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Islamic vs. Conventional Banking

Business Model, Efficiency and Stability

Thorsten Beck
Asli Demirgüç-Kunt
Ouarda Merrouche

Abstract

This paper discusses Islamic banking products and interprets them in the context of financial intermediation theory. Anecdotal evidence shows that many of the conventional products can be redrafted as Sharia-compliant products, so that the differences are smaller than expected. Comparing conventional and Islamic banks and controlling for other bank and country characteristics, the authors find few significant differences in business orientation, efficiency, asset quality, or stability. While Islamic banks seem more cost-effective than conventional banks in a broad cross-country sample, this finding reverses in a sample of countries with both Islamic and conventional banks. However, conventional banks that operate in countries with a higher market share of Islamic banks are more cost-effective but less stable. There is also consistent evidence of higher capitalization of Islamic banks and this capital cushion plus higher liquidity reserves explains the relatively better performance of Islamic banks during the recent crisis.

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Islamic vs. Conventional Banking: Business Model, Efficiency and Stability

Thorsten Beck, Asli Demirgüç-Kunt and Ouarda Merrouche

1.   Introduction

The current global financial crisis has not only shed doubts on the proper functioning of conventional "Western" banking, but has also increased the attention on Islamic banking.[1] Academics and policy makers alike point to the advantages of Shariah-compliant financial products, as the mismatch of short-term, on-sight demandable deposits contracts with long-term uncertain loan contracts is mitigated with equity elements. In addition, Sharia-compliant products are very attractive for segments of the population that demand financial services that are consistent with their religious beliefs. However, little academic evidence exists on the functioning of Islamic banks, as of yet.

This paper describes some of the most common Islamic banking products and links their structure to the theoretical literature on financial intermediation. Specifically, we discuss to which extent Islamic banking products affect the agency problems arising from information asymmetries between lender and borrower or investor and manager of funds. Second, we compare the business model, efficiency, asset quality and stability of Islamic banks and conventional banks, using an array of indicators constructed from balance sheet and income statement data. In separate regressions, we focus specifically on the relative performance of both bank groups during the recent crisis.

While there is a large practitioner literature on Islamic finance, in general, and specifically Islamic banking, there are few academic papers. Cihak and Hesse (2010) test for the stability of Islamic compared to conventional banks, while Errico and Farahbaksh (1998) and Solé (2007) discuss regulatory issues related to Islamic banking. This general dearth of academic work on Islamic finance stands in contrast with the increasing importance that Islamic banking has in many Muslim countries in Asia and in Africa. With this paper we hope to contribute to the emerging literature on this topic.

Sharia-compliant finance does not allow for the charging of interest payments (riba) as only goods and services are allowed to carry a price. On the other hand, Sharia-compliant

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[1] For just two examples, see Willem Buiter: http://blogs.ft.com/maverecon/2009/07/islamic-finance-principles-to-restore-policy-effectiveness/ and Jerry Caprio: http://blogs.williams.edu/financeeconomics/2009/07/20/narrow-banks-or-islamic-banks-to-the-rescue/

finance relies on the idea of profit-, loss-, and risk-sharing, on both the liability and asset side. In practice, however, Islamic scholars have developed products that resemble conventional banking products, replacing interest rate payments and discounting with fees and contingent payment structures. In addition, leasing-like products are popular among Islamic banks, as they are directly linked to real-sector transactions. Nevertheless, the residual equity-style risk that Islamic banks and its depositors are taking has implications for the agency relationships on both sides of the balance sheet as we will discuss below.

Comparing indicators of business orientation, cost efficiency, asset quality and stability of conventional and Islamic banks, we find little significant differences between the two groups. While we find that Islamic banks are more cost-effective in a large sample of countries, this advantage turns around when we focus on a sample of countries with both conventional and Islamic banks. Hence, it is conventional banks that are more cost-effective than Islamic banks in countries where both banks exist. We cannot find any significant differences in business orientation, as measured by the share of fee-based to total income or share of non-deposit in total funding. Neither do we find significant differences in the stability of Islamic banks, though we find that Islamic banks have higher capital-asset ratios. However, we do find some variation of efficiency and stability of conventional banks across countries with different market shares of Islamic banks. Specifically, in countries where the market share of Islamic banks is higher, conventional banks tend to be more cost-effective but less stable.

Considering the performance of Islamic and conventional banks during the recent crisis, we find little differences, except that Islamic banks increased their liquidity holdings in the run-up to and during the crisis relative to conventional banks. This also explains why Islamic banks' stocks performed better during the crisis compared to conventional banks' stocks.

Together, our empirical findings suggest that conventional and Islamic banks are more alike than previously thought. Differences in business models – if they exist at all – do not show in standard indicators based on financial statement information. Other differences, such as cost efficiency, seem to be driven more by country rather than bank type differences. Finally, the good performance of Islamic banks during the recent crisis appears to be driven by higher precaution in liquidity holdings and capitalization, but no inherent difference in asset quality

between the two bank types. This allows two alternative conclusions, which our data do not allow to distinguish: off-setting effects of Sharia-compliant banking on business model, risk taking and ultimately stability cancel each other out, or the functioning and organization of Islamic banks is indeed less different from that of conventional banks than often propagated.

This being one of the first bank-level explorations of Islamic banks, two important caveats are in place. First, anecdotal evidence suggests that there are significant differences across countries in terms of how Sharia-compliant products are exactly structured, with some of the banks basically offering conventional products repackaged as Sharia-compliant products. This implies that we need to exercise caution when interpreting Islamic banking in the context of traditional models of financial intermediation. In addition, there are differences across different Muslim countries in what is considered Sharia-compliant and what is not, which makes it difficult to do cross-country comparisons. Second, given the different nature of conventional and Sharia-compliant products, as discussed in section 2, balance sheet and income statement items might not be completely comparable across bank types even within the same country. In our empirical exercise, we rely on Bankscope data that have been subjected to consistency checks by the provider VanDyck. However, we cannot exclude the possibility that significant differences in ratios derived from financial statements are due to different measurement issues rather than inherent differences across bank types. Finally, our sample includes relatively few Islamic banks which might bias our findings and can only be remedied over time as more data become available.

The remainder of the paper is structured as follows. Section 2 presents some of the basic Sharia-compliant products and links these products to the theoretical literature on financial intermediation. Section 3 presents data and methodology. Section 4 uses bank-level data to assess the relative business orientation, efficiency, asset quality and stability of Islamic and conventional banks. Section 5 compares the relative performance of conventional and Islamic banks during the recent crisis and section 6 concludes.

2.   Sharia-compliant Products and Agency Problems

Islamic or Sharia[2]-compliant banking products are financial transactions that do not violate prescriptions of the Koran. Specifically, Islamic financial transactions cannot include the interest payment (Riba) at a predetermined or fixed rate; rather, the Koran stipulates profit-loss-risk sharing arrangements, the purchase and resale of goods and services and the provision of (financial) services for a fee. A second important characteristic of Islamic banks is that they are in general prohibited from trading in financial risk products, such as derivative products.   In order for banks and their clients to comply with Sharia, over the past decades, specific products have been developed that avoid the concept of interest and imply a certain degree of risk-sharing.

One important feature is the pass-through of risk between depositor and borrower. Among the most common Islamic banking products are partnership loans between bank and borrowers. Under the *Mudaraba* contract, the bank provides the resources, i.e. the "loan", while the client – the entrepreneur – provides effort and expertise. Profits are shared at a predetermined ratio, while the losses are borne exclusively by the bank, i.e. the entrepreneur is covered by limited liability provisions. While the entrepreneur has the ultimate control over her business, major investment decisions, including the participation of other investors, have to be approved by the bank. The *Musharaka* contract, on the other hand, has the bank as one of several investors, with profits and losses being shared among all investors. This partnership arrangement is mirrored on the deposit side, with investment accounts or deposits that do not imply a fixed, preset return but profit-loss sharing. Such investment deposits can be either linked to a bank's profit level or to a specific investment account on the asset side of a bank's balance sheet.

An alternative is the *Murabaha* contract, which resembles a leasing contract in conventional banking. By involving the purchase of goods, it gets around the prohibition to make a return on money lending. As in leasing contracts, the bank buys an investment good on behalf of the client and then on-sells it to the client, with staggered payments and a profit margin in the form of a fee. Similarly, operating leases (*Ijara*) where the bank keeps ownership of the investment good and rents it to the client for a fee are feasible financial transactions under

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[2] Sharia is the legal framework within which the public and private aspects of life are regulated for those living in a legal system based on fiqh (Islamic principles of jurisprudence) and for Muslims living outside the domain.

Sharia-law. While the discounting of IOUs and promissory notes is not allowed under Sharia-law as it would involve indirect interest rate payments, a similar structure can be achieved by splitting such an operation into two contracts, with full payment of the amount of the IOU on the one hand, and a fee or commission for this pre-payment, on the other hand.

On the deposit side, one can distinguish between non-remunerated demand deposits (*amanah*), seen as depositors' loans to the bank– thus similar to demand deposits in many conventional banks around the world – and savings deposits that do not carry an interest rate, but participate in the profits of the bank. However, according to some Islamic scholars, banks are allowed to pay regular bonuses on such accounts. Investment accounts, finally, and as discussed above, mirror the partnership loans on the asset side, by being fully involved in the profit-loss-risk sharing arrangements of Islamic banks.

In summary, while some of the products offered by Islamic banks are the same as in conventional banks (demand deposits) and other are structured in similar ways as conventional products (leasing products), there is a strong element of equity participation in Islamic banking. How do these products fit with the traditional picture of a bank as financial intermediary? Transaction costs and agency problems between savers and entrepreneurs have given rise to banks in the first place, as they can economize on the transaction costs and mitigate agency conflicts.   Banks face agency problems on both sides of their balance sheet, with respect to their depositors whose money they invest in loans and other assets and where the bank acts effectively as agent of depositors, and on the asset side where borrowers (as agent) use depositors' resources for investment purposes. The debt contract with deterministic monitoring (in case of default) (Diamond, 1984) or stochastic monitoring (Townsend, 1979) has been shown to be optimal for financial intermediation between a large number of savers and a large number of entrepreneurs. In addition, however, banks face the maturity mismatch between deposits, demandable on sight and long-term loans, which can result in bank runs and insolvency (Diamond and Dybvig, 1983). Diamond and Rajan (2002) argue that it is exactly the double agency problems banks face, with depositors monitoring banks that disciplines banks in turn to monitor borrowers, and government interventions such as deposit insurance distort such equilibrium.

How does the equity component of Islamic banking affect these agency problems? On the one hand, the equity-like nature of savings and investment deposits might increase depositors' incentives to monitor and discipline the bank. At the same token, the equity-like nature of deposits might distort the bank's incentives to monitor and discipline borrowers as they do not face the threat by depositors of immediate withdrawal. Similarly, the equity-like character of partnership loans can reduce the necessary discipline imposed on entrepreneurs by debt contracts (Jensen and Meckling, 1976).

The equity character of banks' asset-side of the balance sheet, however, might also increase the uncertainty on depositors' return and increase the likelihood of both uninformed and informed bank runs. This is exacerbated by the restrictions that banks face on terminating partnership loans or restricting them in their maturity.

Given the agency problems that the equity character of some Islamic banking products might entail, Islamic banks have designed alternative contracts, where clients are allowed to retain profits completely until a certain level is reached, while at the same time the bank is not allowed to receive more than a fixed fee and the share of profits until another threshold level of profits is reached. This effectively can turn a profit-loss arrangement into a debt-like instrument.

In reality therefore, many Islamic banks offer financial products that, while being Sharia-compliant, resemble conventional banking products. It is unclear, however, whether they effectively are structured as such, thus providing the same incentive structure to depositors, banks and borrowers as conventional banks, or whether the equity-like character is still present, thus impacting the incentive structures of all parties involved.

What do the different characteristics of Islamic and conventional banks imply for their relative business orientation, efficiency, asset quality, and stability? Take first business orientation; the Sharia-compliant nature of Islamic bank products implies a different business model for Islamic banks that should become obvious from banks' balance sheets and income statements. We consider three aspects: the relative shares of interest and non-interest revenue, the relative importance of retail and wholesale funding and the loan-deposit ratio. On the one hand, there might be a higher share of non-interest revenue in Islamic banks as these banks might charge higher fees and commissions to compensate for the lack of interest revenue. On the other

hand, the share of revenue related to non-lending and including investment bank activities should be significantly lower for Islamic bank. The overall implications for the relative share of interest and non-interest revenues in total earnings are therefore a-priori ambiguous. Similarly, in terms of retail vs. wholesale funding, there is a-priori no clear difference, as Islamic banks can rely on market funding as much as conventional banks, as long as it is Sharia-compliant. Similarly, the difference in loan-deposit ratios across bank types is not clear a-priori.

In terms of efficiency, it is a-priori ambiguous whether conventional or Islamic banks should be more efficient. On the one hand, monitoring and screening costs might be lower for Islamic banks given the lower agency problems. On the other hand, the higher complexities of Islamic banking might result in higher costs and thus lower efficiency of Islamic banks.

Differences in asset quality across Islamic and conventional banks are also a-priori, ambiguous, as it is not clear whether the tendency towards equity-funding in Islamic banks provides stronger incentives to adequately assess and monitor risk and discipline borrowers. Similarly, the relationship between bank type and bank stability is a-priori ambiguous. On the one hand, the pass-through role and risk-sharing arrangements of Islamic banks might be a risk-reducing factor. Specifically, interest rate risk – well known feature of any risk management tool and stress test of a conventional bank - should be absent from an Islamic bank. In addition, adverse selection and moral hazard concerns might be reduced in Islamic banks if, as discussed above, depositors have stronger incentives to monitor and discipline. Further, Islamic banks can be assumed to be more stable than conventional banks, as they are not allowed to participate in risk trading activities, as discussed above. This however, also points to the importance of controlling for the importance of non-lending activities in conventional banks. On the other hand, the profit-loss financing increases the overall risk on banks' balance sheet as they take equity in addition to debt risk. In addition, the equity-like nature of financing contract might actually undermine a bank's stability as it reduces market discipline (Diamond and Rajan, 2002). Further, operational risk aspects might be higher in Islamic banks stemming from the complexities of Sharia law and including legal and compliance risks. In a nutshell, it is a-priori not clear whether Islamic or conventional banks are more or less stable than conventional banks.

Summarizing, theory does not provide clear answers whether and how the business orientation, cost efficiency, asset quality and stability differ between conventional and Islamic banks. This ambiguity is exacerbated by lack of clarity whether the products of Islamic banks follow Sharia in form or in content. We therefore turn to empirical analysis to explore differences between the two bank groups.

3.   Data and Methodology

We use data from Bankscope to construct and compare indicators of business orientation, efficiency, asset quality, and stability of both conventional and Islamic banks.[3] We only include banks with at least two observations and countries with data on at least four banks. We restrict our sample to the largest 100 banks in terms of assets within a country so that our sample is not dominated by a specific country. Finally, we eliminate outliers in all variables by winsorizing at the 1st and 99th percentiles. We also double check the categorization of Islamic banks in Bankscope with information from Islamic Banking Associations and country-specific sources.

In our main analysis, we use two different samples, both over the period 1995 to 2007 and thus both pre-dating the recent global financial crisis. In the next section, we compare pre- and post-crisis performance of Islamic and conventional banks. The larger sample comprises 141 countries and 2,956 banks, out of which 99 are Islamic banks. Individual regressions, however, have significantly fewer observations, depending on the availability of specific variables. These samples include countries with (i) only conventional, (ii) only Islamic and (iii) both conventional and Islamic banks. Another, smaller, sample comprises only countries with both conventional and Islamic banks, which allows us to control for any unobserved time-invariant effect by introducing country dummies. This smaller sample includes 486 banks across 20 countries, out of which 89 are Islamic banks.

In Table 1, we present data on 22 countries with both conventional and Islamic banks.[4] Specifically, we present the number of Islamic and total banks as well as the share of Islamic banks' assets in total banking assets, all for 2007, the latest year in our pre-crisis sample. Further, we report the number of listed banks, for both Islamic and conventional banks. On average,

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[3] We use unconsolidated data when available and consolidated if unconsolidated is not available, in order to not double count subsidiaries of international banks.

[4] Two countries are part of the crisis sample and are used in the analysis in Section 5.

Islamic banks constitute 10% of the overall banking market, in terms of assets, but ranging from less than one percent in Indonesia, Singapore and the UK to 51% in Yemen. Not included in this table are banking systems that are completely Islamic, such as Iran. Almost half of all Islamic banks in these 22 countries are listed, which is a larger share than among conventional banks. Table 2 presents descriptive statistics, for both the large (Panel A) and the small sample (Panel B), as well as correlations (Panel C).

Figure 1 shows an increasing number of Islamic banks reporting their financial information to Bankscope over the sample period. Given the high, but incomplete coverage of Bankscope, however, we do not know whether this reflects new entry or previously existing Islamic banks starting to report financial information. Figure 2 suggests, subject to the same caveat, that the market share of Islamic banks has increased between 1995 and 2007, though not dramatically. While in the large sample of 141 countries, their share has approximately doubled from less than one percent to two percent, their share in countries with both Islamic and conventional banks increased from around 6% in 1995 to 16% in 2005, before dropping again.[5]

We use an array of different variables to compare Islamic and conventional banks. First, we compare the business orientation of conventional and Islamic banks, using two indicators suggested by Demirguc-Kunt and Huizinga (2010) as well as the traditional loan-deposit ratio. Specifically, we explore to which extent Islamic and conventional banks are involved in fee-based business by using the ratio of fee-based to total operating income. In our sample, the share of fee-based income to total income varies from 4% to 69%, with an average of 33%. We also consider the importance of non-deposit funding to total funding, which ranges from zero to 27% in our sample, with an average of 5%.The loan-to-deposit ratio varies from 21% to 126%, with a mean of 72%. Focusing on our smaller samples of countries with both conventional and Islamic banks, we find that Islamic banks have a significantly higher share of fee income than conventional banks, rely more on non-deposit funding and have lower loan-deposit ratios. These simple correlations suggest that Islamic banks are less involved in traditional bank business – which relies heavily on interest-income generating loans and deposit funding.

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[5] Again, it is important to note that this variation might be due to differences in reporting intensity by conventional and Islamic banks.

Second, we use two indicators of bank efficiency. Overhead cost is our first and primary measure of bank efficiency and is computed as total operating costs divided total costs. Overhead cost varies from less than one percent to 8.3% in our sample, with an average of 3.5%. As alternative efficiency indicator, we use the cost-income ratio, which measures overhead costs relative to gross revenues, with higher ratios indicating lower levels of cost efficiency. This indicator ranges from 33% to 92%, with an average of 62%. In our smaller sample, we find that Islamic banks have significantly higher overhead costs than conventional banks, but only marginally higher cost-income ratios (significant at 10% level).[6] We also note that cost efficiency is significantly higher in our smaller sample than in the large sample.

Third, we use three indicators of asset quality. Specifically, we use (i) loss reserves, (ii) loan loss provisions, and (iii) non-performing loans, all scaled by gross loans. All indicators decrease in asset quality. We note that there might be problems with cross-country comparability, due to different accounting and provisioning standards. Loan loss reserves range from less than one percent to 13.4%, with an average of 4.5%. Loan loss provisions range from less than zero to 4.7%, with a mean of 1.3%. Non-performing loans, finally, range for 0.4% to 20.1%, with an average of 6.2%. In our smaller sample, Islamic banks have significantly lower loan loss reserves and non-performing loans, while there is no significant difference in loan loss provisions.

Fourth, we use several indicators of bank stability. The z-score is a measure of bank stability and indicates the distance from insolvency, combining accounting measures of profitability, leverage and volatility. Specifically, if we define insolvency as a state where losses surmount equity ($E<-\pi$) (where E is equity and π is profits), A as total assets, $ROA=\pi/A$ as return on assets and $CAR = E/A$ as capital-asset ratio, the probability of insolvency can be expressed as prob($-ROA<CAR$). If profits are assumed to follow a normal distribution, it can be shown that $z = (ROA+CAR)/SD(ROA)$ is the inverse of the probability of insolvency. Specifically, z indicates the number of standard deviation that a bank's return on assets has to drop below its expected value before equity is depleted and the bank is insolvent (see Roy, 1952; Hannan and Henwick, 1988; Boyd, Graham and Hewitt, 1993; and De Nicolo, 2000). Thus, a

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[6] We do not use the net interest margin, a standard indicator of efficiency in the financial intermediation literature (Beck, 2007), as Shariah prohibits the use of interest and Islamic banks should therefore do not show any interest revenue or cost in their financial statements. Nevertheless, Bankscope reports both for Islamic banks.

higher z-score indicates that the bank is more stable. The z-score varies from 3 to 46 in our sample, with an average of 17.5. In our smaller sample, Islamic banks have a significantly lower z-score, suggesting that they are closer to insolvency than conventional banks.

We also consider two components of the z-score, most notably the return on assets and the capital-asset ratio. Return on assets varies from less than zero to 3.3% across banks and over time, with an average of 1.1%, while the capital-asset ratio varies from 3.6% to 25.5% across banks and over the sample period, with an average of 10.8%. In our smaller sample, Islamic banks are significantly more profitable and better capitalized than conventional banks, however, since their z-scores are still lower, their returns also tend to be much more volatile.

Finally, we use an indicator of maturity matching – the ratio of liquid assets to deposit and short-term funding to assess the sensitivity to bank runs. The liquidity ratio varies from to 7% to 87%, with a mean of 37%. In the smaller sample, Islamic banks are significantly less liquid than conventional banks.

To assess differences in business model, efficiency, asset quality, and stability across different bank types in our large sample, we run the following regression:

$$\text{Bank}_{i,j,t} = \alpha + \beta B_{i,j,t} + \gamma_1 C_{j,t} + \gamma_2 Y_t + \delta I_i + \varepsilon_{i,t} \tag{1}$$

where Bank is one of our measures of business orientation, efficiency, asset quality and bank stability of bank i in country j in year t, B is a vector of time-varying bank characteristics, C are time-varying country-factors, Y are year-fixed effects, I is a dummy taking the value one for Islamic banks and ε is a white-noise error term. We allow for clustering of the error terms on the bank level, i.e. correlation among the error terms across years within banks. We prefer to cluster on the bank- rather than country-level, as some of the countries in the large sample host significantly more banks than others and in our small sample we have only 20 countries. Simulations have shown that standard errors can be biased downwards in these two cases (Nichols and Schaffer, 2007). For our smaller sample with countries that have both conventional and Islamic banks, we also run the following fixed effects regression:

$$\text{Bank}_{i,j,t} = \alpha + \beta B_{i,j,t} + \gamma C_i * Y_t + \delta I_i + \varepsilon_{i,t} \tag{2}$$

where C_i*Y_t are country-year-fixed effects. We thus compare Islamic and conventional banks within a country and a specific year. Below we also use additional specifications, including interacting the Islamic bank dummy with the market share of Islamic banks.

We control for an array of time-variant bank characteristics that might confound the relationship between bank type, on the one hand, and business orientation, asset quality, efficiency and stability, on the other hand. Specifically, we control for bank size, using the log of total assets. Larger banks might be more efficient due to scale economies, while the theoretical and empirical literature on the relationship between size and stability is ambiguous (Beck, Demirguc-Kunt and Levine, 2006; Beck, 2008). They might also be more likely to engage in fee-based business and have easier access to wholesale markets. We include the ratio of fixed assets to total assets to control for the opportunity costs that arise from having non-earning assets on the balance sheet, as well as the share of non-interest earning assets to control for non-lending business of banks, which previous research has shown to affect both efficiency and stability of banks (Demirguc-Kunt, Laeven and Levine, 2004; Demirguc-Kunt and Huizinga, 2008). In our large sample, total assets vary from 57 million USD to 22 billion USD, with an average of 948 million USD. The share of fixed in total assets varies from close to zero to 5.4%, with an average of 1.9%. The share of non-loan earning assets in total assets ranges from 14% to 85%, with an average of 44%. In our smaller sample, Islamic banks are significantly smaller than conventional banks, have higher fixed assets, but lower non-interest earning assets.

We would also like to control for the ownership structure of banks, but face the problem that the ownership dummy is not well populated in Bankscope and only reflects the current ownership structure. We therefore control for the ownership structure on the country level, using data from Barth, Caprio, and Levine (2008). The foreign bank share ranges from zero to 100%, while the government ownership share ranges from zero to 98%. On average, the foreign (government) ownership share is 35% (17%).

In some of our regressions, we also include several country-level indicators. Specifically, we include GDP per capita as indicator of economic development, GDP growth, Private Credit to GDP as measure of financial development and the three-bank concentration ratio. A large literature has related bank concentration to both the efficiency and stability of financial systems

(see Berger et al, 2004 and Beck, 2008 for surveys). Finally, we include a measure of Financial Freedom from the Heritage Foundation, with higher values indicating fewer restrictions imposed on banks and less direct government involvement in the financial system. Given the sample size, we have countries at all levels of economic and financial development, as well as a wide variation in economic growth, bank concentration and financial freedom.

The correlations in Panel C of Table 2 confirm some of the differences between Islamic and conventional banks discussed above. Specifically, in the large sample, we find the Islamic banks rely less on non-deposit funding, have lower overhead costs and cost-income ratios, have higher ROAs and capital-asset ratios, are smaller, have higher fixed assets ratios and lower non-interest earning asset ratios. In the smaller sample, however, we find that Islamic banks have a higher share of fee-based income, rely more on non-deposit funding, and have higher loan-deposit ratios, lower nonperforming loans, higher overhead costs, lower z-score, higher ROAs and higher equity asset ratios. As in the large sample, Islamic banks are smaller and have higher fixed asset and lower non-interest earning asset ratios. The different correlations can be explained by the very different country samples, which underlines the importance of (i) controlling for country factors and (ii) checking the robustness of our findings for a sample of countries with both Islamic and conventional banks to thus better control for confounding country factors.

4.   Comparing Islamic and Conventional Banks

Table 3 Panel A reports the regression results for the larger sample of 141 countries and 2,956 banks. Overall, the results suggest that once the bank and country controls are included, Islamic banks are more efficient than conventional banks and have higher capitalization ratios, but that they are not significantly more or less stable, do not have significantly different business models and have similar asset quality. . Specifically, the results in columns (1) to (3) show that there are no significant differences in business orientation between Islamic and conventional banks, as the Islamic bank dummy enters insignificantly (at the 5% level) in the regressions of fee income, non-deposit funding and loan-deposit ratios. On the other hand, Islamic banks have significantly lower operating costs and cost-income ratios than conventional banks (columns 4 and 5). Specifically, we find a 6.4 percentage point difference in the cost-income ratio between

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conventional and Islamic banks and a 0.9 percentage difference in overhead costs, both large given the means of 62% and 3.5%, respectively. Islamic and conventional banks, however, do not show any significant difference in asset quality, as the Islamic bank dummy enters insignificantly in the regressions of loss reserves, loan loss provisions and non-performing loans (columns 6 to 8). Finally, Islamic banks are not more stable, not more profitable, and not more liquid than conventional banks (columns 9 to 12). Islamic banks, however, have a 2.5 percentage point higher capitalization ratio than conventional banks, again a large economic effect, given the average of 10.8% in our large sample.

The other bank-level variables enter with the expected signs. Larger banks rely more on non-deposit funding, have lower loan-deposit ratios, lower overhead costs and cost-income ratios, lower loss reserves and loan loss provisions, lower liquidity, and lower z-scores due to lower profitability and capitalization ratios. Banks with higher fixed assets rely more on fee income, have lower loan-deposit ratios, have higher overhead and cost-income ratios, have higher loan losses, loan loss provisions and non-performing loans, and have lower z-scores in spite of higher capitalization ratios. Banks with a higher share of other earning assets rely more on fee income and have lower loan-deposit ratios, have higher cost-income ratios, have higher loss reserves, loan loss provisions and non-performing loans, have higher liquidity reserves, and have lower z-scores.

Many of the country variables enter significantly, explaining differences in business orientation, cost efficiency, asset quality and stability. Banks in richer countries rely less on fee-based income, but more on non-deposit funding, have higher loan-deposit ratios, have higher overhead costs and cost-income ratios, but also higher asset quality; they are more stable due to higher capitalization and in spite of lower profitability. Banks in countries with higher levels of financial development, on the other hand, rely less on non-deposit funding, have lower loan-deposit ratios, are more cost-efficient, have lower loss reserves and loan loss provisions, and are more stable in spite of lower profitability and capitalization. More concentrated banking systems are associated with lower reliance on non-deposit funding, higher cost efficiency, lower loan provisions, but higher non-performing loans, higher liquidity reserves and higher z-scores. Banks in countries with higher financial freedom indices rely more on fee-based income, have higher overhead costs, higher asset quality, higher profitability, but lower capitalization. Finally, GDP

growth is positively associated with fee-based income, but negatively with reliance on non-deposit funding and loan-deposit ratios; banks in faster growing countries are more cost-efficient, have higher asset quality and liquidity reserves, and are more stable, due to higher profitability and higher capitalization.

The Table 3 Panel B and C results confirm our previous findings, controlling for ownership structure and the regulatory and supervisory framework. We lose 28 countries and 888 banks in these regressions, due to missing observations. As before, we find that Islamic banks are more cost efficient and better capitalized than conventional banks, while there are no significant differences along the other dimensions. We also find that a higher share of government-owned banks is associated with a higher reliance on fee-based income, higher non-deposit funding, lower overhead costs, higher loss reserves and loan loss provisions, and lower z-scores, due to lower profitability and capitalization. A higher degree of foreign bank ownership, on the other hand, is associated with a higher reliance on fee-based income, but lower reliance on non-deposit funding and lower loan-deposit ratios; banking systems that rely more on foreign banks, are more cost-effective and have higher liquidity reserves, but are less stable due to lower profitability and lower capitalization. The Panel C regressions show that activity restrictions are associated with lower fee-based income, lower cost-efficiency, higher asset quality, higher maturity mismatch and higher profitability and capitalization. Stronger supervisory powers are associated with higher non-deposit funding, higher loan-deposit ratios, lower cost-income ratios but higher overhead costs, lower asset quality, lower maturity mismatch and higher profitability and capitalization. More stringent capital regulations, finally, are associated with higher non-deposit funding and loan-deposit ratios, lower cost efficiency, lower loan loss provisions, higher maturity mismatch, and higher z-scores. Controlling for ownership and the indicators of the regulatory and supervisory framework, however, does not change our main findings on significant efficiency and capitalization differences between Islamic and conventional banks.

The Table 4 regressions confirm our previous findings using two alternative estimation methods. Specifically, we report estimates using median least squares and robust regressions. Both estimation methodologies allow us to control for the effect of outliers and the fact that there are few Islamic banks in the sample. While the median least squares regressor minimizes the median square of residuals rather than the average and thus reduces the effect of outliers (Clarke,

Cull and Fuchs, 2006), the robust estimation technique uses all observations available, but assigns different weights to avoid the impact of outliers. Specifically, through an iterative process, observations are weighted based on the absolute value of their residuals, with observations with large residuals being assigned smaller weights (Cull, Matesova and Shirley, 2002; Beck, Cull and Jerome, 2005).[7] In both cases, however, we cannot cluster on the bank-level and our standard errors are therefore biased downwards.

The Panel 4 regressions show many significant differences between Islamic and conventional banks, however they are not robust across the two estimation techniques. Specifically, the results of the robust regressions in Panel A suggest that Islamic banks rely more on fee-based income, are more cost-effective, have higher loan loss reserves, lower non-performing loans (significant at 10% level) and show higher profitability and capitalization. The results of the median least square regressions in Panel B, on the other hand, show that Islamic banks rely less on non-deposit funding, have higher loan-deposit ratios, are more cost-effective, have loan loss reserves, are more liquid and have higher capitalization. If we focus on significant findings across both specifications, we see that Table 4 results confirm the higher cost-effectiveness of Islamic banks and the higher capitalization that we found in Table 3. In addition, both median least square and robust regressions show that Islamic banks have higher loan loss reserves.

In Table 5 Panel A, we interact a measure of the market share of Islamic banks in terms of assets with the Islamic bank dummy and a conventional bank dummy. This specification allows us to directly test for differences between the effect of a cross-country variation in the importance of Islamic banks on Islamic and conventional banks, reported below the coefficient estimates. For ease of presentation, we do not report the other bank- and country-level control variables. The results confirm our previous findings while showing some important variation across countries with different market shares for Islamic banks. We find that conventional banks rely more on fee income in countries with a higher share of Islamic banks, suggesting either a specialization of conventional banks in fee-based activities or the opening of Islamic

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[7] Specifically, the robust estimation technique initially eliminates gross outliers based on Cook's distance exceeding the threshold of one. Through an iterative process, weights are calculated based on the absolute residuals, and the model is regressed against those weights. The iterations continue until the maximum change in weights drops below a pre-specified tolerance level. See Rousseeuw and Leroy (1987).

windows by conventional banks in these countries. In countries with a higher share of Islamic banks, such banks rely more on non-deposit funding; this could be explained by higher reliance on wholesale funding by Islamic banks at the later stages of such a segment in a financial market. In countries with higher shares of Islamic banks, conventional banks exhibit lower loan-deposit ratios, while Islamic banks exhibit higher ratios. While we confirm our previous finding of more cost-efficient Islamic banks, conventional banks are also more cost-efficient if located in countries with a higher share of Islamic banks. Islamic banks hold higher loss reserves if located in countries with a very small share of Islamic banks, while conventional banks incur higher non-performing loans and are less stable in countries with a higher market share for Islamic banks. Our previous finding of higher capitalization of Islamic banks is confirmed and does not vary across countries with different shares of Islamic banks.

In Panel B Table 5 we explore more in depth the effect of differing market shares of Islamic banks across countries, by focusing on conventional banks. Hence, we drop Islamic banks, and investigate the effect of the Islamic Bank Share on business orientation, cost efficiency, asset quality and stability of conventional banks. We find that conventional banks in countries with higher Islamic bank share have higher fee-based income and lower loan-deposit ratios. They are also more cost-efficient in countries with a higher share of Islamic banks, but have lower asset quality, as indicated by higher loss reserves and non-performing loans. Finally, they have lower z-scores in countries with higher market shares for Islamic banks. The significant differences across conventional banks in countries with different shares of Islamic banks point to the importance of focusing on a sample with both Islamic and conventional banks, to which we will turn next. These results also suggest that country characteristics (such as the overall importance of Islamic banks) might be at least as important as the bank type in explaining differences in business orientation, cost efficiency, asset quality and stability. These findings are qualitatively confirmed when using robust regressions.

In Table 6 we focus on a sample of 20 countries that have both conventional and Islamic banks. This sample allows us to include country-year-fixed effects and thus avoid that we are confounding country- with bank-level differences, as we are effectively comparing conventional and Islamic banks within a country and a year. Unlike in our previous regressions, we find that Islamic banks are less cost efficient and have lower loss reserves than conventional banks, but

they continue to be better capitalized. Specifically, Islamic banks have a 3.5 percentage point higher cost-income ratio and 0.3 percentage points higher overhead costs than conventional banks. This suggests that the earlier finding of more cost efficient Islamic banks was driven by an overall higher efficiency in countries with both Islamic and conventional banks. We also find that Islamic banks have lower loss reserves than conventional banks in this smaller sample. As in the large sample, we find that Islamic banks have a higher capital-asset ratio than conventional banks, with the economic size of the effect being 1.2 percentage points. These findings are qualitatively confirmed when using robust regressions.

The results in Table 7 show significant variation in the differences between conventional and Islamic banks, across countries and years with different market shares of Islamic banks. Here we interact the market share of Islamic banks with both a dummy for Islamic and a dummy for conventional banks, a similar specification as in Table 5, but for the smaller sample of countries with both conventional and Islamic banks. Given the high correlation between the Islamic bank dummy and the Islamic market share, we do not include the bank dummy by itself, as otherwise identification would not be possible. We also include the bank- and country-time variant control variables, as well as country- and year-fixed effects.[8] We find that both Islamic and conventional banks reduce their reliance on non-deposit funding as the share of Islamic banks in the market increases, with no significant difference between the two bank types. On the other hand, only Islamic banks reduce their loan-deposit ratio as the overall share of Islamic banks increases. Both Islamic and conventional banks increase their cost-efficiency, as measured by the cost-income ratio, as the share of Islamic banks increases, but this increase is significantly higher for conventional than for Islamic banks. Both conventional and Islamic banks increase their profitability as the market share for Islamic banks increases, with no significant difference between the two bank types. We note that the effects of varying Islamic Bank Share in the smaller sample are mostly consistent with the effects that we found for the larger sample in Table 5, but the significance levels vary across the two samples.

Summarizing, the only robust difference between Islamic and conventional banks is that the former have higher capital-asset ratios. The higher cost efficiency of Islamic banks that we

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[8] Unlike in Table 6, we cannot include country-year-fixed effects, as otherwise there would be perfect multicollinearity with the sum of the two Islamic Banking Share interaction terms.

found in the large sample is driven by the fact that banks in countries with both conventional and Islamic banks are cost effective; in these countries, however, it is the conventional banks that are more cost-effective. We find some evidence that conventional banks' asset quality and stability deteriorate as the share of Islamic banks increases, while their cost efficiency increases.

5.   Islamic and Conventional Banks during the Crisis

This section compares the relative performance of conventional and Islamic banks during the crisis to test whether one bank type is better positioned to withstand large exogenous financial shocks. Unlike in the previous section, we focus on indicators of asset quality and stability since they are more likely to be affected by contagion effects than the business orientation and efficiency of financial institutions. In addition, we consider quarterly stock market indicators for a sub-sample of listed banks. We focus on the sample period 2005 to 2009 for the financial statement indicators and 2005 to 2010 for the stock market indicators. To control for confounding country-level factors in assessing the impact of the global financial crisis, we focus again on a sample of countries with both conventional and Islamic banks so that we can include country-year fixed effects.   Unlike in the previous section (and due to the different sample period) we have 22 countries with 397 conventional and 89 Islamic banks. Out of these 486 banks, 112 are listed, 74 conventional and 38 Islamic.

Table 8 provides descriptive statistics on our sample and shows that our sample is not too different from the pre-crisis sample. However, we also find a large variation in stability and asset quality. The quarterly stock returns vary from -44% to 72% (over the course of a quarter), with a mean of 2.9%. Figure 3 shows the development of quarterly stock returns of both conventional and Islamic banks between 2005 and 2010 and shows a close co-movement between the two bank types.

The estimations reported in Table 9 use financial statement indicators to test for a differential effect of the crisis on the performance of Islamic and conventional banks. Specifically, in addition to the Islamic bank dummy, we include an interaction with a crisis dummy for 2008 and 2009 as well as an interaction with a trend variable. We include the latter to distinguish between the effect of the crisis on any difference between Islamic and conventional banks and any longer-time trends.

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The results in Table 9 show little difference between Islamic and conventional banks during the crisis. Specifically, we find no significant differences in asset quality between Islamic and conventional banks, neither in general nor during the crisis. We find significantly higher liquidity reserves for Islamic banks, though with a decreasing trend over time. Since the on-set of the crisis, however, Islamic banks have shown significantly higher liquidity reserves. None of the stability measures comes in significantly at the 5% level, although we do find some marginally significant results: Islamic banks are better capitalized and less profitable. None of these differences, however, varies with the crisis period.

The Table 10 results show that while Islamic banks yield lower stock returns for their investors in general, the reverse held during the crisis. Here, we regress quarterly stock returns on an Islamic Bank dummy plus interactions with Crisis (Q4-2007 to Q4-2008) and recovery period (Q1 to Q4-2009). In column (2), we also include additional bank characteristics that might explain the behavior of stock returns, while in column (3), we add interactions of these bank characteristics with the crisis and recovery dummies. Controlling for other bank characteristics turns the Islamic bank dummy insignificant, while its interaction with Crisis still enters positively, although only at the 10% significance level. Higher liquidity reserves and better capitalization can explain higher stock returns. The column (3) results confirm this finding and also show that during the crisis lower provisions, less reliance on non-deposit funding, and higher capital-asset ratios boosted stock returns. These effects can thus explain why the Islamic bank dummy and its interaction with crisis and recovery turn insignificant in column (3) of Table 10. In robustness tests, we find the same results when using robust regressions.

6.   Conclusions

This paper discussed the implications of Sharia-compliant products of Islamic banking for agency problems using traditional theory of financial intermediation. While theory suggests significant repercussions of the equity-like nature of Islamic banking for business orientation, efficiency, risk-taking and stability, anecdotal evidence suggests that Islamic banks' business model might be not too different from conventional banks' business model.

Our empirical estimations show little significant differences between Islamic and conventional banks. The tentative conclusion of the cross-country, cross-bank comparison of

conventional and Islamic banks is therefore that either opposing effects of Sharia-compliant banking cancel each other out or that the differences between these two models are smaller than often assumed. However, there are certainly regulatory and supervisory challenges for countries that see an increasing entry of Islamic banks, and our preliminary results suggest that conventional banks that operate in countries with a larger share of Islamic banks are more cost-effective but less stable.

We hope that our theoretical discussions and empirical findings stimulate more research in this area. First, disaggregated data on specific products below balance sheet and income statements are necessary to better understand the differences in financial service provisions between conventional and Islamic banks. This would also allow us to include Islamic windows in our analysis. Second, future work can also assess the impact of varying market shares for Islamic banks on the outreach of the banking system and ultimately the access to and use of banking products by firms and enterprises.

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Figure 1. Number of Islamic banks reporting to Bankscope 1995-2008
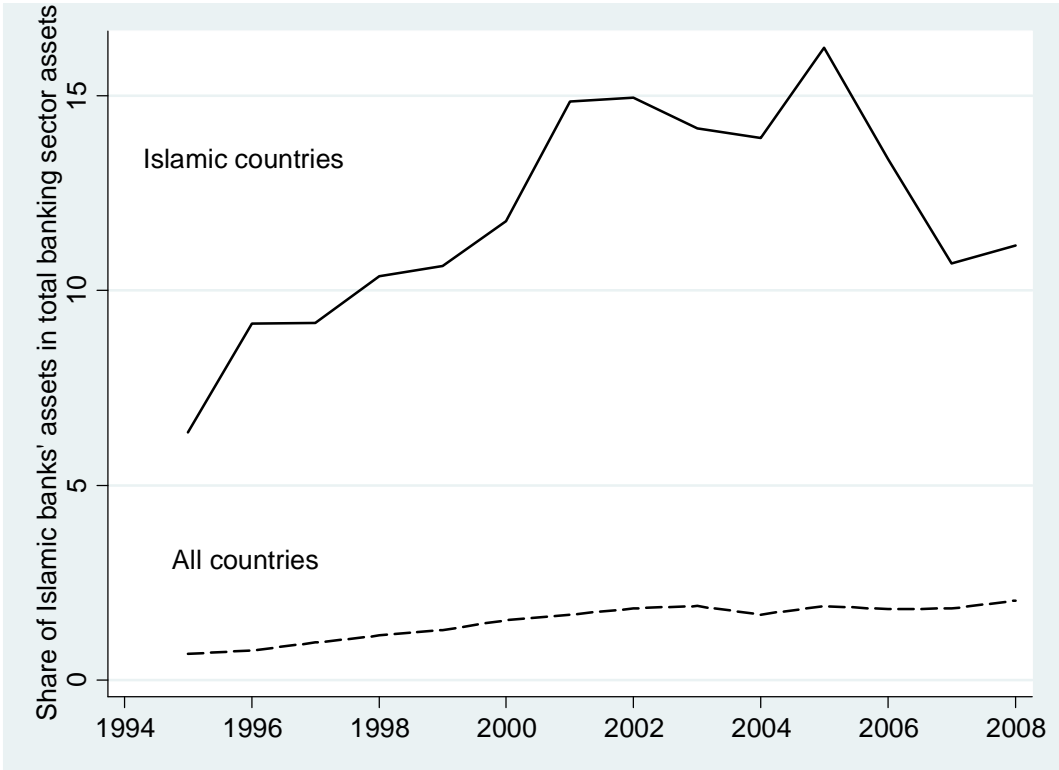
Figure 2. Expansion of Islamic banking 1995-2008
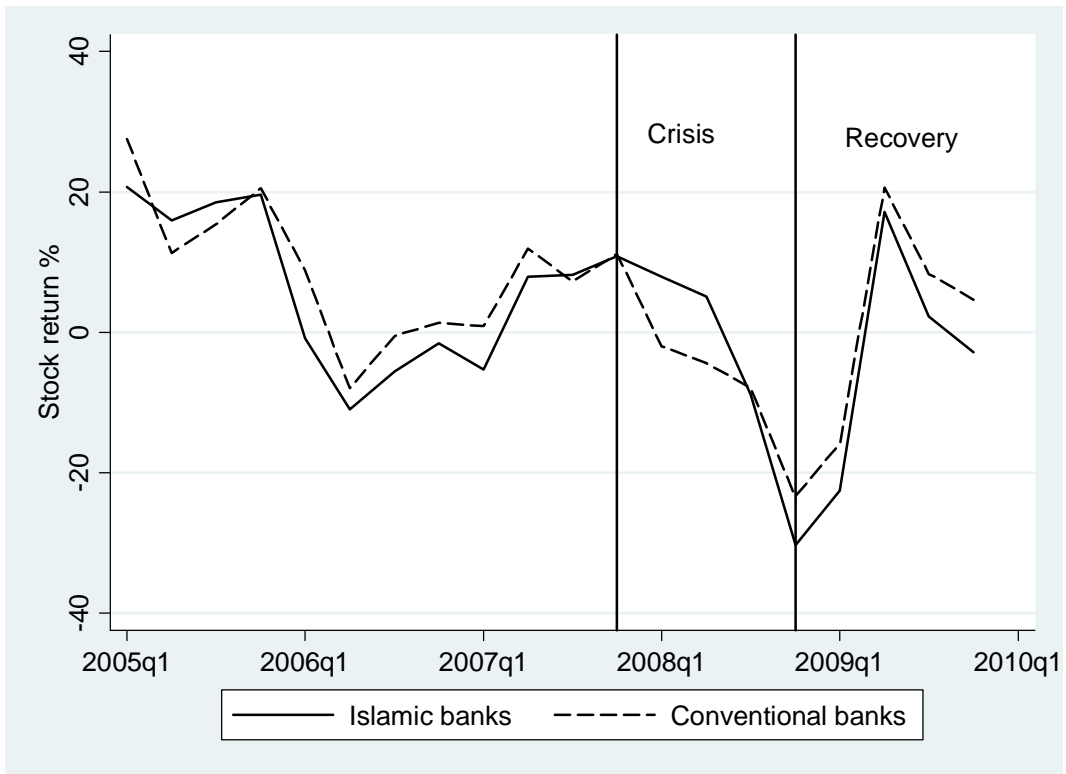
Figure 3. Average bank stock return by specialization 1995-2009

Table 1. Banking sector structure in "Islamic" countries as of 2007

In this table we report details of the banking sector structure of 22 countries in Bankscope that host both islamic banks and conventional banks. The sample is restricted to countries that have at least 4 banks reporting to Bankscope and banks with at least two years of observations. Islamic Banking % is the islamic banks' share of total banking sector assets.

	Number of Banks in 2007		Islamic Banking %	Listed Banks	
	Total	Islamic	2007	Non-Islamic	Islamic
Brahain	11	15	27.68	5	4
Bangladesh	28	5	13.22	22	5
Cayman Islands	11	1	6.53	0	0
Egypt	23	2	4.22	13	2
Gambia (*)	5	1	8.48	0	1
Indonesia	53	1	0.62	24	0
Jordan	7	2	6.20	7	1
Kuwait	5	6	41.33	5	6
Lebanon	27	2	0.33	3	0
Malaysia	29	12	7.26	3	0
Mauritannia	5	1	12.40	0	0
Pakistan	23	10	6.72	21	6
Qatar	7	4	14.02	5	3
Saudi Arabia	9	2	5.92	8	1
Singapore	12	1	0.17	3	0
Sudan	13	9	33.84	7	4
Syria	8	1	1.05	6	1
Tunisia	14	1	1.51	10	0
Turkey	24	3	2.96	12	2
United Arabe Emirates	16	4	12.86	12	4
United Kingdom	88	2	0.01	0	1
Yemen	4	3	51.45	0	0
Total	422	88	9.87	166	41

(*) We use 2005 Bankscope assets

(**) We use 2001 Bankscope assets

Table 2. Descriptive statistics

In this table we report descriptive statistics of the variables used in our analysis for the whole sample and for the sample of countries that host both islamic banks and conventional banks. We also report p-values for the test of difference in means between islamic and conventional banks. All balance sheet data are from Bankscope , are yearly, and cover the period 1995-2007 (i.e. pre-crisis). In the whole sample Panel A there are 2956 banks (that report total assets in Bankscope in 2007) among which 99 are islamic banks. In the "Islamic" countries sample Panel B (countries that host both islamic and non-islamic banks) there are 406 banks of which 86 are islamic banks. In each sample we include countries that have at least 4 banks reporting to Bankscope and banks with at least 2 years of observations. Balance sheets data are unconsolidated when available and consolidated otherwise. Higher value of the zscore indicates greater stability. Maturity match is measured as the ratio of liquid assets to short-term funding. All ratios are in percentage. Macroeconomic variables are all from the World Bank (World Development Indicators, Financial Development and Structure Database, and Bank Regulation and Supervision database) except for the index of Financial Freedom which is from the Heritage Foundation. The concentration ratio is the share of total banking sector assets held by the largest 3 banks in the country. Islamic Banking % is the islamic banks' share of total banking sector assets. Higher values of the financial freedom index indicate fewer restrictions imposed on banks and less direct government involvement in the financial system. Higher values of the activity restrictiveness index indicate greater restriction on banks to engage in insurance, securities, and real estate activities. The capital stringency index measures whether there are explicit regulatory requirements regarding the amount of capital that a bank must have relative to various guidelines. The supervisory power index measures whether the supervisory authorities have the authority to take specific actions to prevent and correct problems (such as restructuring powers and declaring insolvency powers). All variables (except the macroeconomic variables) are winsorized at the 1% and 99% level to remove outliers.

Panel A. Whole Sample

	Scaled by	Number of observations	Mean	Standard deviation	Minimum	Maximum	Islamic Banks	Conventional Banks	Difference Test p-value
Business model									
Fee income	Total operational income	15816	32.639	20.284	4.107	69.326	34.423	32.615	0.240
Non-deposit funding	Total funding	28995	5.490	9.172	0.000	26.742	3.854	5.517	0.000
Gross Loans	Total deposits	28749	71.739	31.524	21.459	125.659	77.384	71.643	0.000
Efficiency									
Overheads	Total assets	28361	3.480	2.395	0.822	8.282	2.650	3.495	0.000
Cost income ratio		27835	62.002	18.182	33.330	92.490	54.090	62.140	0.000
Assets quality									
Loan Loss reserves	Total gross loans	21978	4.485	4.050	0.660	13.440	4.765	4.481	0.213
Loan loss provisions	Total gross loans	25383	1.344	1.510	-0.008	4.747	1.298	1.345	0.542
Non-performing loans	Total gross loans	14747	6.204	6.364	0.379	20.074	6.504	6.200	0.501

Panel A. Continued

	Scaled by	Number of observations	Mean	Standard deviation	Minimum	Maximum	Islamic Banks	Conventional Banks	Difference Test p-value
Stability									
Zscore		29015	17.468	13.870	2.676	45.676	16.793	17.480	0.271
Return on assets		29181	1.126	1.109	-0.320	3.340	1.417	1.121	0.000
Equity assets ratio		29465	10.754	6.575	3.650	25.480	13.528	10.705	0.000
Maturity match		29117	36.895	25.912	7.350	87.110	36.726	36.898	0.886
Controls									
Bank level									
ln(total assets)		38422	13.762	1.888	10.959	16.866	13.572	13.766	0.053
Non-loan earnings assets	Total earnings assets	38333	44.451	23.462	13.610	85.490	41.737	44.513	0.003
Fixed assets	Total assets	37188	1.882	1.712	0.109	5.411	2.288	1.873	0.000
Country level									
ln(GDP per capita)		1812	8.078	1.643	4.442	11.619			
GDP growth		1806	4.625	4.521	-18.000	88.958			
Concentration ratio		1764	0.685	0.196	0.140	1			
Financial freedom index		1859	53.744	19.712	10	90			
Private credit GDP ratio		1587	0.505	0.459	0.004	2.114			
Islamic Banking %		2086	2.470	12.010	0	100			
Government ownership	% of banking sector assets	1364	17.006	22.413	0	98.100			
Foreign ownership	% of banking sector assets	1314	34.738	30.354	0	100			
Activity restrictiveness		1502	7.403	2.051	3	12			
Overall capital stringency		1272	4.074	1.561	1	7			
Official supervisory power		1372	10.982	2.347	4	14			

Panel B. Islamic Countries

	Number of observations	Mean	Standard deviation	Minimum	Maximum	Islamic Banks	Conventional Banks	Difference Test p-value
Fee income	3114	33.790	19.808	4.107	69.326	36.755	33.515	0.011
Non-deposit funding	6041	2.460	6.398	0.000	26.742	3.241	2.362	0.001
Loans deposits ratio	5961	62.412	28.520	17.782	109.422	61.287	71.440	0.000
Overheads	5695	2.549	1.804	0.822	8.282	3.221	2.454	0.000
Cost income ratio	5531	54.583	19.083	33.330	92.490	55.822	54.412	0.072
Loss reserves	4966	5.772	4.534	0.660	13.440	4.918	5.864	0.000
Loan loss provisions	4837	1.351	1.445	-0.008	4.747	1.284	1.359	0.250
Non-performing loans	3332	8.098	7.050	0.379	20.074	5.944	8.309	0.000
Zscore	6023	17.718	13.326	2.676	45.676	16.700	17.854	0.030
Return on assets	6036	1.290	1.092	-0.320	3.340	1.516	1.259	0.000
Equity assets ratio	6165	11.550	6.812	3.650	25.480	15.355	11.046	0.000
Maturity match	6059	41.535	24.749	7.350	87.110	40.794	41.627	0.000

Controls

Bank level

	Number of observations	Mean	Standard deviation	Minimum	Maximum	Islamic Banks	Conventional Banks	Difference Test p-value
ln(total assets)	6870	13.842	1.691	10.959	16.866	13.572	13.882	0.000
Non-loan earnings assets	6843	46.791	23.401	13.610	85.490	41.737	47.514	0.000
Fixed assets	6581	1.626	1.502	0.109	5.411	2.288	1.528	0.000

Country level

	Number of observations	Mean	Standard deviation	Minimum	Maximum	Islamic Banks	Conventional Banks	Difference Test p-value
ln(GDP per capita)	315	8.035	1.528	5.544	10.872			
GDP growth	303	4.871	3.252	-13.127	20.843			
Concentration ratio	309	0.657	0.190	0.243	1.000			
Financial freedom index	322	47.360	21.111	10.000	90.000			
Private credit GDP ratio	258	0.537	0.424	0.017	1.896			
Islamic Banking %	358	14.390	25.892	0.000	100.000			

Panel C. Correlation matrix among selected variables

In this panel we report Pearson correlation coefficients. A star indicates statistical significance at the 5% level and above.

Whole sample

	Islamic	Islamic Banking %	Fee income	Non-deposit funding	Loans deposits ratio	Loss reserves	Loan loss provisions	Non-performing loans	Cost income ratio	Overheads	Zscore	Return on assets	Equity assets ratio	Maturity match	ln(total assets)	Non-loan earnings assets	Fixed assets
Islamic	1																
Islamic Banking %	0.5347*	1															
Fee income	0.0101	0.0356*	1														
Non-deposit funding	-0.0231*	-0.0109	0.0566*	1													
Loans deposits ratio	0.0233*	-0.0005	-0.1708*	0.3366*	1												
Loss reserves	0.0084	0.0559*	0.1379*	0.0035	-0.1955*	1											
Loan loss provisions	-0.0038	0.0184*	0.0815*	0.0817*	-0.0385*	0.5330*	1										
Non-performing loans	0.0055	0.0745*	0.0721*	-0.1080*	-0.2108*	0.7547*	0.4464*	1									
Cost income ratio	-0.0575*	-0.0650*	0.0998*	0.0345*	-0.0760*	0.0891*	0.0023	0.1241*	1								
Overheads	-0.0465*	-0.0429*	0.2030*	0.0882*	0.0247*	0.3355*	0.3986*	0.2275*	0.4625*	1							
Zscore	-0.0065	-0.0448*	-0.1451*	-0.0783*	0.0881*	-0.2178*	-0.2481*	-0.2205*	-0.1369*	-0.2340*	1						
Return on assets	0.0349*	0.0541*	0.0858*	0.0167*	0.0449*	0.0039	-0.0173*	-0.1005*	-0.4744*	0.2028*	0.0018	1					
Equity assets ratio	0.0561*	0.0118*	0.0326*	0.0194*	0.1471*	0.1717*	0.1612*	0.0808*	-0.0425*	0.3885*	0.1324*	0.3803*	1				
Maturity match	-0.0008	0.0182*	0.2313*	-0.0676*	-0.4628*	0.2094*	0.0945*	0.1638*	0.0098	0.1157*	-0.0114	0.1309*	0.2469*	1			
ln(total assets)	-0.0151*	0.0052	-0.1025*	0.1021*	0.0564*	-0.2554*	-0.2208*	-0.2563*	-0.1469*	-0.4661*	0.0664*	-0.1979*	-0.5109*	-0.2532*	1		
Non-loan earnings assets	-0.0266*	-0.0074	0.2071*	0.0123*	-0.7592*	0.2307*	0.0615*	0.1893*	0.0270*	-0.0170*	-0.0454*	0.0251*	0.0608*	0.6491*	-0.0788*	1	
Fixed assets	0.0302*	0.0668*	0.0794*	-0.0088	-0.0043	0.2968*	0.2835*	0.2769*	0.2629*	0.5629*	-0.1349*	0.1125*	0.2577*	0.0149*	-0.3922*	-0.1041*	

"Islamic" countries

	Islamic	Islamic Banking %	Fee income	Non-deposit funding	Loans deposits ratio	Loss reserves	Loan loss provisions	Non-performing loans	Cost income ratio	Overheads	Zscore	Return on assets	Equity assets ratio	Maturity match	ln(total assets)	Non-loan earnings assets	Fixed assets
Islamic	1																
Islamic Banking %	0.3420*	1															
Fee income	0.0456*	0.1574*	1														
Non-deposit funding	0.0433*	0.1484*	0.0616*	1													
Loans deposits ratio	0.1117*	0.0088	0.0472*	0.1573*	1												
Loss reserves	-0.0619*	0.0296*	0.1046*	-0.0803*	-0.2275*	1											
Loan loss provisions	-0.0162	0.0860*	0.0871*	0.0224	-0.0614*	0.4606*	1										
Non-performing loans	-0.0956*	-0.0347*	-0.017	-0.0271	-0.1443*	0.7936*	0.4214*	1									
Cost income ratio	0.0242	0.0324*	0.1144*	0.0119	-0.1885*	0.0909*	-0.0449*	0.2102*	1								
Overheads	0.1404*	0.2566*	0.0920*	0.0175	0.0184	0.0904*	0.2048*	0.0683*	0.4939*	1							
Zscore	-0.0279*	-0.1188*	-0.2473*	-0.0324*	-0.0450*	-0.1858*	-0.1870*	-0.1956*	-0.1331*	-0.1366*	1						
Return on assets	0.0760*	0.1225*	-0.0415*	-0.0136	0.1766*	-0.1315*	-0.2298*	-0.2904*	-0.5628*	0.0438*	0.1305*	1					
Equity assets ratio	0.2033*	0.0933*	-0.1597*	0.0687*	0.1804*	0.0142	-0.0195	-0.0616*	-0.1491*	0.2116*	0.3069*	0.4388*	1				
Maturity match	-0.0106	0.0808*	-0.0659*	0.0595*	-0.4596*	0.1168*	0.0286*	0.0297	0.0161	0.0393*	0.1866*	0.0455*	0.2021*	1			
ln(total assets)	-0.0896*	-0.1054*	-0.0104	0.0009	0.0697*	-0.2018*	-0.1486*	-0.1718*	-0.2487*	-0.3706*	0.0401*	-0.0296*	-0.3117*	-0.1967*	1		
Non-loan earnings assets	-0.0634*	0.0086	-0.0457*	0.0614*	-0.8190*	0.2472*	0.0879*	0.1512*	0.1286*	0.0237	0.1137*	-0.0500*	0.0788*	0.5981*	-0.1396*	1	
Fixed assets	0.1225*	0.2787*	-0.0592*	-0.0183	-0.0685*	0.1698*	0.1480*	0.1814*	0.3245*	0.4890*	-0.0434*	0.0013	0.1567*	-0.0116	-0.3487*	0.0066	

Table 3. Comparing islamic and conventional banks in the whole sample

In this table we report results for the whole sample not controlling and controlling for banking sector ownership structure. The standard errors clustered by bank are reported in brackets. See Table 2 for a detailed definition of all the variables used in the regression. The sample is an unbalanced panel of 2956 banks among which 99 are islamic banks. The period covered is 1995-2007.

Panel A. Baseline specification

	Business model			Efficiency			Asset quality		Stability			
	Fee income	Non-deposit funding	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Islamic bank dummy	2.894	-0.34	3.031	-6.362***	-0.924***	0.077	-0.128	-0.021	2.425	1.278	0.116	2.505***
	[2.969]	[0.850]	[2.241]	[1.805]	[0.183]	[0.445]	[0.131]	[1.128]	[2.013]	[1.533]	[0.118]	[0.805]
ln(total assets)	-0.01	0.495***	-1.201***	-1.204***	-0.349***	-0.120***	-0.046***	-0.023	-2.709***	-0.652***	-0.047***	-1.900***
	[0.228]	[0.090]	[0.190]	[0.151]	[0.018]	[0.038]	[0.011]	[0.068]	[0.184]	[0.140]	[0.009]	[0.053]
Non-loan earnings assets	0.189***	0.001	-1.084***	0.021**	-0.002*	0.037***	0.004***	0.042***	0.724***	-0.033***	0.001	0.008**
	[0.016]	[0.006]	[0.011]	[0.010]	[0.001]	[0.003]	[0.001]	[0.005]	[0.012]	[0.008]	[0.001]	[0.003]
Fixed assets	0.916***	0.027	-1.574***	3.166***	0.591***	0.438***	0.143***	0.574***	0.053	-0.296**	-0.012	0.456***
	[0.221]	[0.084]	[0.195]	[0.146]	[0.018]	[0.037]	[0.011]	[0.070]	[0.173]	[0.124]	[0.010]	[0.055]
ln(GDP per capita)	-1.577***	0.991***	3.193***	3.497***	0.161***	-0.274***	-0.159***	-1.145***	-0.209	1.243***	-0.100***	0.743***
	[0.331]	[0.127]	[0.263]	[0.238]	[0.026]	[0.063]	[0.015]	[0.112]	[0.273]	[0.200]	[0.014]	[0.077]
GDP growth	0.418***	-0.059**	-0.185***	-0.361***	-0.068***	-0.191***	-0.092***	-0.317***	0.260***	0.160***	0.032***	0.030*
	[0.076]	[0.026]	[0.060]	[0.053]	[0.005]	[0.011]	[0.004]	[0.022]	[0.056]	[0.038]	[0.003]	[0.016]
Concentration ratio	1.566	-7.692***	-6.981***	-4.009***	-1.449***	-0.302	-0.604***	1.465***	6.428***	5.788***	-0.014	-0.632
	[1.900]	[0.712]	[1.376]	[1.137]	[0.138]	[0.267]	[0.080]	[0.490]	[1.348]	[1.036]	[0.069]	[0.402]
Financial freedom index	0.147***	-0.001	-0.018	-0.02	0.008***	-0.032***	-0.002**	-0.044***	0.014	0.02	0.003***	-0.011**
	[0.022]	[0.007]	[0.016]	[0.014]	[0.002]	[0.003]	[0.001]	[0.006]	[0.015]	[0.013]	[0.001]	[0.005]
Private credit GDP ratio	1.093	-3.522***	-4.959***	-4.584***	-1.232***	-0.483***	-0.281***	0.450*	0.02	4.440***	-0.265***	-0.467**
	[0.971]	[0.374]	[0.789]	[0.605]	[0.078]	[0.141]	[0.045]	[0.257]	[0.706]	[0.562]	[0.038]	[0.215]
Constant	26.068***	-2.327	118.897***	49.974***	7.318***	8.828***	4.216***	15.141***	38.116***	9.165***	2.413***	29.404***
	[3.953]	[1.442]	[3.054]	[2.761]	[0.290]	[0.637]	[0.181]	[1.238]	[3.112]	[2.264]	[0.153]	[0.921]
Year fixed effects	x	x	x	x	x	x	x	x	x	x	x	x
Number of observations	15816	28995	28749	27835	28361	21978	25383	14747	29117	29015	29181	29465
R-squared	0.07	0.07	0.6	0.13	0.44	0.23	0.18	0.24	0.47	0.1	0.11	0.3

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Panel B. Controlling for banking sector ownership structure

In this panel we add as controls the proportions of the host country banking sector assets that are government owned and foreign owned. These data are from the World Bank Financial Development and Structure database (2007).

	Business model			Efficiency			Asset quality		Stability			
	Fee income	Non-deposit funding	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Islamic bank dummy	2.660	-1.405	-2.060	-5.887***	-0.879***	0.927*	-0.138	0.906	-0.047	1.462	-0.086	2.203**
	[3.693]	[0.966]	[2.393]	[1.962]	[0.229]	[0.504]	[0.181]	[1.360]	[2.677]	[1.860]	[0.132]	[0.901]
ln(total assets)	-0.235	0.456***	-1.399***	-1.356***	-0.356***	-0.090**	-0.044***	-0.008	-2.638***	-0.611***	-0.040***	-1.867***
	[0.241]	[0.100]	[0.210]	[0.157]	[0.020]	[0.040]	[0.012]	[0.071]	[0.192]	[0.155]	[0.009]	[0.057]
Non-loan earnings assets	0.192***	0.003	-1.082***	0.035***	-0.001	0.034***	0.003***	0.047***	0.719***	-0.028***	0.001**	0.013***
	[0.019]	[0.006]	[0.013]	[0.011]	[0.001]	[0.003]	[0.001]	[0.005]	[0.014]	[0.010]	[0.001]	[0.004]
Fixed assets	1.385***	0.044	-1.851***	3.115***	0.532***	0.456***	0.123***	0.532***	-0.438**	-0.211	-0.032***	0.376***
	[0.243]	[0.101]	[0.228]	[0.165]	[0.021]	[0.040]	[0.013]	[0.076]	[0.189]	[0.142]	[0.011]	[0.062]
ln(GDP per capita)	-0.351	1.534***	4.302***	3.234***	0.186***	-0.378***	-0.137***	-1.323***	0.916***	1.278***	-0.117***	0.604***
	[0.382]	[0.158]	[0.316]	[0.272]	[0.030]	[0.071]	[0.018]	[0.129]	[0.312]	[0.245]	[0.016]	[0.093]
GDP growth	0.438***	0.03	-0.157**	-0.253***	-0.070***	-0.212***	-0.100***	-0.353***	0.062	0.141***	0.030***	-0.005
	[0.081]	[0.028]	[0.064]	[0.056]	[0.005]	[0.011]	[0.004]	[0.023]	[0.059]	[0.039]	[0.003]	[0.017]
Concentration ratio	2.808	-8.023***	-7.591***	-3.615***	-1.335***	0.329	-0.565***	1.991***	7.950***	5.197***	-0.005	-0.345
	[2.086]	[0.802]	[1.488]	[1.212]	[0.154]	[0.286]	[0.090]	[0.522]	[1.448]	[1.197]	[0.076]	[0.451]
Financial freedom index	0.180***	0.050***	0.097***	0.006	0.006***	-0.028***	-0.002**	-0.053***	-0.071***	0.058***	0.003***	-0.014**
	[0.025]	[0.008]	[0.019]	[0.016]	[0.002]	[0.003]	[0.001]	[0.006]	[0.017]	[0.014]	[0.001]	[0.005]
Private credit GDP ratio	2.951***	-5.436***	-10.179***	-3.982***	-1.454***	-0.327*	-0.308***	0.685**	-2.356***	2.952***	-0.372***	-1.124***
	[1.118]	[0.455]	[0.942]	[0.726]	[0.089]	[0.171]	[0.052]	[0.297]	[0.813]	[0.672]	[0.044]	[0.253]
Government ownership	0.161***	0.024***	0.031*	0.018	-0.005***	0.012***	0.004***	-0.004	-0.091***	0	-0.007***	-0.016***
	[0.020]	[0.008]	[0.017]	[0.014]	[0.002]	[0.004]	[0.001]	[0.007]	[0.017]	[0.013]	[0.001]	[0.005]
Foreign ownership	0.047***	-0.052***	-0.137***	-0.031***	-0.008***	-0.002	0	0	0.046***	-0.053***	-0.003***	-0.020***
	[0.017]	[0.006]	[0.012]	[0.011]	[0.001]	[0.003]	[0.001]	[0.005]	[0.012]	[0.009]	[0.001]	[0.004]
Constant	10.367**	-6.662***	112.908***	50.825***	7.802***	9.207***	3.930***	16.569***	35.556***	8.692***	2.832***	32.255***
	[4.610]	[1.705]	[3.632]	[3.261]	[0.341]	[0.746]	[0.219]	[1.481]	[3.773]	[2.723]	[0.183]	[1.082]
Year fixed effects	x	x	x	x	x	x	x	x	x	x	x	x
Number of observations	12208	22152	21970	21627	21993	16836	19788	11534	22195	22243	22326	22479
R-squared	0.1	0.1	0.6	0.13	0.43	0.25	0.19	0.26	0.49	0.1	0.11	0.31

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Panel C. Controlling for the regulatory and supervisory framework

In this panel we add as controls the country-level indices of the stringency of capital regulation, bank supervisor power, and activity restrictiveness of banks.

	Business model			Efficiency			Asset quality			Stability			
	Fee income	Non-deposit funding	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Islamic bank dummy	3.668	-1.935*	1.398	-5.590**	-1.083***	0.702	-0.406*	0.09	-2.776	1.713	-0.029	3.231***
	[4.124]	[1.138]	[2.673]	[2.250]	[0.274]	[0.599]	[0.220]	[1.518]	[3.310]	[2.139]	[0.170]	[1.147]
ln(total assets)	0.038	0.612***	-1.121***	-1.275***	-0.377***	-0.139***	-0.055***	-0.052	-2.702***	-0.404***	-0.056***	-1.908***
	[0.235]	[0.100]	[0.209]	[0.164]	[0.020]	[0.042]	[0.012]	[0.078]	[0.200]	[0.151]	[0.009]	[0.057]
Non-loan earnings assets	0.176***	-0.004	-1.089***	0.025**	-0.004***	0.033***	0.002***	0.044***	0.732***	-0.015	0.001	0.006
	[0.018]	[0.006]	[0.012]	[0.012]	[0.001]	[0.003]	[0.001]	[0.006]	[0.014]	[0.009]	[0.001]	[0.004]
Fixed assets	0.956***	-0.111	-1.918***	3.261***	0.570***	0.470***	0.132***	0.585***	0.206	-0.22	-0.021**	0.459***
	[0.237]	[0.099]	[0.233]	[0.161]	[0.020]	[0.042]	[0.013]	[0.080]	[0.196]	[0.139]	[0.011]	[0.061]
ln(GDP per capita)	-2.962***	1.085***	2.723***	3.201***	0.164***	-0.448***	-0.177***	-1.334***	-0.979***	0.643**	-0.085***	0.770***
	[0.366]	[0.155]	[0.320]	[0.273]	[0.030]	[0.074]	[0.019]	[0.129]	[0.329]	[0.250]	[0.016]	[0.092]
GDP growth	0.525***	-0.081***	-0.168**	-0.238***	-0.074***	-0.215***	-0.108***	-0.344***	0.214***	0.249***	0.025***	-0.019
	[0.084]	[0.027]	[0.068]	[0.058]	[0.006]	[0.012]	[0.004]	[0.024]	[0.060]	[0.041]	[0.004]	[0.018]
Concentration ratio	-1.219	-8.602***	-6.127***	-3.985***	-1.226***	0.361	-0.589***	2.124***	9.368***	7.019***	0.103	0.088
	[2.081]	[0.837]	[1.559]	[1.309]	[0.149]	[0.309]	[0.094]	[0.624]	[1.536]	[1.176]	[0.075]	[0.466]
Financial freedom index	0.141***	0.002	-0.004	-0.051***	0.003*	-0.038***	-0.004***	-0.060***	0.023	0.026*	0.004***	-0.012**
	[0.024]	[0.008]	[0.017]	[0.015]	[0.002]	[0.003]	[0.001]	[0.006]	[0.016]	[0.014]	[0.001]	[0.005]
Private credit GDP ratio	2.366**	-4.608***	-5.713***	-2.278***	-1.113***	-0.302*	-0.262***	0.732**	0.786	4.731***	-0.289***	-0.537**
	[0.995]	[0.425]	[0.864]	[0.649]	[0.084]	[0.160]	[0.051]	[0.300]	[0.756]	[0.587]	[0.040]	[0.232]
Activity restrictiveness index	-1.548***	0.095	0.142	0.364***	0.060***	-0.154***	-0.025**	-0.171***	-1.433***	-0.182	0.032***	0.130***
	[0.206]	[0.075]	[0.154]	[0.135]	[0.015]	[0.030]	[0.010]	[0.064]	[0.149]	[0.124]	[0.008]	[0.046]
Supervisory power index	0.018	0.246***	0.759***	-0.789***	0.042***	0.143***	0.056***	0.099**	0.747***	-0.058	0.054***	0.198***
	[0.168]	[0.066]	[0.166]	[0.106]	[0.013]	[0.026]	[0.008]	[0.047]	[0.117]	[0.095]	[0.006]	[0.035]
Capital regulation stringency index	-0.107	0.683***	0.386***	0.327**	0.052***	0.019	-0.022**	0.042	-1.014***	0.469***	-0.009	-0.007
	[0.207]	[0.076]	[0.139]	[0.149]	[0.016]	[0.037]	[0.010]	[0.071]	[0.176]	[0.130]	[0.009]	[0.050]
Constant	48.239***	-10.984***	113.066***	57.765***	6.666***	10.017***	4.260***	17.660***	49.969***	9.250***	1.642***	26.226***
	[5.571]	[2.128]	[4.460]	[3.691]	[0.410]	[0.886]	[0.266]	[1.597]	[4.341]	[3.319]	[0.222]	[1.259]
Year fixed effects	x	x	x	x	x	x	x	x	x	x	x	x
Number of observations	12512	21611	21428	20684	21054	15977	18930	10527	21656	21588	21704	21937
R-squared	0.1	0.1	0.6	0.13	0.46	0.28	0.2	0.29	0.5	0.09	0.13	0.32

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Table 4. Robust and Median regressions

In this table we report robust and median regression for the baseline specification. See Table 3 for details of the sample covered and Table 2 for definitions of the variables used in the regression.

Panel A. Robust regressions

	Business model			Efficiency			Asset quality			Stability			
	Fee income	Non-deposit funding (#)	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Islamic bank dummy	3.189**	-	-0.022	-6.991***	-1.048***	0.381**	-0.058	-0.593*	0.576	0.08	2.117***	5.336***
	[1.482]		[0.646]	[0.845]	[0.074]	[0.188]	[0.053]	[0.359]	[0.624]	[0.050]	[0.244]	[0.786]
ln(total assets)	0.016	-	-0.581***	-1.247***	-0.306***	-0.044***	0.017***	0.169***	-0.606***	-0.037***	-1.735***	-2.913***
	[0.115]		[0.056]	[0.074]	[0.007]	[0.016]	[0.004]	[0.030]	[0.055]	[0.004]	[0.021]	[0.068]
Non-loan earnings assets	0.211***	-	-1.173***	0.024***	-0.003***	0.030***	-0.001***	0.027***	-0.036***	0	0.002	0.866***
	[0.008]		[0.004]	[0.005]	[0.000]	[0.001]	[0.000]	[0.002]	[0.004]	[0.000]	[0.001]	[0.004]
Fixed assets	1.003***	-	-1.182***	3.528***	0.715***	0.493***	0.146***	0.590***	-0.358***	-0.009**	0.636***	0.079
	[0.113]		[0.057]	[0.076]	[0.007]	[0.015]	[0.005]	[0.030]	[0.056]	[0.004]	[0.022]	[0.069]
ln(GDP per capita)	-1.644***	-	1.946***	3.831***	0.125***	-0.282***	-0.175***	-1.187***	0.996***	-0.116***	0.704***	0.067
	[0.179]		[0.088]	[0.117]	[0.010]	[0.024]	[0.007]	[0.045]	[0.087]	[0.007]	[0.034]	[0.106]
GDP growth	0.519***	-	-0.165***	-0.431***	-0.071***	-0.208***	-0.107***	-0.406***	0.183***	0.051***	0.045***	0.234***
	[0.056]		[0.028]	[0.038]	[0.003]	[0.007]	[0.002]	[0.014]	[0.028]	[0.002]	[0.011]	[0.034]
Concentration ratio	1.552*	-	-2.134***	-4.420***	-1.288***	-0.223*	-0.346***	1.857***	6.369***	-0.002	-0.759***	5.995***
	[0.914]		[0.439]	[0.581]	[0.052]	[0.123]	[0.035]	[0.239]	[0.433]	[0.035]	[0.170]	[0.531]
Financial freedom index	0.165***	-	0.038***	-0.026***	0.008***	-0.026***	-0.001	-0.048***	0.029***	0.004***	-0.008***	0.021***
	[0.012]		[0.006]	[0.008]	[0.001]	[0.002]	[0.000]	[0.003]	[0.006]	[0.000]	[0.002]	[0.007]
Private credit GDP ratio	0.919*	-	-2.505***	-4.910***	-1.130***	-0.438***	-0.236***	0.616***	4.898***	-0.231***	-0.460***	-0.109
	[0.499]		[0.250]	[0.330]	[0.029]	[0.067]	[0.020]	[0.123]	[0.245]	[0.020]	[0.096]	[0.302]
Constant	22.924***	-	112.487***	46.486***	6.731***	7.168***	2.739***	12.924***	8.574***	2.455***	28.492***	35.435***
	[2.106]		[1.036]	[1.376]	[0.123]	[0.279]	[0.082]	[0.517]	[1.019]	[0.081]	[0.399]	[1.250]
Year fixed effects	x	x	x	x	x	x	x	x	x	x	x	x
Number of observations	15816	-	28749	27835	28361	21978	25383	14747	29015	29181	29465	29117
R-squared	0.08		0.78	0.13	0.53	0.23	0.24	0.25	0.09	0.11	0.29	0.61

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

(#) Cook's distance exceeds 1 for all observations. There is no outlier.

Panel B. Median regressions

	Business model			Efficiency		Asset quality			Stability			
	Fee income	Non-deposit funding	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Islamic bank dummy	1.170	-0.221***	1.552***	-8.395***	-1.056***	0.574***	-0.036	-0.397	4.331***	-0.324	0.026	1.410***
	[1.702]	[0.037]	[0.447]	[0.998]	[0.079]	[0.160]	[0.044]	[0.344]	[0.844]	[0.735]	[0.045]	[0.226]
ln(total assets)	0.203	0.111***	-0.632***	-1.105***	-0.290***	-0.035***	-0.001	0.104***	-2.799***	-0.502***	-0.031***	-1.531***
	[0.132]	[0.003]	[0.039]	[0.087]	[0.007]	[0.013]	[0.004]	[0.028]	[0.073]	[0.065]	[0.004]	[0.020]
Non-loan earnings assets	0.221***	-0.002***	-1.116***	0.036***	-0.004***	0.023***	0.001**	0.021***	0.910***	-0.042***	-0.000*	-0.002*
	[0.009]	[0.000]	[0.003]	[0.006]	[0.000]	[0.001]	[0.000]	[0.002]	[0.005]	[0.004]	[0.000]	[0.001]
Fixed assets	0.855***	0.038***	-0.821***	4.091***	0.762***	0.452***	0.181***	0.538***	0.097	-0.357***	0.008*	0.636***
	[0.130]	[0.003]	[0.040]	[0.089]	[0.007]	[0.013]	[0.004]	[0.029]	[0.074]	[0.066]	[0.004]	[0.020]
ln(GDP per capita)	-1.893***	0.012**	1.758***	4.446***	0.098***	-0.317***	-0.184***	-1.150***	-0.219*	0.708***	-0.153***	0.548***
	[0.206]	[0.005]	[0.061]	[0.139]	[0.011]	[0.021]	[0.006]	[0.043]	[0.114]	[0.102]	[0.006]	[0.032]
GDP growth	0.684***	-0.001	-0.146***	-0.549***	-0.072***	-0.174***	-0.089***	-0.415***	0.295***	0.208***	0.060***	0.064***
	[0.064]	[0.002]	[0.020]	[0.045]	[0.004]	[0.006]	[0.002]	[0.014]	[0.037]	[0.033]	[0.002]	[0.010]
Concentration ratio	1.138	-0.651***	-1.472***	-4.922***	-1.205***	-0.064	-0.272***	2.205***	5.332***	6.278***	-0.017	-1.207***
	[1.052]	[0.025]	[0.304]	[0.687]	[0.055]	[0.105]	[0.029]	[0.229]	[0.571]	[0.511]	[0.031]	[0.157]
Financial freedom index	0.216***	-0.002***	0.013***	-0.043***	0.009***	-0.022***	-0.002***	-0.050***	0.040***	0.025***	0.006***	0.004**
	[0.014]	[0.000]	[0.004]	[0.009]	[0.001]	[0.001]	[0.000]	[0.003]	[0.007]	[0.007]	[0.000]	[0.002]
Private credit GDP ratio	-1.101*	-0.045***	-2.426***	-5.591***	-1.012***	-0.366***	-0.187***	0.493***	-0.013	5.608***	-0.175***	-0.491***
	[0.574]	[0.014]	[0.173]	[0.389]	[0.031]	[0.057]	[0.016]	[0.118]	[0.324]	[0.289]	[0.018]	[0.089]
Constant	19.388***	-0.916***	111.310***	39.347***	6.428***	6.822***	2.858***	13.653***	33.828***	7.640***	2.426***	26.048***
	[2.424]	[0.060]	[0.718]	[1.627]	[0.130]	[0.238]	[0.069]	[0.496]	[1.343]	[1.201]	[0.073]	[0.370]
Year fixed effects	x	x	x	x	x	x	x	x	x	x	x	x
Number of observations	15816	28995	28749	27835	28361	21978	25383	14747	29117	29015	29181	29465

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Table 5. Consequences of Islamic banking expansion on incumbent conventional banks

In this table we condition the differences between Islamic and non-Islamic to vary with the size of Islamic banking activities in the country where the banks operate. In panel B we restrict the sample to include only conventional banks. We report standard errors clustered by bank in brackets. See Table 2 for a definition of all the variables used in the regression and Table 3 for a description of the sample covered.

		Business model		Efficiency		Asset quality			Stability			
	Fee income	Non-deposit funding	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A. Interaction with Islamic Banking share												
Islamic bank dummy	3.243	-1.818**	-2.168	-7.058***	-0.974***	1.068**	-0.089	0.895	-0.381	2.777	-0.022	2.830***
	[3.581]	[0.868]	[2.418]	[1.993]	[0.220]	[0.477]	[0.172]	[1.176]	[2.676]	[2.223]	[0.140]	[1.034]
(1) Islamic Banking %*Islamic dummy	0.004	0.046**	0.156***	0.008	0.000	-0.038***	-0.001	-0.050	0.088*	-0.050	0.005	-0.011
	[0.073]	[0.018]	[0.053]	[0.061]	[0.005]	[0.011]	[0.003]	[0.043]	[0.050]	[0.032]	[0.003]	[0.022]
(2) Islamic Banking %*Non-Islamic dummy	0.302***	-0.018	-0.155***	-0.289***	-0.030***	0.056**	0.004	0.122***	-0.001	-0.050**	0.005	-0.017
	[0.108]	[0.026]	[0.048]	[0.071]	[0.007]	[0.022]	[0.005]	[0.028]	[0.062]	[0.020]	[0.003]	[0.017]
P-value test (1)=(2)	0.022	0.047	0.000	0.002	0.000	0.000	0.371	0.001	0.258	0.992	0.877	0.849
Number of observations	15816	28995	28749	27835	28361	21978	25383	14747	29117	29015	29181	29465
R-squared	0.08	0.07	0.60	0.13	0.44	0.24	0.18	0.24	0.47	0.10	0.11	0.3
Panel B. Alternative control group												
Islamic Banking %	0.304***	-0.018	-0.158***	-0.287***	-0.030***	0.055**	0.004	0.121***	-0.002	-0.050**	0.005	-0.018
	[0.109]	[0.026]	[0.049]	[0.072]	[0.007]	[0.022]	[0.005]	[0.028]	[0.062]	[0.020]	[0.004]	[0.017]
Year FE	x	x	x	x	x	x	x	x	x	x	x	x
Number of observations	15610	28515	28269	14546	27358	28229	21659	24991	27859	28639	28513	28674
R-squared	0.08	0.07	0.60	0.25	0.13	0.66	0.24	0.19	0.44	0.48	0.10	0.11

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Table 6. Comparing islamic and conventional banks in "Islamic" countries

In this table we report results for the sample of countries that host both islamic and conventional banks. Hence the specification includes country*year fixed effects exploiting within countries variations only. The sample includes 406 banks among which 86 are islamic banks. The period covered is 1995-2007. See Table 2 for a definition of all the variables used.

	Business model			Efficiency		Asset quality			Stability			
	Fee income	Non-deposit funding	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Islamic bank dummy	-2.893	-0.268	2.233	3.494**	0.313*	-1.081***	-0.113	-1.386	0.343	0.070	-0.127	1.218**
	[2.937]	[0.688]	[1.479]	[1.557]	[0.170]	[0.414]	[0.110]	[0.885]	[1.702]	[1.541]	[0.087]	[0.576]
ln(total assets)	0.181	-0.074	-1.530***	-0.947**	-0.241***	-0.175*	-0.004	-0.121	-3.176***	-0.462	-0.095***	-2.318***
	[0.567]	[0.122]	[0.368]	[0.415]	[0.038]	[0.098]	[0.026]	[0.205]	[0.455]	[0.382]	[0.020]	[0.139]
Non-loan earnings assets	0.032	-0.009	-1.016***	0.015	-0.003	0.033***	0.006**	0.031**	0.626***	0.058***	0.000	0.006
	[0.038]	[0.010]	[0.023]	[0.025]	[0.003]	[0.006]	[0.002]	[0.012]	[0.031]	[0.021]	[0.001]	[0.010]
Fixed assets	-0.316	-0.099	-1.675***	3.420***	0.356***	0.131	0.042	0.412**	-1.223***	0.488	-0.066***	0.439***
	[0.486]	[0.120]	[0.372]	[0.381]	[0.040]	[0.102]	[0.026]	[0.210]	[0.433]	[0.317]	[0.023]	[0.133]
Constant	27.197***	7.862***	142.124***	49.968***	4.677***	8.896***	0.813*	3.001	68.539***	25.054***	3.895***	47.951***
	[8.637]	[2.812]	[6.853]	[7.115]	[0.570]	[2.312]	[0.476]	[3.533]	[7.212]	[5.961]	[0.360]	[2.240]
Country*Year FE	x	x	x	x	x	x	x	x	x	x	x	x
Number of observations	3114	6041	5961	5531	5695	4966	4837	3332	6059	6023	6036	6165
R-squared	0.33	0.27	0.75	0.3	0.47	0.44	0.31	0.35	0.53	0.22	0.3	0.44

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Table 7. Systemic impact of islamic banking

Islamic banking is the share of total banking sector assets owned by Islamic banks. Standard errors clustered by bank are reported in brackets. See Table 2 for a definition of the variables used in the estimation. The sample covers countries that host both islamic and conventional banks in the period 1995-2007. All specifications include country and year fixed effects. The time-varying control variables included are GDP per capita, GDP growth, the concentration ratio (assets held by the largest 3 banks in the country), the financial freedom index, and the bank credit GDP ratio. We include the same bank level controls as in Table 6.

		Business model			Efficiency		Asset quality			Stability			
		Fee income	Non-deposit funding	Loans deposit ratio	Cost income ratio	Overheads	Loss reserves	Loan loss provisions	Non-performing loans	Maturity match	Zscore	Return on assets	Equity assets ratio
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Islamic Banking %*Islamic bank dummy	0.024	-0.147**	-0.180***	-0.483***	0.012	-0.061*	0.020*	-0.157	-0.144	-0.047	0.019**	0.019
		[0.298]	[0.072]	[0.025]	[0.123]	[0.012]	[0.035]	[0.012]	[0.101]	[0.160]	[0.096]	[0.008]	[0.043]
(2)	Islamic Banking %*Non-Islamic bank dummy	0.241	-0.159***	-0.116	-0.653***	0.000	-0.011	0.022**	-0.042	-0.264*	-0.003	0.025***	-0.007
		[0.195]	[0.059]	[0.076]	[0.116]	[0.011]	[0.031]	[0.011]	[0.058]	[0.138]	[0.086]	[0.008]	[0.036]
	P-value (1)=(2)	0.414	0.789	0.455	0.027	0.220	0.099	0.862	0.219	0.265	0.332	0.169	0.353
	Bank controls	X	X	X	X	X	X	X	X	X	X	X	X
	Country time-varying controls	X	X	X	X	X	X	X	X	X	X	X	X
	Country FE	X	X	X	X	X	X	X	X	X	X	X	X
	Year FE	X	X	X	X	X	X	X	X	X	X	X	X
	Number of observations	2279	4413	5961	3972	4080	3614	3502	2360	4433	4397	4405	4512
	R-squared	0.27	0.23	0.75	0.20	0.39	0.43	0.24	0.29	0.50	0.20	0.18	0.36

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Table 8. Descriptive statistics

This table reports descriptive statistics of variables explored in the subsequent analysis of the effect of the global crisis on bank stability and performance. The sample covers 21 countries that host both islamic and conventional banks over the period 2005-2010. The stock return is quarterly from Datastream. The sample includes 486 banks of which 112 are listed banks. The sample includes 89 islamic banks of which 38 are listed. See Table 2 for a detailed definition of all the variables.

	Number of observations	Mean	Standard deviation	Min	Max
Return on assets	2124	1.417	1.143	-0.320	3.340
Equity assets ratio	2148	12.499	7.044	3.650	25.480
Zscore	2123	18.737	13.431	2.676	45.676
Nondeposits funding	2107	1.773	5.421	0.000	26.742
Loans deposits ratio	2070	64.005	28.104	19.282	110.487
Maturity match	2098	40.834	25.174	7.350	87.110
Non-performing loans	1336	5.903	6.103	0.379	20.074
Loss reserves	1767	4.705	4.139	0.660	13.440
Loss provisions	1716	1.217	1.412	-0.008	4.747
ln(total assets)	2148	14.265	1.614	10.959	16.866
Stock returns	2016	2.863	21.658	-43.652	71.592

Table 9. Islamic versus conventional banks: Performance and stability during the global crisis

In this table we compare the performance and soundness of islamic banks and conventional banks during the crisis. All specifications include country*year fixed effects. The sample period is 2005-2009. See Table 2 for a definition of all the variables. Standard errors clustered by bank are reported in brackets.

		Return on assets	Equity assets ratio	Zscore	Loans deposit ratio	Maturity match	Non-performing loans	Loss reserves	Loss provisions
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	Islamic bank dummy	-0.276*	1.877*	1.805	2.585	7.117**	-1.211	-0.994	0.154
		[0.163]	[0.970]	[2.364]	[2.929]	[3.212]	[1.030]	[0.645]	[0.229]
(2)	Islamic bank dummy*Crisis	-0.100	0.696	-1.249	-1.623	6.424**	-0.509	0.723	0.473*
		[0.183]	[0.981]	[2.543]	[2.611]	[3.224]	[1.129]	[0.797]	[0.271]
	Islamic bank dummy*Trend	0.073	-0.578	-0.602	-0.161	-3.112**	-0.135	-0.059	-0.132
		[0.071]	[0.393]	[1.007]	[1.256]	[1.354]	[0.447]	[0.305]	[0.097]
	ln(total assets)	-0.036	-2.452***	-0.49	-1.239**	-3.341***	-0.259	-0.229*	0.048
		[0.029]	[0.173]	[0.482]	[0.611]	[0.597]	[0.244]	[0.124]	[0.036]
	Non-loan earnings assets	0.003	0.017	0.069**	-0.969***	0.609***	0.032**	0.033***	0.003
		[0.002]	[0.011]	[0.030]	[0.037]	[0.040]	[0.015]	[0.008]	[0.003]
	Fixed assets	-0.055	0.508***	0.254	-1.251**	-0.803	0.205	0.183	0.082*
		[0.034]	[0.174]	[0.459]	[0.579]	[0.713]	[0.273]	[0.140]	[0.042]
	Constant	3.542***	52.600***	26.900***	133.719***	67.402***	5.874	5.786***	-0.122
		[0.475]	[3.006]	[8.228]	[9.909]	[9.891]	[4.112]	[2.134]	[0.635]
	Test (1)+(2)=0	0.191	0.128	0.896	0.834	0.009	0.259	0.819	0.123
	Country*Year FE	x	x	x	x	x	x	x	x
	Number of observations	2124	2148	2123	2070	2098	1336	1767	1716
	R-squared	0.35	0.51	0.19	0.71	0.53	0.37	0.44	0.28

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.

Table 10. Islamic versus conventional banks: Stock market performance during the crisis

The dependent variable is the quarterly stock return. The sample covers countries that host Islamic banking and conventional banking activities in the period Q1-2005 to Q4-2009. Crisis is a dummy that takes value 1 in the period Q4-2007 to Q4-2008 and recovery is a dummy that takes value one in 2009. Standard errors clustered by bank are reported in brackets. See Table 2 for a definition of all variables. All control variables are lagged by one year (4 quarters).

		(1)	(2)	(3)
(1)	Islamic bank dummy	-3.319**	-1.154	1.704
		[1.352]	[1.301]	[1.475]
(2)	Islamic bank dummy*Crisis	4.951**	4.059*	-2.015
		[2.016]	[2.174]	[2.757]
(3)	Islamic bank dummy*Recovery	1.17	-0.613	-2.888
		[1.684]	[1.852]	[2.190]
	Maturity match		0.088***	0.133***
			[0.025]	[0.048]
	Maturity match*Crisis			0.038
				[0.101]
	Maturity match*Recovery			-0.155
				[0.105]
	Loans-deposits ratio		0.014	0.023*
			[0.008]	[0.012]
	Loans-deposits ratio*Crisis			-0.02
				[0.014]
	Loans deposits ratio*Recovery			0.018
				[0.017]
	Provisions		-0.456	3.279*
			[0.575]	[1.958]
	Provisions*Crisis			-6.443***
				[2.210]
	Provisions*Recovery			-3.889*
				[2.031]
	ln(total assets)		0.37	0.813
			[0.350]	[0.509]
	ln(total assets)*Crisis			0.243
				[0.228]
	ln(total assets)*Recovery			-0.677
				[0.876]
	NonDepositFunding		0.03	0.274*
			[0.047]	[0.143]
	NonDepositFunding*Crisis			-0.391**
				[0.153]
	NonDepositFunding*Recovery			-0.286*
				[0.147]
	Equity capital ratio		-0.005	-0.045
			[0.064]	[0.102]
	Equity capital ratio*Crisis			0.615***
				[0.183]
	Equity capital ratio*Recovery			-0.094
				[0.138]
	Constant	28.630***	20.038***	7.156
		[3.569]	[7.341]	[10.055]
	Tests p-values			
	(1)+(2)=0	0.208	0.069	0.892
	(1)+(3)=0	0.085	0.211	0.452
	Country*Year FE	x	x	x
	Number of observations	2016	1636	1387
	R-squared	0.28	0.3	0.31

(***) significance at the 1 per cent level, (**) 5 per cent level, (*) 10 per cent level.