UNIL | Université de Lausanne
Département de finance

ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

FINANCE RESEARCH SEMINAR SUPPORTED BY UNIGESTION

"Regulatory arbitrage and cross-border bank acquisitions"

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Friday, March 8th, 10.30-12.00

Room 126, 1st floor of the Extranef building at the University of Lausanne

Regulatory arbitrage and cross-border bank acquisitions

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This version: January 2013

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JEL Classification Codes: G21; G28; G34; G38.

Keywords: Cross-border mergers and acquisitions; financial institutions; bank regulation.

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1. Introduction.

The recent global financial crisis, caused in part by systemic failures in bank regulation (Levine 2012) has sparked major overhauls in financial regulation throughout the world that includes, among others, a strong push for stricter capital requirements and for greater international coordination in regulation. Consider, for example, that seven of the ten recommendations of 2011 Report of the Cross-Border Bank Resolution Group of the Basel Committee for Banking Supervision (BCBS) proposed greater coordination of national resolution measures to deal with the increasingly important cross-border activities of banks.[2] The cost of centralizing bank regulation, of course, is that it limits flexibility in the design of policy toward greater cross-country regulatory competition to the extent that a fully-harmonized global regulation would impose uniform standards across all countries (Acharya, 2003; Dell'Ariccia and Marquez, 2006). A benefit is that it internalizes any interdependencies that may exist across countries due to the integration of their financial systems. Indeed, behind the push for stricter regulations has been a concern about one such interdependency; namely, an increase in the risk of "regulatory arbitrage."[3]

There are two views on the consequences of regulatory arbitrage in which banks from countries with stricter regulations engage in cross-border activities in countries with fewer regulations. On the one hand, banks engaging in such activities can maximize value for shareholders and improve capital allocation if regulatory arbitrage occurs when banks are constrained from pursuing profitable investment opportunities because of costly regulations in their home country. By engaging in cross-border activities, banks can maximize value by pursuing profitable opportunities in markets in which they are not constrained by excessive, costly regulations. Moreover, target banks may benefit from "bonding" to a more robust regulatory regime after being acquired by banks from countries with stronger supervision.[4] On the other

[2] The group was approved by the BCBS in December 2007, but its report originated with the G20 communiqué of April 2009 and the follow-on G20 Working Group on Reinforcing International Cooperation and Promoting Integrity in Financial markets, which became a permanent initiative in the form of the Financial Stability Board. The BCBS, as a forum for regular cooperation on banking supervisory matters, has been in existence since 1974 and reached prominence with the Basel Capital Accords in 1988.

[3] BCBS member, José María Roldán stated at the Asian Banker Summit in Hong Kong in April 2011: *"If we have higher capital requirements, we are going to have higher incentives for regulatory arbitrage. Within banks, across banks, across countries, if you have an uneven application of Basel III you will see banking activity going to the country that has a softer approach."*

[4] The bonding hypothesis (Coffee, 1999; Stulz, 1999) has been widely documented in the cross-listing literature (see, e.g., Doidge, Karolyi and Stulz, 2004). Bonding could happen through the tougher discipline imposed by stronger regulatory authorities from the acquirer's home country for the newly consolidated entity. This is similar to what has been documented in the cross-border

hand, banks may engage in regulatory arbitrage to pursue value-destroying activities in the form of excessive risk-taking, for example, by acquiring targets in countries with lax regulations and weak supervisors. This form of regulatory arbitrage could have adverse consequences on bank performance and shareholder value, for the banking system as a whole, and could even be a catalyst for a harmful "race to the bottom" in bank regulations.[5] Understanding the quality of the banks engaging in cross-border activity is thus important toward determining the motives for pursuing regulatory arbitrage. Riskier institutions with poor performance are more likely to engage in regulatory arbitrage for the wrong reasons. These institutions may be closer to insolvency and would be more willing to engage in riskier, "make-or-break" gambles that may reward existing shareholders at the expense of depositors and creditors. Such multinational financial institutions, which may experience increased scrutiny from their home country regulators, may want to pursue such risky activities in countries that would allow them to do so. Regulatory arbitrage of this harmful form can be especially dangerous as it increases the fragility of interconnected financial systems around the world if the multinational banks can extract subsidies from the host country's regulator, central bank or its taxpayers for losses from its more weakly-monitored risk exposures.[6]

In this paper, we examine whether regulatory arbitrage is taking place by means of one of the most important investing decisions that banks can engage in – a cross-border acquisition. Cross-border deals are a particularly useful setting to evaluate the effects of regulatory restrictions *not only* because the acquiring banks can, in effect, escape from some of the tough regulatory restrictions in their home country by acquiring institutions in weaker regimes *but also* because we can study the quality of the acquiring institutions to understand their motives.[7] We also add power to our tests by controlling for other motives for bank

M&A literature in which the target firm usually adopts the governance structures of the country of the acquiring firm (Rossi and Volpin, 2004; Bris and Cabolis, 2008; Starks and Wei, 2004; and, Ellis, Moeller, Schlingemann, and Stulz, 2012).

[5] By engaging in cross-border bank acquisitions in countries with weaker regulations, acquirers may also extract safety-net subsidies from home country regulators. We thank Edward Kane for providing this alternative "subsidy extraction" interpretation.

[6] Acharya (2003) models how international convergence of bank capital requirements can lead to an unintended "race to the bottom" equilibrium if not accompanied by consistent resolution policies across regimes. Banks that operate across borders will undertake greater risk in more forbearing regimes which reduces profits of banks in less forbearing regimes and which forces those banks to exit. All regulators, therefore, converge on the worst level of forbearance and, in turn, destabilize the banking system. Other models with similar regulatory arbitrage outcomes include Dell'Ariccia and Marquez (2006), Morrison and White (2009), and Agarwal, Lucca, Seru, and Trebbi (2012). Acharya, Wachtel, and Walter (2009) discuss how regulatory arbitrage activities might expose all jurisdictions to the influence of excess risk-taking.

[7] We also benefit from the enormous growth in bank consolidation - domestic and cross-border - facilitated in part by major regulatory changes like: 1999's Gramm-Leach-Bliley Financial Services Modernization Act in the U.S. that overturned the Glass

acquisitions, such as improvements in efficiency, increases in market power, as well as governance-related motives, by benchmarking against purely domestic deals. Ours is, to the best of our knowledge, the first study to examine regulatory arbitrage in cross-border bank acquisitions on a global basis.

Using a sample of 5,125 domestic and 793 majority cross-border deals cumulatively valued in excess of $157 billion involving acquirers and targets from over 80 countries over the period from 1995 through 2008, we first evaluate how differences in regulations influence the overall volume of cross-border bank acquisitions and the flow of deal activity between home countries of the bank acquirers and targets to determine whether the flows are in line with regulatory arbitrage. Even more importantly, we examine the impact on shareholder wealth created through the short-run stock price reactions to deal announcements.

While cross-border acquisitions are just one way in which banks may engage in regulatory arbitrage, examining cross-border acquisitions allows us to disentangle the motivations behind regulatory arbitrage - the harmful pursuit of excessive risk-taking opportunities that may lead to a race-to-the-bottom, or the more benign escape-from-costly-regulations form – by allowing us to control for the quality of the acquirers engaging in such deals. We hypothesize that high risk-taking and poor-performing banks are more likely to engage in regulatory arbitrage through cross-border acquisitions for the wrong reasons (race-to-the-bottom view), and we expect an adverse market reaction to cross-border acquisitions from good to weak countries, all else being equal.[8] On the other hand, if strong, well-run banks are engaging in regulatory arbitrage through cross-border acquisitions, then their motivation is more likely to be benign (escape-from-costly-regulations view), which should be associated with a positive market reaction. In such cases, target banks may benefit from the adoption of better risk management practices and managerial expertise that the acquiring bank may possess as well as from tougher discipline by better regulators from the acquirer's home country, or from "bonding" to a tougher regulatory regime. We focus on majority acquisitions (those in which the acquirer owns more than 50% of the target after the deal) because we are interested in examining

Steagall Act of 1933 which had separated commercial from investment banking activities; the Federal Reserve's Regulation K that reduced regulatory burden on foreign banks operating in the U.S. (final amendment in October 2001); and, 1989's Second Banking Directive in the European Union (EU) that created a single banking license valid throughout the EU.

[8] Although the "race to the bottom" is the outcome for regulatory choices associated with the harmful motive behind cross-border bank acquisitions, for simplicity, we use the term "race to the bottom" to refer to the harmful form of regulatory arbitrage in the rest of the paper.

the acquirer's motivation for pursuing such deals. Whatever their objectives, acquirers are more likely to require sufficient control of the target to be able to implement them.

We uncover several new results. First, cross-border bank acquisitions are indeed more likely to involve acquirers from countries with stronger supervision and more stringent capital requirements, which suggests that regulatory arbitrage is a motivation for cross-border bank acquisitions. These factors are important even after controlling for broader measures of corporate governance that do not have any incremental impact on these cross-border bank acquisitions flows. Second, target banks' (and aggregate) abnormal returns are positive *and* significantly larger when acquirers are from countries with stronger supervision and more restrictions on bank activities. These results suggest that deals that are in line with regulatory arbitrage are rewarded by shareholders, which adds support to the escape-from-costly-regulations or bonding views of regulatory arbitrage. Finally, when incorporating acquirers' attributes into the analysis, we document significantly lower abnormal returns in deals involving higher risk-taking (as proxied by lower Z-score and lower excess risk-based capital) acquirers. Yet, even when we control for these acquirer bank-specific attributes, target (and aggregate) abnormal returns are still reliably positive when acquirers are domiciled in tougher regulatory environments. The key results are robust to a number of different samples of banks, subperiods, and measures of bank regulation, estimation methods, and other elements of our tests.

Our study contributes to several strands of the finance literature. Cross-border studies about bank regulation have shown that tough regulatory restrictions on bank activities and barriers to foreign entry hurt banking sector performance (Barth, Caprio, and Levine 2006). Moreover, the existence of deposit insurance schemes has been shown to increase the likelihood of banking crises, especially when the government runs the deposit insurance fund (Demirgüç-Kunt and Detragiache 2002). In a more recent study, Laeven and Levine (2009) examine how tougher bank regulation reduces bank's risk-taking behavior. They show that the negative relation between bank risk and capital requirements, deposit insurance policies, and restrictions on bank activities depends critically on each bank's ownership structure; banks with large, controlling block-holders neutralize and even reverse the effects of the regulations. What our study on cross-border bank acquisitions can contribute to this stream of research is unique evidence on the potential economic

consequences of *changes* in bank regulation. Cross-border acquisitions are one mechanism through which banks can change their regulatory environment and potentially engage in regulatory arbitrage. Effectively, the acquirer bank can escape strong supervision, strict capital requirements, and restrictions on bank activities imposed by home country regulators by acquiring a majority stake in a target from a much weaker regime.[9] As a result, this cross-border setting allows for an experiment with rich variation in the sign *and* magnitude of the changes in regulatory constraints experienced across the cross-border deals we study.

Our study also contributes to the small literature to date examining regulatory arbitrage and the need for global coordination in financial regulation. In a recent paper, Houston, Lin, and Ma (2012) examine international bank flows and find evidence of regulatory arbitrage, as banks tend to predominantly transfer funds to countries with fewer regulations. While the direction of the flows could signal a harmful "race to the bottom," they find that flows tend to go to countries with stronger institutions (strong creditor rights). In a related paper, Ongena, Popov and Udell (2012) examine the impact of home country regulations on lending activity abroad by European banks with presence in 16 Eastern European countries. They find that banks from countries with tighter restrictions on bank activities and more capital requirements tend to make riskier loans abroad, which is in line with the race-to-the-bottom view of regulatory arbitrage. They find, however, that stronger supervision at home reduces risk-taking abroad. Examining cross-border acquisitions, we contribute to this newer literature by providing more direct evidence of the type of regulatory arbitrage that is taking place. We are able to do this at the deal level by studying the attributes of the acquirers that engage in cross-border deals to assess whether the deals that flow from strong to weak supervisory regimes are likely motivated by the harmful race-to-the-bottom or the more benign "escape from costly regulations" form of regulatory arbitrage.

Two recent studies do evaluate regulatory issues in cross-border banking mergers, but only do so in the context of the European Union (EU). Carbo, Kane, and Rodriguez (2012) evaluate pre-versus post-merger risk-shifting behavior around 165 EU deals between 1993 and 2004 by modeling the elasticity of

[9] While the home country supervisor retains ultimate supervisory authority over the consolidated operations of the acquiring bank, monitoring banks' activities in host countries is complicated by several factors such as distance and lack of coordination with host country supervisors, among others. In addition, by acquiring banks in countries with less restrictions on bank activities, acquirers may engage in activities that are prohibited in the home country (e.g., providing insurance services), which could further complicate the home country supervisory authorities' monitoring role.

bank leverage and an option-based "implied put premium" to asset risk. They find these elasticities increase post-merger, which they imply measure differences in safety-net benefits across countries captured by the acquiring banks and which they interpret as consistent with a race-to-the-bottom form of regulatory arbitrage. Though they employ a useful measure of risk-taking behavior, their EU sample is small and it ignores the breadth of differences in regulatory and supervisory powers globally which our study exploits. Hagendorff, Hernando, Nieto, and Wall (2012) evaluate 143 domestic and 74 EU cross-border deals between 1997 and 2007 and find that bid premiums paid by acquiring banks are lower for targets domiciled in stricter prudential regulatory regimes, which allows them to conclude that it is inconsistent with a race-to-the-bottom form of regulatory arbitrage. They, like us, study pricing of bank acquisitions, but, unlike our study, they do not consider the attributes of the acquiring banks to gauge the motives for the deals. They also acknowledge that their results are mainly driven by domestic deals.[10] Neither study examines overall cross-border banking flows as it relates to differences in regulations.[11]

We also contribute to the literature on cross-border bank acquisitions by exploring yet another plausible motive for the increase in cross-border bank acquisition activity over the past few years. Banks engaged in cross-border deals may be pursuing the very same benefits associated with domestic deals, such as economies of scale, economies of scope, risk and revenue diversification, among others (Berger, Hunter, and Timme 1993; Cornett and Tehranian 1992; Pilloff and Santomero 1998). Despite the many potential gains from cross-border bank acquisitions, however, there is little empirical support for the argument that banks engaging in such deals attain cost or profit efficiencies. In fact, existing studies fail to find significant gains associated with cross-border bank acquisitions (Amel, Barnes, Panetta, and Salleo 2004; Correa 2009; Vander Vennet 2002). Many studies argue that there exist barriers (e.g. differences in language, culture, and currency; differences in regulatory structure) that prevent the proliferation of cross-border bank deals and

[10] A contemporaneous study by Dong, Song, and Tao (2011) examines more than 2,000 cross-border bank mergers completed between 1990 and 2007 and uncovers strong evidence of a harmful form of regulatory arbitrage, which they call "competition in laxity" of bank regulations. Like our study, they measure the annual flows cross-border bank merger activity, the pricing of the deals in terms of bid premiums, and the long-term financial performance of the deals.

[11] In an earlier study, Buch and DeLong (2008) find that regulatory factors play a minor role in explaining the number of bank mergers between countries. They study 299 cross-border bank mergers in OECD countries between 1985 and 2001 and find that acquiring banks from countries with fairly priced deposit insurance tend to reduce risk after a merger. Their study uses a static measure of supervision, and unlike us, they do not examine the stock price reaction to the announcement, nor do they control for the attributes of the acquirers.

that impede the full exploitation of potential synergies in such mergers (Berger, De Young, and Udell 2001; Buch and DeLong 2004; Focarelli and Pozzolo 2001).[12] Despite the failure to uncover gains in with cross-border bank acquisitions, very few studies have examined the role that bank regulation and corporate governance might play in such deals.[13]

2. Data and summary statistics

We first explore the determinants of cross-border bank acquisitions by building a broad sample of domestic and cross-border bank acquisitions. The initial sample consists of all bank acquisitions announced between January 1995 and December 2008. We define a bank acquisition as one in which the acquirer is a commercial bank, bank holding company, or credit institution, while targets may also be insurance companies, mortgage bankers, and security brokers. Because we are interested in studying deals involving changes in control, we focus on majority acquisitions in which the acquirer owns less than 50% of the target's stock before the deal and more than 50% of the target's stock after the deal. Data was obtained from Thomson Financial's Securities Data Corporation (SDC) Platinum database. In line with the literature, we exclude privatizations, leveraged buyouts, spin-offs, recapitalizations, exchange offers, repurchases, and self-tender offers. The initial sample consists of 5,145 (836) domestic (cross-border) deals announced between January 1995 and December 2008. We exclude deals involving countries with no available information on banking regulation (to be discussed below) which reduces the sample to 5,125 (793) domestic (cross-border) deals announced over the period with a total value of $324 ($157) billion as reported by SDC.[14]

Table 1 provides descriptive statistics of the sample. Given that SDC does not provide stock price information, we merge this sample with Thomson Reuter's DataStream database. Panel A shows considerable variation across years in the number of domestic and cross-border acquisitions. The fraction of

[12] Other studies that analyze the share-price reaction to cross-border mergers also provide mixed results. Campa and Hernando (2006) find positive excess returns to targets in cross-border bank deals, although these tend to be lower than for targets in domestic mergers. By contrast, Amihud, DeLong, and Saunders (2002) find significantly negative abnormal returns to the acquirers. Finally, Cybo-Ottone and Murgia (2000) find that cross-border deals did not capture positive expectations from the market.

[13] An exception is Hagendorff, Collins, and Keasey (2008) which analyzes the share-price effects of 31 cross-border bank acquisitions in Europe and the U.S. They document an inverse relationship between the quality of legal protections for minority investors in the target bank's country and the bidder's abnormal returns.

[14] Deals involving institutions (as targets or acquirers) from the following countries are excluded because of lack of data on banking regulation: American Samoa, Andorra, Bahamas, Barbados, Bermuda, Brunei, Faroe Islands, Greenland, Guernsey, Iran, Iraq, Jersey, Kiribati, Laos, Libya, Monaco, Myanmar (Burma), North Korea, San Marino, Yemen, Yugoslavia, and Zaire.

all completed deals that are cross-border rises over the 14 year period and reaches about one-fifth of the total count and 43% of the total value by 2008. The cross-border deals are larger than domestic deals, on average ($470 million compared to $187 million), and proportionally more of them report values.

The descriptive statistics in Panel B of Table 1 show that after merging the initial SDC sample with the DataStream database (our source for bank stock price information), the sample size drops to 3,122 (481) completed domestic (cross-border) deals, out of which 1,213 (240) domestic (cross-border) deals report value. After merging our original SDC sample with DataStream, we also collect accounting information on targets and acquirers from Bloomberg database. Panel B of Table 1 also provides some descriptive statistics of the samples. As expected, the average deal value in the SDC+DataStream sample is significantly larger than in the original SDC sample. The average value of domestic (cross-border) deals is $215 ($597) million in the merged sample, compared to $190 ($476) million in the original SDC sample.

Our sample of bank acquisitions is geographically diverse. Results in Table 2 reveal that our sample includes targets from 85 countries and acquirers from 72 countries. While acquirers and targets from the U.S. and the U.K. dominate the sample of cross-border bank acquisitions, the sample contains many target banks from several developing countries including Brazil, Russia, and Mexico, and some emerging countries, such as South Africa, are reasonably active acquirers in cross-border deals. In addition, the statistics in Table 2 show large variation in cross-border bank acquisition activity across countries. Cross-border bank acquisitions represent 100% of all bank acquisitions over our sample period in the Ukraine and Kazakhstan, for example, but only 5.1% and 5.2% in the U.S. and Japan, respectively.

To examine whether the banking system regulation of the target or acquirer country has any influence on cross-border acquisition flows, target choices, and share price reactions to acquisition announcements, we use several measures of bank regulatory quality from Barth, Caprio, and Levine (2004, 2006; 2008) and Abiad, Detragiache, and Tressel (2010). We focus on those regulations that are not only stressed by the BCBS, but also those that theory and empirical evidence highlights as affecting bank risk-taking behavior and as influencing the stability of the banking system. These measures include: 1) an index of prudential supervision from Abiad et al. (2010) that captures the degree to which an agency is involved in

the supervision of the banking sector;[15] 2) an index of restrictions on bank activities that measures regulatory impediments to banks engaging in securities market activities (underwriting, brokering, dealing, mutual funds), insurance activities (underwriting and selling), and real estate (development or management), and 3) an index measuring the stringency of capital regulation regarding how much capital banks must hold, as well as the sources of funds that count as regulatory capital.[16] The last two indices are taken from Barth et al. (2004, 2006; 2008). The index of prudential supervision from Abiad et al. (2010) is available annually through 2005. Given that our sample period ends in 2008, we apply the value of the 2005 variable to the period 2006-2008. When using the regulatory variables from Barth et al. (2004, 2006; 2008), we use the variables from the 1998 survey for the period 1995-1999; the value of the variables from the second survey (as of 2002) are applied to the period 2000-2003; finally, we use the variables from the third survey (as of 2005) for the period 2004-2008. These and other variables used in our analyses are described in detail in Appendix A. Appendix B presents the average values across years for each index by country.

We also use several measures of country-level governance and development that have been shown to influence cross-border merger and acquisition activity. Our primary measure of governance is an index that is the average of the six governance indicators from Kaufmann, Kraay, and Mastruzzi (2009): voice and accountability; regulatory quality; political stability; government effectiveness; rule of law, and control of corruption.[17] Appendix B shows the average governance scores for all countries in our sample. To control for financial development and growth, we use the log of GDP per capita and the growth in real GDP obtained from the World Bank's World Development Indicators database. We also control for real stock market returns and real exchange rate returns that have been shown to be important determinants of cross-border mergers and acquisitions (Erel, Liao, and Weisbach 2012). We also use a measure of bank-credit-to-GDP from Beck and Demirgüç-Kunt (2009) and a proxy for bank concentration (assets of the top 3 banks as a

[15] This index is based on answers to a series of questions, including: Has the country adopted a capital adequacy ratio based on the Basel standard? Is the banking supervisory agency independent of the executives' influence? Does the banking supervisory agency conduct effective supervisions through on-site and off-site examinations?

[16] This index is based on answers to a series of nine questions that include: Is the minimum capital asset ratio requirement risk weighted in line with the Basel guidelines? Does the minimum ratio vary as a function of market risk? Are market values of loan losses not realized in accounting books deducted from capital? The index measures the regulatory approach to assessing and verifying the degree of capital at risk in a bank.

[17] Each of these indicators range in value from -2.5 to +2.5 with higher values indicating better governance.

proportion of all commercial bank assets) to control for the size and composition of the baking sector, respectively. Finally, we incorporate a measure of exogenous growth opportunities (the log of the inner product of the vector of global industry PE ratios and the vector of country-specific industry weights) from Bekaert, Harvey, Lundblad, and Siegel (2007) to capture additional factors that may affect cross-border deals and as one way to mitigate plausible endogeneity concerns.[18] Appendix C provides descriptive statistics (Panel A) and the respective correlations (Panel B) for our various measures of governance, development, and bank regulation, as well as for the ratios of cross-border bank acquisitions. The correlations suggest that countries with better governance tend to have stronger supervision. This would suggest that stronger country level governance may complement supervision of the banking sector. In addition, countries with tougher capital requirements tend to have more restrictions on bank activities, while there is a positive correlation between a country's development and the strength of supervision and capital requirements, while weaker supervision is associated with faster growth in GDP. Finally, there is a negative correlation between the cross-border ratio – defined as cross-border bank acquisitions as a percent of all bank acquisitions in the target country- and the bank regulatory measures, suggesting less cross-border bank acquisition activity in countries with stronger regulation.

In addition to the country level variables, we compile financial data on targets and acquirers from Bloomberg. To mitigate the influence of outliers, all independent variables are winsorized at the top/bottom 1% of the distribution. Table 3 shows some descriptive statistics of the acquirers and targets. We show how the sample size varies depending on which variable is used. Panel A shows descriptive statistics for acquirers and targets in domestic and cross-border bank acquisitions. Acquirers tend to be larger and more profitable than targets not only in domestic but also, and especially so, in cross-border deals. Acquirers in cross-border deals are larger, more profitable (as measured by return on assets, ROA), but riskier than their counterparts in domestic acquisitions. We measure bank risk using four proxies: 1) the Z-score of each bank, which equals the ROA plus the capital asset ratio divided by the standard deviation of asset returns; it

[18] Because this measure of growth opportunities does not use local price information, Bekaert, et al. (2007) argue that it can be useful in addressing endogeneity problems.

captures the distance from insolvency, so a higher score indicates that the bank is more stable;[19] 2) the ratio of non-performing loans as a share of gross loans; 3) the volatility of equity returns (annualized standard deviation of the past year's weekly returns), and 4) the bank's risk-based capital ratio in excess of the minimum capital requirement in the country. Acquirers in cross-border deals have lower Z-scores, higher non-performing loans, and lower excess risk-based capital, but lower equity volatility than those in domestic deals. Targets in cross-border deals are larger than their domestic counterparts. Targets in cross-border deals seem to be riskier than their counterparts in domestic deals; they have lower Z-scores, higher non-performing loans, and lower risk-based capital ratios.[20]

Given our objective is to determine the acquirer's motive in pursuing deals that are in line with regulatory arbitrage (from countries with strong regulations to those with fewer regulations), in Panels B through D of Table 3, we report descriptive statistics of acquirers and targets in cross-border deals based on differences in acquirer and target countries' supervision, restrictions on bank activities, and capital requirements. Results in Panel B show negligible differences between acquirers in cross-border deals based on strength of supervision in their home country. Acquirers in cross-border deals in which targets are in countries with weaker supervision are larger than their counterparts and have higher equity volatility. The difference in median size and equity volatility is statistically significant at the 10% (1%) level, respectively. The difference is not statistically significant in any of the other variables (by *t*-statistic on the means and by Wilcoxon matched-pairs signed rank test). Notable examples in this category include Spain's Banco Bilbao Vizcaya and its $467 million acquisition of Granahorrar SA of Colombia in 2005 and the UK's Standard Chartered bank and its $191 million acquisition of 67% of Extebandes of Venezuela in 2003.

Panel C reveals that acquirers in cross-border deals from countries with more restrictions on bank activities than the targets' are smaller and more profitable (by Wilcoxon test). No significant differences obtain between the two sets of targets. Many of these deals are diversification opportunities for banks in which there are stringent restrictions. One of largest deals in this category was Banca Commerciale

[19] Insolvency is a state in which losses surmount equity (Laeven and Levine 2009). The probability of insolvency is that where ROA falls below the capital asset ratio and, under the assumption of a normal distribution for profits, it is the inverse of the sum of ROA and the capital asset ratio to the standard deviation of ROA, which we measure based on the trailing three years.

[20] While the differences in means are statistically insignificant, the differences in median are significant at the 10%, 1%, and 5% level for the Z-score, NPL-to-loans ratio, and excess risk-based capital ratio, respectively.

Italiana's 1999 acquisition of 66% of Privredna Banka Zagreb of Croatia, an investment and commodity dealer, for $397 million. Panel D shows that acquirers in cross-border deals that come from countries with more stringent capital requirements have lower equity volatility and more excess risk-based capital, but no other attributes of acquirers or targets reveal any differences. Thus, it appears that acquirers engaging in regulatory arbitrage through cross-border acquisitions are safer and have above average profitability. This preliminary univariate evidence suggests that the acquirers' motive for engaging in regulatory arbitrage may not be the harmful race-to-the-bottom form. If this were the case, we would expect that acquirers from countries with more stringent regulations would be riskier and have poor performance.

3. Determinants of cross-border bank acquisition activity

To examine how differences in regulation could influence cross-border bank acquisitions, we construct a cross-border ratio for each target and acquirer country pair annually from 1995 through 2008. The cross-border ratio is the number of cross-border bank acquisitions in year t where the acquirer comes from country j and the target is in country k ($j \neq k$) as a percentage of all domestic and cross-border bank acquisitions in target country k in year t. Appendix C shows descriptive statistics on the annual cross-border ratios that constitute the panel. The average country-pair cross-border ratio is 0.43% with a sizable standard deviation of 4.98%. Appendix C also reports statistics on the average percentage of cross border deals in the target country (denoted "Cross-border $\text{ratio}_{\text{target}}$") across our full sample period. For the average target country, 39.2% of bank acquisitions were cross-border with a maximum of 100%.

To examine how differences in laws and regulations across countries affect the volume and frequency of cross-border bank acquisitions, we will run the following panel regressions, following the ordered-pairs analysis in Rossi and Volpin (2004):

$$\text{Cross} - \text{border ratio}_{j,k,t} = \beta \Delta X_{j-k} + \gamma \Delta REG_{j-k} + \delta_j + \vartheta_k + \epsilon_t, \quad (1)$$

where Cross-border $\text{ratio}_{j,k,t}$ is the number of cross-border bank acquisitions in year t where the acquirer comes from country j and the target is in country k ($j \neq k$) as a percentage of all domestic and cross-border bank acquisitions in target country k. X_{j-k} is a vector of controls measured as differences between acquirer

and target country that includes: the governance index from Kaufmann et al. (2009); the log of GDP per capita; growth in real GDP; a proxy for bank concentration; a proxy for the size of the banking sector- bank-credit-to-GDP; the real exchange rate return and the real stock market return over the prior twelve months; these have been found to influence cross-border acquisitions (Erel et al., 2012); a proxy for exogenous growth opportunities following Bekaert et al. (2007) to capture additional factors that may influence cross-border flows; a same language indicator variable that equals one if both target and acquirer's country share the same language, and zero otherwise, and a binary variable indicating whether the target and acquirer's countries are in the same geographical region.[21] REG is a vector of variables measured as differences between acquirer and target country that includes: the index of prudential supervision from Abiad et al. (2010) denoted "Supervision;" and the two indices from Barth et al. (2004; 2006; 2008) measuring restrictions on bank activities ("Activities restrictions") and the stringency of capital regulation regarding how much capital banks must hold ("Capital regulatory index"). We compute the cross-border ratio for each country pair annually from 1995-2008. Our approach differs from Rossi and Volpin (2004, Table 6) as they cumulate flows by country-pair across their entire sample period and thus inhibit any time-series variation. Note that we have 28,632 country-pair-years in our largest sample, while Rossi and Volpin have at most 2,352 country-pairs. Target country fixed effects are included in all regressions to control for other time-invariant country characteristics and year fixed effects are employed as well.

Table 4 shows that the volume of cross-border bank acquisition activity between two countries is related in a statistically and economically important way to differences in the quality of bank regulations. Acquirers come from countries with stronger supervision and with more stringent capital requirements. In Model (2), for example, the coefficient on the difference in supervision is 0.232 (robust *t*-statistic of 5.12) and that on the capital regulatory index in Model (4) is 0.051 (robust *t*-statistic of 3.52). Regulatory arbitrage appears to be a motivating factor in cross-border bank acquisitions. The coefficient on differences in activities restrictions enters in negative (opposite of what we would expect from regulatory arbitrage), but is statistically insignificant. We also find that acquirers in cross-border bank acquisitions tend to come from

[21] We classify countries into the following seven regions according to the World Bank's definition: East Asia and Pacific; Europe and Central Asia; Latin America and Caribbean; Middle East and North Africa; North America; South Asia, and Sub-Saharan Africa.

countries with less concentrated and smaller banking sectors. Consistent with prior findings in the corporate literature (Bris and Cabolis 2008; Rossi and Volpin 2004, and Starks and Wei 2004), governance does play a role in cross-border bank acquisition flows; there is more activity in which acquirers come from countries with better governance. Once we incorporate all controls for differences in bank regulation in Model (5), the broader measure of governance loses much of its explanatory power for cross-border bank acquisition flows, however. Finally, consistent with prior findings on cross-border acquisitions of industrial firms, we also document that cross-border bank acquisition activity is more common between countries located in the same region, which share the same language, and tends to involve acquirers from richer countries.

The results in Table 4 are economically significant. For example, a one standard deviation increase in the difference in prudential supervision for a given country pair (1.1 points, which roughly corresponds to the difference between Spain and Argentina) increases the likelihood of a cross-border deal between two countries by 59%.[22] Similarly, a one standard deviation increase in the difference in capital regulatory index (2.3 points) increases the expected volume of cross-border deals for the average country-pair by about 27%.[23]

In Table 5, we present several model specifications to examine the robustness of our results. One concern with the results in Table 4 is that they may be endogenous. It is possible that an increase in cross-border activity induces the very changes in banking regulations that we seek to study, so our results cannot be interpreted as causal. While incorporating the exogenous growth opportunities measure may mitigate some endogeneity concerns (Bekaert et al. 2007), as an alternate way to address this valid concern, in Model (1) of Table 5 we present results using instrumental variables analysis for the regulatory measures. In particular, we use several variables suggested by empirical and theoretical literature that could affect the shape of regulations and institutions. As in other studies (Houston et al. 2012), we use geographic latitude - as a proxy for geographical environment- and ethnic fractionalization as instruments because these have been shown to be important factors in determining the shape of financial institutions (Acemoglu, Johnson, and

[22] The average annual cross-border ratio across all country-pair-years is 0.43%. The coefficient on the difference in supervision from Model (2) in Table 4 is 0.232; thus, the percentage change in the cross-border ratio associated with a one standard deviation increase in the difference in supervision is (.232×1.1)/0.43, or 0.593.

[23] Given coefficient on the difference in capital regulatory index from Model (4), Table 4 (0.051), the percentage change in the cross-border ratio associated with a one standard deviation increase in the difference in capital regulatory index is (.051×2.3)/0.43, or 0.273.

Robinson 2001; Barth et al. 2008, and Beck, Demirgüç-Kunt, and Levine 2003). In addition, we use the average Gini coefficient, a measure of income inequality, because income distributional considerations can exert a significant influence on bank regulation (Beck, Levine, and Levkov 2010). Following Beck, Demirgüç-Kunt, and Levine (2006), we also use the percentage of years since 1776 that a country has been independent; countries that have been independent for a longer period of time may have been able to adopt regulations that are more beneficial for economic development. Finally, we use a common law indicator as a proxy for the legal origin of a country's commercial laws (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998) given that legal origin may help shape bank regulation in a country. None of these instrumental variables should have a direct influence on cross-border bank acquisition flows. The first-stage *F*-statistics reject the null hypothesis that the instruments have no explanatory power (at the 1% level). In addition, the Sargan's overidentification test fails to reject the null hypothesis that the instruments are valid.[24] The results from Model (1) show that after addressing endogeneity concerns using instrumental variables, differences in supervision and in capital regulatory index have a positive impact on cross-border bank acquisition flows, supporting our prior results. In addition, there is now some evidence that acquirers from countries with weaker activities restrictions engage in more cross-border deals, but this result is not statistically reliable with a *t*-statistic of 1.81.

In Model (2) of Table 5, we run the regressions using a Tobit model instead of the Ordinary Least Squares (OLS) regressions shown in Table 4 to address concerns about having a large number of observations with a value of 0. The coefficient on the difference in supervision continues to be positive and significant, but the statistical significance of the difference in capital regulatory index abates, although its sign and magnitude remain the same. In Model (3), we exclude all deals in which a U.S. target or acquirer is involved, given that U.S. institutions represent a large fraction of our sample. Our earlier results continue to hold, while, once again, the coefficient on the difference in activities restrictions comes in negative and this time reliably, suggesting higher volume of cross-border deals in which acquirers come from countries with fewer activities restrictions. This somewhat surprising result is not robust, however. If we exclude the UK or

[24] The null hypothesis is that the instrumental variables are uncorrelated with the set of residuals rendering them acceptable instruments.

Germany – target markets with a large fraction of deals in our sample – the coefficient on the difference in activities restrictions becomes insignificant, yet those on supervision and capital regulatory index remain positive and reliably. A similar result holds if we only exclude U.S. targets from the regressions.

Finally, in Model (4) of Table 5, we control for additional variables that may affect the flow of cross-border bank acquisitions. In particular, we incorporate controls for government ownership of banks and foreign direct investment inflows. Target countries with a larger presence of government-owned banks may encourage cross-border acquisitions in pursuit of political economy goals, especially when governments decide to privatize the banking sector. More foreign direct investment into a country may also attract subsequent cross-border bank acquisition activity. The results show that there is more cross-border acquisition activity involving targets from countries that receive more foreign direct investments relative to the acquirers' country. Differences in government ownership of banks do not appear to add any explanatory power. More importantly, even after controlling for these additional factors, our main results continue to hold. Both the coefficient on supervision and that on capital regulatory index remain positive and highly statistically significant.

The results thus far show that cross-border acquisitions as a proportion of all bank acquisition activity are influenced by the quality of bank regulations in the target and acquirer's countries in a way that is consistent with regulatory arbitrage. The relationships are robust to controlling for differences in the level of economic and financial development, geographic proximity, and similarities in culture and language. We learn that once we capture these differences in bank regulations, the marginal impact of familiar country-level governance factors, though still in the same direction we saw in previous cross-border M&A studies, becomes weaker. The results are also robust to specifications with various combinations of the control variables and to excluding target country fixed effects designed to capture unobservable, omitted features of the targets.

Our findings on cross-border bank acquisition flows accord well with the main findings in Houston, et al. (2012) that bank flows - as measured by changes in total foreign claims from a given source country to another recipient country from the Bank for International Settlements – are stronger from countries with

stronger bank regulations to those with weaker ones. While they point to theirs as evidence of a destructive race-to-the-bottom form of regulatory arbitrage, we do not yet render a verdict on regulatory arbitrage and cross-border bank acquisition patterns without further analysis at the deal level. To this end, we examine the market's reaction to the announcement of such deals as a key step in determining whether the harmful race-to-the-bottom or the more benign escape-from-costly-regulations views are the primary motive for regulatory arbitrage in cross-border bank acquisition flows.

4. Stock Price Reactions to Acquisition Announcements.

The next step in our analysis is to examine how differences in banking regulations are linked to the stock price reactions to cross-border bank acquisition announcements. To explore stock price reaction to bank acquisition announcements, we calculate buy-and-hold cumulative abnormal returns (BHCAR) around the announcement date for both targets and acquirers using a market model with the world market index as the proxy for the market return:

$$R_{ijt} = \alpha_i + \beta_i^w R_{wt} + \varepsilon_{it} \quad t = -260, \dots, -21, \tag{3}$$

where R_{ijt} refers to the daily stock return for either acquirer or target i in country j; R_{wt} is the world market index, and ε_{it} represents the error term. The abnormal returns are then accumulated over three different event windows: (t_1, t_2) = (-20,-3), (-1, +1) and (-2, +2). The BHCAR is computed as follows:

$$\text{BHCAR}_i^{(t_1,t_2)} = \prod_{t=t_1}^{t=t_2}(1 + \widehat{\varepsilon_{it}}) - 1. \tag{4}$$

Our approach to estimating abnormal returns using a world market index facilitates comparison of abnormal returns across countries. We also replicate our results using a two-factor model with both a local market index and the world market index as proxies for market return. While we accumulate abnormal returns over three event windows, our regression tests will focus primarily on abnormal returns accumulated over the five days (-2, +2) surrounding the announcement. Results are similar when we use abnormal returns accumulated over the three-day window (-1, +1).

Table 6 shows descriptive statistics of BHCARs for targets and acquirers. Panel A compares abnormal returns for targets and acquirers in domestic and cross-border acquisitions. The results in Panel A

show that targets in domestic (cross-border) bank acquisitions experience a 15.6% (7.4%) cumulative abnormal return over the five-day period surrounding the announcement. Targets in domestic deals experience significantly larger abnormal returns than targets in cross-border deals. The difference is economically large, at about 8.2 percentage points. The results in Panel A of Table 6 also show significant differences in mean and median BHCARs for targets in cross-border and domestic deals. In addition, the results show insignificant pre-announcement (t=-20 to t=-3) cumulative abnormal returns in cross-border deals. Consistent with prior studies, the results in Panel A show negative, although statistically insignificant, cumulative abnormal returns for acquirers in both domestic and cross-border deals.[25]

Given that our objective is to examine the motives behind regulatory arbitrage in cross border deals, Panels B through D of Table 6 offer descriptive statistics for BHCARs for targets and acquirers based on differences in acquirer and target country's regulations by supervision, bank activities restrictions, and stringency of capital requirements. Panel B shows some support for the race-to-the-bottom view of regulatory arbitrage. Target abnormal returns are positive and significant when acquirers come from countries with similar or weaker supervision, but they are negative, albeit statistically insignificant, when acquirers are from countries with stronger supervision. The difference is statistically significant. For the five days surrounding the announcement, target BHCARs are 10.7% (insignificant -0.3%) for deals in which acquirers come from countries with similar or weaker (stronger) supervision. Thus, deals that are in line with regulatory arbitrage are not well received by target's shareholders suggesting a plausible harmful motive for such acquisitions.

In contrast, the descriptive statistics in Panels C and D of Table 6 suggest that the deals that are in line with regulatory arbitrage are well received by targets' shareholders, consistent with a more benign motive underlying such deals. Targets' BHCARs around the five days surrounding the announcement of deals in which acquirers come from countries with more restrictions on bank activities and more stringent capital requirements are positive and significant, 7.1% and 11.7%, respectively. Similarly, deals involving acquirers from countries with stricter capital requirements have significantly larger stock price reactions

[25] Some cross-border studies do find significant negative abnormal returns to acquirers in cross-border deals (Amihud et al. 2002).

(albeit statistically insignificant) than those deals involving acquirers from countries with similar or more lenient capital requirements than the target's country. The evidence presented in Panels C and D suggests that deals that are in line with regulatory arbitrage are rewarded by targets' shareholders. This does not support the idea of a race to the bottom being the primary motive for pursuing such cross-border acquisitions. But, to pin down motives more carefully, we need to distinguish these share-price reactions by controlling for acquirer characteristics, which we explore next. Note that acquirers' abnormal returns are insignificant in many cases, as are differences across regulatory regimes. Thus, our analysis will focus on examining the determinants of a target's cumulative abnormal returns, but we will also examine aggregate cumulative abnormal returns for targets and acquirers.

4.1. Determinants of stock price reactions to acquisition announcements.

We next turn to the determinants of share price reactions to cross-border bank acquisition announcements, focusing on how differences in regulation play a role in value creation around such deals. We first analyze the determinants of a target's cumulative abnormal returns around the announcement. If regulatory arbitrage is driven by a costly race-to-the-bottom motive in which acquirers escape from tough regulatory regimes by acquiring targets in weaker regimes to pursue value-destroying activities, we expect negative stock price reactions from targets' shareholders around the announcement of such deals. An important consideration in examining the stock price reaction to deals that are in line with regulatory arbitrage would be to control for the characteristics of the acquirers. We hypothesize that harmful race-to-the-bottom motivated acquisitions are more likely to involve riskier, poor performing acquirers from countries with tough regimes.[26] Poor performing banks in countries with strong supervisors and tough regulations may have their hands tied as far as pursuing new business ventures, especially risky ones. In the U.S., for example, poor performing risky banks are usually placed under some form of supervisory action that limits their risk-taking activities, and in some cases, places severe restrictions on the types of activities in

[26] One example in our sample is Allied Irish Bank's €40 million acquisition in 2007 of AmCredit, the mortgage finance business of the Baltic-American Enterprise Fund operating in Latvia, Lithuania, and Estonia. Company officials emphasized the importance of not only geographic diversification in Eastern Europe, but their ability to expand the range of products (See "Irish bank acquires Baltic mortgage company," *Katram Latvietim Pasaule*, June 7, 2007). Concerns arose in 2009 among legislators about how potential property losses from these "speculative investments abroad" would need to be bailed out by the Irish government's National Asset Management Agency ("AIB's eastern exposure could cost taxpayer," *The Independent*, April 10, 2009).

which they can engage.[27] In contrast, regulatory arbitrage may be a way for sound institutions to expand their business and diversify their activities, especially when they are constrained by costly restrictions and regulations in their home country. A target's shareholders may welcome deals involving solid banks from tougher regimes. They may stand to gain from receiving a capital infusion from a bank that comes from a better regime that brings managerial talent and better risk-management techniques or from "bonding" to a stronger regulatory regime, among other benefits.

To examine these competing views on regulatory arbitrage, we run regressions with target (aggregate) BHCARs as the dependent variable as follows. Consider:

$$\mathrm{BHCAR}_{ijkt} = \alpha_{it} + \beta\Delta\mathrm{REG}_{jkt} + \gamma\Delta\mathrm{GOV}_{jkt} + \varphi\mathrm{C}_{jkt} + \delta\mathrm{B}_{it} + \rho_t + \varepsilon_i, \quad (5)$$

where BHCAR_{ijkt} is the target's (aggregate) cumulative buy and hold abnormal return for acquirer i from country j targeting country k at time t; $\Delta\mathrm{REG}_{jkt}$ is a vector of differences in the proxy variables for the quality of bank regulation between acquirer country j and target country k in year t, as before. $\Delta\mathrm{GOV}_{jkt}$ is the difference in the governance indexes from Kaufmann et al. (2009) in year t. C_{jkt} is a vector of country characteristics, measured as differences between acquirer country j and target country k in year t that includes: GDP per capita (in log) to capture differences in economic development between the acquirer and target countries; GDP growth, to capture changes in economic conditions throughout the period; the annual real stock market return and the real exchange rate returns between acquirer and target country to control for currency movements and stock market performance that have been shown to be important determinants of cross-border mergers and acquisitions (Erel et al. 2012); bank concentration, as a proxy for the structure of the banking sector, private credit provided by the banking sector as a percent of GDP as a proxy for the size of the banking sector; a proxy for exogenous growth opportunities, following Bekaert et al. (2007), and binary variables indicating whether the target and acquirer country belong to the same geographical region and share the same language. B_{it} is a vector of bank-level controls, measured as differences between the acquirer and target banks that includes: total assets (log) and return on assets, net income divided by total

[27] Poor performing banks in the US, for example, can be placed under various types of supervisory actions such as memorandum of understanding, or the more formal cease-and-desist order. Banks that are placed under any type of supervisory action are usually required to submit monthly or quarterly reports to their supervisors, and in certain cases, may be required to raise sufficient capital to meet minimum capital guidelines, or cease from continuing certain activities that may adversely affect their capital base.

assets, given that large differences in size and profitability between target and acquirers may significantly affect the outcome of the deal, and as such, the abnormal returns obtained from such deals; finally, ρ_t refers to year dummy variables. We also incorporate an indicator variable for diversifying deals, those in which a commercial bank acquires an insurance company, mortgage banker, or security broker; the potential for regulatory arbitrage – both harmful and benign - is greater in such deals, especially for banks that are prohibited from engaging in non-commercial banking activities in their home country. Finally, we include four different proxies for acquirer's risk-taking from Table 3: 1) the log of Z-score; 2) the non-performing loans-to-total gross loans ratio; 3) total risk-based capital in excess of the regulatory minimum, and 4) equity volatility. We include target country fixed effects in all specifications and cluster standard errors by target country.

The results from the estimation of Eq. (5) are reported in Table 7. The results in Panel A of Table 7 show the importance of differences in the quality of bank regulations between the acquirer and the target countries. Target banks' BHCARs are significantly higher when the acquirer comes from a country with stronger supervision and more restrictions on bank activities, which does not support the view that regulatory arbitrage is motivated by a destructive "race to the bottom." The impact is both statistically and economically significant. The estimates from Model (1) show that a one standard deviation increase in the difference in supervision (0.22 points) is associated with BHCARs that are 4.0 percentage points higher (or 19.8% of its standard deviation).[28] Similarly, a one standard deviation increase in activities restrictions (0.72 points) is associated with a 2.9 percentage points higher BHCARs (or 14.8% of its standard deviation). For both of these indexes of bank regulation, the cross-sectional regressions uncover larger and more reliable differences in target BHCARs than the simple univariate tests in Table 6. In the base specification of Model (1), we find no significant relationship with the differences in the capital regulatory index, which means that the univariate differences in Panel D of Table 6 disappear after controlling for several measures of country-level governance, development, and acquirer characteristics. Overall, target bank shareholders reward cross-border acquisitions in which the acquirers come from better regulatory environments in terms of stronger

[28] The standard deviation of target's BHCARs is 0.20.

supervision and more restrictions on bank activities. These results suggest that target shareholders view this influence of bank regulation positively, which is inconsistent with the harmful view of regulatory arbitrage in cross-border bank acquisitions.

Results in Panel A of Table 7 also underscore the importance of acquirer characteristics. Acquisitions involving higher risk acquirers, those with lower Z-scores (lower distance to insolvency), higher non-performing loans, lower excess risk-based capital, and higher equity volatility, are associated with significantly lower abnormal returns. The results are also economically significant. As an example, the coefficient of -0.116 in Model (5) shows that a one standard deviation increase in the acquirer's equity volatility (0.14) is associated with a 1.6 percentage points (8.1% of its standard deviation) lower BHCARs. Most of the coefficients on the regulatory index variables retain their signs, but do not always retain their statistical significance. The coefficient on differences in the capital regulatory index becomes significant at the 1% level in Model (5). This result is not robust, however; the coefficient on the capital regulatory index becomes insignificant if we exclude the other two regulatory variables. Part of this lack of reliability may stem from the shifting samples underlying the regressions given the different levels of availability of acquirer characteristics and part from the interactions among the regulatory variables themselves.

In addition to the importance of differences in bank regulation and acquirer characteristics, the results show that target's BHCARs are significantly surprisingly lower for diversifying deals in which commercial banks acquire non-bank targets. These results suggest that target shareholders perceive that the synergies from acquisitions may be harder to achieve when there are bigger differences between financial institutions in terms of products and services offered. Of course, ours is a simple dummy variable and not one that captures the extent of the overlap in target and acquirer operations. In addition, the results show that targets' BHCARs are higher for deals involving larger and more profitable acquirers, and in those deals in which acquirers come from countries with higher stock market returns relative to the target's country. There is some evidence in Models (1 and 4) that after controlling for the quality of banking regulation, BHCARs are significantly lower when acquirers come from countries with better governance. It is also important to

note that the coefficients on the regulatory indexes weaken in some specifications that include acquirer controls. This is likely due to the reduced sample.

So far, we have shown that target shareholders reward cross-border deals that are in line with regulatory arbitrage as well as those deals involving larger, more profitable and safer acquirers. The positive stock price reaction by target shareholders to acquisitions involving acquirers from stronger supervision and more restrictions on bank activities may not necessarily reflect that such deals generate value. Target shareholders may react favorably to value destroying deals as long as they obtain an adequate premium. Thus, observing a positive stock price reaction to deals that are in line with regulatory arbitrage may not necessarily indicate that the acquirers' motives are benign. To more carefully examine the motive behind regulatory arbitrage and to determine whether such deals are value creating, we first turn to examine aggregate returns for targets and acquirers. We present the results in Panel B of Table 7. Given that we need to have abnormal returns for both targets and acquirers, our sample size is reduced somewhat when using aggregate BHCARs. The maximum sample size in Model (1) drops from 750 in Panel A to 692 in Panel B.

Consistent with our prior findings for target's BHCARs, the results in Panel B show that aggregate returns are higher for deals involving acquirers from countries with stronger supervision and from countries with more restrictions on bank activities. The results continue to be both statistically and economically significant. The coefficient on difference in supervision in Model (1), 0.263, suggests that a one standard deviation increase in the difference in supervision (0.23) is associated with BHCARs that are 6.0 percentage points higher (or 27.5% of its standard deviation).[29] Similarly, the coefficient in Model (1) suggests that a one standard deviation increase in the difference in activities restrictions (0.74) is associated with BHCARs that are 4.0 percentage points higher, or 18.2% of its standard deviation. In addition, we find no significant relationship with the differences in the capital regulatory index in any of the specifications in Panel B.

The results in Panel B also suggest that not all acquirer characteristics are significant in explaining aggregate BHCARs. We continue to observe that riskier acquirers (those with lower Z-scores and lower excess risk-based capital ratios) are associated with lower aggregate BHCARs. The results are also

[29] The standard deviation of aggregate BHCARs is 0.22.

economically significant. Taking the coefficient on excess risk-based capital in Model (4), a one standard deviation increase in excess risk-based capital (0.03) is associated with BHCARs that are 1.4 percentage points higher (6.4% of its standard deviation). Neither the non-performing loans-to-loans ratio nor the acquirer's equity volatility is significant in explaining aggregate BHCARs.

The results in Panel B continue to show that BHCARs are lower for diversifying deals in which commercial banks acquire non-bank targets. In addition, the results show higher BHCARs for deals involving larger and more profitable acquirers and for those deals in which acquirers come from countries with better performing stock markets relative to the target's country. Aggregate BHCARs are lower for deals involving acquirers from faster growing countries, with better governance, and from the same region.

The results thus far show that differences in bank regulatory quality between acquirer and target countries are significant in explaining the market's reaction to cross-border bank acquisitions. To examine the robustness of our results, we present various additional tests in Table 8. To conserve space, we present robustness tests for target banks' abnormal returns. We conduct similar tests using aggregate abnormal returns (unreported) and obtain qualitatively similar results. Specifically, we use instrumental variables approach to address endogeneity concerns in Model (1); we replicate our results excluding targets and acquirers from the U.S., which comprise the bulk of our sample, in Model (2); in Model (3) we exclude cash deals to address concerns that the favorable reaction by target shareholders to cross-border acquisitions is due to the premium paid; we incorporate additional controls in Model (4), and finally, we incorporate a cross-border indicator in Model (5).

In Model (1) of Table 8, we address possible endogeneity problems using instrumental variables analysis. Similar to the IV regressions in Table 5, we instrument the regulatory variables using instruments that may affect the quality of regulation in the country, but should not affect the market's reaction to cross-border bank acquisitions. In particular, we use several variables suggested by empirical and theoretical literature that could affect the shape of regulations and institutions (Acemoglu and Johnson 2005; Beck et al. 2003; Beck et al. 2006; Easterly and Levine 1997; Houston et al. 2012). These instruments include: geographic latitude - as a proxy for geographical endowment; ethnic fractionalization; the average Gini

coefficient, a measure of income inequality; the percentage of years since 1776 that a country has been independent, and a common law indicator as a proxy for the legal origin of a country's commercial laws (La Porta et al. 1998) given that legal origin may help shape bank regulation in a country. The instruments appear to be exogenous, but we offer more mixed findings here than in Table 5. The Sargan's test of overidentifying restrictions (p-value of 0.53) fails to reject the null that the instruments are valid. In addition, the *F*-statistic of excluded instruments rejects the null hypothesis that the instruments do not explain cross-sectional variation in the regulatory variables at the 1% level.

The results in Table 8 suggest that even after controlling for potential endogeneity problems using IV regressions, our earlier results continue to hold, and in fact become stronger. The results in Model (1) indicate that target's BHCARs are significantly higher for deals involving acquirers from countries with stronger supervision and more restrictions on bank activities. The magnitude of the coefficients in Panel C are larger than those from the OLS regressions in Panel A, which may signal measurement error in the original results. In Model (2) of Panel C, we exclude all deals involving U.S. targets or acquirers. U.S. institutions comprise a large proportion of our sample; thus, a valid concern is the fact that our results may be driven by these particular institutions. Even after excluding U.S. institutions from our sample, the results show that target banks' BHCARs are higher when acquirers come from countries with better supervision and more activities restrictions. In Model (3) we restrict our sample to stock-financed deals. If target shareholders receive stock, they are more exposed to and should care more about the motives of the acquirers and thus react adversely to value-destroying deals. After excluding cash deals, the results continue to show a positive (and even stronger) reaction by target shareholders to deals involving acquirers from countries with stronger supervision and more restrictions on bank activities. The results in Model (3) also show a negative and significant coefficient on the difference in capital regulatory index, which suggests a more adverse reaction to deals involving acquirers from countries with stricter capital regulations. When we estimate regressions using the difference in capital regulation as the only regulatory measure, the coefficient becomes positive and significant, suggesting, as earlier in our tests on acquisition flows, that some unexpected interactions among the regulatory variables may explain this odd result.

In Model (4), we incorporate additional controls that may affect the market's reaction to cross-border bank acquisitions. In particular, we incorporate controls for the level of government ownership of banks, and the foreign direct investment inflows as a percent of GDP. Our main findings remain unchanged once we incorporate these additional controls. In addition, the results also show a more positive stock price reaction to deals in which the acquirer comes from a country with larger government ownership of banks. Finally, in Model (5), we include an indicator variable for cross-border deals. It is possible that the changes in the bank regulatory measures are picking up cross-border deals, which as shown in the cross-border acquisition flows regressions, are more likely to involve acquirers from countries with better regulatory quality. The results show that cross-border deals are associated with lower target's BHCARs, but more importantly, the results reveal that deals in which acquirers come from better regimes (stronger supervision; more activities restrictions) are associated with significantly higher BHCARs.

In additional tests using aggregate BHCARs (unreported), the results continue to show that deals involving acquirers from countries with stronger supervision and more activities restrictions than the targets' country are associated with higher BHCARs. The results are robust to: using IV regressions to address endogeneity concerns; to the exclusion of deals involving U.S. institutions and cash deals; and, to the inclusion of additional controls (government ownership of banks and FDI inflows, and a cross-border indicator).

As an additional test, in unreported results, we examine the acquirers' stock price reactions using matched "acquisition-adjusted" BHCARs for a subset of acquirers involved in both domestic and cross-border acquisitions. That is, for each acquirer involved in both a domestic and cross-border acquisition during our sample period, we compute matching acquisition-adjusted BHCARs by subtracting the cumulative buy and hold abnormal return for a domestic acquisition from the cumulative buy and hold abnormal return for a cross-border acquisition by the same acquirer.[30] The results using this matched BHCAR approach show larger and more positive reactions to cross-border deals in which acquirers come

[30] We match each cross-border acquisition with the closest domestic acquisition in calendar time (within at most a 3 year limit) by the same acquirer.

from countries with more restrictions on bank activities and more stringent capital requirements. The impact of differences in supervision is no longer significant, however.

Overall, the results in this section present evidence that tilts in favor of a positive impact of regulatory arbitrage in cross-border deals. The positive stock price reaction to cross-border deals that involve acquirers from stronger supervisory and regulatory environments suggest that the harmful "race-to-the-bottom" motivation may not be the primary driver of regulatory arbitrage in cross-border bank acquisitions.

5. Additional Robustness Tests.

We perform several additional tests to verify the robustness of our results. First, we perform several additional tests for the flows regressions of Table 4. In unreported results, we incorporate alternative proxies for the quality of country-level governance, such as: the anti-director's rights index from La Porta, Lopez-de-Silanes, and Shleifer (2006) and the anti-self-dealing index from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008). Using these alternate proxies for governance does not alter our results. In addition, to determine whether the numerator of the cross-border ratio (total number of cross-border deals between country j and k) is, in fact, driving the results, the denominator (total domestic and cross-border deals in target country) is included as an additional control. Our results continue to hold. Finally, to address concerns dealing with the changing sample size across the various specifications in Table 4, in unreported results, we use a consistent sample across all specifications and find qualitatively similar results.

In our multivariate analyses of cumulative abnormal returns of Table 7, we replicate our results using abnormal returns over the three days – that is, $(t_1, t_2) = (-1, +1)$ – instead of five days surrounding the announcement date. The results using these abnormal returns are qualitatively similar to the ones shown in Table 7. The significance of the changes in activities restrictions weakens, however (significant at the 10% level). In addition, we restrict the observations in the regressions in Table 7 to be common across all model specifications; after all, there is considerable variation in the base sample of cross-border and domestic deals across the various acquirer characteristics we employ. In this case, most results hold, but we lose the

significance associated with the difference in bank supervision quality, although the sign remains the same. The sample size drops to only 345 observations in each regression, so a lack of power may explain this. In addition, similar to the cross-border flows regression analysis, we use alternative measures of governance in the regressions (again, the anti-self-dealing index and the revised anti-director's rights index). All results remain unchanged; the anti-director's rights index enters in negative and significant, but the anti-self-dealing index is insignificant.

Finally, we incorporate additional proxies for the quality of bank regulation into the regressions. In particular, we incorporate several additional measures from Barth et al. (2004; 2006; 2008), including the private monitoring index; the financial statement transparency index as a proxy for the quality of disclosure; the entry into banking requirements index; the official supervisory power index as an additional proxy for the quality of supervision, and the independence of supervisory authority index. The inclusion of these additional controls does not reduce the significance of our regulatory variables. Some of these additional controls do enter in significant; for example, the difference in private monitoring index and the difference in financial statement transparency are negative and significant, suggesting lower BHCARs for deals in which acquirers come from countries with stronger "private" monitoring and more transparent financial statement data. Overall, incorporating these additional proxies for the quality of supervision and regulation does not add significant explanatory power to our regressions.

The acquisition literature in finance has documented the importance of deal characteristics, such as the percentage of the transaction financed in cash versus stock, in explaining merger premium (Starks and Wei 2004). Although we exclude cash deals in some of the robustness tests shown in Table 8, in unreported results we incorporate several variables that control for deal characteristics including indicator variables for transactions financed by stock (cash). Including such controls does not alter the main results.

As a final test, we explore the acquirer's peers' reactions to the announcement of cross-border acquisitions.[31] In unreported results, we find average negative reaction for acquirer's peers for cross-border deals in which the targets are in countries with less stringent capital requirements. This provides additional

[31] We define the acquiring bank's peers as the closest five banks in the country in terms of size as of the year of the acquisition.

support for the more benign motive behind regulatory arbitrage in cross-border bank acquisitions. If the motive for engaging in cross-border acquisitions was the harmful race-to-the-bottom one, we would not expect a negative reaction by the acquiring banks' peers. The observed negative reaction by peer banks suggests that the acquiring bank may be in fact pursuing some value creating opportunities in less restrictive regimes.

6. Conclusion.

This paper explores an important, yet understudied, aspect of cross-border bank acquisitions: the impact of differences in national bank regulations on the level of deal activity and on the shareholder wealth created around deal announcements. In particular, we focus on exploring whether regulatory arbitrage is a driving force behind the increased cross-border bank acquisition activity observed over the last decade or so. More importantly, we test two competing hypotheses dealing with regulatory arbitrage. On one hand, regulatory arbitrage could be driven by the search for profitable opportunities, if banks from overly-restrictive regimes are not allowed to engage in certain value-generating activities. Through bank acquisitions of targets in countries with fewer restrictions, such banks may "escape from costly regulations," or transfer sound supervision and regulation from the home country. On the other hand, a more harmful motive for regulatory arbitrage could be motivated by a race-to-the-bottom in which banks acquire assets abroad targeting countries with weak regulations in order to pursue value-destroying, high-risk activities. We find more evidence in favor of the former than the latter hypothesis.

Using a sample of 5,125 (793) majority domestic (cross-border) acquisitions announced between 1995 and 2008, we show that differences in bank regulation do affect cross-border bank acquisition flows and share price reactions to acquisition announcements. The results show that the volume of bank acquisition activity between two countries is correlated with differences in the quality of bank regulations. In particular, acquirers are typically from countries with stronger supervision and stricter capital requirements, all of which is in line with regulatory arbitrage. The quality of bank regulation plays an economically

important role in explaining cross-border acquisition flows and share price reactions to cross-border deal announcements than a number of other country-level measures related to investor protection and governance.

We find that target banks' and aggregate cumulative abnormal returns around the announcement date are positively correlated with differences in the quality of bank regulation between the acquirer and target countries. Target (and aggregate) abnormal returns are higher when acquirers are from countries with a tougher bank regulatory environment. In particular, target (aggregate) BHCARs are higher when acquirers are from countries with stronger supervision and more restrictions on bank activities. This suggests that the motive for pursuing regulatory arbitrage may not necessarily be in line with the harmful race-to-the bottom view. In addition, we find that the acquirer's risk-taking attributes are important determinants of share price reactions to acquisitions. Target banks' (aggregate) cumulative abnormal returns are typically lower when riskier acquirers are involved. Yet, even when we control for acquirer-specific attributes, the target BHCARs are still higher for deals for acquirers domiciled in tougher regulatory regimes. These additional findings also support the escape-from-costly-regulations view of regulatory arbitrage. Our findings are robust to the use of additional measures of regulatory quality and to various ways to address potential endogeneity concerns.

Caveats abound in our study, but two are worthy of note. A distinct advantage of our effort relative to others is that we can evaluate regulatory arbitrage *at the deal level* by studying the market's reaction to their announcements to judge the economic consequences and by measuring the attributes of the acquirers and targets to understand motives. But with this advantage comes a cost: our effort narrowly frames the issue of regulatory arbitrage in the context of cross-border bank acquisitions, an important, but only one of many other important multinational banking activities that are shaped by regulation. Our sample period is short (starts in 1995). To some extent we are constrained by data availability, but, more importantly, cross-border bank acquisitions were fewer in number, smaller in size, and limited in scope globally by the many government rules that blocked foreign acquisitions until recently.

Our research is important given the dramatic changes that have taken place in the global banking sector as a result of the recent global financial crisis. Indeed, the increased importance of regulations and

governance mechanisms in the banking industry is highlighted in the December 2009 Basel Committee's Report on Strengthening the Resilience of the Banking Sector, which stresses the vital role those enhancing governance mechanisms, transparency and disclosure can play in promoting stability in the banking sector. The impact of these rules and other proposed regulatory changes that will lead to more stringent government oversight of financial institutions throughout the world will certainly have an impact on banks and on the financial sector as a whole. A major concern associated with this push for tougher regulations is the potential for regulatory arbitrage. Our findings show that not all regulatory arbitrage may be a cause for concern, at least within the scope of cross-border acquisitions. More importantly, we show that knowing the types of institutions that engage in regulatory arbitrage can shed some light on whether their motives should be of concern.

References

Abiad, A.G., Detragiache, E., Tressel, T., 2010. A New Database of Financial Reforms. *IMF Staff Papers* 57, 281-302.

Acemoglu, D., Johnson, S., Robinson, J.A., 2001. The Colonial Origins of Comparative Development: An Empirical Investigation, *American Economic Review* 91, 1369-1401.

Acemoglu, D., Johnson, S., 2005. Unbundling Institutions. *Journal of Political Economy* 113, 5, 949-995.

Acharya, V., 2003. Is the International Convergence of Capital Adequacy Regulation Desirable? *Journal of Finance* 58, 2745-2781.

Acharya, V., Wachtel, P., Walter, I., 2009. International Alignment of Financial Sector Regulation. *Financial Markets, Institutions, and Instruments* 18, 188-190.

Agarwal, S., Lucca, D., Seru, A., Trebbi, F., 2012. Inconsistent Regulators: Evidence from Banking. Unpublished Working Paper No. 17736, National Bureau of Economic Research.

Amel, D., Barnes, C., Panetta, F., Salleo, C., 2004. Consolidation and Efficiency in the Financial Sector: A Review of the International Evidence. *Journal of Banking and Finance* 28, 2493-2519.

Amihud, Y., DeLong, G.L., Saunders, A., 2002. The Effects of Cross-Border Bank Mergers on Bank Risk and Value. *Journal of International Money and Finance* 21, 857-877.

Barth, J., Caprio, G., Levine, R., 2004. Bank Regulation and Supervision: What Works Best? *Journal of Financial Intermediation* 13, 205-248.

Barth, J., Caprio, G., Levine, R., 2006. Rethinking Bank Supervision and Regulation: Until Angels Govern. Cambridge University Press, Cambridge, UK.

Barth, J.R., Caprio, G., Jr., Levine, R., 2008. Bank Regulations Are Changing: For Better or Worse? *Comparative Economic Studies* 50, 537-563.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2003. Law, Endowment and Finance. *Journal of Financial Economics* 70, 137-181.

Beck, T., Demirgüç-Kunt, A., Levine, R., 2006. Bank Supervision and Corruption in Lending. *Journal of Monetary Economics* 53, 2131-2163.

Beck, T, Demirgüç-Kunt, A, 2009. Financial Institutions and Markets across Countries and over Time: Data and Analysis. Unpublished Working Paper, World Bank Policy Research.

Beck, T., Levine, R., Levkov, A., 2010. Big Bad Banks? The Winners and Losers from Bank Deregulation in the United States. *Journal of Finance* 65, 1637-1667.

Bekaert, G., Harvey, C.R., Lundblad C., and Siegel, S., 2007. Global Growth Opportunities and Market Integration. *Journal of Finance* 62, 1081-1137.

Berger, A.N., De Young, R., Udell, G.F., 2001. Efficiency Barriers to the Consolidation of the European Financial Services Industry. *European Financial Management* 7, 117-130.

Berger, A.N., Hunter, W.C., Timme, S.G., 1993. The Efficiency of Financial Institutions: A Review and Preview of Research Past, Present, and Future. *Journal of Banking and Finance* 17, 221-249.

Bris, A., Cabolis, C., 2008. The Value of Investor Protection: Firm Evidence from Cross-Border Mergers. *Review of Financial Studies* 21, 605-648.

Buch, C.M., DeLong, G., 2004. Cross-Border Bank Mergers: What Lures the Rare Animal? *Journal of Banking and Finance* 28, 2077-2102.

Buch, C.M., DeLong, G., 2008. Do Weak Supervisory Systems Encourage Bank Risk-taking? *Journal of Financial Stability* 4, 23-39.

Campa, J.M., Hernando, I., 2006. M&As Performance in the European Financial Industry. *Journal of Banking and Finance* 30, 3367-3392.

Carbo-Valverde, S., Kane, E.J., Rodriguez-Fernandez, F., 2012. Regulatory Arbitrage in Cross-Border Banking Mergers within the EU. *Journal of Money, Credit, and Banking* 44, 1609-1629.

Coffee, J., 1999. The Future as History: The Prospects for Global Convergence in Corporate Governance and its Implications. *Northwestern University Law Review* 93, 641-708.

Cornett, M.M., Tehranian, H., 1992. Changes in Corporate Performance Associated with Bank Acquisitions. *Journal of Financial Economics* 31, 211-234.

Correa, R., 2009. Cross-Border Bank Acquisitions: Is There a Performance Effect? *Journal of Financial Services Research* 36, 169-197.

Cybo-Ottone, A., Murgia, M., 2000. Mergers and Shareholder Wealth in European Banking. *Journal of Banking and Finance* 24, 831-859.

Dell'Ariccia, G., Marquez, R., 2006. Competition among Regulators and Credit Market Integration. *Journal of Financial Economics* 79, 401-430.

Demirgüç-Kunt, A., Detragiache, E., 2002. Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation. *Journal of Monetary Economics* 49, 1373-1406.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2008. The Law and Economics of Self-Dealing. *Journal of Financial Economics* 88, 430-465.

Doidge, C., Karolyi, G.A., Stulz, R, 2004. Why Are Foreign Firms Listed in the U.S. Worth More? *Journal of Financial Economics* 71, 205-238.

Dong, H., Song, F., Tao, L., 2011. Regulatory Arbitrage: Evidence from Bank Cross-Border M&As. Unpublished Working Paper, University of Hong Kong.

Easterly, W., Levine, R., 1997. Africa's Growth Tragedy: Policies and Ethnic Divisions. *Quarterly Journal of Economics* 112 (4), 1203-1250.

Ellis, J.A., Moeller, S.B., Schlingemann, F.P., Stulz, R.M., 2012. Globalization, Governance, and the Returns to Cross-Border Acquisitions. Unpublished Working Paper, Ohio State University.

Erel, I., Liao, R.C., Weisbach, M.S., 2012. Determinants of Cross-Border Mergers and Acquisitions. *Journal of Finance* 67, 1045-1082.

Focarelli, D., Pozzolo, A.F., 2001. The Patterns of Cross-Border Bank Mergers and Shareholdings in OECD Countries. *Journal of Banking and Finance* 25, 2305-2337.

Hagendorff, J., Collins, M., Keasey, K., 2008. Investor Protection and the Value Effects of Bank Merger Announcements in Europe and the US. *Journal of Banking and Finance* 32, 1333-1348.

Hagendorff, J., Hernando, I., Nieto, M., Wall, L., 2012. What do Premiums Paid for Bank M&As Reflect? The Case of the European Union. *Journal of Banking and Finance* 36, 749-759.

Houston, J.F., Lin, C., Ma, Y., 2012. Regulatory Arbitrage and International Bank Flows. *Journal of Finance,* 67 1845-1895.

Kaufmann, D., Kraay, A., Mastruzzi, M., 2009. Governance Matters VIII: Aggregate and Individual Governance Indicators 1996-2008. Unpublished Working Paper, World Bank.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 1998. Law and Finance. *Journal of Political Economy* 106, 1113-1155.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 2006. What Works in Securities Laws? *Journal of Finance* 61, 1-33.

Laeven, L., Levine, R., 2009. Bank Governance, Regulation and Risk Taking. *Journal of Financial Economics* 93, 259-275.

Levine, R., 2012. The Governance of Financial Regulation: Reform Lessons from the Recent Crisis. *International Review of Finance* 12, 39-56.

Morrison, A.D., White, L., 2009. Level Playing Fields in International Financial Regulation. *Journal of Finance* 64, 1099-1142.

Ongena, S., Popov, A., Udell, G.F., 2012. When the Cat's Away the Mice Will Play: Does Regulation at Home Affect Bank Risk Taking Abroad? forthcoming, *Journal of Financial Economics*.

Pilloff, S.J., Santomero, A.M., 1998. The Value Effects of Bank Mergers and Acquisitions, in Y. Amihud and G. Miller, eds.: Bank Mergers and Acquisitions. Kluwer Academic Publishers, Dordrecht.

Rossi, S., Volpin, P.F., 2004. Cross-Country Determinants of Mergers and Acquisitions. *Journal of Financial Economics* 74, 277-304.

Starks, L.T., Wei, K.D., 2004. Cross-Border Mergers and Differences in Corporate Governance. Unpublished Working Paper, University of Texas.

Stulz, R., 1999. Globalization, Corporate Finance, and the Cost of Capital. *Journal of Applied Corporate Finance* 12, 8-25.

Vander Vennet, R., 2002. Cross-Border Mergers in European Banking and Bank Efficiency Unpublished Working Paper, Ghent University.

Table 1. Bank acquisitions around the world.

This table describes all majority acquisitions in which the acquirer is a commercial bank, bank holding company, or credit institution, while targets may also be insurance companies, mortgage bankers, and security brokers. The year represents the year in which the deal was announced. Acquisitions in which the target institution or the acquiring institution's country of origin was not identified are excluded. The initial sample, broken down by year in Panel A consists of all bank majority acquisitions (those in which the acquirer owns more than 50% of the target after the deal) announced between January 1995 and December 2008. Data was obtained from Thomson Financial's SDC Platinum database. All recapitalizations, spinoffs, LBOs, divestitures, share repurchases, and privatizations are excluded. We then construct a sample of domestic and cross-border bank acquisitions with stock price information available in Thomson Financial's DataStream (SDC+ DataStream sample in Panel B). The SDC+DataStream sample consists of all deals for which we can compute abnormal returns for either acquirers or targets. P-values (in parentheses) are for t-tests (Kolmogorov-Smirnov nonparametric test) for differences in mean (median). *, **, *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A - Full Sample by Year

	Domestic acquisitions					Cross-border acquisitions				
Year	Total Announced	# Completed	Total Value (US$M)	Mean Value (US$M)	# reporting value	Total Announced	# Completed	Total Value (US$M)	Mean Value (US$M)	# reporting value
1995	450	450	$10,947	$97	113	27	27	$2,989	$332	9
1996	402	402	$17,048	$147	116	40	39	$5,688	$316	18
1997	456	456	$24,047	$200	120	58	58	$9,759	$349	28
1998	497	497	$20,079	$199	101	57	57	$16,816	$731	23
1999	438	436	$33,106	$290	114	58	58	$23,518	$1,383	17
2000	376	376	$29,362	$219	134	76	76	$28,689	$897	32
2001	312	312	$19,341	$177	109	51	50	$12,023	$481	25
2002	330	329	$24,709	$211	117	42	42	$3,064	$180	17
2003	334	331	$19,840	$137	145	38	38	$2,693	$150	18
2004	333	331	$31,959	$212	151	60	60	$9,326	$322	29
2005	365	364	$36,543	$230	159	69	67	$6,387	$266	24
2006	352	351	$29,859	$198	151	85	84	$14,738	$433	34
2007	283	283	$19,563	$160	122	85	83	$15,158	$399	38
2008	197	196	$8,072	$139	58	47	47	$6,172	$343	18
TOTAL (Mean)	**5,125**	**5,114**	**$324,476**	**$187**	**1,710**	**793**	**786**	**$157,019**	**$470**	**330**

Panel B- Sample Comparison - Completed Majority Acquisitions

	Initial SDC sample			SDC + DataStream sample		
	Domestic	Cross-Border	Difference (p-value)	Domestic	Cross-Border	Difference (p-value)
Mean Value (US$ million)	$190	$476	(0.000)	$215	$597	(0.000)
Total value (US$ million)	$324,476	$157,019		$260,905	$143,223	
Total Deals Announced	5,125	793		3,133	488	
Total Deals Completed	5,114	786		3,122	481	
# reporting value	1,710	330		1,213	240	
Test of difference with SDC sample (p-value)				(0.000)	(0.000)	

Table 2. Domestic and cross-border bank acquisitions by country.

This table reports descriptive statistics on all completed domestic and cross-border majority bank acquisitions with available information on the total value of the deal. Bank acquisitions are defined as those in which the acquirer is a commercial bank, bank holding company, or credit institution, while targets may also be insurance companies, mortgage bankers, and security brokers. The deals are listed by country of origin of the target and acquirer. The data was obtained from Thomson Financial's SDC Platinum database for all acquisitions announced between 1995 and 2008. Reported values are in constant (2008) U.S. dollars.

Completed Majority Cross-Border & Domestic Bank Acquisitions (1995-2008) by Country

	Cross-border deals		Domestic deals				Cross-border deals		Domestic deals		
Country of Target	#	Value (US$ M)	#	Value (US$ M)	Total Value (US$ M)	Country of Acquirer	#	Value (US$ M)	#	Value (US$ M)	Total Value (US$ M)
USA	64	$75,117	1191	$183,688	$258,805	USA	42	$22,514	1191	$183,688	$206,202
UK	28	$14,885	56	$33,814	$48,699	UK	27	$16,553	56	$33,814	$50,367
Japan	3	$9,385	55	$17,410	$26,795	Germany	16	$20,767	11	$15,753	$36,520
Italy	9	$873	51	$16,981	$17,854	Italy	12	$4,520	51	$16,981	$21,501
Germany	5	$1,022	11	$15,753	$16,775	Spain	25	$15,411	17	$4,010	$19,422
Brazil	11	$6,866	21	$5,414	$12,280	Canada	20	$15,742	18	$1,890	$17,631
France	16	$4,139	19	$7,211	$11,350	Japan	1	$26	55	$17,410	$17,437
Australia	6	$1,288	30	$8,633	$9,921	Australia	9	$5,194	30	$8,633	$13,826
Ukraine	14	$5,736	0	$0	$5,736	France	21	$6,183	19	$7,211	$13,394
Spain	3	$406	17	$4,010	$4,416	Switzerland	9	$11,483	5	$222	$11,705
Russia	13	$3,367	3	$150	$3,517	Austria	18	$7,685	1	$9	$7,693
Mexico	4	$1,199	9	$2,247	$3,446	Netherlands	11	$5,373	3	$883	$6,256
Portugal	4	$2,827	4	$414	$3,240	Belgium	10	$6,163	0	$0	$6,163
Argentina	9	$1,678	15	$1,428	$3,106	Brazil	2	$633	21	$5,414	$6,047
Hong Kong	5	$2,749	6	$296	$3,045	Greece	8	$2,930	5	$337	$3,267
Turkey	5	$2,880	3	$23	$2,903	China	1	$2,474	1	$776	$3,249
Finland	2	$534	8	$2,201	$2,736	Mexico	1	$277	9	$2,247	$2,524
Saudi Arabia	0	$0	1	$2,503	$2,503	Saudi Arabia	0	$0	1	$2,503	$2,503
Chile	4	$1,972	8	$482	$2,454	Finland	4	$177	8	$2,201	$2,378
Netherlands	3	$1,506	3	$883	$2,389	Puerto Rico	6	$1,147	4	$1,104	$2,252
Sweden	6	$651	9	$1,618	$2,269	Sweden	4	$604	9	$1,618	$2,222
Canada	1	$171	18	$1,890	$2,061	Norway	1	$67	6	$1,980	$2,047
Denmark	2	$103	6	$1,957	$2,059	Denmark	1	$13	6	$1,957	$1,970
Norway	2	$28	6	$1,980	$2,008	Ireland	7	$1,918	1	$28	$1,946
Kazakhstan	3	$1,958	0	$0	$1,958	South Africa	6	$249	9	$1,538	$1,788
Rest of countries (60)	108	$15,679	160	$13,490	$29,169	Rest of countries (47)	68	$8,917	173	$12,269	$21,186
TOTAL (85 countries)	330	$157,019	1,710	$324,476	$481,495	TOTAL (72 countries)	330	$157,019	1,710	$324,476	$481,495

Table 3. Descriptive statistics of targets and acquirers.

The table shows descriptive statistics of the acquirers and targets in majority bank acquisitions. Financial information on targets and acquires was obtained from Bloomberg. Panel A shows results for acquirers and targets in domestic and cross-border deals. Panels B-D report results for cross-border deals by differences in the quality of the regulatory environment between the acquirer and target country. The last columns report p-values from tests of differences in mean (t-tests) and median (Wilcoxon matched-pairs signed rank test).

Description of sample of majority acquisitions - Acquirer & Target Characteristics										
Panel A - Cross-border and domestic acquisitions										
	Cross-border acquisitions				Domestic acquisitions					
Acquirers:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
Total Assets	$304,276	$186,281	$278,208	457	$46,687	$5,373	$123,971	2,956	(0.000)	(0.000)
ROA	1.77%	1.16%	2.36%	451	1.60%	1.39%	1.57%	2,944	(0.029)	(0.032)
Z-score	2.21	2.26	1.00	368	2.79	2.78	1.07	1,657	(0.000)	(0.000)
NPL-to-GL	2.46%	1.69%	3.31%	363	1.44%	0.64%	2.91%	2,726	(0.000)	(0.000)
Excess risk-based capital	0.04	0.04	0.03	309	0.05	0.05	0.03	2,414	(0.200)	(0.008)
Equity volatility	0.30	0.27	0.16	310	0.31	0.29	0.15	2,734	(0.000)	(0.000)
Targets:										
Total Assets	$35,343	$2,255	$100,335	128	$28,592	$898	$109,487	945	(0.483)	(0.001)
ROA	1.57%	1.23%	3.11%	125	1.41%	1.17%	2.57%	937	(0.593)	(0.182)
Z-score	1.95	1.91	1.41	52	2.30	2.36	1.28	281	(0.123)	(0.067)
NPL-to-GL	4.26%	1.95%	5.86%	72	1.83%	0.75%	3.74%	804	(0.519)	(0.000)
Excess risk-based capital	0.07	0.04	0.08	19	0.07	0.05	0.06	647	(0.256)	(0.018)
Equity volatility	0.36	0.31	0.26	68	0.40	0.35	0.23	871	(0.879)	(0.156)
Panel B - Cross-border deals by differences in supervision										
	Acquirers from countries with stronger supervision				*Acquirers from countries with similar or weaker supervision*					
Acquirers:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
Total Assets	$315,573	$224,665	$274,687	178	$297,070	$178,229	$280,684	279	(0.203)	(0.089)
ROA	1.59%	1.23%	2.08%	178	1.88%	1.12%	2.53%	273	(0.352)	(0.341)
Z-score	2.28	2.34	1.00	144	2.16	2.17	1.00	224	(0.590)	(0.272)
NPL-to-GL	2.41%	1.93%	2.84%	138	2.50%	1.50%	3.57%	225	(0.527)	(0.159)
Excess risk-based capital	0.04	0.04	0.02	119	0.04	0.04	0.03	190	(0.728)	(0.621)
Equity volatility	0.30	0.28	0.17	128	0.30	0.27	0.16	182	(0.010)	(0.006)
Targets:										
Total Assets	$22,505	$2,144	$68,282	50	$43,572	$2,480	$116,024	78	(0.199)	(0.142)
ROA	1.90%	1.14%	2.68%	50	1.35%	1.38%	3.37%	75	(0.314)	(1.000)
Z-score	2.08	1.99	1.51	22	1.86	1.77	1.34	30	(0.639)	(0.445)
NPL-to-GL	5.42%	3.42%	5.95%	34	3.23%	1.17%	5.66%	38	(0.482)	(0.014)
Excess risk-based capital	0.06	0.03	0.07	5	0.07	0.04	0.09	14	(0.985)	(0.402)
Equity volatility	0.36	0.28	0.32	21	0.36	0.31	0.23	47	(0.903)	(0.617)

Table 3. Descriptive statistics of targets and acquirers. Continued

Panel C - Cross-border deals by differences in restrictions on bank activities

	Acquirers from countries with more restrictions				*Acquirers from countries with similar or fewer restrictions*					
Acquirers:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
Total Assets	$226,650	$88,540	$267,039	187	$358,040	$325,021	$273,510	270	(0.000)	(0.000)
ROA	2.20%	1.41%	2.75%	183	1.48%	1.08%	2.02%	268	(0.127)	(0.005)
Z-score	2.19	2.27	0.98	139	2.22	2.25	1.01	229	(0.724)	(0.619)
NPL-to-GL	2.66%	1.66%	3.74%	144	2.33%	1.70%	2.99%	219	(0.415)	(0.639)
Excess risk-based capital	0.04	0.04	0.03	115	0.04	0.04	0.03	194	(0.482)	(0.872)
Equity volatility	0.31	0.27	0.17	145	0.29	0.28	0.15	165	(0.282)	(0.193)
Targets:										
Total Assets	$38,174	$2,249	$101,192	46	$33,754	$2,351	$10,440	82	(0.813)	(0.574)
ROA	1.79%	1.29%	3.07%	44	1.45%	1.23%	3.14%	81	(0.553)	(0.736)
Z-score	1.56	1.55	1.84	17	2.14	1.93	1.12	35	(0.225)	(0.290)
NPL-to-GL	5.10%	2.31%	7.42%	23	3.87%	1.56%	5.01%	49	(0.445)	(0.675)
Excess risk-based capital	0.17	0.09	0.19	3	0.05	0.04	0.04	16	(0.704)	(0.132)
Equity volatility	0.38	0.37	0.14	16	0.36	0.28	0.29	52	(0.386)	(0.302)

Panel D - Cross-border deals by differences in capital requirements

	Acquirers from countries with stricter capital requirements				*Acquirers from countries with similar or more lenient capital requirements*					
Acquirers:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
Total Assets	$322,241	$174,664	$305,182	204	$289,791	$197,718	$254,083	253	(0.832)	(0.297)
ROA	1.81%	1.27%	2.50%	202	1.73%	1.10%	2.25%	249	(0.862)	(0.300)
Z-score	2.30	2.40	0.94	166	2.13	2.15	1.05	202	(0.580)	(0.466)
NPL-to-GL	2.49%	1.79%	3.32%	165	2.44%	1.62%	3.31%	198	(0.698)	(0.286)
Excess risk-based capital	0.05	0.05	0.03	142	0.03	0.03	0.02	167	(0.011)	(0.005)
Equity volatility	0.27	0.24	0.15	152	0.33	0.31	0.17	158	(0.000)	(0.000)
Targets:										
Total Assets	$51,892	$2,616	$134,257	63	$19,302	$1,997	$44,545	65	(0.071)	(0.241)
ROA	1.75%	1.39%	2.66%	61	1.39%	1.18%	3.49%	64	(0.520)	(0.730)
Z-score	1.81	1.89	1.64	31	2.16	1.93	0.96	21	(0.277)	(0.509)
NPL-to-GL	5.13%	2.20%	6.99%	42	3.06%	1.54%	3.53%	30	(0.439)	(0.444)
Excess risk-based capital	0.09	0.04	0.12	9	0.05	0.04	0.03	10	(0.286)	(0.151)
Equity volatility	0.33	0.28	0.25	33	0.39	0.37	0.27	35	(0.320)	(0.718)

Table 4. The role of government regulation in cross-border bank acquisitions.

This table presents results from Ordinary Least Squares (OLS) regressions for a sample of matched country pairs (acquirers and targets). Following Rossi and Volpin (2004), the dependent variable is the number of majority cross-border bank acquisitions in year t where the target is from country *k* and the acquirer is from country *j*, as a proportion of all majority bank acquisitions in the target country, *k*. We compute the cross-border ratio for each country pair annually from 1995-2008. Independent variables are computed as the differences between the acquirer country (*j*) and the target country (*k*). These include an index of the quality of supervision, the prudential supervision index from Abiad et al. (2010); an index of bank activity restrictiveness that measures regulatory impediments to banks engaging in securities, insurance, and real estate activities, and a capital stringency index measuring the stringency of capital regulation; these last two indices were taken from Barth et al. (2004, 2006; 2008); a governance index that is the average of all six Kaufmann et al. (2009) governance indicators; the log of GDP per capita as of 1995; the annual growth in real GDP; a proxy for bank concentration - the assets of the top three banks as a share of all commercial banks' assets; private credit provided by the banking sector as a percent of GDP as a proxy for the size of the banking sector; the average annual real stock market return; the average annual real bilateral U.S. dollar exchange rate return; a proxy for exogenous growth opportunities, following Bekaert et al. (2007), and binary variables indicating whether the acquirer and target country share the same language, or are from the same region. Target country fixed effects and year fixed effects (not shown) are included in all regressions. Standard errors are clustered by target country. Robust (White) t-statistics are shown in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Independent variables:	Dependent variable: Cross-border ratio$_{i,k}$				
	(1)	(2)	(3)	(4)	(5)
Δ supervision$_{j-k}$		0.232***			0.214***
		(5.12)			(4.88)
Δ activities restrictions$_{i-k}$			-0.013		-0.007
			(-1.32)		(-0.58)
Δ capital regulatory index$_{i-k}$				0.051***	0.048***
				(3.52)	(3.01)
Δ governance index$_{i-k}$	0.165***	0.059	0.158***	0.134**	0.041
	(2.84)	(1.05)	(2.69)	(2.28)	(0.71)
Δ log GDP per capita$_{j-k}$	0.182***	0.184***	0.179***	0.206***	0.206***
	(5.52)	(5.36)	(5.37)	(6.01)	(5.77)
Δ GDP growth$_{j-k}$	-1.926**	-1.684*	-1.927**	-1.773**	-1.564*
	(-2.21)	(-1.86)	(-2.20)	(-2.01)	(-1.70)
Δ bank concentration$_{j-k}$	-0.744***	-0.776***	-0.747***	-0.688***	-0.743***
	(-3.35)	(-3.39)	(-3.36)	(-3.11)	(-3.25)
Δ bank credit-to-GDP$_{j-k}$	-0.236***	-0.203**	-0.240***	-0.240***	-0.213**
	(-2.74)	(-2.04)	(-2.82)	(-2.76)	(-2.18)
Δ real exchange rate return$_{j-k}$	-0.117	-0.209	-0.120	-0.141	-0.230
	(-0.77)	(-1.25)	(-0.79)	(-0.91)	(-1.37)
Δ real stock market return$_{j-k}$	0.029	0.032	0.029	0.033	0.034
	(0.61)	(0.43)	(0.60)	(0.68)	(0.43)
Same region	0.360***	0.340**	0.355***	0.355***	0.336**
	(3.01)	(2.56)	(2.97)	(2.97)	(2.51)
Same language	0.588**	0.586**	0.589**	0.585**	0.582**
	(2.36)	(2.26)	(2.36)	(2.35)	(2.25)
Δ growth opportunities$_{i-k}$	0.452***	0.532***	0.446***	0.484***	0.546***
	(4.56)	(3.45)	(4.39)	(4.93)	(3.55)
Constant	0.139	-0.685	0.141	0.138	-0.684
	(1.03)	(-1.62)	(1.05)	(1.03)	(-1.60)
Observations	28,632	25,713	28,632	28,632	25,713
R-squared	0.011	0.013	0.011	0.012	0.013
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Target country fixed effects	Yes	Yes	Yes	Yes	Yes

Table 5. The role of government regulation in cross-border bank acquisitions. Robustness tests

This table presents some robustness tests for cross-border bank acquisition flows for a sample of matched country pairs (acquirers and targets). Following Rossi and Volpin (2004), the dependent variable is the number of majority cross-border bank acquisitions in year t where the target is from country *k* and the acquirer is from country *j*, as a proportion of all majority bank acquisitions in the target country, *k.* We compute the cross-border ratio for each country pair annually from 1995-2008. Independent variables are computed as the differences between the acquirer country (*j*) and the target country (*k*) and are the same ones used in Table 4 and defined in Appendix A. In Model (1) we show results in which we instrument the three bank regulatory variables. We use the following variables as instruments: a country's latitude - as a proxy for geographical environment; ethnic fractionalization; the average Gini coefficient, a measure of income inequality; the percentage of years since 1776 that a country has been independent, and a common law indicator as a proxy for the legal origin of a country's commercial laws (La Porta et al. 1997). In Model (2) we present results from Tobit regressions. In Model (3) we replicate results excluding all U.S. banks, while in Model (4) we incorporate government ownership of banks and FDI inflows as additional controls. Target country fixed effects and year fixed effects (not shown) are included in all regressions. Standard errors are clustered by target country. Robust (White) t-statistics are shown in parentheses. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively

Dependent variable: Cross-border $ratio_{i,k}$				
	(1)	(2)	(3)	(4)
	IV	TOBIT	No U.S.	Additional controls
Δ $supervision_{j-k}$	0.879***	1.747***	0.147***	0.220***
	(3.38)	(3.15)	(3.94)	(4.67)
Δ $activities\ restrictions_{i-k}$	-0.518*	-0.092	-0.035***	-0.009
	(-1.81)	(-0.57)	(-3.08)	(-0.72)
Δ capital $regulatory\ index_{j-k}$	0.248***	0.235	0.048***	0.049***
	(3.31)	(1.37)	(2.90)	(3.03)
Δ $governance\ index_{j-k}$	-0.884**	-0.840	-0.051	0.042
	(-2.54)	(-0.92)	(-0.93)	(0.67)
Δ log GDP $per\ capita_{j-k}$	0.124**	1.126**	0.107***	0.197***
	(2.35)	(2.19)	(3.67)	(5.57)
Δ $GDP\ growth_{j-k}$	2.047	-9.229	-0.871	-1.380
	(1.61)	(-0.84)	(-1.02)	(-1.48)
Δ $bank\ concentration_{j-k}$	-0.714*	2.628	0.008	-0.727***
	(-1.66)	(1.58)	(0.05)	(-3.21)
Δ bank $credit\text{-}to\text{-}GDP_{j-k}$	-0.717***	0.293	0.069	-0.212**
	(-2.68)	(0.35)	(0.76)	(-2.16)
Δ real $exchange\ rate\ return_{j-k}$	-0.300	-2.106	-0.151	-0.237
	(-1.38)	(-0.85)	(-1.24)	(-1.39)
Δ real $stock\ market\ return_{j-k}$	-0.624***	0.519	0.052	0.041
	(-2.77)	(0.65)	(0.66)	(0.53)
Same region	0.231**	6.781***	0.489***	0.342**
	(2.02)	(5.59)	(4.30)	(2.54)
Same language	0.749***	10.051***	0.298	0.571**
	(3.79)	(5.91)	(1.50)	(2.22)
Δ $growth\ opportunities_{i-k}$	1.515***	6.589***	0.204	0.553***
	(4.13)	(2.99)	(1.48)	(3.48)
Δ $government\ ownership_{i-k}$				-0.140
				(-0.80)
Δ FDI net inflows $\%GDP_{i-k}$				-0.913*
				(-1.89)
Constant	-1.044**	-48.614***	0.093	0.161
	(-1.98)	(-6.75)	(0.68)	(1.09)
Observations	17136	25713	24530	25454
R-squared	0.0892	0.0649	0.011	0.014
Year fixed effects	Yes	Yes	Yes	Yes
Target country fixed effects	Yes	Yes	Yes	Yes
1st stage F-test (pvalue) - supervision	0.000			
1st stage F-test (pvalue) - restrictions	0.000			
1st stage F-test (pvalue) - capital requirements	0.000			
Sargan's overidentification test (pvalue)	0.939			

Table 6. Cumulative buy and hold abnormal returns for targets and acquirers.

The table shows descriptive statistics of buy and hold cumulative abnormal returns (BHCARs) for targets and acquirers in completed domestic and cross-border (CB) majority acquisitions announced between 1995 and 2008. To compute abnormal returns, we estimate the following market model for each target (acquirer):

$$R_{ijt} = \alpha_i + \beta_i^w R_{wt} + \varepsilon_i; \;\; t = -260, \ldots, -21$$

where R_{ijt} refers to the daily stock return for target (acquirer) i in country j; R_{wt} is the world market index, and the residual ε_i is the excess return for each bank. All returns for international banks are obtained from DataStream, while the returns for U.S. institutions are obtained from CRSP. Abnormal returns are accumulated over three event windows: (-20, -3), (-1, +1), and (-2, +2) as follows:

$$BHCAR_i^{(T_1,T_2)} = \prod_{t=T_1}^{t=T_2}(1 + \hat{\epsilon}_{it}) - 1$$

where BHCAR in period (T1, T2) is the buy and hold cumulative abnormal return. Panel A shows descriptive statistics for buy and hold cumulative abnormal returns for targets (acquirers) in domestic and cross-border deals. Panels B-D show descriptive statistics for cross-border deals by differences in three measures of regulatory quality between acquirer and target countries: supervision, restrictions on bank activities, and stringency of capital requirements. The measure of supervision is the prudential supervision index from Abiad et al. (2010); the index on restrictions on bank activities and the capital regulatory index were taken from Barth et al. (2004, 2006; 2008). The last column of each panel shows p-values from t-statistics (Wilcoxon Z-statistics) for differences in mean (median) BHCARs between groups. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Cumulative abnormal returns in majority acquisitions - Acquirers & Targets

Panel A - Cross-border and domestic acquisitions

	Cross-border acquisitions				Domestic acquisitions				Test of Difference (p-value)	
Targets:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
BHCAR (-20,-3)	0.0270	0.017	0.168	75	0.038***	0.017	0.141	887	(0.566)	(0.497)
BHCAR (-1,+1)	0.065***	0.010	0.134	75	0.143***	0.106	0.190	887	(0.000)	(0.000)
BHCAR (-2,+2)	0.074***	0.029	0.142	75	0.156***	0.123	0.203	887	(0.000)	(0.000)
Acquirers:										
BHCAR (-20,-3)	0.003	0.004	0.080	462	0.002	-0.002	0.080	2,960	(0.794)	(0.223)
BHCAR (-1,+1)	0.001	0.001	0.037	462	0.000	-0.002	0.046	2,960	(0.378)	(0.016)
BHCAR (-2,+2)	-0.001	-0.001	0.043	462	0.000	-0.003	0.055	2,960	(0.946)	(0.359)

Table 6. Cumulative buy and hold abnormal returns for targets and acquirers. Continued

Panel B - Cross-border deals by differences in supervision										
	Acquirers from countries with stronger supervision				*Acquirers from countries with similar or weaker supervision*				Test of Difference (p-value)	
Targets:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
BHCAR (-1,+1)	0.015	0.000	0.086	23	0.087***	0.026	0.146	52	(0.000)	(0.000)
BHCAR (-2,+2)	-0.003	0.000	0.079	23	0.107***	0.066	0.151	52	(0.000)	(0.000)
Acquirers:										
BHCAR (-1,+1)	0.003	0.004	0.034	183	0.000	0.000	0.038	279	(0.248)	(0.012)
BHCAR (-2,+2)	0.002	0.001	0.040	183	-0.002	-0.004	0.044	279	(0.427)	(0.072)
Panel C - Cross-border deals by differences in restrictions on bank activities										
	Acquirers from countries with more restrictions				*Acquirers from countries with similar or fewer restrictions*				Test of Difference (p-value)	
Targets:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
BHCAR (-1,+1)	0.068**	0.015	0.126	21	0.064***	0.009	0.138	54	(0.014)	(0.028)
BHCAR (-2,+2)	0.071**	0.047	0.120	21	0.075***	0.025	0.150	54	(0.005)	(0.020)
Acquirers:										
BHCAR (-1,+1)	0.002	0.001	0.033	190	0.001	0.001	0.039	272	(0.482)	(0.053)
BHCAR (-2,+2)	-0.002	0.000	0.040	190	0.000	-0.002	0.044	272	(0.551)	(0.810)
Panel D - Cross-border deals by differences in capital requirements										
	Acquirers from countries with stricter capital requirements				*Acquirers from countries with similar or more lenient capital requirements*				Test of Difference (p-value)	
Targets:	Mean	Median	Std. dev.	N	Mean	Median	Std. dev.	N	T-test	Test of median
BHCAR (-1,+1)	0.102***	0.048	0.146	31	0.039**	0.003	0.120	44	(0.136)	(0.294)
BHCAR (-2,+2)	0.117***	0.065	0.145	31	0.043**	0.008	0.133	44	(0.147)	(0.304)
Acquirers:										
BHCAR (-1,+1)	0.000	-0.001	0.031	208	0.002	0.003	0.041	254	(0.811)	(0.158)
BHCAR (-2,+2)	-0.001	-0.003	0.036	208	0.000	0.001	0.047	254	(0.732)	(0.786)

Table 7. Regressions of cumulative abnormal returns.

The table shows results from OLS regressions of buy and hold cumulative abnormal returns for targets and acquirers in domestic and cross-border bank acquisitions over the period 1995-2008. The dependent variable represents cumulative buy and hold abnormal returns (BHCAR) for targets (targets and acquirers) over the period t=-2 to t= +2 around the announcement day. BHCARs are estimated from a market model using a world market index. All returns for international banks are obtained from DataStream, while the returns for U.S. institutions are obtained from CRSP. The independent variables are calculated as differences between acquirers from country *j* and targets from country *k*. These include an index of the quality of supervision, the prudential supervision index from Abiad et al. (2010); an index of bank activity restrictiveness that measures regulatory impediments to banks engaging in securities, insurance, and real estate activities, and a capital stringency index measuring the stringency of capital regulation; these last two indices were taken from Barth et al. (2004, 2006; 2008); a governance index that is the average of all six Kaufmann et al. (2009) governance indicators; the log of GDP per capita; the annual growth in real GDP; a proxy for bank concentration - the assets of the top three banks as a share of all commercial banks' assets; private credit provided by the banking sector as a percent of GDP as a proxy for the size of the banking sector; the average annual real stock market return; the average annual real bilateral U.S. dollar exchange rate return; a proxy for exogenous growth opportunities, following Bekaert et al. (2007), and binary variables indicating whether the acquirer and target country share the same language, or are from the same region. Bank level controls include the difference in size (log assets) and return on assets between acquirer and target measured as of the year-end prior to the acquisition; an indicator variable for diversifying deals – those in which the acquirer is a commercial bank or bank holding company while the target is an insurance company, mortgage bank, or security broker, and four measures of acquirers' risk-taking: 1) the log of Z-score, computed as the return on assets + capital asset ratio divided by standard deviation of asset returns: (ROA+Equity-to-Assets)/σ(ROA); 2) the non-performing loans-to-total loans ratio; 3) the total risk-based capital ratio in excess of the regulatory minimum, and 4) the equity volatility computed as the annualized standard deviation of weekly returns. The bank level controls are obtained from Bloomberg. Year and target country fixed effects are included in all regressions. Standard errors are clustered by target country. Robust (White) t-statistics are shown in parentheses. In Panel A we show results for the full sample using target's BHCARs, while in Panel B we present results using the aggregate BHCARs for acquirers and targets. Controls are measured as differences between acquirer country (j) and target country (k).*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Table 7. Regressions of cumulative abnormal returns. Continued.

Panel A – Targets' Abnormal Returns					
	Dependent variable: Target's buy and hold abnormal returns (-2, +2)				
	(1)	(2)	(3)	(4)	(5)
Z-score$_{acq}$		0.011***			
		(4.33)			
NPL-to-loans$_{acq}$			-0.034**		
			(-2.34)		
Excess risk-based capital$_{acq}$				0.366***	
				(6.58)	
Equity volatility$_{acq}$					-0.116***
					(-3.69)
Δ supervision$_{j-k}$	0.180***	0.253***	0.161***	0.281***	0.192***
	(4.74)	(7.18)	(3.48)	(4.19)	(3.95)
Δ activities restrictions$_{j-k}$	0.041**	0.040**	0.034	-0.001	0.026*
	(2.67)	(2.44)	(1.68)	(-0.11)	(1.73)
Δ capital regulatory index$_{j-k}$	-0.004	-0.004	-0.001	-0.009	-0.045***
	(-0.45)	(-0.41)	(-0.13)	(-1.12)	(-3.10)
Diversifying deal	-0.022***	-0.026**	-0.023***	-0.036***	-0.020***
	(-3.58)	(-2.23)	(-3.20)	(-3.73)	(-5.11)
Δ ROA$_{j-k}$	0.023***	0.063***	0.033***	0.185***	0.042***
	(3.56)	(9.68)	(2.96)	(5.89)	(6.97)
Δ asset size$_{j-k}$	0.013***	0.025***	0.013***	0.017***	0.016***
	(6.45)	(7.52)	(7.41)	(5.44)	(12.60)
Δ Governance index$_{j-k}$	-0.160**	-0.077	-0.105	-0.283***	0.147***
	(-2.28)	(-0.79)	(-1.31)	(-5.37)	(3.39)
Δ Log GDP per capita$_{j-k}$	-0.008	-0.026	-0.003	-0.017	-0.185***
	(-0.19)	(-0.37)	(-0.04)	(-0.43)	(-4.94)
Δ GDP growth$_{j-k}$	-1.388	-3.074***	-2.056**	-4.809***	-1.211
	(-1.15)	(-4.81)	(-2.12)	(-5.42)	(-1.21)
Δ bank concentration$_{j-k}$	0.357***	0.304**	0.324**	0.432***	0.191
	(3.55)	(2.62)	(2.37)	(4.04)	(0.49)
Δ bank credit-to-GDP$_{j-k}$	-0.053	-0.189***	-0.113	-0.217***	0.019
	(-0.62)	(-3.43)	(-1.07)	(-5.01)	(0.15)
Δ real stock market return$_{j-k}$	0.036	0.334***	0.143	0.541***	0.194
	(0.22)	(3.42)	(0.82)	(4.88)	(0.60)
Δ real exchange rate return$_{j-k}$	-0.292	-0.339	-0.391	-0.584*	0.293
	(-1.11)	(-1.06)	(-1.23)	(-2.07)	(0.69)
Same region	-0.062**	-0.154***	-0.094***	0.015	0.129**
	(-2.31)	(-3.44)	(-3.32)	(0.31)	(2.74)
Same language	0.092***	0.097**	0.080**	0.083*	-0.001
	(3.20)	(2.37)	(2.24)	(1.78)	(-0.05)
Δ growth opportunities$_{j-k}$	0.127	0.193	0.161	0.658***	0.067
	(0.45)	(0.59)	(0.50)	(3.48)	(0.20)
Constant	0.093**	0.023	0.232***	0.089**	0.035
	(2.63)	(0.66)	(6.82)	(2.50)	(0.46)
Observations	750	422	727	638	658
R-squared	0.160	0.208	0.157	0.150	0.173
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Target country fixed effects	Yes	Yes	Yes	Yes	Yes

Table 7. Regressions of cumulative abnormal returns. Continued

Panel B – Aggregate Abnormal Returns					
	Dependent variable: Aggregate buy and hold abnormal returns (-2, +2)				
	(1)	(2)	(3)	(4)	(5)
$Z\text{-score}_{acq}$		0.009***			
		(4.39)			
$NPL\text{-to-loans}_{acq}$			-0.004		
			(-0.14)		
Excess $risk\text{-based capital}_{acq}$				0.469***	
				(4.67)	
$Equity\ volatility_{acq}$					-0.033
					(-0.87)
$\Delta\ supervision_{j-k}$	0.263***	0.301***	0.299**	0.258**	0.219***
	(3.05)	(4.21)	(2.41)	(2.76)	(3.15)
Δ activities $restrictions_{j-k}$	0.054***	0.039**	0.058**	0.011	-0.017
	(3.01)	(2.42)	(2.56)	(1.32)	(-0.37)
Δ capital regulatory $index_{j-k}$	-0.013	-0.009	-0.016	-0.014	-0.011
	(-1.37)	(-1.07)	(-1.67)	(-1.40)	(-0.25)
Diversifying deal	-0.027**	-0.020	-0.027*	-0.036**	-0.016**
	(-2.09)	(-1.21)	(-1.87)	(-2.25)	(-2.63)
$\Delta\ ROA_{i-k}$	0.040***	0.069***	0.042***	0.130*	0.059***
	(6.44)	(7.63)	(5.14)	(2.03)	(4.76)
$\Delta\ asset\ size_{i-k}$	0.016**	0.034***	0.017***	0.021***	0.020***
	(2.61)	(6.99)	(3.22)	(3.89)	(7.29)
Δ Governance $index_{i-k}$	-0.221**	-0.093	-0.123	-0.302***	-0.089
	(-2.34)	(-0.99)	(-1.66)	(-4.35)	(-0.36)
Δ Log GDP per $capita_{i-k}$	0.025	0.016	-0.010	0.015	-0.010
	(0.29)	(0.20)	(-0.11)	(0.24)	(-0.06)
$\Delta\ GDP\ growth_{i-k}$	-1.484	-3.536***	-3.829***	-4.881***	0.895
	(-0.91)	(-4.63)	(-2.99)	(-5.07)	(0.37)
Δ bank $concentration_{i-k}$	0.388**	0.187	0.337*	0.514***	0.139
	(2.10)	(1.57)	(2.00)	(4.86)	(0.24)
Δ bank $credit\text{-to-GDP}_{i-k}$	0.010	-0.162**	-0.058	-0.140*	-0.140
	(0.09)	(-2.43)	(-0.60)	(-1.83)	(-0.80)
Δ real stock market $return_{i-k}$	0.133	0.459***	0.399***	0.615***	-0.122
	(0.59)	(4.49)	(3.56)	(3.85)	(-0.23)
Δ real exchange rate $return_{i-k}$	-0.610	-0.460	-0.590	-0.737**	-0.180
	(-1.56)	(-1.41)	(-1.47)	(-2.10)	(-0.25)
Same region	-0.143**	-0.180***	-0.223***	-0.073	0.118***
	(-2.50)	(-2.99)	(-5.44)	(-1.00)	(3.21)
Same language	0.152***	0.078	0.169**	0.199**	-0.001
	(2.94)	(1.34)	(2.38)	(2.13)	(-0.01)
$\Delta\ growth\ opportunities_{j-k}$	0.195	0.138	0.292	0.775***	-0.187
	(0.75)	(0.44)	(1.21)	(4.84)	(-0.26)
Constant	0.184***	0.071	0.245***	0.042	-0.014
	(3.48)	(1.37)	(4.78)	(0.84)	(-0.21)
Observations	692	403	676	618	638
R-squared	0.152	0.226	0.150	0.153	0.176
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Target country fixed effects	Yes	Yes	Yes	Yes	Yes

Table 8. Regressions of cumulative abnormal returns – Robustness tests

The table presents some robustness tests for regressions of buy and hold cumulative abnormal returns for targets in domestic and cross-border bank acquisitions over the period 1995-2008. All independent variables are the same ones used in Table 7 and defined in Appendix A. In Model (1) we show results using instrumental variables approach. We use the following variables as instruments: a country's latitude - as a proxy for geographical environment; ethnic fractionalization; the average Gini coefficient, a measure of income inequality; the percentage of years since 1776 that a country has been independent, and a common law indicator as a proxy for the legal origin of a country's commercial laws (La Porta et al. 1998). In Model (2) we replicate results excluding U.S. banks, while in Model (3) we exclude cash deals and in Model (4) we incorporate government ownership of banks and FDI inflows as additional controls; finally, in Model (5) we add an indicator variable for cross-border deals ("CB indicator"). Controls are measured as differences between acquirer country (j) and target country (k).*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Targets' Abnormal Returns				
	Dependent variable: Target's buy and hold abnormal returns (-2, +2)				
	(1)	(2)	(3)	(4)	(5)
	IV	No U.S.	No cash deals	Other controls	CB indicator
Δ supervision$_{j-k}$	0.203**	0.241**	0.367***	0.241***	0.187***
	(2.42)	(2.23)	(5.21)	(6.56)	(5.65)
Δ activities restrictions$_{j-k}$	0.065**	0.076***	0.078***	0.050***	0.043***
	(2.15)	(2.96)	(4.46)	(3.36)	(3.80)
Δ capital regulatory index$_{j-k}$	-0.027**	0.004	-0.037***	-0.013	-0.017
	(-1.98)	(0.13)	(-4.04)	(-1.43)	(-1.22)
Diversifying deal	-0.030*	-0.032	-0.021**	-0.023***	-0.022***
	(-1.79)	(-0.71)	(-2.51)	(-3.66)	(-3.65)
Δ ROA$_{j-k}$	0.013	0.023*	0.021***	0.024***	0.023***
	(1.20)	(2.03)	(3.04)	(3.61)	(3.57)
Δ asset size$_{j-k}$	0.015*	0.010*	0.015***	0.013***	0.013***
	(1.86)	(1.87)	(6.48)	(6.01)	(6.49)
Δ government ownership$_{j-k}$				0.517***	
				(4.33)	
Δ FDI net inflows % GDP$_{j-k}$				-0.093	
				(-0.13)	
Cross-border					-0.155*
					(-2.03)
Δ Governance index$_{j-k}$	-0.268**	-0.041	-0.424***	-0.301***	-0.122*
	(-2.44)	(-0.14)	(-4.03)	(-5.16)	(-1.89)
Δ Log GDP per capita$_{j-k}$	-0.064	-0.077	0.024	0.104**	-0.026
	(-0.89)	(-0.62)	(0.53)	(2.08)	(-0.79)
Δ GDP growth$_{j-k}$	-4.545***	-1.064	-2.143*	-0.081	-0.745
	(-2.62)	(-0.60)	(-1.98)	(-0.08)	(-0.67)
Δ bank concentration$_{j-k}$	0.507	0.099	0.670***	0.467***	0.398***
	(1.42)	(0.25)	(4.31)	(3.97)	(3.38)
Δ bank credit-to-GDP$_{j-k}$	-0.156	0.013	-0.019	-0.027	-0.063
	(-0.88)	(0.08)	(-0.33)	(-0.36)	(-0.87)
Δ real stock market return$_{j-k}$	0.421*	-0.219*	0.067	0.097	-0.017
	(1.66)	(-2.00)	(0.30)	(0.61)	(-0.11)
Δ real exchange rate return$_{j-k}$	-0.610	-0.483	-0.474**	-0.199	-0.112
	(-1.36)	(-0.98)	(-2.07)	(-1.10)	(-0.50)
Same region	-0.092	-0.056	-0.128*	-0.055*	-0.160**
	(-1.10)	(-1.10)	(-1.82)	(-1.90)	(-2.21)
Same language	0.083	0.068	0.192**	0.090*	0.032
	(1.24)	(1.34)	(2.21)	(2.03)	(1.14)
Δ growth opportunities$_{j-k}$	0.383**	-0.340	0.312	0.063	-0.122
	(1.99)	(-0.92)	(1.28)	(0.22)	(-0.60)
Constant	0.165	0.077	0.112***	0.091**	0.334***
	(1.42)	(1.53)	(3.39)	(2.05)	(5.12)
Observations	661	126	693	750	750
R-squared	0.105	0.331	0.164	0.162	0.162
1st stage F-test (pvalue) - supervision	0.000				
1st stage F-test (pvalue) - restrictions	0.000				
1st stage F-test (pvalue) – capital. req.	0.000				
Sargan's overidentification test (pvalue)	0.534				
Year and target country fixed effects	Yes	Yes	Yes	Yes	Yes

Appendix A. Variable definitions.

Variable	Definition
Cross-border bank ratio$_{target}$	The total number of majority cross-border bank acquisitions in target country divided by the total number of domestic and cross-border bank deals in the target country. Aggregated for the full sample period 1995-2008.
Cross-border ratio$_{j,k}$	The number of majority cross-border bank acquisitions in year t where the target is from country k and the acquirer is from country j, as a proportion of all majority bank acquisitions in the target country, k. We compute the cross-border ratio for each country pair annually from 1995-2008.
Bank concentration	Assets of the three largest banks as a share of all commercial banks' assets. Variable was obtained from Ross Levine's website.
Bank credit-to-GDP	Private credit by deposit money banks as a percent of GDP. Source: Beck and Demirgüç-Kunt (2009). Updates obtained from the World Bank's website.
GDP Growth	Annual growth in real GDP (1995-2008). Source: World Development Indicators.
Log GDP per capita	Logarithm of real GDP (U.S. $) divided by the average population (1995-2008). Source: World Development Indicators.
Supervision	An index that captures the degree to which an agency is involved in the supervision of the banking sector. Index ranges from 0 to 3 with higher values indicating more involvement/government intervention. Data obtained from Abiad et al.(2010)..
Activities restrictions	An index of regulatory restrictions on the activities of banks. It measures regulatory impediments to banks engaging in securities market activities, insurance activities, and real estate activities. Index value ranges from 3 to 12 (higher values indicate more restrictiveness). Data obtained from Barth et al. (2004; 2006; 2008).
Capital regulatory index	Index measuring the stringency of regulations regarding how much capital banks must hold, as well as the sources of funds that count as regulatory capital. Index ranges from 0 to 10 with higher values indicating greater stringency. Data obtained from Barth et al. (2004; 2006; 2008).
Governance index	The average of all six Kaufmann et al. (2009) governance indicators: political stability; voice and accountability; government effectiveness; regulatory quality; control of corruption, and rule of law. Each of the indices ranges from -2.5 to 2.5, with higher values indicating better governance.
Real exchange rate returns	Annual (prior 12-months) real bilateral U.S. dollar exchange rate return. Exchange rates (WMR/Reuters) and 2000 constant dollar Consumer Price Index data are obtained from Thomson Financial's DataStream.
Real stock market return	Annual (prior 12-months) real stock market return. The DataStream local currency country level stock market return indices are deflated using the Consumer Price Index (base 2000).
Growth opportunities	A measure of a country's exogenous growth opportunities following Bekaert et al. (2007). It is the log of the inner product of the vector of global industry PE ratios and the vector of country-specific industry weights. Source: DataStream.
Diversifying deal	An indicator variable that equals one if the acquirer is a commercial bank or bank holding company while the target is an insurance company, mortgage banker, or security broker.
NPL-to-loans	Total non-performing loans (past due 90 days or more) as a share of gross loans. Source: Bloomberg.
Equity volatility	The annualized standard deviation of banks' returns computed from weekly data. Source: DataStream.
ROA	Net income divided by total assets. Source: Bloomberg.
Z-score	Z-score is estimated as (ROA+equity/assets)/σ(ROA); the standard deviation of ROA, σ(ROA), is estimated as a 3-year moving average.
BHCARs	Buy and hold cumulative abnormal returns around the announcement of the acquisitions. We obtain abnormal returns by estimating a market model using a world market index from 260 to 21 days prior to the announcement of the acquisition.

Appendix B. Indicators of bank regulatory quality and governance.

Listed below are measures of bank regulation and governance. Supervision is the prudential supervision index from Abiad et al. (2010) that measures the degree to which an agency is involved in the supervision of the banking sector. The index on restrictions on bank activities and the capital regulatory index are obtained from Barth et al. (2004; 2006; 2008). The activities restrictions index measures regulatory impediments to banks engaging in securities market activities, insurance activities, and real estate activities, while the capital regulatory index measures the stringency of regulations regarding how much capital banks must hold, as well as the sources of funds that count as regulatory capital. Finally, the governance index is the average of all six Kaufmann et al. (2009) governance indicators. Values for all indices are averaged across time. Higher values of the indices indicate stronger supervisory power, more restrictions on bank activities, more stringent capital requirements, and better governance, respectively.

Country	Supervision	Activities restrictions	Capital regulatory index	Governance Index	Country	Supervision	Activities restrictions	Capital regulatory index	Governance Index
Albania	2	5	3	-0.44	Luxembourg	.	5	7	1.68
Algeria	0	4	4	-0.99	Macau	.	7	5	0.57
Argentina	1	7	6	-0.08	Macedonia	.	7	4	-0.34
Armenia	.	9	5	-0.42	Malaysia	1	8	4	0.39
Australia	1	8	6	1.54	Malta	.	8	6	1.06
Austria	1	5	8	1.60	Mauritius	.	10	7	0.71
Azerbaijan	1	6	4	-0.89	Mexico	0	7	6	-0.07
Bahrain	.	8	6	0.15	Moldova	.	8	7	-0.38
Belarus	1	9	6	-0.97	Morocco	0	9	6	-0.15
Belgium	2	6	5	1.32	Namibia	.	5	3	0.32
Bolivia	1	9	6	-0.37	Netherlands	1	5	6	1.69
Bosnia	.	7	6	-0.48	New Zealand	1	3	4	1.72
Botswana	.	8	8	0.70	Nicaragua	1	7	4	-0.47
Brazil	1	7	7	0.00	Nigeria	1	8	8	-1.18
Bulgaria	1	7	6	0.11	Norway	1	4	5	1.66
Canada	2	5	4	1.59	Oman	.	9	7	0.34
Cayman Islands	.	4	4	1.26	Pakistan	0	6	5	-0.93
Chile	1	9	6	1.13	Panama	.	8	5	0.12
China	1	7	3	-0.47	Paraguay	0	3	1	-0.74
Colombia	0	7	3	-0.52	Peru	1	7	5	-0.31
Costa Rica	0	7	4	0.67	Philippines	0	5	5	-0.25
Croatia	.	6	5	0.16	Poland	2	7	6	0.70
Cyprus	.	7	5	1.03	Portugal	1	7	6	1.18
Czech Republic	2	8	5	0.83	Puerto Rico	.	6	5	0.93
Denmark	2	6	6	1.76	Qatar	.	4	4	0.39
Dominican Republic	0	.	2	-0.27	Romania	1	9	5	0.03
Ecuador	0	3	3	-0.66	Russia	1	6	7	-0.68
Egypt	1	8	5	-0.44	Saudi Arabia	.	8	5	-0.39
El Salvador	1	10	3	-0.24	Senegal	0	5	5	-0.19
Estonia	2	5	5	0.90	Serbia	.	2	2	.
Fiji	.	3	3	-0.15	Singapore	1	6	7	1.42
Finland	0	6	5	1.80	Slovakia	.	7	6	0.64
France	2	5	6	1.22	Slovenia	.	7	8	1.02
Gabon	.	5	2	-0.45	South Africa	1	7	8	0.29
Georgia	2	2	1	-0.64	Spain	2	5	9	1.10
Germany	2	4	6	1.51	Sri Lanka	0	4	6	-0.37
Ghana	0	9	7	-0.09	Sudan	.	3	2	-1.53
Greece	1	7	5	0.76	Sweden	1	7	3	1.70
Guatemala	0	9	6	-0.60	Switzerland	2	5	6	1.70
Honduras	.	7	5	-0.56	Taiwan	1	10	6	0.82
Hong Kong	2	2	4	1.13	Thailand	0	8	6	0.11
Hungary	2	8	7	0.91	Togo	.	5	5	-0.87
Iceland	.	8	5	1.60	Tonga	.	5	2	-0.26
India	1	9	8	-0.17	Trinidad	.	8	3	0.37
Indonesia	0	7	4	-0.64	Tunisia	0	3	3	0.01
Ireland	1	5	4	1.49	Turkey	1	5	3	-0.20
Israel	1	10	5	0.66	Turks/Caicos	.	6	3	.
Italy	1	8	5	0.77	UAE	.	2	3	0.44
Japan	1	9	6	1.07	UK	2	4	6	1.51
Jordan	1	7	8	0.07	USA	2	8	6	1.36
Kazakhstan	2	7	5	-0.66	Uganda	1	3	3	-0.64
Kenya	0	9	7	-0.75	Ukraine	1	2	2	-0.57
Korea	0	7	5	0.60	Uruguay	1	5	5	0.70
Kuwait	.	7	8	0.29	Uzbekistan	2	.	.	-1.27
Kyrgyzstan	1	6	6	-0.69	Venezuela	0	7	4	-0.81
Latvia	2	6	6	0.53	Vietnam	0	4	2	-0.50
Lebanon	.	9	7	-0.44	Average	0.958	6.383	5.009	0.281
Liechtenstein	.	7	7	1.45	Std. deviation	0.583	2.001	1.678	0.852
Lithuania	2	7	4	0.62					

Appendix C. Summary statistics on main variables.

The table shows summary statistics of the main variables. Cross-border ratio$_{target}$ is the total number of majority cross-border bank acquisitions in target country divided by the total number of domestic and cross-border bank deals in the target country; this is aggregated across the full sample period 1995-2008. Cross-border ratio$_{j,k}$ is an annual measure of the number of majority cross-border bank acquisitions in year t where the target is from country k and the acquirer is from country j, as a proportion of all majority bank acquisitions in the target country, k in year t. Supervision is the prudential supervision index from Abiad et al. (2010) that measures the degree to which an agency is involved in the supervision of the banking sector; the index on restrictions on bank activities and the capital regulatory index are obtained from Barth et al. (2004, 2006; 2008). The activities restrictions index measures regulatory impediments to banks engaging in securities market activities, insurance activities, and real estate activities, while the capital regulatory index measures the stringency of regulations regarding how much capital banks must hold, as well as the sources of funds that count as regulatory capital; the governance index is the average of all six Kaufmann et al. (2009) governance indicators; GDP per capita (log) and annual real GDP growth were obtained from the World Development Indicators; bank concentration refers to the assets of the three largest banks as a share of all commercial banks' assets; private credit provided by the banking sector as a percent of GDP is a proxy for the size of the banking sector; the average annual real stock market return from 1995-2008; the real exchange rate return is the average annual real bilateral U.S. dollar exchange rate return from 1995-2008, and exogenous growth opportunities is a measure from Bekaert et al. (2007). All variables are defined in Appendix B. Panel B shows the correlations matrix. * indicates significance at the 10% level.

Panel A – Descriptive statistics of country level variables

Variable	N	Mean	Median	Std. Dev.	Maximum	Minimum
Cross-border ratio$_{j,k}$ (%)	28,632	0.43	0.00	4.98	100.00	0.00
Cross-border ratio$_{target}$	126	0.39	0.34	0.36	1.00	0.00
Supervision	123	1.68	1.93	0.81	3.00	0.00
Activities restrictions	126	7.49	7.50	1.78	12.00	3.62
Capital regulatory index	126	5.77	5.76	1.43	9.00	2.00
Bank concentration	107	0.67	0.68	0.19	1.00	0.24
Bank credit-to-GDP	109	0.49	0.34	0.42	1.60	0.03
Governance index	124	0.22	0.09	0.85	1.81	-1.66
GDP per capita	123	8.05	8.05	1.59	10.98	4.84
GDP growth	124	0.04	0.04	0.03	0.15	-0.10
Real exchange rate return	87	-0.02	0.00	0.06	0.07	-0.24
Real stock market return	66	0.11	0.09	0.21	1.10	-0.33
Exogenous growth opportunities	54	2.89	2.93	0.21	3.23	2.02

Panel B- Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	1											
(2)	-0.072	1										
(3)	-0.035	-0.397*	1									
(4)	-0.147	-0.015	0.046	1								
(5)	0.177*	-0.045	-0.089	-0.031	1							
(6)	-0.161*	0.461*	-0.397*	-0.012	-0.010	1						
(7)	0.023	0.525*	-0.383*	0.043	0.154	0.762*	1					
(8)	-0.0202	0.533*	-0.390*	0.032	0.024	0.725*	0.827*	1				
(9)	0.065	0.125	0.034	-0.005	-0.089	-0.023	-0.003	0.085	1			
(10)	0.063	0.319*	-0.183*	-0.166	0.183*	0.413*	0.411*	0.314*	0.135	1		
(11)	0.239*	-0.191	0.070	-0.113	0.008	-0.263*	-0.151	-0.248*	0.011	0.229*	1	
(12)	-0.239*	0.101	-0.164	-0.125	-0.155	0.250*	0.326*	0.316*	-0.350*	0.182	-0.100	1

Variable			
(1)	Cross-border ratio$_{target}$	(7)	Governance Index
(2)	Supervision	(8)	GDP per capita
(3)	Activities restrictions	(9)	GDP Growth
(4)	Capital Stringency Index	(10)	Real Exchange Rate Return
(5)	Bank Concentration	(11)	Real Stock Market Return
(6)	Bank Credit-to-GDP	(12)	Exogenous Growth Opportunities