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# Boards of Banks

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# Abstract

Bank board directors are highly independent but possess limited prior banking experience. Using a sample of banks from 90 countries between 2000 and 2020, we find that country-specific characteristics explain most of the cross-sectional variation in bank board independence. In contrast, country characteristics have little explanatory power for boards' banking experience. While we document evidence of international convergence in bank board independence, U.S. banks lag behind their global counterparts in director banking experience. The data suggest that country-specific laws and regulations primarily shape bank board composition through requirements for director independence.



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**Abstract**

Bank board directors are highly independent but possess limited prior banking experience. Using a sample of banks from 90 countries between 2000 and 2020, we find that country-specific characteristics explain most of the cross-sectional variation in bank board independence. In contrast, country characteristics have little explanatory power for boards' banking experience. While we document evidence of international convergence in bank board independence, U.S. banks lag behind their global counterparts in director banking experience. The data suggest that country-specific laws and regulations primarily shape bank board composition through requirements for director independence.

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## 1 Introduction

The 2023 banking crisis brought bank governance back into the spotlight. In his introduction to the Federal Reserve System's review of the failure of Silicon Valley Bank (SVB), Michael Barr, the vice chair for supervision, stated that SVB's "board of directors failed to oversee senior leadership and hold them accountable" (Board of Governors of the Federal Reserve System (2023)). These events echo the 2007-09 global financial crisis, which led to regulatory proposals singling out bank boards as one of their main targets (Kirkpatrick, 2009; Walker, 2009; European Commission, 2010). These calls for regulation were mostly based on circumstantial and anecdotal evidence. We currently know little about boards of banks and their relation to bank characteristics.

In this paper, we study the characteristics of boards of banks around the world. We focus on two attributes of bank directors: independence from management and experience in the banking industry. We do not take a stance on whether director independence and experience are inherently good or bad, nor do we equate them with good governance. Our interest in these variables stems from their relevance to policy. The failure of SVB provides a recent example, with several commentators attributing the bank's failure to manage risks properly to its directors' lack of banking expertise (see, e.g., Nestor and Nolan (2023) and Wenger et al. (2024)). This situation is reminiscent of Lehman Brothers in 2007, where the board included directors with diverse backgrounds, including theatrical productions, broadcasting, and acting, but only one director with prior banking experience (Larcker and Tayan (2010)).

Our study uses a dataset of director characteristics that we constructed by collecting detailed biographic data for a sample of 32,054 directors working for a global sample of 1,589 publicly listed banks. The sample spans 21 years (2000-2020) and includes banks from 92 countries. We collect data on four board and director characteristics: director independence, previous banking experience, board size, and director busyness. We supple-

ment our director data with information on bank and country characteristics. We examine the cross-sectional and time-series dimensions of our sample separately. To facilitate the presentation, we use two benchmark years: 2006 and 2019.

Our data suggest that board independence and board banking experience are determined in significantly different ways. In the cross-section, country characteristics explain most of the variation in board independence. In contrast, neither country nor bank characteristics explain much of the cross-sectional variation in boards' banking experience. In the time series, we find that both independence and experience increase over time. The importance of country effects for board independence has steadily declined since 2006. Consistent with this decline, we find evidence of *convergence*: while most countries exhibit an "independence gap" relative to U.S. banks, such gaps have narrowed significantly since 2006.

Outside directors in our sample have little banking experience. For the median "bank-year," the proportion of outside directors with banking experience is 14%, which translates into one outside director (out of a median of seven). U.S. banks have lower levels of board banking expertise than non-U.S. banks, and this difference has increased over time. U.S. banks' board banking experience was 17% in 2020, while in non-U.S. banks, that number was 24%. Such low levels of banking experience are surprising, given the emphasis placed on banking expertise since the 2007 crisis. Both demand and supply forces may explain the low employment of directors with banking experience. We show that directors with banking experience hold more board seats, especially in banks. Thus, despite the low numbers overall, directors with banking experience appear to be in high demand. The data suggest that low levels of board banking experience are at least partly due to the scarcity of directors with such experience.

Once we account for aggregate trends and time-invariant bank characteristics, we find that, on average, boards become more independent as banks increase in size. This

relationship is strong in the first part of the sample (2000-2008) but reverses in the second part (2009-2019), when, if anything, boards of banks that grow larger become less independent. Similarly, we find evidence that changes in board experience are positively correlated with changes in bank size, particularly in the early part of the sample. Other bank characteristics, such as market-to-book ratios, return on assets, and leverage, do not display robust correlations with board structure over the entire sample period.

Our discussion of the determinants of board structure is limited by the difficulties in establishing causal relationships between the variables in our dataset. As we are interested in examining the extent to which board structure is correlated with observable firm- and country-specific variables, determining the ultimate source of such correlations is not our primary concern. With these limitations in mind, a natural question arises: Why are country-specific factors correlated with banks' board structure? While countries may differ for several reasons, such as business culture and practices, industry composition, and labor markets, regulation is arguably the leading candidate for explaining our findings. Director independence has been at the top of the agenda for regulators and governance activists for some time. For example, director independence featured prominently in the cluster of governance reforms associated with the Sarbanes-Oxley Act of 2002; financial expertise was also a feature of the act, but with less stringent requirements.[1] Thus, if banks have little freedom in choosing their board independence levels, country effects should be the primary determinant of board independence. By the same logic, if regulation plays a minor role in determining bank directors' expertise, country effects should not be a major determinant of board experience.

If board structure regulations converge over time, we expect two outcomes. First, the differences in independence levels between U.S. and non-U.S. banks are expected to de-

[1]The Sarbanes-Oxley Act required firms to appoint financial experts to their auditing committees. Lehman Brothers had a financial expert on their audit committee who was in his 80s during the financial crisis.

crease as most countries gradually adopt the more stringent independence requirements that apply to U.S. banks. Second, as country-level regulations become more similar, country effects should explain a smaller proportion of the cross-sectional variation in board independence.

Our results raise some important questions. For example, would banks benefit from being less regulated, allowing them to tailor board independence to their needs? Or is regulation preventing them from choosing inferior governance structures? Although answering these questions is beyond the scope of this paper, the evidence we present underscores their importance.

The remainder of the paper is organized as follows. After reviewing the related literature in Section 2, we describe the data and present summary statistics in Section 3. In Section 4, we analyze the cross-section of board structures. In Section 5, we exploit the time-series dimension of the sample and investigate more closely the role of bank characteristics in explaining board structure. We conclude in Section 6.

## 2 Related literature

Our findings are consistent with some existing evidence in the international corporate governance literature, such as the finding that most of the cross-sectional variation in governance variables is explained by country characteristics. Using samples of mostly non-financial firms, Doidge, Karolyi and Stulz (2007) and Aggarwal, Erel, Stulz and Williamson (2009) find that the quality of firm-level governance is increasing in a country's level of economic and financial development and investor protection. Such empirical relations suggest that country-level governance and firm-level governance are complements. Our results are similar as they highlight the importance of countries for the governance of banks.

Our work also complements the empirical literature on (non-financial) corporate board structures. This literature shows that the composition of boards is related to several firm characteristics such as size, growth opportunities, proxies for information asymmetry and capital structure (among others, Boone, Field, Karpoff and Raheja (2007), Coles, Daniel and Naveen (2008), Linck, Netter and Yang (2008), Lehn, Patro and Zhao (2009), Ferreira, Ferreira and Raposo (2011), and Ferreira, Ferreira and Mariano (2018)). There is also evidence that boards of banks differ from those of non-financial firms (Adams and Mehran, 2003, 2012). As banks are more opaque than non-financial firms (Morgan, 2002), outsiders could face difficulties in assessing risks and properly valuing banks. Under such conditions, external governance mechanisms may not function effectively, placing additional pressure on the board.

Although our focus is on the potential determinants of bank board structure, a natural question arises as to whether board structure, and particularly director independence, matters for firm policies and performance. In the context of non-financial firms, there is evidence that board composition affects important firm outcomes, such as, e.g., CEO turnover (Weisbach, 1988; Adams and Ferreira, 2009; Jenter and Lewellen, 2021). In the case of banks, there is also some evidence of correlations between board governance and risk-taking (Laeven and Levine, 2009).

Research on the role of bank directors during the global financial crisis of 2007-09 reveals some surprising results. Adams (2012) finds that U.S. banks with more independent directors were more likely to receive Troubled Asset Relief Program (TARP) money. Minton, Taillard and Williamson (2014) provide ample evidence that board characteristics in financial institutions are related to several performance measures during the crisis. Similarly, Beltratti and Stulz (2012) find that banks with more pro-shareholder boards performed worse during the crisis, and Erkens, Hung and Matos (2012) find that financial firms with more independent boards experienced more significant losses than did

firms with less independent boards.

This literature suggests that bank governance matters, but not necessarily in obvious ways. Fahlenbrach and Stulz (2011) find that banks run by CEOs with large ownership stakes, if anything, performed worse than those with low CEO ownership stakes during the 2007–09 crisis. Similarly, Ferreira, Kershaw, Kirchmaier and Schuster (2021) find that banks where managers were more insulated from shareholders in 2003 were less likely to be bailed out in 2008/09 and targeted by activist shareholders. Cheng, Hong and Scheinkman (2015) present evidence that a culture of short-term compensation leads to more risk-taking in financial firms, but they argue that such risk-taking is consistent with shareholders' goals. This explanation is compatible with findings by Laeven and Levine (2009) that banks with more shareholder-oriented governance structures take more risks.

## 3 Data and Sample

Our initial sample comprises an unbalanced panel of 1,589 publicly listed banks from 92 countries, spanning the 21-year period from 2000 to 2020. We source our director data from BoardEx. Figure 1 gives an overview of the distribution of our sample by year and country. The sample is skewed towards U.S. banks.

BoardEx provides standard biographical information, such as age, nationality, and gender, for all board members, as well as details about their current and past board positions, including the company's name and the director's tenure at each position. It also provides information on directors' past non-board positions, income, and educational background (albeit sometimes incomplete). To construct the banking experience variable, we identified companies and non-profit organizations that employed at least one director from our sample at some point.

Our independence variable classifies a director as independent if the director is listed

as non-executive by BoardEx and if the role name of the director contains the word "independent." We construct a banking experience indicator variable that equals one if an outside director had a prior managerial or top-executive position in any bank. We follow several steps to identify banks (both public and private) in the employment history of directors. First, we include companies classified in the Boardex sector as "Banks" or those with a Compustat SIC code starting with 60; we exclude companies in other sectors. Second, for companies without sector data, we rely on company names that clearly indicate industries.[2] Third, we conduct a name-based fuzzy matching with banks identified in BvD BankFocus.[3] Fourth, for the remaining U.S. companies, we web-scrape their primary SIC codes using their company names from siccode.com, including those of banks and excluding those of non-banks. Lastly, we conduct manual checks for companies matched with at least five bank directors.

Note that director independence and banking experience might be negatively related if experienced directors were former employees or directors of subsidiaries. Statistical analyses confirm this relationship. However, this relationship is only weak, and – as we show in this article – independence and experience are differentially affected by regulation (or other country characteristics) and firm-specific characteristics.

We construct a director busyness variable by counting the number of board positions of each director each year. We measure board size by the number of directors per bank-year.

To obtain bank financial data, we merge our sample with Compustat. We use book assets as the proxy for bank size.[4] To control for the various dimensions of bank perfor-

[2]Specifically, we include companies with names ending in "banca," "banc," "banco," "bancorp," "bank," and "SA." We also include companies with names containing "loan" and "saving." Additionally, we exclude companies with names containing "air," "aircraft," "airline," "authority," "cement," "chamber of commerce," "college," "energy," "exchange," "food," "gas," "health," "insurance," "life," "liquid," "oil," "pension," "petrol," "power," "resource," "securities," "tech," "transport," "university," and "venture."

[3]We identify banks by SIC codes starting with 60, and we only include matches with a matching score higher than 95 out of 100.

[4]Our base currency for assets and all other accounting variables is the U.S. dollar (USD). All non-USD-

mance, we use Market-to-Book and Return on Assets (ROA). We calculate market-to-book as the market value of shares over common equity[5] and ROA as pre-tax income over assets. We follow the standard practice in the banking literature of measuring leverage as assets over common equity (e.g., Adrian and Shin (2010)). We obtain share price data from Compustat.

We collect several country-specific variables. In line with Doidge, Karolyi and Stulz (2007), we construct a variable measuring the quality of investor protection (which we call Antidirector) by multiplying the anti-director rights index (the DLLS index) constructed by Djankov, La Porta, Lopez-de Silanes and Shleifer (2008) by the rule of law index reported by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998). We use GDP per capita (PPP, constant 2017 international USD) and stock market capitalization over GDP from the World Bank's World Development Indicators. Our dummy indicating the right of courts to remove board directors in reorganizations comes from the World Bank database on bank regulation and supervisory practices developed by Barth, Caprio and Levine (2008). We also hand-collected data from different sources to construct a dummy variable indicating whether a country has a compulsory one-tiered board structure.

Table 1 depicts the summary statistics for all variables from 2000 to 2020. The unit of observation is a bank-year. There is considerable variability in the characteristics of bank boards. Some bank boards have no independent directors, and some have no outside directors with banking experience. On the other hand, we see boards that are fully staffed with independent directors, as well as some in which all outside directors have a banking background. Similarly, there is substantial variation in board size.

denominated values were converted into USD at market exchange rates on the closing day of the fiscal period. We do not correct assets for inflation as it is unnecessary, given that we use the log of assets in the regressions so that year dummies implicitly capture the effects of inflation.

[5]Compustat code csho for North American banks and cshoc for non-U.S. and non-Canadian banks.

## 4 The Cross-Section of Board Independence and Board Experience

In this section, we focus on the cross-sectional variation in board structure. With 21 years of bank-level data, we initially focus on two representative years. In this article's early working paper version, Ferreira, Kirchmaier and Metzger (2012) used 2006 as the benchmark year. Here, we use 2006 and 2019 as benchmark years; we also use all available years in some tests.

### 4.1 Explaining Variation in Bank Board Structure: Countries versus Firm Characteristics

How much of the cross-sectional variation in board structure is explained by country effects and firm characteristics? Methodologically, we follow the approach of Doidge, Karolyi and Stulz (2007) and run linear regressions of board structure variables (independence and experience) on firm characteristics and country dummies. We then compare the incremental (adjusted) R2 of each set of explanatory variables.[6]

Specifically, we estimate the following models:

$$y_{ij} = \alpha + \mathbf{x}'_{ij}\boldsymbol{\beta} + u_{ij} \tag{1}$$

$$y_{ij} = \alpha + \mathbf{d}'_{j}\boldsymbol{\theta} + u_{ij} \tag{2}$$

$$y_{ij} = \mathbf{x}'_{ij}\boldsymbol{\beta} + \boldsymbol{d}'_{j}\boldsymbol{\theta} + u_{ij} \tag{3}$$

where $y_{ij}$ is the board structure variable of bank $i$ in country $j$, $\alpha$ is a constant, $\mathbf{x}'_{ij}$ is a vector of bank characteristics, $\mathbf{d}_j$ is a vector of country dummies, $\boldsymbol{\beta}$ and $\boldsymbol{\theta}$ are vectors of parameters to be estimated, and $u_{ij}$ is the error term. Our goal in this section is not to make inferences about the estimated parameters but to compare these three models'

[6] Rauh and Sufi (2010) employ a similar approach in their investigation of the role of measurement errors in explaining the poor explanatory power of firm and industry characteristics in the cross-section of capital structure.

explanatory power, or goodness of fit.

Our main variables of interest are either the proportion of independent directors or the proportion of outside directors with banking experience. As these variables are bounded between zero and one, we use a logistic transformation (also known as the log odds ratio) of the original variable $z_{ij}$ as our dependent variable: $y_{ij} = \ln \frac{z_{ij}}{1-z_{ij}}$.[7]

We report the results in Table 2, Panel (a) (board independence) and (b) (board experience). The first three columns of each panel show results for 2006, and the last three show results for 2019. Column (1) in Panel (a) shows the results for model 1.a, i.e., a regression of board independence on a vector of four firm characteristics: (log) assets, (log) market to book, return on assets, and (log) leverage (we report the coefficients of these control variables in the Appendix). Overall, these four bank characteristics explain 7.6% of the total variation in the sample (using the adjusted R2 as the metric). Thus, at first glance, observable bank variables seem to explain only a small fraction of the heterogeneity in board independence. A natural question is whether this is a feature of our empirical design. For example, there could be other bank-specific variables with stronger explanatory power that are omitted from our specification. To put our results into perspective, we compare them with those found in other papers on board independence in non-financial firms. In regressions of board independence on a much larger set of firm-level controls, Linck, Netter and Yang (2008) report a maximum R2 of 17%. Ferreira, Ferreira and Raposo (2011) report R2s varying from 14% to 16%, using up to 18 firm-specific variables as regressors. Thus, the relatively low R2s in board independence regressions are a well-established regularity. It seems unlikely that adding more firm-specific right-hand side variables will significantly increase the joint explanatory power of the regressors.

Column (2) shows results for model 1.b, i.e., a regression of board independence on a set of country fixed effects. This exercise reveals that country effects alone can explain

[7] In practice, this transformation has no important consequences for our results. We transform all bounded dependent variables because not doing so may lead to implausible estimates of marginal effects.

64% of the observed variation in board independence. Finally, in Column (3), we include bank characteristics and country fixed effects. The incremental explanatory power of bank characteristics is negligible.

Columns (4)-(6) replicate this exercise for 2019. Bank characteristics now explain 4% of the observed variation in board independence, while country effects alone explain 48%. Bank characteristics and country effects jointly explain 49% of the variation. Overall, our results suggest that while bank characteristics explain a small portion of the observed variation in board independence, country-specific characteristics account for a substantial fraction of that variation. It also appears that the importance of country fixed effects has declined over time. Figure 2 shows the adjusted R2s of these regressions for 21 cross-sections from 2000 to 2020. The importance of country effects increases until 2006 and then falls.

We now address the question of whether the same applies to board experience. In Panel (b) of Table 2, we report the results of estimating models 1.a-c for the (logistic transformation of the) percentage of outside directors with banking experience. These results are in sharp contrast with those of board independence. Bank characteristics can explain just 3% of the total variation in bank experience, while country fixed effects alone account for about 8-9%. Most of the variation in the proportion of directors with banking experience cannot be explained by variation in observed characteristics; the adjusted R2 for the model 1.c regression is only 11-12%.

We conclude that countries are more important for understanding the cross-section of board independence than bank characteristics. In contrast, neither country characteristics nor observed bank characteristics are good predictors of the banking experience of outside directors.

### 4.2 Estimating Country Effects

Which countries have high levels of board independence? Comparing country averages is difficult because our sample size is small for most countries. In fact, U.S. banks represent more than 50% of the sample. This sample imbalance creates two problems. First, with few observations per country, country effects cannot be estimated with much precision. Second, differences in bank characteristics across countries may explain some of the cross-country variation in board independence.

There is nothing we can do concerning the first problem, as it is simply a limitation of the available data. The small sample sizes in most countries, except the U.S., are not solely a consequence of the better availability of U.S. data; they are primarily due to the fact that most countries have few publicly traded banks. As our goal here is to describe the data in our sample, the small sample sizes in some countries only mean we should attach less confidence to their estimated country effects.

The second problem is more important. For example, comparing the average board independence in Belgian banks with the average board independence in U.S. banks can be misleading if the five Belgian banks in our sample are very different from the typical U.S. bank. Any observed differences in independence could be attributed to the distinct characteristics of Belgian banks rather than to their location within Belgium. One solution is to estimate country effects as the coefficients of the country dummies in regressions that include firm controls, as in Table 2. The problem is that, with few observations per country, country effects are likely to be overestimated for those countries with few banks in the sample.[8] To address this problem, we use an alternative approach. We estimate country-specific effects using a matching procedure in which non-U.S. banks are matched with U.S. banks that have similar observable characteristics. Our matching approach enables us to produce reliable estimates of country effects, even when only one bank

[8] To see this intuitively, consider the extreme case in which there is only one bank per country. In such a case, the country dummy in a cross-sectional regression explains the level of independence perfectly.

operates in a country. Obviously, this approach relies on somewhat strong assumptions.[9]

Our procedure is as follows. Let $j \in \{1, \ldots, N\}$ index the $N$ countries in our sample, with the convention that $j = 1$ denotes the U.S. Let $z_{ij}$ be the board structure variable for bank $i$ in country $j$ and let $\mathbf{x_{ij}}$ be a vector of observable bank characteristics (covariates). We match each bank $i$ from country $j \neq 1$ with a U.S. bank with observable characteristics similar to $\mathbf{x_{ij}}$. We then compute the effect of country $j \neq 1$ as $c_j = \bar{z}_j - \bar{z}_{jm}$, where $\bar{z}_j$ is the average level of the board characteristic (independence or experience) in country $j$ and $\bar{z}_{jm}$ is the respective average among matching U.S. banks.

We implement the matching method by using propensity scores.[10] Using the full sample, we first estimate the parameters of a Probit model, as in

$$\Pr[Y_{ij} = 1 \mid \mathbf{x}_{ij}] = \Phi(\mathbf{x}'_{ij}\boldsymbol{\beta}), \tag{4}$$

where $Y_{ij}$ is a "treatment" variable that takes the value of 1 if bank $i$ is from the U.S. (i.e., if $j = 1$), $\boldsymbol{\beta}$ is a vector of parameters to be estimated, and $\Phi$ is the standardized normal cumulative distribution function. The probability of receiving treatment conditional on the covariates is the propensity score, $\Pr[Y_{ij} = 1 \mid \mathbf{x}_{ij}]$. We then match each non-U.S. bank with a U.S. bank on the basis of their estimated propensity scores. We use five bank characteristics in the matching procedure: (log) assets, (log) sales, (log) market-to-book, return on assets, and (log) leverage. For each non-U.S. bank, we define the matching bank as the U.S. bank whose propensity score is the closest (in absolute terms) to that of the non-U.S. bank.

To obtain an estimate of $c_j$, we calculate the difference between the board structure variable of each non-U.S. bank and its matched U.S. bank and then average this differ-

[9] This approach can be formally justified under the assumption that a non-U.S. bank, if located in the U.S., would have the same expected level of the board structure variable as a U.S. bank with similar characteristics. This is a version of what Imbens and Wooldridge (2009) call unconfoundedness assumption.

[10] This is similar to the approach of Aggarwal, Erel, Stulz and Williamson (2009).

ence by country. We call the difference between the average of country $i$'s independence levels and those in the matching sample the *independence gap* of country $i$. A negative gap indicates that the country has a lower level of board independence than observed in similar U.S. banks (by construction, the U.S. has an independence gap of zero). Figure 3 summarizes the results for countries with at least five banks in the sample (the data underlying this figure is shown in the Appendix in Tables A1 and A2).

Figure 3 confirms that there is much cross-country variation in bank board independence. Notably, in 2006, only Canada and Australia appear to have an edge over the U.S. At the other end of the spectrum, there are several countries with 2006 bank board independence gaps of -40% or less, including France (-52%), Germany (-66%), Chile (-53%), Japan (-59%), Russia (-64%), and Switzerland (-41%), among others. Overall, most countries exhibit an independence deficit relative to the United States.

Figure 3 also shows robust evidence of convergence: most countries have narrowed their independence gaps relative to the U.S. Remarkably, by 2019, the UK and Switzerland have leapfrogged the U.S. and joined Australia and Canada in the group of nations with positive independence gaps. Only four countries have widened their independence gaps: Hong Kong, Indonesia, Poland, and Belgium.

For completeness, we also estimate country effects for board bank experience, even though our previous results reveal that these effects can only explain a trivial part of the cross-sectional variation in board experience. Figure 4 reports the results of a matching procedure similar to that reported in Figure 3. In 2019, most countries had banks with more directors with banking experience than U.S. banks.

### 4.3 Why do countries matter so much for bank board independence?

Our results suggest that countries substantially influence bank board structures and that their importance is disproportionately higher for independence than for banking experi-

ence. In this subsection, we address the question of why countries matter so much for bank board independence.

One possibility is that stronger governance at the bank level is complementary to stronger investor protection at the country level. Using samples of mostly non-financial firms, Doidge, Karolyi and Stulz (2007) and Aggarwal, Erel, Stulz and Williamson (2009) find evidence of complementarities: the quality of firm-level governance is increasing in a country's level of investor protection.

Related to the previous point is the possibility that board independence is higher in countries with more developed capital markets. This effect could again result from complementarities between bank and country governance, as financial development is likely to be associated with better investor protection. Independent directors are also more easily found in countries with a higher number of publicly listed firms.

Other possible explanations for the importance of countries include idiosyncrasies in business practices across countries (e.g., business culture) and differences in laws and regulations. Laws and regulations can have direct effects on board composition. For example, the Sarbanes-Oxley Act of 2002 has effectively increased the demand for independent directors by requiring audit committees to be entirely composed of independent directors.[11] Laws and regulations can also affect board composition indirectly, for example, by redefining directors' fiduciary duties and liabilities. These duties and liabilities can impact companies' perceptions of the costs associated with hiring independent directors.

To test these explanations, we use country-specific variables that capture some of these possibilities. However, we note that none of these explanations are mutually ex-

[11] This rule has been in place for NYSE and Nasdaq-listed firms since 1999.

clusive. We estimate the following model:

$$y_{ijt} = \mathbf{x}'_{ijt}\boldsymbol{\beta} + \mathbf{h}'_j\delta + \mathbf{p}'_t\gamma + u_{ijt} \tag{5}$$

where $y_{ijt}$ is the board structure variable for bank $i$ in country $j$ in year $t$, $\mathbf{x}_{ijt}$ is a vector of bank characteristics, $\mathbf{h}_j$ is a vector of (time-invariant) country characteristics, $\mathbf{p}_t$ is a vector of year dummies, $\boldsymbol{\beta}$, $\delta$ and $\gamma$ are vectors of parameters to be estimated, and $u_{ijt}$ is the error term. Because our goal is to make inferences about the estimated parameters, in particular $\delta$, to facilitate the comparison with previous results, we work with the 2006 and 2019 samples, as well as with samples 2000-2008 and 2000-2019, in which case we estimate (5) by pooled OLS. We include year dummies to account for year effects.

To proxy for the quality of investor protection, in the vector of country characteristics $\mathbf{h}_j$, we include the anti-director index times the rule of law index. We choose this variable to facilitate the comparison with the existing literature, in particular with Doidge, Karolyi and Stulz (2007) and Aggarwal, Erel, Stulz and Williamson (2009). To proxy for the level of financial development, we use the country's stock market capitalization as a percentage of its GDP. We use per capita GDP to proxy for the level of economic development. We also include dummies indicating three legal origins: English (the omitted dummy), German, and French.

To address whether regulation affects board composition more directly, we use two variables that are particularly relevant for board structure. The first one indicates whether courts are allowed to remove directors from the banks' boards in reorganization cases. Although regulators in virtually all countries in our sample (Germany is the exception) have the right to remove bank directors, the right of courts to do so shows more variation across countries. We hypothesize that this variable captures the extent to which courts can influence the composition of bank boards. This is the only regulatory variable we know that refers explicitly to boards of banks and is available for a sufficiently large number of

countries.

Our second board regulation variable is a dummy indicating whether a country has a mandatory one-tiered board structure. This regulation affects board structures directly. We note, however, that this variable indicates the requirement of a one-tiered board for all companies, not only banks.

Table 3 displays the results. In columns (1)-(4), we report the results for regressions that use the (logistic transformation of the) proportion of independent directors as the dependent variable. We first note that, although replacing country dummies with country characteristics is expected to reduce the adjusted R2, the country characteristics model in (5) does a reasonably good job in fitting the data, with an adjusted R2 of 39% in 2006 and 25% in 2019.

The analysis reveals that, among the country-level variables, only GDP per capita and the legal origin indicators exhibit statistically significant correlations with board independence: bank boards are more independent in wealthier countries and those adopting the English legal system. These results are, to a large extent, expected, given that Canada, Australia, the U.S., and the UK all have high levels of bank board independence, especially in more recent years.

By contrast, columns (5)-(8) show that country-level variables have limited explanatory power for the cross-section of banking experience. Bank board experience appears to depend primarily on bank-specific characteristics, including those that are idiosyncratic.

## 5 The Evolution of Board Structures

In this section, we exploit the time-series dimension of our data to understand the evolution of bank board structures. We first examine the aggregate trends and then consider how banks change their boards when bank characteristics change.

### 5.1 Trends in Board Independence and Experience

Figure 5 shows U.S. and non-U.S. banks' annual board independence and experience averages. U.S. bank board independence increases monotonically at a decreasing rate. We observe a rapid increase in independence from 2000 to 2005, after which the trend tapers off. The concavity of board independence trends is expected; independence is bounded above, and CEOs are never independent, implying that the effective upper bound for independence is around 90% in practice. Because non-U.S. banks have far lower levels of board independence, their trends in board independence do not seem to be affected by this upper bound.

We cannot be certain why board independence in the U.S. increased so much at the beginning of our sample. We note, however, that changes in the regulatory environment, such as the Sarbanes-Oxley Act (SOX) of 2002, coincide with the period of the most dramatic changes in board structure.[12] The figure also shows that the increase in board independence over the 2000-2005 period is less pronounced for non-U.S. banks.

Banking experience levels are much lower than independence levels, especially in U.S. banks. Banking experience also increases throughout the period. Here, we observe some signs of divergence, with banking experience in U.S. banks lagging behind the global trend. In light of the emphasis on bank board experience following banking crises, the low levels of banking experience seem puzzling. An obvious constraint on banks arises from antitrust concerns; in countries with robust competition regulations, regulators are unlikely to allow directors to sit on the boards of direct competitors. Another issue is that directors with banking experience might be scarce. Table 4 shows evidence consistent with this hypothesis. Using director-level data, the table shows that older and male directors are more likely to have prior banking experience. Column (2) shows that directors with more board positions (in any industry) are likelier to have prior banking

[12] NYSE and Nasdaq implemented changes in their listing requirements between 1999 and 2003, which, together with SOX regulations, possibly affected the demand for independent directors.

experience, indicating that directors with banking experience are "busier" and, thus, in high demand. Column (3) shows that the correlation between board positions and past banking experience is stronger when considering only bank positions. Overall, the evidence suggests that directors with previous banking experience hold more bank board positions, which is consistent with the notion that such directors are in short supply.

In summary, the data suggest that year effects are significant and can account for a substantial portion of the evolution of board independence and banking experience. Independence levels are high, particularly in the United States. There is evidence of convergence in board independence levels between U.S. and non-U.S. banks. In contrast, banking experience levels are generally low, especially in the United States. Banking experience is higher in non-U.S. banks than in U.S. banks, and the gap has increased over time.

### 5.2 Changes in Bank Characteristics and Board Structure

If regulation is an essential determinant of board independence, one may wonder whether board composition in banks is set optimally. Although standard empirical designs typically cannot address this issue, we can investigate the link between bank characteristics and board structures in more detail. One possibility is that regulatory effects are so crucial that bank characteristics become irrelevant for determining board structure. Alternatively, it is also possible that regulations affect banks differently depending on their characteristics.

To shed some light on these issues and provide a broader picture of the bank-level determinants of board structure, we estimate the following model:

$$y_{ijt} = \mathbf{x}'_{ijt}\boldsymbol{\beta} + \mathbf{p}'_t\boldsymbol{\gamma} + f_{ij} + u_{ijt} \tag{6}$$

where $y_{ijt}$ is the board structure variable for bank $i$ in country $j$ in year $t$, $\mathbf{x}_{ijt}$ is a vector of

bank characteristics, $\mathbf{p}_t$ is a vector of year dummies, $\boldsymbol{\beta}$ and $\gamma$ are vectors of parameters to be estimated, $f_{ij}$ is a unobservable time-invariant bank-specific effect, and $u_{ijt}$ is the error term. We estimate (6) by fixed-effects methods.

We utilized our entire panel to exploit the time-series and cross-sectional variation in our sample. The fixed effects eliminate the impact of time-invariant bank characteristics, including country-specific effects. One possible concern is that year effects are important. To estimate (6), we assume that, as long as the underlying relationship between bank characteristics and board structure remains stable over time, year dummies can capture the effects of the crisis and other year effects. To check whether this assumption is reasonable, we also estimate (6) in two subsamples: 2000-2008 and 2009-2019.

Table 5 displays the results of the fixed-effects regressions. In Columns (1)-(3), we report the results for a regression that uses the (logistic transformation of the) proportion of independent directors as the dependent variable. In the first part of the sample, we find that changes in bank size (assets) are positively related to changes in board independence. In the second part of the sample, this relationship reverses. On average, the overall relation between bank size and board independence is positive for the whole period, as shown in Column (3). When considering the whole period, we find no statistically reliable evidence that within-bank changes in observable characteristics other than size are related to changes in bank board independence.

The results for bank experience are similar. Columns (4)-(6) show that, as banks become larger, board banking experience increases. Note that bank fixed effects explain a significant amount of the variation in bank experience. Replacing bank fixed effects with country fixed effects reduces the R2s by 40 percentage points or more (see Table A4), indicating that most of the variation in bank board experience is bank-specific. By contrast, country fixed effects regressions explain about 50% of the variation in board independence (see Table A4)).

Panel (b) shows bank-fixed effect regressions with country-year fixed effects. This specification is the most saturated we use. Again, we find that country-year fixed effects have explanatory power for board independence that exceeds that of bank fixed effects, suggesting that banks follow country-specific trends in board independence. The importance of such trends is apparent when considering the entire period; the incremental R-squared of country-year fixed effects is approximately eight percentage points. Note also that no bank-specific variable is significant in this specification.

The results are again different for banking experience. The inclusion of country-year fixed effects has an incremental impact of one percentage point on the R2 for the entire period. Again, we conclude that countries matter substantially for bank board independence, but not much for board banking experience.

Finally, we note that the correlation between ROA and banking experience is negative in all specifications, although often statistically weak. While this might seem counterintuitive at first, one possible explanation is that banks with poor operating performance (often persistent in the short to medium run) might be more likely to search for and hire directors with more banking experience. However, we must caution against over-interpreting such correlations, and also note that they are statistically imprecise.

## 6 Final remarks

Our evidence suggests that bank board independence worldwide is primarily shaped by external factors, such as regulatory pressure. In contrast, the past banking experience of bank board directors is primarily explained by bank characteristics, most of which are idiosyncratic in nature.

Our results lead naturally to the question of why countries matter so much for bank board independence but not so much for director banking experience. Country character-

istics could be related to board characteristics because laws, regulations, and institutions can either complement or substitute for internal governance (Doidge, Karolyi and Stulz, 2007; Aggarwal, Erel, Stulz and Williamson, 2009). Additionally, the direct and indirect regulation of bank board appointments may also explain why bank board independence varies so much across countries. The data provide some support for the importance of board regulations. Overall, our evidence is consistent with the view that banks adjust the composition of their boards to their particular conditions, provided that regulations allow them the freedom to do so. This interpretation of the evidence suggests that board structure can have real consequences for bank performance, risk management, and banking crises, as regulation may push banks away from their privately optimal board structures.

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# 7 Figures

Figure 1. Number of Banks

This figure shows the number of banks over time, in all countries, the U.S., and countries excluding the U.S., for three different samples: (1) The full sample comprises all countries from 2000 to 2020; (2) the second sample consists of 30 selected countries/regions that were part of the sample before 2008; (3) the third sample includes countries with at least three banks in any year once they appear in the sample (23 countries in total). The selected 30 countries/regions in the second sample are Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Italy, Japan, Liechtenstein, Luxembourg, Malaysia, Morocco, Netherlands, Nigeria, Norway, Poland, Portugal, Puerto Rico, Ireland, Russia, Spain, Sweden, Switzerland, Taiwan, Turkey, United Arab Emirates, United Kingdom, and United States.

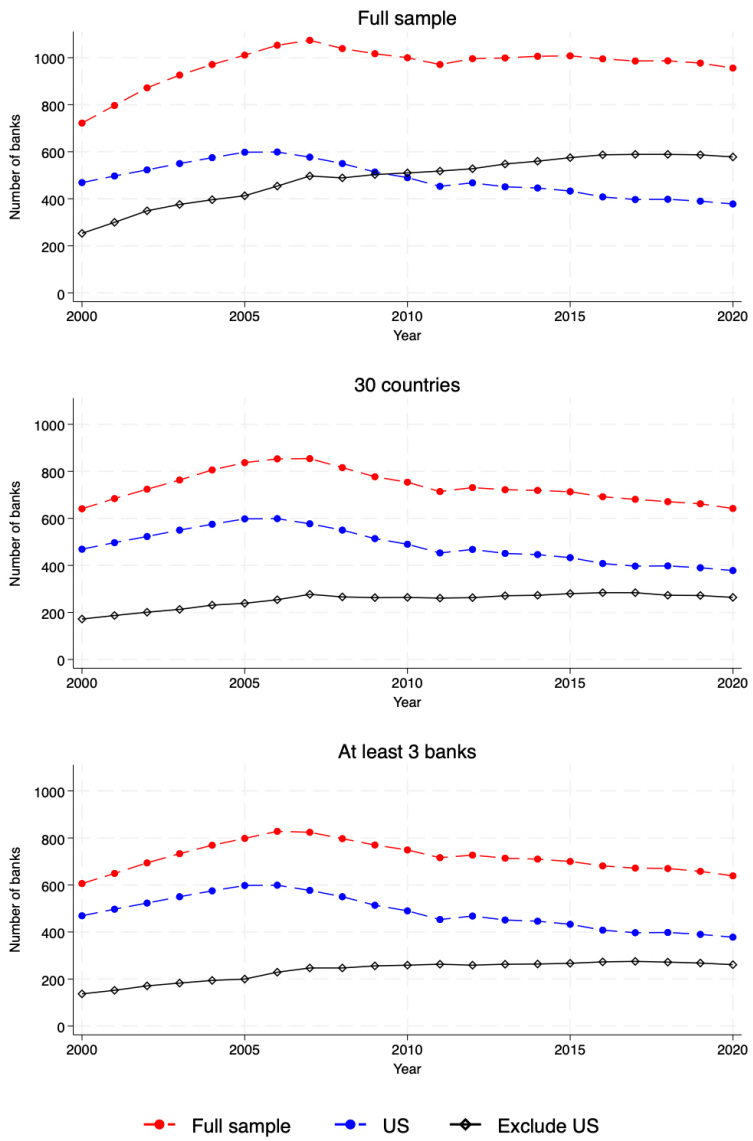


Figure 2. R2 of Board Independence Regressions: 2000 to 2020

This figure shows the adjusted R2 values from cross-sectional regressions over time for three different samples: (1) The full sample comprises all countries from 2000 to 2020; (2) The second sample consists of 30 selected countries/regions that were part of the sample before 2008; (3) The third sample includes countries with at least three banks in any year once they appear in the sample (23 countries in total). The selected 30 countries/regions in the second sample are Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Hungary, India, Italy, Japan, Liechtenstein, Luxembourg, Malaysia, Morocco, Netherlands, Nigeria, Norway, Poland, Portugal, Puerto Rico, Ireland, Russia, Spain, Sweden, Switzerland, Taiwan, Turkey, United Arab Emirates, United Kingdom, and United States.

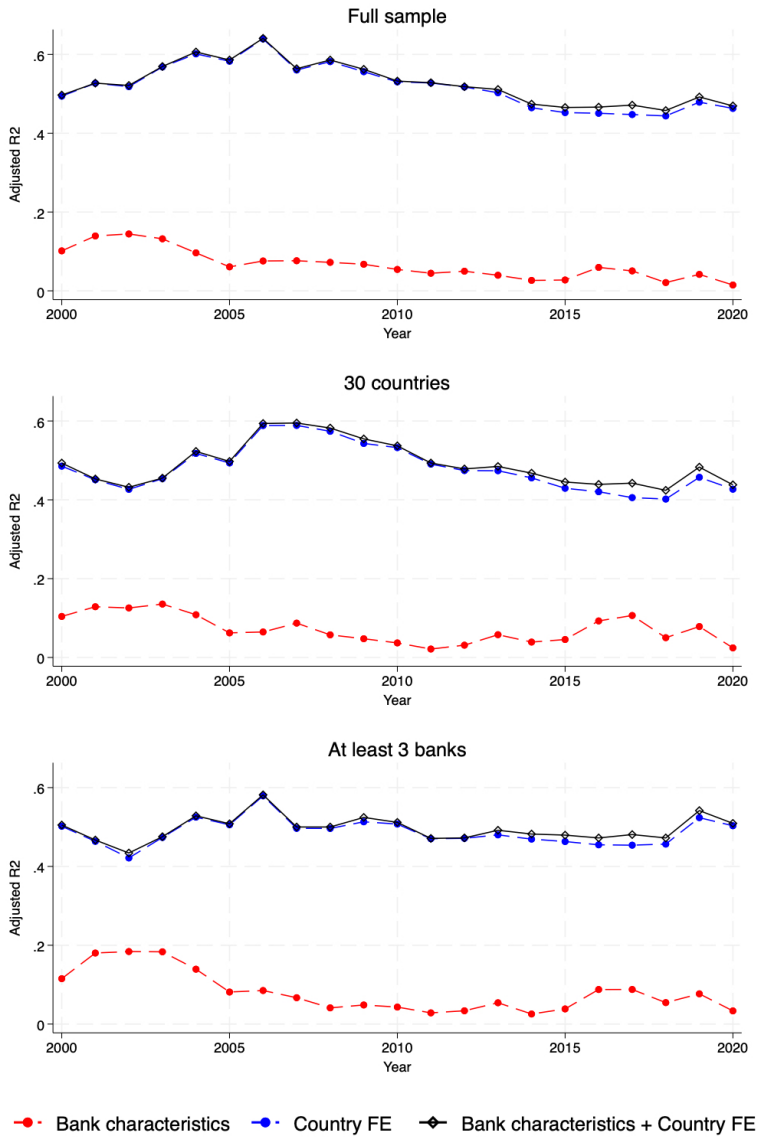


Figure 3. Banks' Independence Gap by Country: 2006 and 2019

This figure shows average differences in board independence between non-US banks and matched U.S. banks in 2006 and 2019. Countries included have at least five banks in both years. A negative gap means that the country has a lower level of board independence than what is observed in similar U.S. banks (by construction, the U.S. has an independence gap of zero). Banks are matched on five characteristics (assets, sales, market-to-book, ROA, and leverage) using the nearest neighbor propensity matching procedure.

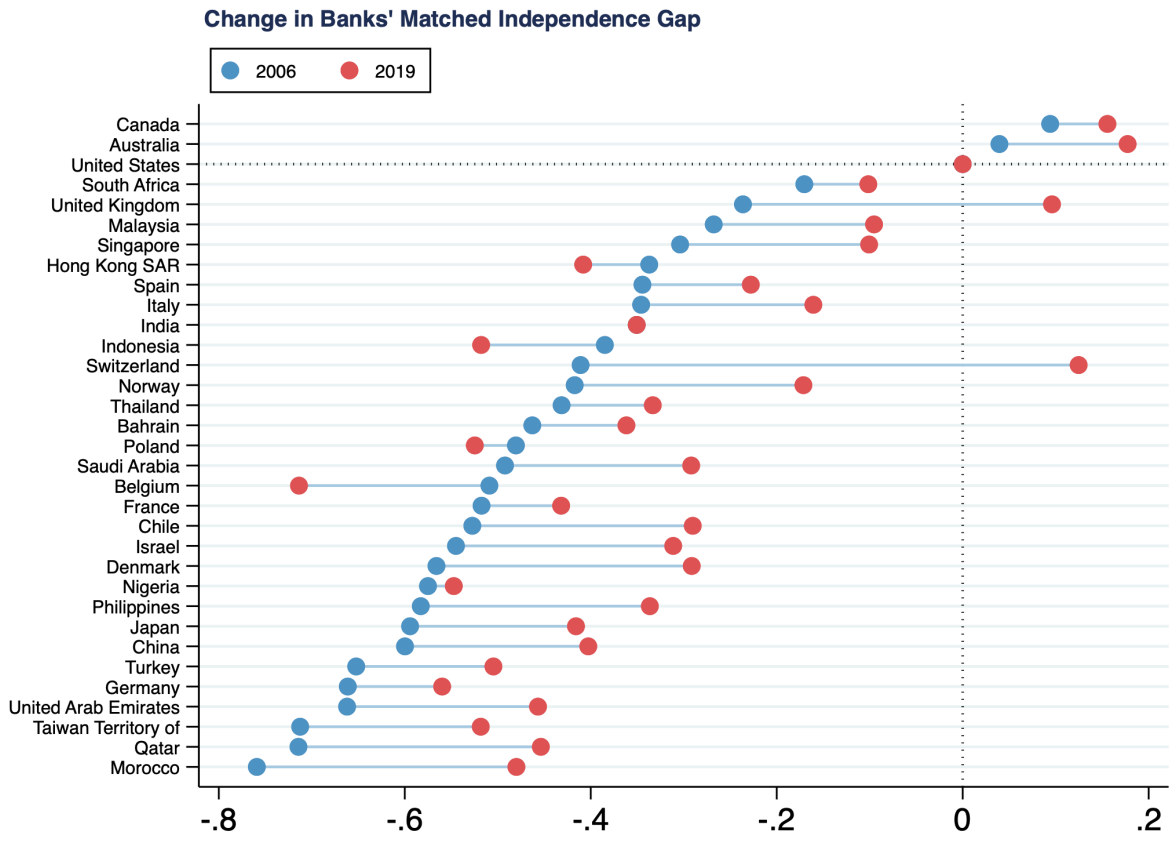


Figure 4. Banks' Experience Gap by Country: 2006 and 2019

This figure shows average differences in board experience between non-US banks and matched U.S. banks in 2006 and 2019. Countries included have at least five banks in both years. A negative gap means that the country has a lower level of board experience than what is observed in similar U.S. banks (by construction, the U.S. has an independence gap of zero). Banks are matched on five characteristics (assets, sales, market-to-book, ROA, and leverage) using the nearest neighbor propensity matching procedure.

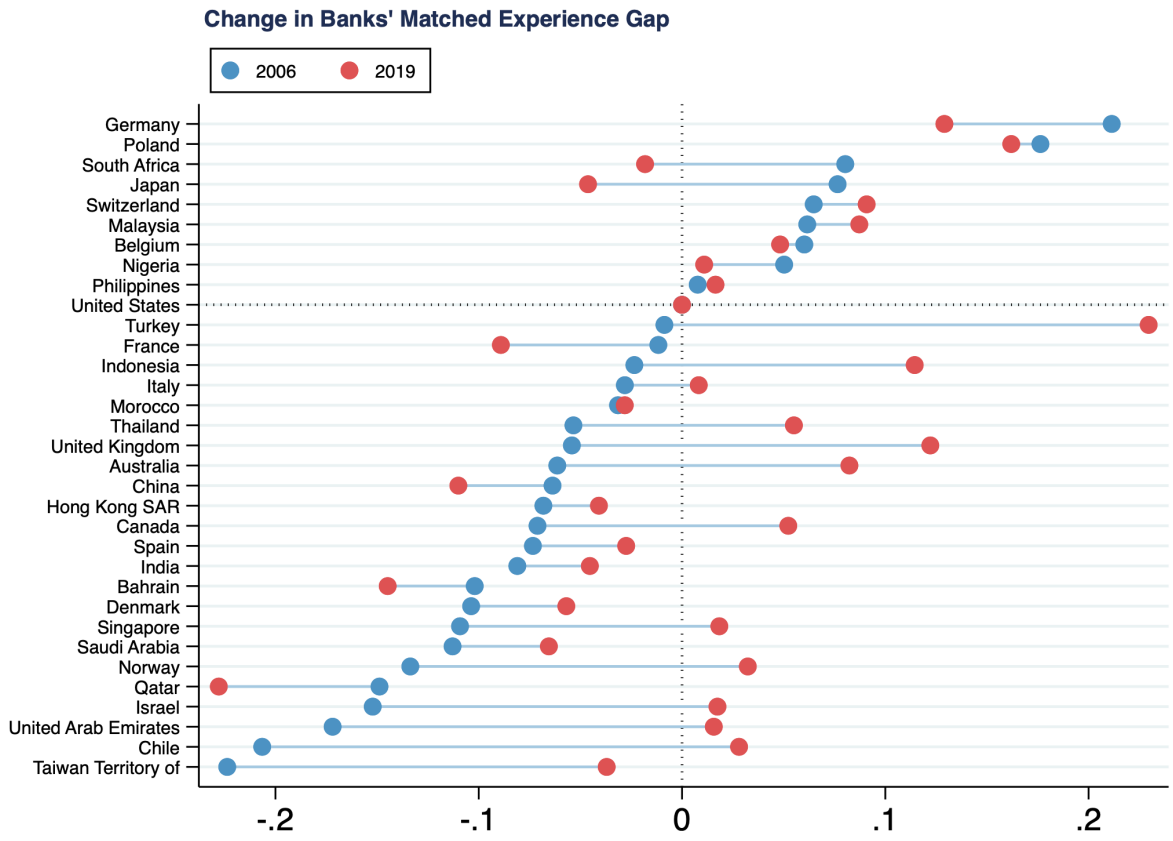
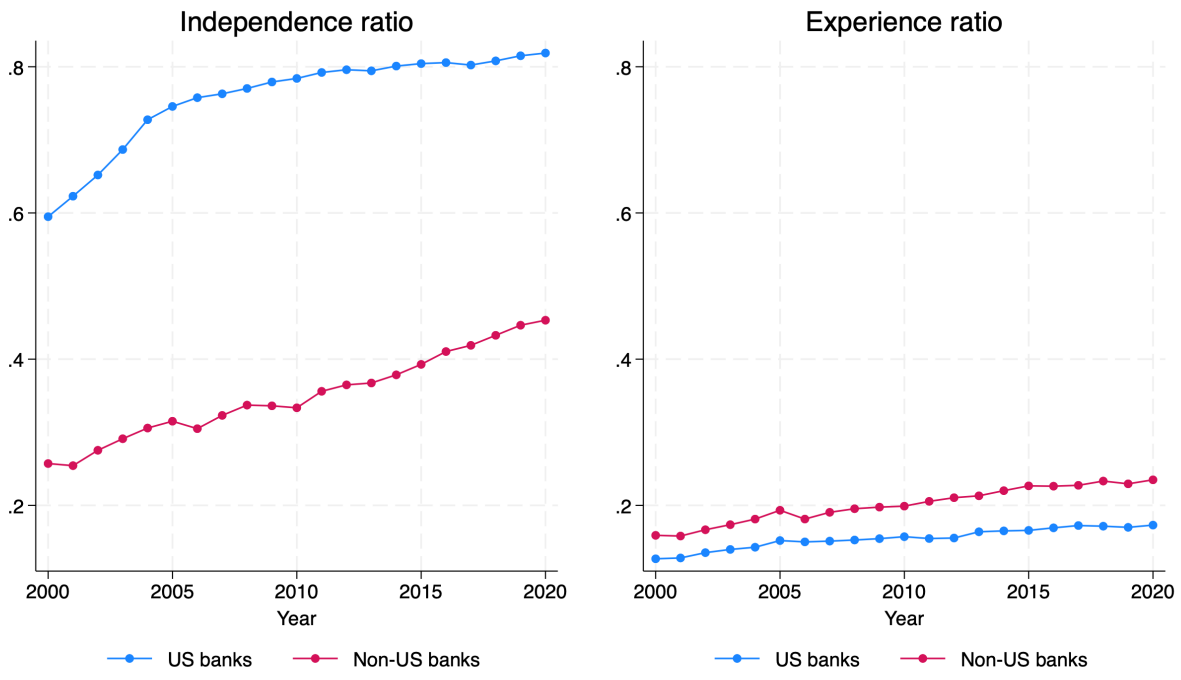


Figure 5. Time Trends in Board Characteristics: 2000-2020

This figure shows the average board independence and banking experience for U.S. and non-U.S. banks in the sample. Board independence is measured as a fraction of board size, while banking experience is measured as a fraction of the number of independent directors.



# 8 Tables

Table 1. Summary Statistics

The sample consists of an unbalanced panel of 19,638 observations from 1,589 banks for the period 2000-2020. Director data are from BoardEx. We obtain additional financial information from Compustat, and country information from Djankov, La Porta, Lopez-de Silanes and Shleifer (2008), La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998), and the World Bank. *Independence* is the ratio of independent outside directors over board size. *Board size* is the number of directors on the board. *Banking Experience* is the ratio of outside directors with prior managerial or top-executive experience in banking over all outside directors. *Busyness* is the average number of commercial and non-commercial outside director appointments of all outside directors. *Assets* is the book value of total assets (in billions of USD). *Sales* is in billions of USD. *Market-to-book* is market value of equity over book common equity. *ROA* is pre-tax income over assets. *Leverage* is assets over common equity. *Anti-director* is obtained by multiplying the anti-director rights index constructed by Djankov, La Porta, Lopez-de Silanes and Shleifer (2008) with the rule of law index reported by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998). *GDP per capita* (PPP adjusted, in thousands of 2017 international USD) and *Market Capitalization* over GDP are sourced from the World Bank's World Development Indicators. *Removal of directors by courts* is a dummy variable that equals 1 if courts are allowed to remove bank directors; this variable is taken from the revised World Bank database on bank regulation and supervisory practices developed by Barth, Caprio and Levine (2008). *One-tier board* is a dummy variable that equals 1 if boards are required to have a unitary board structure; this variable was hand-collected from various sources.

| | Mean | SD | p10 | p50 | p90 | N |
|---|---|---|---|---|---|---|
| **Board Characteristics** | | | | | | |
| Independence | 0.56 | 0.30 | 0.00 | 0.64 | 0.89 | 19,645 |
| Banking experience | 0.18 | 0.17 | 0.00 | 0.14 | 0.40 | 19,645 |
| Board size | 11.46 | 5.14 | 6.00 | 11.00 | 18.00 | 19,645 |
| Busyness | 2.41 | 1.16 | 1.33 | 2.10 | 3.80 | 19,645 |
| **Firm Characteristics** | | | | | | |
| Assets | 75.69 | 292.05 | 0.50 | 5.46 | 107.58 | 19,645 |
| Sales | 3.62 | 12.84 | 0.03 | 0.34 | 6.50 | 19,640 |
| Market-to-book | 1.40 | 0.83 | 0.54 | 1.24 | 2.45 | 19,645 |
| ROA | 0.01 | 0.02 | 0.00 | 0.01 | 0.02 | 19,645 |
| Leverage | 12.04 | 5.48 | 6.64 | 10.94 | 18.53 | 19,645 |
| **Country Characteristics** | | | | | | |
| Antidirector | 28.42 | 7.37 | 16.05 | 30.00 | 39.00 | 17,025 |
| Market cap over GDP | 1.21 | 1.29 | 0.35 | 1.15 | 1.58 | 17,955 |
| GDP per capita | 44.71 | 18.79 | 10.37 | 51.84 | 60.14 | 19,163 |
| Removal of directors by courts (2007) | 0.70 | 0.46 | 0.00 | 1.00 | 1.00 | 18,366 |
| One-tier board | 0.83 | 0.38 | 0.00 | 1.00 | 1.00 | 16,490 |

Table 2. Independence, Banking Experience, and Country Fixed Effects: 2006 and 2019

This table shows regressions of two board characteristics on bank characteristics and country fixed effects. The dependent variable in panel (a) is the logistic transformation of board independence. The dependent variable in panel (b) is the logistic transformation of board experience. In each panel, columns (1)-(3) present results for the sample in 2006, and columns (4)-(6) present results for the sample in 2019. Controls include ROA and the natural logarithms of assets, market-to-book ratio and leverage. See Table 1 for the definition of variables and Table A3 for the coefficients of the control variables. Robust t-statistics (clustered by country) are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

(a) Dependent Variable: Independence

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Adj. R2 | 0.076 | 0.639 | 0.641 | 0.042 | 0.479 | 0.492 |
| N | 1,025 | 1,025 | 1,025 | 945 | 945 | 945 |
| Country FE | NO | YES | YES | NO | YES | YES |
| Controls | YES | NO | YES | YES | NO | YES |
| Year | 2006 | 2006 | 2006 | 2019 | 2019 | 2019 |
| No. of Countries | 81 | 81 | 81 | 88 | 88 | 88 |

(b) Dependent Variable: Experience

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Adj. R2 | 0.027 | 0.084 | 0.116 | 0.030 | 0.087 | 0.116 |
| N | 1,025 | 1,025 | 1,025 | 945 | 945 | 945 |
| Country FE | NO | YES | YES | NO | YES | YES |
| Controls | YES | NO | YES | YES | NO | YES |
| Year | 2006 | 2006 | 2006 | 2019 | 2019 | 2019 |
| No. of Countries | 81 | 81 | 81 | 88 | 88 | 88 |

Table 3. Board, Bank, and Country Characteristics

This table shows regressions of two board characteristics on bank characteristics and country characteristics in 2006, 2019 during 2000-2008, and during the 2000-2019 period. The dependent variable in columns (1)-(4) is the logistic transformation of board independence. The dependent variable in columns (5)-(8) is the logistic transformation of board experience. See Table 1 for the definition of variables. Robust t-statistics (clustered by country) are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

| | Independence | | | | Experience | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Log(Assets) | 0.068 | 0.033 | 0.247 | 0.135 | 0.533*** | 0.619*** | 0.439*** | 0.586*** |
| | (0.87) | (0.34) | (1.03) | (0.97) | (4.79) | (6.77) | (7.18) | (9.93) |
| Log(Market-to-Book) | 0.361 | 0.333 | 0.425 | 0.268 | -0.011 | 0.551 | 0.379 | 0.581 |
| | (0.55) | (0.80) | (0.77) | (0.61) | (-0.01) | (1.15) | (1.14) | (1.66) |
| ROA | 6.624 | 3.813 | -0.891 | 1.670 | 25.969*** | -5.361 | 9.558*** | -6.261 |
| | (0.64) | (0.65) | (-0.28) | (0.40) | (2.82) | (-0.73) | (6.44) | (-1.35) |
| Log(Leverage) | 0.530 | 0.237 | -0.080 | 0.062 | 0.260 | -0.462 | -0.225 | -0.410 |
| | (1.37) | (1.02) | (-0.14) | (0.24) | (0.98) | (-1.23) | (-0.53) | (-1.01) |
| Antidirector | -0.057 | -0.060 | 0.008 | -0.048 | -0.035 | 0.003 | -0.061* | -0.035 |
| | (-0.68) | (-1.00) | (0.15) | (-0.91) | (-0.70) | (0.10) | (-1.85) | (-1.25) |
| One-tier board | 1.228 | 1.907* | -1.154 | 1.044 | 1.891 | 0.440 | -1.965* | -0.710 |
| | (0.88) | (1.75) | (-0.51) | (0.87) | (1.27) | (0.38) | (-1.96) | (-0.81) |
| Legal origin - French | -1.511 | -0.963 | -2.466** | -1.253* | 0.719 | 0.285 | 1.518** | -0.237 |
| | (-1.20) | (-0.94) | (-2.21) | (-1.72) | (0.83) | (0.43) | (2.39) | (-0.40) |
| Legal origin - German | -5.011*** | -4.663*** | 0.361 | -3.026*** | 1.789 | 0.138 | -1.032 | -0.281 |
| | (-3.66) | (-3.63) | (0.26) | (-2.85) | (1.37) | (0.12) | (-0.95) | (-0.34) |
| GDP per capita | 0.068* | 0.076** | -0.008 | 0.059** | 0.051* | 0.032 | 0.004 | 0.010 |
| | (1.80) | (2.52) | (-0.19) | (2.47) | (1.78) | (1.59) | (0.18) | (0.57) |
| Market cap over GDP | 0.095 | 0.236 | -0.175* | -0.101 | -0.139 | -0.283* | 0.026 | -0.041 |
| | (0.35) | (0.67) | (-1.95) | (-0.86) | (-1.00) | (-2.02) | (0.45) | (-0.83) |
| Removal of directors by courts | 1.307 | 0.885 | 3.936* | 1.642 | -0.124 | 0.257 | 0.071 | 0.671 |
| | (1.23) | (0.89) | (1.86) | (1.58) | (-0.14) | (0.35) | (0.08) | (1.17) |
| N | 821 | 6,732 | 609 | 14,095 | 821 | 6,732 | 609 | 14,095 |
| Sample | 2006 | 2000-2008 | 2019 | 2000-2019 | 2006 | 2000-2008 | 2019 | 2000-2019 |
| Adj. R2 | 0.393 | 0.336 | 0.254 | 0.296 | 0.048 | 0.070 | 0.060 | 0.075 |
| Year FE | NO | YES | NO | YES | NO | YES | NO | YES |
| No. of Countries | 25 | 28 | 20 | 29 | 25 | 28 | 20 | 29 |

Table 4. Banking Experience and Director Characteristics

This table presents regressions of bank experience on the characteristics of outside directors. The dependent variable is a dummy that equals one if a director has managerial or top-executive experience in banking prior to a given year. The sample period covers 2000-2019. *NBoardPositions* (*NBankPositions*) represents the standardised number of board (bank) positions a director holds in a given year. Robust t-statistics (clustered at the director level) are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

| | (1) | (2) | (3) |
|---|---|---|---|
| Female | -0.0467*** | -0.0416*** | -0.0402*** |
| | (-5.30) | (-4.77) | (-4.70) |
| Age | 0.0034*** | 0.0036*** | 0.0038*** |
| | (9.88) | (10.56) | (11.26) |
| NBoardPositions | | 0.0444*** | |
| | | (10.81) | |
| NBankPositions | | | 0.0777*** |
| | | | (16.82) |
| N | 124,656 | 124,656 | 124,656 |
| Adj. R2 | 0.0595 | 0.0710 | 0.0934 |
| Bank-Year FE | YES | YES | YES |

Table 5. Bank Fixed Effects Regressions of Board Characteristics on Bank Characteristics

The sample consists of panel data of banks between 2000 and 2019. The dependent variable in column (1)-(3) is the logistic transformation of board independence. The dependent variable in column (4)-(6) is the logistic transformation of board experience. The sample periods are 2000-2008 in columns (1) and (4), 2009-2019 in columns (2) and (5), and 2000-2019 in columns (3) and (6). Panel (a) includes bank and year fixed effects, while Panel (b) includes bank and country-year fixed effects. See Table 1 for the definition of variables. Robust t-statistics (clustered at the bank level) are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

(a) Bank and Year Fixed Effects

| | Independence | | | Experience | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Log(Assets) | 0.582*** | -0.327* | 0.324** | 0.629** | 0.311 | 0.647*** |
| | (3.10) | (-1.94) | (2.43) | (2.22) | (1.11) | (3.45) |
| Log(Market-to-Book) | 0.090 | -0.329** | -0.141 | 0.277* | -0.141 | 0.111 |
| | (0.82) | (-2.57) | (-1.32) | (1.87) | (-0.81) | (0.87) |
| ROA | 6.074 | 0.488 | 3.380 | -5.883* | -5.243 | -4.789 |
| | (1.59) | (0.18) | (1.42) | (-1.75) | (-1.29) | (-1.64) |
| Log(Leverage) | -0.127 | 0.642*** | 0.010 | -0.566* | 0.112 | -0.053 |
| | (-0.60) | (3.20) | (0.06) | (-1.82) | (0.32) | (-0.23) |
| N | 7,986 | 10,250 | 18,321 | 7,986 | 10,250 | 18,321 |
| Sample | 2000-2008 | 2009-2019 | 2000-2019 | 2000-2008 | 2009-2019 | 2000-2019 |
| Adj. R2 | 0.841 | 0.784 | 0.717 | 0.693 | 0.622 | 0.556 |
| Year FE | YES | YES | YES | YES | YES | YES |
| Bank FE | YES | YES | YES | YES | YES | YES |
| No. of Countries | 64 | 70 | 70 | 64 | 70 | 70 |

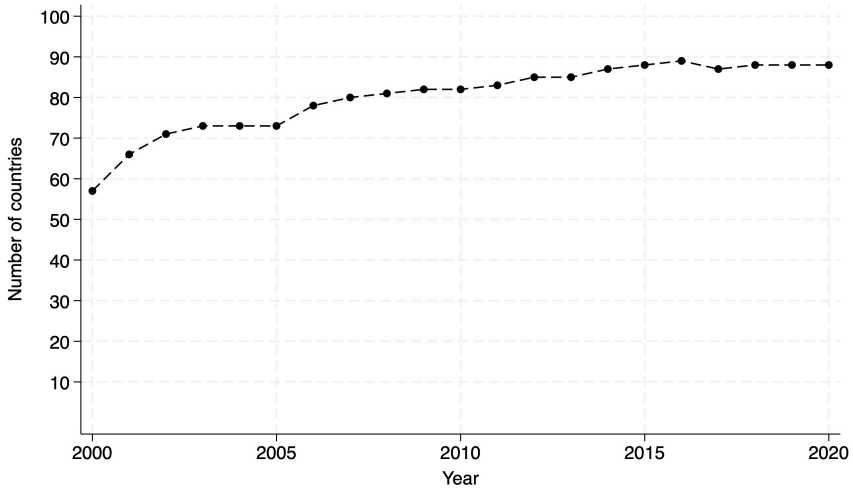
(b) Bank and Country-Year Fixed Effects

| | Independence | | | Experience | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Log(Assets) | 0.318* | 0.104 | 0.161 | 0.454 | 0.459 | 0.270 |
| | (1.81) | (0.67) | (1.43) | (1.41) | (1.35) | (1.24) |
| Log(Market-to-Book) | -0.034 | 0.143 | 0.016 | -0.043 | 0.222 | 0.015 |
| | (-0.40) | (1.14) | (0.19) | (-0.27) | (1.04) | (0.10) |
| ROA | 2.321 | -1.879 | -0.965 | -7.565** | -5.487 | -5.383* |
| | (0.76) | (-0.89) | (-0.52) | (-2.03) | (-1.41) | (-1.78) |
| Log(Leverage) | -0.004 | -0.132 | -0.088 | -0.464 | -0.254 | 0.038 |
| | (-0.02) | (-0.85) | (-0.60) | (-1.33) | (-0.71) | (0.16) |
| N | 7,986 | 10,250 | 18,321 | 7,986 | 10,250 | 18,321 |
| Sample | 2000-2008 | 2009-2019 | 2000-2019 | 2000-2008 | 2009-2019 | 2000-2019 |
| Adj. R2 | 0.862 | 0.832 | 0.795 | 0.694 | 0.622 | 0.568 |
| Country-Year FE | YES | YES | YES | YES | YES | YES |
| Bank FE | YES | YES | YES | YES | YES | YES |
| No. of Countries | 64 | 70 | 70 | 64 | 70 | 70 |

# A Appendix

Appendix Figure A1. Number of Countries Over Years

This figure shows the number of countries in the sample over time.



## Appendix Table A1. Bank Board Independence Gaps

This table shows the average difference in self-reported board independence between non-US banks and matched US banks in 2006 and 2019. A negative gap means that the country has a lower level of board independence than what is observed in similar US banks (by construction, the US has an independence gap of zero). In *Matched* columns banks are matched on five characteristics (assets, sales, market-to-book, ROA, and leverage) using the nearest neighbor propensity matching procedure. In *No matching* columns country averages are compared with the US average, without matching on characteristics.

| | 2006 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Matched | No matching | N | Matched | No matching | N |
| Argentina | -0.415 | -0.389 | 3 | -0.256 | -0.317 | 4 |
| Australia | 0.039 | 0.023 | 10 | 0.177 | 0.044 | 8 |
| Austria | -0.326 | -0.287 | 4 | -0.317 | -0.348 | 7 |
| Bahrain | -0.463 | -0.474 | 5 | -0.362 | -0.407 | 5 |
| Bangladesh | -0.646 | -0.758 | 2 | -0.514 | -0.565 | 4 |
| Barbados | -0.636 | -0.758 | 1 | -0.250 | -0.315 | 1 |
| Belgium | -0.509 | -0.384 | 5 | -0.714 | -0.564 | 5 |
| Bermuda | -0.661 | -0.633 | 1 | -0.105 | -0.352 | 3 |
| Brazil | -0.703 | -0.677 | 4 | -0.480 | -0.498 | 7 |
| Canada | 0.094 | 0.072 | 12 | 0.156 | 0.095 | 13 |
| Chile | -0.527 | -0.585 | 5 | -0.290 | -0.513 | 6 |
| China | -0.600 | -0.543 | 5 | -0.403 | -0.458 | 16 |
| Colombia | -0.773 | -0.686 | 2 | -0.248 | -0.314 | 4 |
| Croatia | -0.357 | -0.758 | 1 | -0.459 | -0.715 | 2 |
| Cyprus | -0.380 | -0.346 | 3 | -0.083 | -0.148 | 1 |
| Czech Republic | -0.656 | -0.681 | 1 | -0.507 | -0.615 | 2 |
| Denmark | -0.566 | -0.525 | 6 | -0.291 | -0.397 | 8 |
| Egypt | -0.769 | -0.758 | 1 | -0.313 | -0.478 | 3 |
| Faroe Islands | | | | -0.306 | -0.370 | 1 |
| Finland | -0.377 | -0.327 | 3 | 0.101 | 0.008 | 6 |
| France | -0.517 | -0.642 | 11 | -0.432 | -0.676 | 15 |
| Germany | -0.661 | -0.728 | 17 | -0.560 | -0.633 | 13 |
| Ghana | | | | -0.559 | -0.690 | 1 |
| Greece | -0.542 | -0.546 | 7 | -0.414 | -0.419 | 4 |
| Greenland | -0.833 | -0.758 | 1 | -0.064 | -0.515 | 1 |
| Hong Kong SAR | -0.337 | -0.372 | 10 | -0.408 | -0.428 | 26 |
| Hungary | -0.611 | -0.633 | 2 | -0.618 | -0.633 | 1 |

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| | 2006 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Matched | No matching | N | Matched | No matching | N |
| Iceland | -0.186 | -0.244 | 3 | 0.033 | 0.044 | 2 |
| India | -0.351 | -0.342 | 32 | -0.351 | -0.387 | 39 |
| Indonesia | -0.385 | -0.389 | 11 | -0.518 | -0.596 | 15 |
| Israel | -0.545 | -0.686 | 6 | -0.311 | -0.421 | 6 |
| Italy | -0.346 | -0.331 | 28 | -0.161 | -0.198 | 22 |
| Jamaica | -0.283 | -0.313 | 1 | -0.087 | -0.201 | 2 |
| Japan | -0.594 | -0.634 | 15 | -0.416 | -0.497 | 33 |
| Jordan | -0.411 | -0.758 | 3 | -0.372 | -0.397 | 3 |
| Kazakhstan | | | | -0.092 | -0.065 | 1 |
| Kenya | -0.117 | 0.042 | 1 | -0.094 | -0.212 | 3 |
| Kuwait | -0.729 | -0.758 | 3 | -0.548 | -0.663 | 8 |
| Lebanon | -0.351 | -0.462 | 3 | -0.341 | -0.300 | 3 |
| Liechtenstein | -0.200 | -0.346 | 2 | -0.495 | -0.546 | 2 |
| Lithuania | -0.714 | -0.758 | 1 | -0.791 | -0.661 | 1 |
| Malaysia | -0.268 | -0.316 | 10 | -0.095 | -0.123 | 11 |
| Malta | 0.208 | 0.076 | 1 | 0.092 | -0.122 | 1 |
| Mauritius | -0.367 | -0.458 | 2 | -0.063 | -0.150 | 2 |
| Mexico | -0.231 | -0.300 | 4 | -0.253 | -0.225 | 7 |
| Monaco | -0.692 | -0.758 | 1 | | | |
| Morocco | -0.759 | -0.758 | 5 | -0.480 | -0.590 | 5 |
| Netherlands | -0.212 | -0.229 | 5 | -0.261 | -0.227 | 3 |
| New Zealand | | | | 0.040 | -0.215 | 1 |
| Nigeria | -0.575 | -0.758 | 7 | -0.547 | -0.633 | 10 |
| Norway | -0.417 | -0.480 | 6 | -0.171 | -0.251 | 12 |
| Oman | -0.410 | -0.512 | 3 | -0.221 | -0.324 | 4 |
| Pakistan | -0.565 | -0.624 | 4 | -0.405 | -0.459 | 6 |
| Panama | 0.083 | -0.008 | 1 | 0.048 | 0.019 | 1 |
| Papua New Guinea | | | | 0.083 | 0.019 | 1 |
| Peru | -0.532 | -0.533 | 4 | -0.138 | -0.253 | 5 |
| Philippines | -0.583 | -0.511 | 11 | -0.336 | -0.413 | 13 |
| Poland | -0.480 | -0.639 | 7 | -0.525 | -0.559 | 9 |
| Portugal | -0.385 | -0.431 | 4 | -0.373 | -0.521 | 1 |
| Puerto Rico | -0.135 | -0.082 | 7 | -0.024 | -0.021 | 3 |

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| | 2006 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Matched | No matching | N | Matched | No matching | N |
| Qatar | -0.714 | -0.684 | 6 | -0.454 | -0.618 | 8 |
| Republic of Ireland | -0.288 | -0.129 | 5 | -0.030 | -0.081 | 3 |
| Romania | -0.697 | -0.758 | 2 | -0.242 | -0.315 | 2 |
| Russian Federation | -0.642 | -0.726 | 4 | -0.473 | -0.552 | 7 |
| Saudi Arabia | -0.492 | -0.360 | 8 | -0.292 | -0.376 | 11 |
| Serbia | | | | -0.198 | -0.584 | 1 |
| Singapore | -0.304 | -0.260 | 5 | -0.101 | -0.197 | 5 |
| Slovakia | -0.773 | -0.758 | 2 | -0.489 | -0.815 | 2 |
| South Africa | -0.170 | -0.259 | 7 | -0.101 | -0.191 | 7 |
| South Korea | -0.491 | -0.408 | 2 | -0.065 | -0.148 | 8 |
| Spain | -0.344 | -0.297 | 9 | -0.228 | -0.312 | 9 |
| Sri Lanka | -0.415 | -0.424 | 3 | -0.111 | -0.265 | 7 |
| Sweden | -0.308 | -0.163 | 4 | -0.131 | -0.146 | 7 |
| Switzerland | -0.411 | -0.419 | 21 | 0.125 | 0.068 | 20 |
| Taiwan Territory of | -0.713 | -0.728 | 14 | -0.518 | -0.530 | 16 |
| Tanzania | | | | -0.769 | -0.815 | 1 |
| Thailand | -0.431 | -0.430 | 8 | -0.333 | -0.393 | 11 |
| Togo | -0.500 | -0.758 | 1 | -0.500 | -0.440 | 1 |
| Trinidad And Tobago | -0.683 | -0.591 | 2 | -0.589 | -0.555 | 3 |
| Turkey | -0.652 | -0.695 | 12 | -0.505 | -0.512 | 12 |
| Turks And Caicos Islands | -0.750 | -0.758 | 1 | -0.119 | -0.100 | 1 |
| United Arab Emirates | -0.662 | -0.651 | 12 | -0.457 | -0.550 | 16 |
| United Kingdom | -0.236 | -0.257 | 12 | 0.096 | -0.042 | 14 |
| United States | 0.000 | 0.000 | 599 | 0.000 | 0.000 | 390 |
| Venezuela | -0.257 | -0.158 | 1 | 0.067 | 0.085 | 1 |
| Vietnam | | | | -0.580 | -0.637 | 9 |
| Virgin Islands British | | | | -0.353 | -0.398 | 1 |
| Zambia | | | | -0.444 | -0.815 | 1 |
| Zimbabwe | | | | 0.159 | -0.370 | 1 |

## Appendix Table A2. Bank Board Experience Gaps

This table shows the average difference in board experience between non-US banks and matched US banks in 2006 and 2019. A negative gap means that the country has a lower level of board experience than what is observed in similar US banks (by construction, the US has an experience gap of zero). In *Matched* columns banks are matched on five characteristics (assets, sales, market-to-book, ROA, and leverage) using the nearest neighbor propensity matching procedure. In *No matching* columns country averages are compared with the US average, without matching on characteristics.

| | 2006 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Matched | No matching | N | Matched | No matching | N |
| Argentina | 0.150 | 0.110 | 3 | 0.122 | 0.169 | 4 |
| Australia | -0.061 | 0.020 | 10 | 0.082 | 0.157 | 8 |
| Austria | 0.208 | 0.268 | 4 | -0.027 | 0.154 | 7 |
| Bahrain | -0.102 | -0.118 | 5 | -0.145 | -0.049 | 5 |
| Bangladesh | -0.083 | -0.151 | 2 | -0.182 | -0.142 | 4 |
| Barbados | -0.250 | -0.151 | 1 | 0.222 | 0.163 | 1 |
| Belgium | 0.060 | 0.123 | 5 | 0.048 | -0.017 | 5 |
| Bermuda | 0.179 | 0.278 | 1 | 0.209 | 0.100 | 3 |
| Brazil | 0.279 | 0.278 | 4 | 0.229 | 0.256 | 7 |
| Canada | -0.071 | 0.042 | 12 | 0.052 | 0.016 | 13 |
| Chile | -0.206 | -0.024 | 5 | 0.028 | 0.107 | 6 |
| China | -0.064 | -0.005 | 5 | -0.110 | -0.007 | 16 |
| Colombia | -0.018 | 0.087 | 2 | -0.122 | -0.037 | 4 |
| Croatia | 0.318 | 0.349 | 1 | 0.131 | 0.392 | 2 |
| Cyprus | 0.011 | 0.029 | 3 | 0.090 | 0.142 | 1 |
| Czech Republic | 0.036 | 0.099 | 1 | 0.197 | 0.286 | 2 |
| Denmark | -0.104 | -0.015 | 6 | -0.057 | -0.007 | 8 |
| Egypt | -0.100 | -0.151 | 1 | 0.355 | 0.393 | 3 |
| Faroe Islands | | | | -0.167 | -0.170 | 1 |
| Finland | 0.097 | 0.137 | 3 | 0.102 | 0.084 | 6 |
| France | -0.012 | 0.003 | 11 | -0.089 | -0.094 | 15 |
| Germany | 0.211 | 0.195 | 17 | 0.129 | 0.124 | 13 |
| Ghana | | | | 0.252 | 0.258 | 1 |
| Greece | -0.174 | -0.073 | 7 | 0.492 | 0.466 | 4 |
| Greenland | 0.000 | -0.151 | 1 | 0.125 | -0.045 | 1 |
| Hong Kong SAR | -0.068 | -0.016 | 10 | -0.041 | 0.034 | 26 |
| Hungary | 0.091 | 0.116 | 2 | 0.625 | 0.455 | 1 |

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| | 2006 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Matched | No matching | N | Matched | No matching | N |
| Iceland | -0.071 | 0.028 | 3 | 0.239 | 0.296 | 2 |
| India | -0.081 | -0.051 | 32 | -0.045 | 0.010 | 39 |
| Indonesia | -0.023 | 0.030 | 11 | 0.114 | 0.150 | 15 |
| Israel | -0.152 | -0.034 | 6 | 0.017 | 0.042 | 6 |
| Italy | -0.028 | 0.043 | 28 | 0.008 | 0.011 | 22 |
| Jamaica | 0.000 | -0.151 | 1 | -0.133 | -0.070 | 2 |
| Japan | 0.077 | 0.206 | 15 | -0.046 | -0.010 | 33 |
| Jordan | -0.064 | 0.011 | 3 | -0.094 | -0.018 | 3 |
| Kazakhstan | | | | 0.018 | -0.027 | 1 |
| Kenya | 0.000 | -0.151 | 1 | -0.083 | -0.068 | 3 |
| Kuwait | -0.151 | -0.151 | 3 | -0.200 | -0.145 | 8 |
| Lebanon | -0.138 | 0.071 | 3 | 0.028 | 0.089 | 3 |
| Liechtenstein | 0.108 | 0.036 | 2 | 0.260 | 0.343 | 2 |
| Lithuania | -0.167 | -0.151 | 1 | 0.441 | 0.330 | 1 |
| Malaysia | 0.062 | 0.098 | 10 | 0.087 | 0.104 | 11 |
| Malta | -0.200 | -0.151 | 1 | -0.143 | -0.170 | 1 |
| Mauritius | 0.018 | 0.063 | 2 | -0.059 | 0.021 | 2 |
| Mexico | -0.245 | -0.126 | 4 | 0.067 | 0.002 | 7 |
| Monaco | 0.109 | 0.049 | 1 | | | |
| Morocco | -0.031 | 0.029 | 5 | -0.028 | 0.015 | 5 |
| Netherlands | 0.014 | 0.088 | 5 | 0.124 | 0.184 | 3 |
| New Zealand | | | | -0.023 | 0.080 | 1 |
| Nigeria | 0.050 | 0.112 | 7 | 0.011 | 0.050 | 10 |
| Norway | -0.134 | -0.075 | 6 | 0.032 | 0.030 | 12 |
| Oman | -0.036 | -0.020 | 3 | -0.118 | -0.077 | 4 |
| Pakistan | -0.077 | -0.068 | 4 | -0.080 | 0.001 | 6 |
| Panama | 0.071 | 0.420 | 1 | 0.462 | 0.375 | 1 |
| Papua New Guinea | | | | 0.033 | 0.030 | 1 |
| Peru | -0.172 | -0.024 | 4 | 0.071 | 0.094 | 5 |
| Philippines | 0.008 | 0.011 | 11 | 0.016 | 0.083 | 13 |
| Poland | 0.176 | 0.253 | 7 | 0.162 | 0.193 | 9 |
| Portugal | 0.092 | 0.256 | 4 | -0.061 | 0.102 | 1 |
| Puerto Rico | 0.061 | 0.073 | 7 | 0.098 | 0.130 | 3 |

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| | 2006 | | | 2019 | | |
|---|---|---|---|---|---|---|
| | Matched | No matching | N | Matched | No matching | N |
| Qatar | -0.149 | -0.151 | 6 | -0.228 | -0.117 | 8 |
| Republic of Ireland | -0.122 | -0.024 | 5 | 0.042 | 0.095 | 3 |
| Romania | -0.103 | 0.016 | 2 | 0.161 | 0.223 | 2 |
| Russian Federation | -0.012 | 0.041 | 4 | 0.081 | 0.231 | 7 |
| Saudi Arabia | -0.113 | -0.101 | 8 | -0.065 | -0.055 | 11 |
| Serbia | | | | -0.157 | -0.027 | 1 |
| Singapore | -0.109 | -0.042 | 5 | 0.018 | 0.109 | 5 |
| Slovakia | 0.012 | 0.099 | 2 | 0.299 | 0.446 | 2 |
| South Africa | 0.080 | 0.095 | 7 | -0.018 | 0.143 | 7 |
| South Korea | -0.067 | -0.101 | 2 | -0.262 | -0.158 | 8 |
| Spain | -0.073 | 0.075 | 9 | -0.027 | 0.054 | 9 |
| Sri Lanka | -0.167 | -0.151 | 3 | -0.088 | -0.029 | 7 |
| Sweden | -0.039 | 0.151 | 4 | 0.207 | 0.126 | 7 |
| Switzerland | 0.065 | 0.062 | 21 | 0.091 | 0.102 | 20 |
| Taiwan Territory of | -0.224 | -0.104 | 14 | -0.037 | 0.008 | 16 |
| Tanzania | | | | -0.250 | -0.170 | 1 |
| Thailand | -0.053 | 0.038 | 8 | 0.055 | 0.093 | 11 |
| Togo | 0.075 | 0.049 | 1 | 0.024 | 0.187 | 1 |
| Trinidad And Tobago | -0.111 | -0.151 | 2 | -0.081 | -0.002 | 3 |
| Turkey | -0.009 | 0.071 | 12 | 0.230 | 0.229 | 12 |
| Turks And Caicos Islands | 0.190 | 0.182 | 1 | 0.300 | 0.230 | 1 |
| United Arab Emirates | -0.172 | -0.107 | 12 | 0.016 | -0.008 | 16 |
| United Kingdom | -0.054 | 0.029 | 12 | 0.122 | 0.174 | 14 |
| United States | 0.000 | 0.000 | 599 | 0.000 | 0.000 | 390 |
| Venezuela | 0.083 | 0.099 | 1 | 0.049 | -0.059 | 1 |
| Vietnam | | | | -0.083 | 0.022 | 9 |
| Virgin Islands British | | | | 0.427 | 0.530 | 1 |
| Zambia | | | | 0.300 | 0.330 | 1 |
| Zimbabwe | | | | -0.077 | -0.170 | 1 |

Appendix Table A3. Regressions of Board Characteristics on Bank Characteristics and Country Fixed Effects in 2006 and 2019

This table shows regressions of two board characteristics on bank characteristics and country fixed effects. The dependent variable in columns (1)-(2) is the logistic transformation of board independence. The dependent variable in columns (3)-(4) is the logistic transformation of board experience. Columns (1) and (3) present results for the sample in 2006, and columns (2) and (4) present results for the sample in 2019. See Table 1 for the definition of variables. Robust t-statistics (clustered by country) are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

| | Independence | | Experience | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Log(Assets) | 0.124 | 0.165 | 0.568*** | 0.459*** |
| | (1.17) | (1.32) | (5.26) | (6.16) |
| Log(Market-to-Book) | 0.243 | 0.576 | -0.047 | 0.153 |
| | (0.43) | (1.41) | (-0.07) | (0.56) |
| ROA | 0.752 | -1.200 | 12.733 | 6.588** |
| | (0.07) | (-0.57) | (1.23) | (2.20) |
| Log(Leverage) | 0.108 | 0.348 | 0.410 | -0.140 |
| | (0.29) | (0.89) | (1.31) | (-0.39) |
| N | 1,025 | 945 | 1,025 | 945 |
| Adj. R2 | 0.641 | 0.492 | 0.116 | 0.116 |
| Country FE | YES | YES | YES | YES |
| Year | 2006 | 2019 | 2006 | 2019 |
| No. of Countries | 81 | 88 | 81 | 88 |

Appendix Table A4. Country Fixed Effects Regressions of Board Characteristics on Bank Characteristics

The sample consists of panel data of banks between 2000 and 2019. The dependent variable in column (1)-(3) is the logistic transformation of board independence. The dependent variable in column (4)-(6) is the logistic transformation of board experience. The sample periods are 2000-2008 in columns (1) and (4), 2009-2019 in columns (2) and (5), and 2000-2019 in columns (3) and (6). See Table 1 for the definition of variables. Robust t-statistics (clustered at the bank level) are in parentheses. Asterisks indicate significance at 0.01 (***), 0.05 (**), and 0.10 (*) levels.

| | Independence | | | Experience | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Log(Assets) | 0.096** | 0.185*** | 0.143*** | 0.649*** | 0.577*** | 0.621*** |
| | (2.07) | (4.41) | (4.15) | (9.25) | (9.58) | (11.88) |
| Log(Market-to-Book) | 0.150 | 0.039 | 0.045 | 0.414** | 0.310* | 0.388*** |
| | (0.95) | (0.28) | (0.36) | (2.03) | (1.80) | (2.72) |
| ROA | 5.252 | 0.483 | 2.534 | -2.894 | -5.191 | -4.327 |
| | (1.43) | (0.18) | (1.17) | (-0.62) | (-1.07) | (-1.38) |
| Log(Leverage) | 0.016 | 0.077 | 0.065 | -0.146 | -0.265 | -0.189 |
| | (0.08) | (0.46) | (0.47) | (-0.51) | (-0.96) | (-0.87) |
| N | 8,128 | 10,456 | 18,670 | 8,128 | 10,456 | 18,670 |
| Sample | 2000-2008 | 2009-2019 | 2000-2019 | 2000-2008 | 2009-2019 | 2000-2019 |
| Adj. R2 | 0.558 | 0.472 | 0.467 | 0.145 | 0.158 | 0.148 |
| Year FE | YES | YES | YES | YES | YES | YES |
| Country FE | YES | YES | YES | YES | YES | YES |
| No. of Countries | 80 | 90 | 90 | 80 | 90 | 90 |

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