	150	150	150	150	150	150
Number of instruments	124	124	124	122	122	122	124	124	124	124	124	124
AR(2) p-value[b]	0.80	0.91	0.89	0.69	0.83	0.54	0.88	0.96	0.85	0.99	0.99	0.83
Hansen p-value[c]	0.26	0.24	0.19	0.13	0.27	0.20	0.34	0.22	0.47	0.50	0.32	0.46

See notes for Table 1.

Table 5b: Robustness tests (continued)

Dependent variable: Tobin's Q. Method: System Generalized Method of Moments. Estimation period: 2004-2013.												
	Exclude US banks			Exclude Chinese banks			Use five regions			Test for symmetry of effects		
	TOTAL	INTRA	INTER	TOTAL	INTRA	INTER	TOTAL	INTRA	INTER	TOTAL	INTRA	INTER
	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Lagged Dependent	0.30***	0.31***	0.25**	0.34***	0.32***	0.28**	0.34***	0.33***	0.28***	0.32***	0.30***	0.28***
	(3.34)	(3.52)	(2.09)	(3.74)	(3.15)	(2.54)	(4.18)	(3.38)	(2.93)	(3.51)	(3.19)	(2.72)
ID $*$ EC[a]	0.05**	0.06**	-0.01	0.06**	0.07**	-0.07	0.05**	0.07**	-0.03	0.06***	0.07*	-0.03
	(2.43)	(2.07)	(0.08)	(2.58)	(2.15)	(0.62)	(2.47)	(2.16)	(0.43)	(2.58)	(1.75)	(0.29)
ID $*$ DC[a]	-0.02	-0.01	-0.05	0.01	0.01	0.01	-0.01	0.01	0.03	-0.01	0.01	0.05
	(1.18)	(0.38)	(0.66)	(0.33)	(0.60)	(0.16)	(0.01)	(0.49)	(0.51)	(0.13)	(0.09)	(0.60)
Income Diversity	0.01	0.01	0.01	0.05	0.03	0.08	0.03	0.02	0.05	0.06	0.04	0.09
	(0.25)	(0.06)	(0.24)	(0.94)	(0.57)	(0.91)	(0.46)	(0.35)	(0.56)	(0.93)	(0.64)	(0.91)
Capitalization	-0.63	-0.58	-0.73*	-0.28	-0.44	-0.37	-0.38	-0.49	-0.41	-0.56	-0.69*	-0.59
	(1.57)	(1.54)	(1.71)	(0.65)	(1.06)	(0.85)	(1.05)	(1.45)	(1.06)	(1.31)	(1.77)	(1.37)
Operational Inefficiency	-0.07	-0.08	-0.09	-0.06	-0.05	-0.04	-0.05	-0.03	-0.05	-0.06	-0.06	-0.07
	(1.20)	(1.15)	(1.23)	(1.06)	(0.89)	(0.80)	(0.84)	(0.63)	(1.03)	(1.14)	(0.80)	(1.26)
NPL	-0.73*	-0.89**	-0.66	-0.68*	-0.83**	-0.69**	-0.68*	-0.87**	-0.57	-0.75**	-0.89**	-0.59
	(1.95)	(2.15)	(1.60)	(1.84)	(2.13)	(1.98)	(1.95)	(2.15)	(1.58)	(1.99)	(2.06)	(1.42)
Growth	0.31	0.41*	0.42***	0.36*	0.46**	0.51***	0.37*	0.49***	0.56***	0.39**	0.49***	0.59***
	(1.57)	(1.96)	(2.74)	(1.69)	(2.47)	(2.98)	(1.90)	(2.73)	(3.46)	(2.13)	(2.69)	(3.18)
Inflation	0.02	0.07	0.09	0.01	0.07	0.11*	0.03	0.08	0.09	0.05	0.10*	0.10*
	(0.28)	(1.24)	(1.36)	(0.09)	(1.12)	(1.65)	(0.33)	(1.32)	(1.53)	(0.66)	(1.66)	(1.67)
Long-run effect (ID $*$ EC)	0.07**	0.08**	-0.01	0.10***	0.11**	-0.09	0.08**	0.11**	-0.05	0.09***	0.10*	-0.04
Long-run effect (ID $*$ DC)	-0.03	-0.01	-0.06	0.01	0.02	0.01	-0.01	0.01	0.04	-0.01	0.01	0.07
Year, country, size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	794	794	794	852	852	852	900	900	900	900	900	900
Number of banks	138	138	138	134	134	134	150	150	150	150	150	150
Number of instruments	123	123	123	123	123	123	124	124	124	124	124	124
AR(2) p-value[b]	0.82	0.94	0.74	0.96	0.97	0.92	0.91	0.99	0.83	0.93	0.98	0.87
Hansen p-value[c]	0.53	0.40	0.23	0.46	0.52	0.48	0.43	0.45	0.50	0.50	0.52	0.53

Equations in columns (22) to (24) are estimated using weighted regressions, where double weight is assigned to banks that do not exhibit decreases in 'TOTAL' during the sample period. See also notes for Table 1.

Table 6: Distance- and concentration-based measures as proxies for diversification

Dependent variable: Tobin's Q. Method: System Generalized Method of Moments. Estimation period: 2004-2013.										
	Distance-based measures						Concentration-based measures			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Lagged Dependent	0.30***	0.29***	0.28***	0.26**	0.28***	0.29***	0.32***	0.35***	0.31***	0.32***
	(3.19)	(3.22)	(3.03)	(2.57)	(3.11)	(2.89)	(3.45)	(4.38)	(3.10)	(2.86)
Geographic Distance	0.01									
	(0.30)									
Language Distance			-0.06							
			(0.68)							
Institutional Distance					0.01					
					(0.58)					
International Concentration							0.03			
							(0.72)			
Regional Concentration									0.09	
									(1.20)	
$\Theta * \text{EC}^a$		0.02		-0.07		0.01		0.10*		0.22***
		(0.88)		(0.93)		(0.57)		(1.94)		(2.85)
$\Theta * \text{DC}^a$		0.03		0.07		0.02		-0.01		0.09
		(0.98)		(0.50)		(0.85)		(0.12)		(1.03)
Long-run effect (Θ)	0.01		-0.08		0.02		0.04		0.12	
Long-run effect ($\Theta * \text{EC}$)		0.04		-0.10		0.01		0.15*		0.32***
Long-run effect ($\Theta * \text{DC}$)		0.04		0.09		0.02		-0.01		0.13
Year, country, size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	900	900	900	900	895	895	900	900	900	900
Number of banks	150	150	150	150	148	148	150	150	150	150
Number of instruments	110	124	110	124	110	124	110	124	110	124
AR(2) p-value^b	0.84	0.85	0.83	0.83	0.83	0.84	0.87	0.91	0.98	0.85
Hansen p-value^c	0.10	0.11	0.31	0.17	0.40	0.38	0.30	0.34	0.18	0.10

[a] $\Theta \in \{$'Geographic Distance', 'Language Distance', 'Institutional Distance', 'International Concentration', 'Regional Concentration'$\}$. For brevity, the estimated coefficients on 'Income Diversity', 'Capitalization', 'Operational Inefficiency', 'NPL', 'Growth' and 'Inflation' are not displayed. See also notes for Table 1.

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