Trade, financial openness and dual banking economies: Evidence from GCC Region☆

Ashraf Khan [a], M. Kabir Hassan [b], Andrea Paltrinieri [c,*], Salman Bahoo [d]

[a] *Institute of Business Administration Karachi, Pakistan*
[b] *University of New Orleans, USA*
[c] *Università Cattolica Del Sacro Cuore*
[d] *University of Udine and Agder University, Italy*

A R T I C L E   I N F O

A B S T R A C T

The recent wave of liberalization in Gulf Cooperation Council (GCC) countries has opened up a debate on the role of Islamic finance in the financial development of an economy. Using a comprehensive dataset of 43 Islamic and 49 conventional banks for the period 2007–2015, in this paper, we investigate the impact of trade and financial openness on financial development in the GCC region. We find that trade and financial openness have a positive effect on the profitability of both banking systems, while the interaction term of openness is negative for the profitability of Islamic banks. Moreover, trade and financial openness affect Islamic banks differently than conventional banks. Notably, we unveil that trade and financial openness decrease the loan volume of Islamic banks but reduce the stability of both Islamic and conventional banks.

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1. Introduction

The recent wave of liberalization in GCC countries has opened up a debate on the role of Islamic finance in the financial development of an economy. Preliminary literature provides enough evidence that financial development positively contributes to economic growth. Rajan and Zingales (2003) proposed the openness theory of financial development, suggesting that the level of financial development depends on the country's overall participation in global goods and financial markets. According to this theory, existing industrial and economic groups are usually against financial development, arguing that financial openness will make it easier for the new entrants to start a business, further reducing the monopoly of the existing groups.

Trade and financial openness are interconnected. Trade openness increases the competition by bringing more foreign companies, putting pressure on domestic firms to invest more in their overall infrastructure. Therefore, regulatory authorities are encouraged to bring reform in the financial sector to have easy access to loans. Those financial reforms make the banking

sector more competitive, decreasing the cost of a loan for firms and increasing the volume of credit in the economy. On the other hand, higher financial openness will open external sources of funding from international money and capital markets for domestic firms, accelerating the competition in the credit market. To be competitive, the bank will likely reduce the firm's loan cost (Ashraf, 2018).

Trade and financial openness might also affect the stability of a bank. Higher trade openness gives a bank an advantage to improve its borrower's selection, reducing the bank risk. On the other hand, trade and financial openness foster competition, lowering the cost of credit. Thus, banks might relax their credit standards and increase financing on the asset side of their balance to compensate for the lower cost of loans, hence, increasing overall bank risk and reducing the bank stability.

Several studies investigate the openness theory and primarily support that trade and financial openness augment financial development and economic growth (Hossain et al., 2020; Hauner et al., 2013; Baltagi et al., 2009). However, these studies primarily focus on the macro-level (for example, by incorporating private credit and stock market capitalization to GDP ratio to proxy financial development). How financial liberalization and openness in trade can affect a country at the micro-level are yet to be investigated. In particular, it is worth investigating how financial and trade openness affect banks' profitability, the capacity to generate a loan, and eventually the stability of the overall banking industry.

Since the structure of Islamic banks is different, we might observe different financial and trade openness patterns, compared to conventional, at least for two reasons. First, Islamic banks do not deal only in documents but also in goods, making actual economic transactions and promoting the real economy, ultimately improving both the financial sector and the overall economy (Ayub, 2007; pp. 82).

Secondly, the fundamental essence of Islamic banks is to promote the culture of risk-sharing (i.e., profit & loss sharing, P&LS), being not involved in transactions based on interest, uncertainty, and speculation. Therefore, in an ideal P&LS mode of financing, trade and financial openness should positively affect Islamic banks' cost and volume of financing, unlike conventional banks. Moreover, the clients on both sides of the Islamic bank balance sheet can enjoy maximum profit and, even in the case of a recession, the losses would be shared. This process would not put the overall economy at stake, as happened during recent subprime financial crises.

The previous research on Islamic banks mainly focused on profitability (Paltrinieri et al., 2020; Azad et al., 2019; Yanikkaya et al., 2018), efficiency (Safiullah and Shamsuddin, 2019; Beck et al., 2013), stability (Albaity et al., 2019; Čihák and Hesse, 2010) and risk management (Hassan et al., 2019; Ibrahim and Rizvi, 2018; Abedifar et al., 2013). There are very few papers assessing the impact of Islamic banks on financial development and, eventually, on economic growth (Grassa and Gazdar, 2014; Hassan et al., 2013; Imam and Kpodar, 2016; Kassim, 2016). In general, the authors find Islamic banks to positively contribute to the country's economic growth, but without considering the impact of trade and financial openness on financial development.

The primary purpose of this paper is to investigate the impact of trade and financial openness on the banking sector development in GCC countries for 2007–2015. The GCC is the ideal region to explore this topic for mainly two reasons. First, GCC countries share similar economic policies, including free trade and capital movements with a high level of trade openness, which varies from 66.56 % in Saudi Arabia to 161.83 % in UAE (WDI, 2019). Since the GCC nations are heavily dependent on the oil and energy-related sectors, the latest oil price drop has pushed the governments to promote industrial growth, which considers the real and financial industries to play critical roles. The GCC countries have taken many initiatives to increase the role of the private sector (e.g., Saudi Arabia is planning to expand privatization in 16 sectors and the sale of ARAMCO). Second, GCC countries are arguably considered the hub of Islamic finance with total assets of USD 1,106.6 billion, including Islamic banking assets of USD 854.0 billion (IFSB, 2020). Islamic banking assets in the GCC region constitute a significant proportion (over 45.4 %) of the overall Islamic banking assets worldwide. The market share within total commercial banking assets ranges from 69 % to 13.8 % in GCC nations. It is evident that Islamic banks have strong footprints and have become systematically important in Saudi Arabia and Kuwait, accounting for about 69 % and 45 % of the total banking assets (IFSB, 2020). At the height of the global financial crisis, Islamic banks generally performed better and were more resilient than their traditional counterpart (Hassan and Aliyu, 2018).

Overall, we find that trade and financial openness have a positive and significant impact on the profitability of Islamic banks. In contrast, the interaction effect of trade and financial openness is negative. This last result implies that the positive marginal effect of TO on bank profitability decreases as the level of FO increases i.e., TO can still have a positive effect on bank profitability as far as the level of FO is not very high. This study also reveals that trade openness hurts the volume of Islamic bank loans. In contrast, the interaction impact of trade and financial openness is positive, suggesting that Islamic banks are more prudent in generating credit in the economy. Lastly, we use both accounting-based measures (i.e., Z-score) and market-based measures (i.e., Merton distance to default, DD) to test the impact of openness variables on the stability of banks. The results provide evidence that trade and financial openness reduce the banking industry's stability in the GCC region, regardless of their business model.

This study contributes to the existing literature at least in two ways. First, we extend the literature studying the role of Islamic banks, at the macro level, on financial development and economic growth (Grassa and Gazdar, 2014; Hassan et al., 2013; Imam and Kpodar, 2016; Kassim, 2016). More specifically, we test the openness theory proposed by Rajan and Zingales (2003) on Islamic banks' profitability and stability at the micro-level. Secondly, the structure of Islamic banks prohibits them from being involved in interest-bearing instruments. Anecdotal evidence shows that Islamic banks have better asset quality and are well-capitalized. However, little is known on the impact on the business structure of Islamic banks if a country is financially and trade-wise open. This is the first study investigating the effect of trade and financial openness on Islamic

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bank's profitability, the volume of loans, and stability to the best of our knowledge. Moreover, this study adds to the very small but expanding strand of the literature examining the determinants of Islamic banks' stability in comparison to conventional banks (Čihák and Hesse, 2010; Beck et al., 2013; Kabir et al., 2015; Albaity et al., 2019; Hassan et al., 2019). In this regard, we unveil that a country that is simultaneously open to trade and capital accounts might observe the decrease in the stability of Islamic banks.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 describes our dataset, variables, and econometric strategy. Section 4 discusses our findings and, finally, Section 5 concludes this study.

2. Related literature

A vast amount of literature assessing the financial development and economic growth nexus mainly finds that financial development positively favors economic growth (Levine, 1997; Rajan and Zingales, 1998; Demetriades and Andrianova, 2004; Jedidia et al., 2014). If financial development is so essential for economic growth, authors wonder why so many countries have underdeveloped financial systems (Rajan and Zingales, 2003). To answer this question, they propose an interest-group theory of financial development, alternatively known as openness theory. In this theory, Rajan and Zingales (2003) argue that both industrial and financial incumbent groups, cross-border trades, and capital flows are the main factors to influence the financial sector development. A developed financial sector creates opportunities for new firms to establish and grow, ultimately boosting the competition and corroding the rent of incumbent groups. Therefore, these groups might discourage and oppose the financial sector development. The above-mentioned group's impact will be weaker if the economy is simultaneously open to trade and capital flows. In other words, trade openness without financial openness might result in financial repression and loan subsidies, with the consequence of providing cheap financing to industrial incumbents. Instead, financial openness without trade openness is more likely to give access to industrial incumbents to raise funding from external sources, probably deteriorating the profits of domestic financial institutions.

Previous literature mainly focused on the impact of trade and financial openness on economic growth at a macro level (Law, 2008, 2009; Baltagi et al., 2009; Kim et al., 2010; Herwartz and Walle, 2014; Menyah et al., 2014; Muhammad et al., 2016) and micro level, using bank-level data (Bonaccorsi di Patti and Hardy, 2005; Denizer et al., 2007; Hermes and Nhung, 2010; Zhang et al., 2015; Luo et al., 2016; Bremusa and Buch, 2017; Ashraf, 2018; Aluko and Ajayi, 2018).

Law (2008) investigates the impact of trade and financial openness on financial development in Malaysia, using the bound testing approach. He finds that both trade and financial openness positively spur financial development, but no evidence is provided for the simultaneous effect of trade and financial openness on financial development. In another study, this simultaneous effect is a significant positive determinant of financial development for developing countries (Law, 2009).

Baltagi et al. (2009) assess the role of trade and financial openness on financial development in industrialized and developing countries, finding that both variables significantly impact financial development. Furthermore, they also provide evidence that the marginal effect of trade openness is negatively related to financial openness and vice versa. Kim et al. (2010) find that financial development and trade openness are complements in the long run and substitutes in the short run.

Herwartz and Walle (2014) argue that the impact of financial development on economic growth depends on the level of openness of a country in terms of trade and capital accounts. Using a comprehensive dataset of 78 countries for 1981–2006, they find an inverse impact of financial openness on finance-growth nexus and positive for trade openness. More specifically, a higher level of financial openness reduces the impact of financial development on economic growth, while trade openness enhances this relationship. Menyah et al. (2014) reject finance-led growth and trade-led growth hypothesis for 21 African countries in a similar vein. Their empirical findings suggest very limited support to the hypothesis above, which implies that trade and financial liberalization have no impact on economic growth. In contrast, Muhammad et al. (2016) find a positive relationship of financial development with economic growth in GCC countries, but they do not consider the openness hypothesis proposed by Rajan and Zingales (2003).

Considering the role of trade and financial openness at a micro level, Zhang et al. (2015) investigate the impact of trade and financial openness on financial development with three different indicators to differentiate the size, efficiency, and competition within the dimensions of financial development. They find that openness has a positive impact on financial efficiency and competition, but it's negatively related to the size of financial development.

Bonaccorsi di Patti and Hardy (2005) find profit efficiency increased for Pakistani banks immediately after financial liberalization but reduced in the following years. Denizer et al. (2007) also report similar findings that banking efficiency for Turkish banks was reduced after financial liberalization due to severe macroeconomic instability in the Turkish economy. On the other hand, Hermes and Nhung (2010) show a positive impact of financial liberalization on banking efficiency in Latin American and Asian banks during 1991–2000.

Bourgain et al. (2012) argue that financial openness is indispensable and induces banks to be financially more transparent, keeping under control the risk management. Nonetheless, it increases the competition for financial institutions, potentially reducing the profitability. In this regard, Luo et al. (2016), using a comprehensive dataset of 2007 commercial banks for 1999–2011, document the relationship between financial openness, bank risk, and profit efficiency in 140 countries. They find that financial openness reduces the efficiency of bank profitability without any change in bank risk level. Simultaneously, it has an indirect positive effect on bank risk level through the channel of reduced bank profit efficiency.

Table 1
Sample description.

Country Name	Initial Population			Sample Dataset				
	Islamic Banks	Conventional Banks	Total	Islamic Banks	Conventional Banks	Total	Number of Observation	Observations (in %)
Bahrain	15	20	35	17	10	27	228	29.77
Oman	2	10	12	0	6	6	54	7.05
Kuwait	7	20	27	6	5	11	90	11.75
Qatar	6	11	17	6	6	12	87	11.36
Saudi Arabia	8	10	18	4	8	12	109	14.23
United Arab Emirates	12	32	44	10	14	24	198	29.77
Total	50	103	153	43	49	92	766	100

This table contains bank population and sample data set, divided by bank type and country list. The initial sample of banks is 153, and after filtering the data, the final sample became 92 banks, with 43 Islamic and 49 conventional banks.

Bremusa and Buch (2017) investigate the impact of financial openness and large bank on economic growth using a panel dataset of 79 countries from 1996 to 2009. They find that bank-level shock significantly influences economic growth, while financial openness negatively impacts GDP growth. Moreover, granular effects are more potent when the economies are financially closed and concentrated.

Ashraf (2018) tests the openness theory on emerging economies, taking into account bank-level data of 287 banks for the period 2000−2012. He finds that trade openness stimulates bank development through increasing loan volume and lowering the cost and risk of the bank credit. Financial openness, instead, hurts the price and the loan volume of the bank, being also positively associated with bank risk-taking. Higher financial openness brings more competition to the economy, forcing banks to reduce the cost of credit. Still, banks expose themselves to risk for higher profitability by extending higher loan credit. Recently, Rahman et al. (2020) and Hossain et al. (2020) assess the impact of trade openness on bank risk-taking behavior and find that it reduces bank risk-taking while Ashraf et al. (2021) report that both openness variable reduces the loan spread in emerging economies.

Most of the above studies test openness theory either at the macro level using private credit to GDP as the proxy variable of financial development (Muhammad et al., 2016; Herwartz and Walle, 2014; Baltagi et al., 2009), and micro-level using only conventional bank data (Ashraf et al., 2021; Rahman et al., 2020; Ashraf, 2018). We argue that Islamic banks are not involved in interest-based transactions and are inherently reluctant to exhibit excessive risk-taking behavior. Further, as noted above, the transections of Islamic banks ensure economic activity and are asset-backed with partial participation in the PLS mode of financing. Thus, being naturally different from conventional banks, how trade and financial openness can influence the profitability and stability of Islamic banks is yet to be seen.

3. Data and methodology

3.1. Data

For the collection of data, we rely on four databases. We collect financial statement data using Bankscope and Bloomberg databases for 2007–2015 for the banks working in the GCC countries (i.e., Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates). For the data of trade openness and macroeconomic variables, we use the WDI World Bank database and financial openness data, collected from Chinn and Ito (2006).

Because we are interested in examining the impact of trade and financial openness on profitability, the volume of loans, and banks' stability, we consider only banks and exclude investment banks and other types of financial institutions, using consolidated data where possible and individual data for the remaining banks. We eventually have a sample of 92 banks, comprised of 43 Islamic banks and 49 conventional banks. Table 1 presents a detailed summary of the data for this study.

3.2. Measurement of variables

3.2.1. Dependent variables

Keeping in mind the study's objective, we incorporate the Net Interest Margin (NIM) as a proxy variable to assess the cost of banks, which is computed as the difference of interest income and interest expense divided by total interest-bearing assets. This variable measures total interest income received from the borrower and interest expense paid to depositors (Demirgüç-Kunt et al., 2004; Claessens et al., 2018; Ashraf, 2018).

Since interest is prohibited under *Shariah* Law, interest income and interest expense should be considered as financing income (profit for Islamic banks from PLS, *Musharaka,* and *Mudarabah*), cost-plus profit (*Murabaha*), lease based (*Ijarah*) mode of financing, and financing expense (profit for the depositors mainly through *Mudarabah*) divided by profit-generating assets for Islamic banks.

For the volume of bank credit, we use a proxy variable of annual gross loans to total assets (GLTA). This variable captures the bank lending behavior, i.e., how much funds banks allocate for loans out of their total assets (Ashraf, 2018).

For bank stability, we use Z-Score, which is widely used in the literature as an accounting measure of bank stability (Ashraf, 2018; Beck et al., 2013; Čihák and Hesse, 2010). This variable is measured as the sum of return on assets (ROA) and equity to asset ratio (ETA) divided by the standard deviation of ROA. A higher value of this variable indicates a higher level of stability for a bank.

The Z-score is calculated as the sum of the Return on Average Assets (ROAA) and the equity-to-asset ratio, divided by the standard deviation of the ROAA. Higher values of Z-score signal higher resilience and, therefore, more stability.

Islamic banks, by their nature, have a large amount of investment account holders (IAH), with similar features of equity capital. Still, these IAH are not fully reflected in this traditional measure (Čihák and Hesse, 2010). Therefore, such an accounting base variable can lead Islamic banks to be shown as less stable.

To account for this issue, we also apply a market-based measure of stability, i.e., Merton's Distance to Default (DD), which is considered the best measure in assessing bank stability (Kabir et al., 2015). The DD is traditionally measured as the difference between the market value of assets and a default point, defined as the sum of short-term and half of long-term liabilities, divided by the product of the market value of assets and their volatility. A higher value of this variable implies that the bank is more stable.

For this study, we collect default probabilities from Bloomberg Professional Services and measure the DD by the inverse cumulative distribution function.

Let DD be a standard normal variable, where the probability of default is defined as:

$$P_{default} = CDF(-DD) = \phi(-DD) = 1 - \phi(DD)$$

$$\phi(DD) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{DD} e^{-t^2/2} \, dt$$

or, equivalently:

$$\phi(DD) = \frac{1}{2}\left[1 + erf\left(\frac{DD}{\sqrt{2}}\right)\right] \tag{1}$$

Eqn. 1 allows us to define DD in Eqn 2 from the probability of default, as follows:

$$\phi^{-1}\left(P_{default}\right) = \sqrt{2}\, erf^{-1}\left(2P_{default} - 1\right), \; P_{default} \in (0, 1) \tag{2}$$

Due to data unavailability on this variable, we reduce the sample of this particular analysis to 21 Islamic and 35 conventional banks.

3.2.2. Measurement of independent variables

To assess trade openness (TO), we use trade to GDP ratio, measured as the sum of total import and export divided GDP. This variable is widely used in the literature on economic growth and financial development (Ashraf, 2018; Zhang et al., 2015).

For financial openness (FO), we employ the dejure Chinn-Ito index (which is known as the KAOPAN index). This index is constructed based on the information available in the IMF annual report on exchange arrangement and exchange restriction (AREAER). More specifically, it considers a binary dummy variable, which codifies a cross-border financial transaction limitation. A high number indicates a lower level of restriction (Chinn and Ito, 2006).

3.2.3. Control variables

Following the literature on bank cost, volume, and stability, we also incorporate few bank-specific variables. We include the natural log of total assets (log_TA), growth of total assets (GTA), the equity to total assets (ETA), the deposits to total assets (Deposits_TA), the cost to income ratio (CIR), non-interest income to gross revenue (NIIGR), non-performing loans (NPLGL) and return on average assets (ROAA).

We use gross domestic product growth (GDP) and inflation level (inf) in a country to control country-specific factors. Moreover, we include the bank concentration proxy variable (bank_con), which is the share of three largest bank assets over total commercial bank assets in a country, to account for the possible effect of the banking industry on individual bank performance in terms of cost, volume and stability level. Finally, we also control the global financial crisis by introducing a dummy variable Crisis for 2007 and 2008.

Table 2 presents all the variables used in this study, while Table 3 provides the correlation matrix. The correlation results show the absence of multicollinearity in the data since all the variables of interest are not highly correlated.

3.3. Econometric model

We run a series of multivariate regressions to investigate the impact of trade and financial openness on cost, volume, and stability of banks with the following static panel model in Eqn 3;

$$Y_{i,j,t} = \alpha_0 + \beta_1 TO_{j,t} + \beta_2 FO_{j,t} + \beta_3 (TO\_FO)_{j,t} + \beta_4 bank\_con_{j,t} + \gamma CV_{i,j,t} + \delta M_{j,t} + \varepsilon_{i,j,t} \tag{3}$$

Table 2
Main variable description.

Type	Variable	Estimation
Dependent variables	Net Interest Margin (NIM)	(Net Interest Income /Total Average Earning Assets)
	Gross Loans to total assets (GLTA)	(Total Gross Loans /Total Assets)
	Z-Score	(ROA + Equity/TA) / σROA
	Distance to Default (DOD)	
Independent variables	Trade Openness (TO)	(Import + export)/GDP
	Financial Openness (FO)	Kaopen index measures the level of capital account openness in a country.
	Size(Log_TA)	Natural Logarithm of total assets
	Growth of Total Assets (GTA)	Growth of Total Assets
	Equity Ratio(ETA)	Equity/Total Assets
	Deposits to Total Assets (Deposits_TA)	Total Deposits/Total Assets
	Cost to Income Ratio (CIR)	(Operating Expenses/Total Revenue)
	Non-Interest Income to Gross revenue (NIIGR)	(Non-Interest Income / Gross Revenues)
	ROAA	Return on Average Asset
	Non-Performing Loans to Gross Loans(NPLGL)	(Non-performing loan/Gross Loans)
	Crises	Dummy variable for the year 2007 and 2008
Macroeconomic Variables	GDP	GDP Growth
	Inflation (Inf)	Inflation (Consumer price index)
	Bank Concentration (bank_con)	Assets of three largest bank/Total Commercial Bank Assets in a country

This table describes the main variables and their estimation.

The $Y_{i,j,t}$ will take the alternative dependent variables, which are NIM, GLTA, Z-score, and DD, while (TO), (FO) and their interaction term TO_FO are the three main explanatory variables. CV and M are the vectors for the bank and macroeconomic country-specific control variables, respectively. All the bank-specific variables are winsorized at 1% at each tail to mitigate the possible effect of an outlier. We include interacted year countries dummy in all regression models. To choose between fixed and random effect models, we apply Hausman tests that suggest using a fixed-effect model.

4. Main results and discussion

4.1. Descriptive statistics

Table 4, 5, and 6 present the descriptive statistics of all variables subdivided by Islamic and conventional banks. For Islamic banks, the average value of NIM is 2.84, which is slightly lower than conventional banks, implying that Islamic banks are less profitable. This could be because Islamic banks have to be more prudent to be *Shariah*-compliant and bear extra monitoring and controlling cost. The mean value of GLTA indicates that conventional banks have a higher share of client base with a higher amount of loans in their balance sheet.

Considering the bank stability measure, we find Islamic banks to be more stable compared to conventional, implying that Islamic banks have better quality assets and are more resilient in the event of distress. The mean value of the Z-score, an accounting-based measure, is 7.78 for Islamic while the same variable has the mean value of 4.08 for conventional banks. On the other hand, the mean value of DD is 3.25 and 3.28 for Islamic and conventional banks, respectively.

Trade and financial openness are the country-level variables that are the same for Islamic and conventional banks. The mean value of TO is 132.204, while FO has a mean value of 2.02.

Considering the bank-specific variables, the mean value of ROAA, log_TA, and deposits_TA confirms our earlier finding that Islamic banks are less profitable and smaller than conventional banks. However, Islamic banks have a higher dependency on non-interest income activities with the mean value of NIIGR 46.60. The non-performing loans are also higher in Islamic banks than conventional banks, with a mean value of 9.46. Furthermore, on average, Islamic banks have an equity asset ratio of 31.27 which is higher than conventional banks with an average equity ratio of 15.40. Simultaneously, the cost to income ratio is higher for Islamic banks, which could be due to unexploited economies and higher monitoring costs. Our results are consistent with the previous literature, such as Abuzayed et al. (2018) and Albaity et al. (2019).

4.2. Openness and bank profitability

Table 7 presents the impact of trade and financial openness on bank profitability. For conventional banks, we find both trade and financial openness positively and significantly affect banks' profitability. At the same time, we observe only trade openness to have a positive and significant impact on the profitability of Islamic banks. On the other hand, the interaction term of financial and trade openness (TO_FO) enters with negative coefficient and statistically significant on the profitability of Islamic bank at 5% level. The interaction term result suggests that the marginal effects of trade (financial) openness on the profitability of Islamic banks are positively related to the degree of financial (trade) openness. Alternatively, the positive marginal effect of TO on bank profitability decreases as the level of FO increases.

There might be several reasons for this negative relationship, but, above all, Islamic banks are smaller in size and have a lower client base both on the assets and liability side of the balance sheet, as observed in Section 4.1 (Beck et al., 2013; Čihák

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Table 3

Correlation Matrix.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) TO	1.000																	
(2) FO	0.626***	1.000																
	−0.008																	
(3) NIM	−0.066*	−0.007	1.000															
(4) GLTA	0.183***	−0.018	0.273***	1.000														
(5) Z_score	−0.367***	0.076**	0.057	−0.264***	1.000													
(6) DD	−0.088***	−0.159***	0.007	0.136***	0.021	1.000												
(7) GTA	0.167***	0.044	0.188***	0.000	0.059	0.050	1.000											
(8) ETA	−0.185***	0.120***	−0.046	−0.371***	0.854***	0.090**	−0.071*	1.000										
(9) Deposits_TA	−0.290***	−0.226***	0.152***	0.474***	−0.419***	0.081*	−0.109***	−0.555***	1.000									
(10) log_TA	0.108***	−0.317***	0.056	0.308***	−0.607***	0.287***	0.070*	−0.732***	0.438***	1.000								
(11) CIR	0.124***	0.046	−0.184***	−0.293***	0.171***	−0.243***	−0.133***	0.315***	−0.061	−0.326***	1.000							
(12) NIIGR	−0.021	0.042	−0.395***	−0.399***	0.358***	−0.250***	−0.007	0.415***	−0.259***	−0.375***	0.302***	1.000						
(13) ROAA	0.165***	−0.049	0.408***	0.290***	0.277***	0.192***	0.307***	0.023	0.050	0.056	−0.428***	−0.053	1.000					
(14) NPLGL	−0.142***	0.014	−0.181***	−0.430***	0.211***	−0.366***	−0.203***	0.331***	−0.190***	−0.391***	0.329***	0.374***	−0.356***	1.000				
(15) Crisis	−0.145***	−0.067*	0.175***	−0.021	0.229***	−0.145***	0.379***	−0.008	−0.081**	−0.034	−0.093***	0.019	0.197***	−0.100***	1.000			
(16) GDP	−0.216***	0.162***	0.086***	−0.031	0.121***	0.187***	0.248***	0.034	−0.057	−0.021	−0.079***	−0.006	0.141***	−0.118***	0.233***	1.000		
(17) INF	−0.129***	−0.201***	0.041	0.081**	0.065*	−0.104**	0.253***	−0.101***	0.067*	0.110***	−0.053	−0.003	0.076**	−0.118***	0.687***	0.096***	1.000	
(18) Bankconcentra_3	−0.129***	0.210***	−0.110***	−0.276***	0.119***	0.127***	−0.070*	0.203***	−0.310***	−0.321***	0.106***	0.136***	−0.106***	0.115***	−0.154***	0.224***	−0.240***	1.000

Table 4
Descriptive statistics: All banks.

Variable	Obs	Mean	Std.Dev.	Min	Max
NIM	759	3.005	3.184	−4.480	62.220
GLTA	731	57.936	19.826	0.000	102.247
Z_score	766	5.705	6.052	−4.957	46.188
DD	511	3.265	0.529	1.612	5.306
ROAA	766	1.403	4.967	−55.490	31.950
ETA	766	22.380	21.279	0.770	99.780
Deposits_TA	675	62.114	18.883	0.139	84.583
log_TA	766	22.507	1.747	16.309	25.720
GTA	737	14.056	27.940	−56.640	264.330
NIIGR	758	38.189	30.195	−63.350	362.280
NPLGL	649	6.204	10.313	0.000	100.000
CIR	748	53.737	71.732	9.090	973.330
TO	766	132.204	39.927	72.353	196.430
FO	766	2.023	0.561	1.082	2.374
GDP	766	4.454	4.179	−7.076	19.592
INF	766	3.434	3.349	−4.863	15.050
Bank_concentration	766	70.299	11.317	49.485	89.313

This table presents the descriptive statistics of all banks. Net Interest Margin (NIM), Gross loans to Total assets (GLTA), Zscore (Z-score), and Merton distance to default (DD) are dependent variables. Trade openness (TO) and Financial Openness (FO) are the main explanatory variables, while bank-specific variables include return on assets (ROA), equity to total assets (ETA), deposit to total assets (Deposits_TA), log of total assets (log_TA), growth of total assets (GTA), Non-interest income to gross revenue (NIIGR), Non-performance loans to gross loans, cost to income ratio (CIR), and growth of gross domestic product (GDP), inflation (Inf) and bank concentration (Bank_concentration) are the macroeconomic variables.

Table 5
Descriptive statistics: Islamic banks.

Variable	Obs	Mean	Std.Dev.	Min	Max
NIM	333	2.84	4.49	−4.48	62.22
GLTA	313	51.90	25.14	0.00	99.32
Z_score	337	7.78	8.03	−2.89	46.19
DD	187	3.25	0.60	1.61	5.31
ROAA	337	0.93	6.13	−31.15	31.95
ETA	337	31.27	27.94	6.34	99.78
Deposits_TA	263	58.00	24.20	0.14	84.58
log_TA	337	21.76	1.78	16.31	25.16
GTA	319	15.76	35.54	−56.64	264.33
NIIGR	332	46.60	41.24	−63.35	362.28
NPLGL	235	9.46	15.58	0.00	100.00
CIR	324	74.52	102.90	10.09	973.33

This table presents the descriptive statistics of all banks. Net Interest Margin (NIM), Gross loans to Total assets (GLTA), Zscore (Z-score), and Merton distance to default (DD) are dependent variables. Trade openness (TO) and Financial Openness (FO) are the main explanatory variables, while bank-specific variables include return on assets (ROA), equity to total assets (ETA), deposit to total assets (Deposits_TA), log of total assets (log_TA), growth of total assets (GTA), Non-interest income to gross revenue (NIIGR), Non-performance loans to gross loans, cost to income ratio (CIR). Country-specific variables are the same as in Table 3.

Table 6
Descriptive statistics: Conventional banks.

Variable	Obs	Mean	Std.Dev.	Min	Max
NIM	426	3.13	1.52	−3.45	10.33
GLTA	418	62.46	12.93	14.60	102.25
Z_score	429	4.08	2.97	−4.96	26.93
DD	324	3.28	0.48	1.65	5.18
ROAA	429	1.77	3.78	−55.49	24.10
ETA	429	15.40	9.23	0.77	99.78
Deposits_TA	412	64.74	13.92	0.44	82.59
log_TA	429	23.10	1.47	17.28	25.72
GTA	418	12.76	20.27	−47.71	164.73
NIIGR	426	31.64	14.17	−44.65	158.33
NPLGL	414	4.36	4.45	0.05	30.33
CIR	424	37.86	20.43	9.09	333.33

This table presents the descriptive statistics of all banks. Net Interest Margin (NIM), Gross loans to Total assets (GLTA), Zscore (Z-score), and Merton distance to default (DD) are dependent variables. Trade openness (TO) and Financial Openness (FO) are the main explanatory variables, while bank-specific variables include return on assets (ROA), equity to total assets (ETA), deposit to total assets (Deposits_TA), log of total assets (log_TA), growth of total assets (GTA), Non-interest income to gross revenue (NIIGR), Non-performance loans to gross loans, cost to income ratio (CIR). Country-specific variables are the same as in Table 3.

Table 7
Openness and cost of bank.

VARIABLES	NIM											
	All Banks				Islamic Banks				Conventional Banks			
TO	0.00 (0.006)		−0.02 (0.065)	0.06** (0.027)	0.00 (0.012)		−0.08 (0.153)	0.13** (0.056)	0.01*** (0.002)		0.03* (0.013)	0.03** (0.016)
FO		−12.62 (7.745)	−14.41* (8.211)	−0.62 (2.551)		−17.62 (12.465)	−23.07* (13.545)	0.61 (6.784)		0.22 (1.419)	0.69 (1.601)	2.09** (0.909)
TO_FO			0.01 (0.029)	−0.02* (0.012)			0.04 (0.067)	−0.05** (0.024)			−0.01 (0.006)	−0.01 (0.007)
Deposits_TA				0.05** (0.023)				0.05* (0.027)				0.01** (0.005)
NPLGL				0.06 (0.036)				0.08** (0.035)				0.00 (0.011)
ETA				0.08* (0.038)				0.06 (0.039)				0.06*** (0.014)
NIIGR				−0.04** (0.019)				−0.05** (0.019)				−0.02*** (0.005)
log_TA				0.96 (0.994)				2.77 (1.791)				−0.23 (0.182)
GTA				0.01** (0.004)				0.01** (0.004)				0.00 (0.002)
CIR				−0.00 (0.004)				0.00 (0.003)				−0.02*** (0.004)
Crisis				1.05 (0.65)				2.57 (1.59)				0.28 (0.18)
GDP				0.04* (0.019)				0.13*** (0.047)				0.01 (0.005)
Inf				−0.01 (0.023)				−0.01 (0.079)				−0.02** (0.007)
Bank-concentration				−0.00 (0.017)				−0.03 (0.062)				0.00 (0.009)
Constant	4.33*** (1.443)	29.40* (15.913)	32.41* (17.362)	−21.49 (21.992)	6.76** (3.100)	41.26 (25.903)	52.60* (29.665)	−64.26 (42.442)	1.86*** (0.296)	2.77 (2.888)	0.32 (3.278)	3.29 (5.161)
Observations	759	759	759	612	333	333	333	209	426	426	426	403
Number of indexnumber	92	92	92	82	43	43	43	34	49	49	49	48
Adjusted R-squared	0.04	0.09	0.09	0.37	0.10	0.15	0.14	0.56	0.07	−0.00	0.07	0.49

This table presents the effects of trade and financial openness on banks' net interest margin using the fixed-effect model. Net interest margin (NIM) is the dependent variable, while trade openness (TO), Financial openness (FO), and their combined effect (TO_FO) are the main explanatory variables. Banks specific variables are deposit to total assets (Deposits_TA), Non-Performing loans to gross loans (NPLGL), Equity to total assets (ETA), Non-interest income to gross revenue (NIIGR), log of total assets (log_TA), growth of total assets (GTA) and cost to income ratio (CIR) while bank concentration (Bank_concentration), growth of gross domestic product (GDP) and inflation (inf) are the country-specific variables.
Robust standard error in parenthesis.
Significance codes: *** indicate statistical significance at 1 %, ** at 5 % and * at 10 %, respectively.

and Hesse, 2010). Secondly, the fundamental essence of Islamic banks is to promote the culture of risk-sharing through the profit & loss relationship. Still, they are reluctant to participate in profit and loss sharing mode of financing due to moral hazard and asymmetric information issues.

Deposit size and growth of total assets increase the profitability of Islamic banks, while this result remains insignificant for conventional banks in the growth of total assets. Albeit highly capitalized, conventional banks are profitable. Consistent with the previous literature, we do not find any impact of financial crisis on the profitability of the banking industry in GCC, regardless of the business model. Moreover, switching from traditional activities to non-traditional activities reduces the profitability of both the banking system. Our results are consistent with existing literature, which suggests that banks with aggressive diversification strategies might lose their core advantage of loaning and translate into lower profitability.

4.3. Openness and volume of bank loans

This section presents the relationship between trade and financial openness on the volume of bank loans. We find a statistically significant negative impact of FO on the volume of loans for conventional banks, which suggests that banks operating in financially liberalized countries will have a lower volume of the issued loans. Naturally, any entry of a new bank in a country will increase the competition and affect the business activities of its competitor. Results are reported in Table 8 .

For Islamic banks, the individual effect TO on the volume of loans is statistically significant and negative. But the interaction of TO and FO enters with a statistically significant positive coefficient on the volume of loans. This interaction results suggest that the negative impact of trade openness on banks' loan volume strengthens at higher levels of financial openness and vice versa. This could be true for Islamic banks since the history of Islamic banks is not very old, still in its evolutionary phase, and

Table 8
Openness and Volume of bank loans.

VARIABLES	GLTA											
	All Banks				Islamic Banks				Conventional Banks			
TO	−0.04		−0.27	−0.35***	−0.05		−0.24	−0.47**	−0.05*		−0.31**	−0.19
	(0.029)		(0.195)	(0.112)	(0.063)		(0.517)	(0.211)	(0.029)		(0.131)	(0.122)
FO		−6.22	−18.84	−24.39**		1.47	−9.27	−27.67		−24.06	−38.60*	−24.72*
		(9.512)	(14.648)	(11.540)		(12.379)	(28.424)	(20.092)		(17.697)	(22.056)	(13.061)
TO_FO			0.10	0.13**			0.08	0.21**			0.12*	0.05
			(0.087)	(0.051)			(0.220)	(0.094)			(0.064)	(0.055)
Deposits_TA				0.14**				0.07				0.13*
				(0.053)				(0.063)				(0.074)
NPLGL				−0.23**				−0.34***				−0.01
				(0.090)				(0.075)				(0.154)
ETA				−0.50**				−0.82***				0.27
				(0.242)				(0.202)				(0.191)
NIIGR				−0.08**				−0.11***				−0.13**
				(0.033)				(0.041)				(0.050)
log_TA				−7.06**				−10.61***				−2.85
				(2.861)				(3.571)				(2.508)
GTA				−0.04**				−0.05**				−0.01
				(0.017)				(0.021)				(0.019)
CIR				0.01				0.01				−0.07
				(0.006)				(0.006)				(0.071)
Crisis				−7.77***				−3.92				−7.63***
				(2.27)				(4.7)				(2.01)
GDP				−0.16**				−0.11				−0.25***
				(0.082)				(0.169)				(0.068)
Inf				0.01				−0.24				0.15
				(0.121)				(0.322)				(0.129)
Bank-concentration				0.13				0.42				0.07
				(0.128)				(0.268)				(0.163)
Constant	59.17***	66.71***	99.17***	271.95***	53.15***	44.49*	74.53	345.16***	65.55***	107.04***	143.90***	174.84**
	(3.505)	(19.284)	(30.930)	(73.688)	(7.496)	(23.147)	(64.046)	(100.744)	(3.394)	(36.167)	(44.497)	(66.055)
Observations	731	731	731	612	313	313	313	209	418	418	418	403
Number of indexnumber	90	90	90	82	42	42	42	34	48	48	48	48
Adjusted R-squared	0.03	0.02	0.03	0.30	0.04	0.04	0.04	0.45	0.03	0.05	0.06	0.26

This table presents the effects of trade and financial openness on the loan behavior of banks using the fixed-effect model. Gross loan to a total asset (GLTA) is the dependent variable, while trade openness (TO), Financial openness (FO), and their combined effect (TO_FO) are the main explanatory variables. Banks specific variables are deposit to total assets (Deposits_TA), Non-Performing loans to gross loans (NPLGL), Equity to total assets (ETA), Non-interest income to gross revenue (NIIGR), log of total assets (log_TA), growth of total assets (GTA) and cost to income ratio (CIR) while bank concentration (Bank_concentration), growth of gross domestic product (GDP) and inflation (inf) are the country-specific variables.
Robust standard errors in parentheses.
Significance codes: *** indicate statistical significance at 1 %, ** at 5 % and * at 10 %, respectively.

can reap more the benefit of trade and financial openness than conventional banks. However, an increase in trade openness will make banks more prudent in terms of borrower's selection and less willing to take an excessive risk; thus, they might generate fewer loans in the economy.

Turning to the control variables, banks with high deposit ratios tend to lend more. The main functions of a bank are to receive deposits on the liability side and lend it on the asset side. Our finding supports the results who find the positive relationship between deposits and bank lending. Higher non-performing loans negatively affect banks' lending behavior and restrict them from issuing fewer loans. Further, highly capitalized banks allocate fewer assets to give loans, which could be due to rigid risk-based capital requirements. We find no effects of financial crises on the loan volume of Islamic banks, suggesting that Islamic banks were creating more liquidity, which eventually restricted the adverse shocks to trickle down the economy. Cornetta et al. (2011) argue that banks increase their liquidity and decrease lending during the financial crisis. In line with this study, we find that conventional banks reduce their lending during financial crises.

Lastly, NIIGR, log_TA, and GTA exhibit a negative relationship with the volume of banks, implying that banks diversify their operations between traditional and non-traditional activities significantly when the bank size is increasing. However, conventional banks have more incentives than Islamic banks, which is consistent with the previous literature.

4.4. Openness and bank stability

In this section, we examine the impact of openness on the level of bank stability. Considering both variables of bank stability measures, Z-score and Merton's DD, we find some contrasting results for both the banking business models. Table 9 presents the results of openness and bank stability.

Table 9
Openness and Bank stability.

VARIABLES	Z_score												DD											
	All Banks				Islamic Banks				Conventional Banks				All Banks				Islamic Banks				Conventional Banks			
TO	0.04***		0.04	−0.03	0.09***		0.32	−0.03	0.01		−0.05	0.00	−0.00		−0.00	−0.00	0.00		0.04	0.03**	−0.00		−0.03***	−0.02**
	(0.014)		(0.136)	(0.027)	(0.028)		(0.347)	(0.060)	(0.006)		(0.042)	(0.021)	(0.002)		(0.013)	(0.009)	(0.004)		(0.027)	(0.012)	(0.002)		(0.010)	(0.009)
FO		−14.26***	−16.14	−10.97***		−13.02*	−1.76	−14.48**		−7.05	−10.80	−1.31		−1.32***	−1.44*	−1.40**		−1.04**	1.34	0.25		−1.25	−2.89***	−3.06***
		(5.182)	(10.387)	(4.123)		(7.450)	(23.614)	(5.999)		(7.683)	(8.386)	(3.044)		(0.380)	(0.846)	(0.688)		(0.470)	(1.629)	(1.030)		(0.796)	(0.943)	(1.045)
TO_FO			0.00	0.02*			−0.10	0.03			0.03	−0.00			0.00	0.00			−0.02	−0.01**			0.01***	0.01**
			(0.057)	(0.013)			(0.142)	(0.026)			(0.019)	(0.010)			(0.006)	(0.004)			(0.011)	(0.005)			(0.004)	(0.004)
ROAA				0.32***				0.29***				0.28***				0.00				0.01				0.05
				(0.048)				(0.051)				(0.081)				(0.017)				(0.020)				(0.044)
ETA				0.22***				0.22***				0.25***				0.03***				0.03***				0.01
				(0.023)				(0.032)				(0.031)				(0.007)				(0.007)				(0.011)
NIIGR				−0.00				−0.00				0.02*				−0.00				−0.00				−0.00
				(0.003)				(0.004)				(0.011)				(0.001)				(0.001)				(0.004)
log_TA				0.40				0.54				0.95				0.23*				0.26*				0.13
				(0.447)				(0.773)				(0.639)				(0.134)				(0.152)				(0.192)
GTA				−0.00				−0.00				−0.00				−0.00				−0.00				−0.00
				(0.003)				(0.005)				(0.002)				(0.001)				(0.002)				(0.001)
CIR				−0.00				−0.00				0.00				−0.00***				−0.00**				−0.00
				(0.001)				(0.001)				(0.004)				(0.000)				(0.000)				(0.003)
Crisis				1.03***				1.26**				1.17***				0.082				0.1				−0.02
				(0.37)				(0.59)				(0.51)				(0.15)				(0.17)				(0.23)
GDP				−0.03**				−0.04				−0.01				−0.01				−0.00				−0.01
				(0.012)				(0.028)				(0.010)				(0.005)				(0.009)				(0.005)
Inf				−0.02				−0.05				0.02				0.02**				0.02				0.01
				(0.023)				(0.068)				(0.019)				(0.007)				(0.013)				(0.009)
Bank-concentration				−0.04				−0.06				0.02				−0.01*				−0.00				−0.02*
				(0.025)				(0.085)				(0.018)				(0.007)				(0.013)				(0.008)
Constant	1.67	34.94***	32.74	13.67	−1.34	35.45**	−2.36	17.77	4.13***	18.60	25.80	−21.88	3.44***	5.89***	6.11***	1.19	3.37***	5.31***	−0.02	−3.81	3.53***	5.80***	9.39***	7.55
	(1.664)	(10.348)	(22.416)	(13.164)	(3.365)	(14.623)	(52.994)	(20.255)	(0.848)	(15.501)	(16.721)	(18.576)	(0.214)	(0.710)	(1.872)	(3.763)	(0.431)	(0.828)	(3.692)	(4.863)	(0.214)	(1.540)	(1.890)	(4.973)
Observations	766	766	766	722	337	337	337	308	429	429	429	414	511	511	511	493	187	187	187	176	324	324	324	317
Number of indexnumber	93	93	93	92	43	43	43	43	50	50	50	49	60	60	60	60	23	23	23	23	37	37	37	37
Adjusted R-squared	0.41	0.42	0.45	0.72	0.52	0.48	0.54	0.73	0.42	0.43	0.44	0.86	0.33	0.35	0.35	0.48	0.25	0.26	0.30	0.53	0.40	0.41	0.43	0.47

This table presents the effects of trade and financial openness on the stability of banks using the fixed-effect model. Z-score (Zscore) and Merton distance to default (DD) are the dependent variables, while trade openness (TO), Financial openness (FO), and their combined effect (TO_FO) are the main explanatory variables. Banks specific variables are return on average assets (ROAA), Equity to total assets (ETA), Non-interest income to gross revenue (NIIGR), Log of total assets (log_TA), growth of total assets (GTA), and cost to income ratio (CIR) while bank concentration (Bank_concentration), growth of gross domestic product (GDP) and inflation (inf) are the country-specific variables.

Robust standard errors in parentheses.

Significance codes: *** indicate statistical significance at 1%, ** at 5% and * at 10 %, respectively.

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Table 10

Openness impact on Banks with a cost-income ratio above the median value.

VARIABLES	NIM	GLTA	Z_score	DD
TO	0.08	−1.23	−0.07	0.03**
	(0.064)	(0.959)	(0.115)	(0.011)
FO	6.29***	−13.20	−26.32	1.08
	(2.062)	(43.021)	(15.593)	(1.247)
TO_FO	−0.03	0.49	0.05	−0.01
	(0.027)	(0.392)	(0.053)	(0.005)
Deposits_TA	0.03***	0.13		
	(0.008)	(0.112)		
NPLGL	−0.02***	−0.15***		
	(0.006)	(0.048)		
ROAA			0.26***	0.07***
			(0.087)	(0.021)
ETA	0.02*	−0.75**	0.21***	0.03***
	(0.009)	(0.274)	(0.042)	(0.004)
NIIGR	−0.02***	−0.12**	−0.01	−0.00
	(0.003)	(0.044)	(0.011)	(0.001)
log_TA	−0.12	2.95	−0.00	0.20
	(0.338)	(4.880)	(1.291)	(0.155)
GTA	−0.00*	−0.01	−0.01	−0.00
	(0.001)	(0.022)	(0.009)	(0.001)
GDP	0.07**	−0.14	0.07	0.03
	(0.029)	(0.443)	(0.104)	(0.023)
Inf	−0.09***	0.10	−0.39**	0.01
	(0.026)	(1.035)	(0.181)	(0.047)
Bank-concentration	−0.00	1.69*	0.06	−0.01
	(0.061)	(0.982)	(0.279)	(0.024)
Constant	−8.69	−38.93	44.36	−4.28
	(10.994)	(180.317)	(27.930)	(4.018)
Observations	90	90	148	76
Number of indexnumber	25	25	34	16
Adjusted R-squared	0.71	0.58	0.74	0.71

This table presents the effects of trade and financial openness on cost, loan behavior, and stability of banks using the fixed-effect model. Net interest margin (NIM), Gross loan to total asset, Z-score (Zscore), and Merton distance to default (DD) are the dependent variables, while trade openness (TO), Financial openness (FO), and their joint effect (TO_FO) are the main explanatory variables. Banks specific variables are deposit to total assets (Deposits_TA), Non-performing loans to gross loans, Return on average assets (ROAA), Equity to total assets (ETA), Non-interest income to gross revenue (NIIGR), log of total assets (log_TA) and growth of total assets (GTA), while bank concentration (Bank-concentration), growth of gross domestic product (GDP) and inflation (inf) are the country-specific variables.

Robust standard errors in parentheses.

Significance codes: *** indicate statistical significance at 1 %, ** at 5 % and * at 10 %, respectively.

For Islamic banks, FO has a statistically significant negative impact on bank stability when we employ Z-score as the dependent variable, while we observe no effect of interaction-term. We observe a similar pattern for conventional banks. However, the results of the market-based measure of stability, i.e., Merton distance to default (DD), suggest some difference in trade and financial openness on Islamic and conventional banks. We find the positive impact of trade openness on the stability of Islamic banks, while the interaction term TO_FO has a negative impact on the stability of Islamic banks. When the trade and financial openness are high, and profitability is the primary objective of a bank manager, it might motivate the managers to take more risk by extending more loans, which will result in higher volatility of ROA, thereby decreasing the stability of banks.

On the other hand, the individual impact of TO and FO is negative for conventional banks. Simultaneously, the interaction term TO_FO exhibits a positive relationship, which implies that the negative effect of trade openness on the stability of conventional banks strengthens at higher levels of financial openness and vice-versa.

This contrasting result of z-score and DD is due to different methodological approaches to estimate these variables. Therefore, one must emphasize selecting variables while assessing bank stability (Kabir et al., 2015; Abuzayed et al., 2018)). Lastly, we provide evidence that both banking systems remain stable during the financial crisis. The previous literature strongly supports our results showing Islamic banks to have better assets quality, highly capitalized, and more resilient during financial crises.

4.5. Robustness checks

We applied three different robustness checks. Due to central banks' higher monetary and controlling powers, Islamic banks usually face higher costs to execute their operations. Therefore, it is interesting to investigate if trade and financial openness have a similar impact on banks' cost, loan behavior, and stability. In this regard, we split our sample of Islamic banks with cost to income (CIR) above the median value. Our results (reported in Table 10) remain consistent with the main findings, with some insignificant variables, but the coefficient signs stay the same.

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Table 11

Openness impact on Banks with a capital ratio above the median value.

VARIABLES	NIM	GLTA	Z_score	DD
To	0.39*	0.32	0.46	0.03
	(0.209)	(1.763)	(0.409)	(0.019)
FO	17.51	34.54	8.17	−1.15
	(28.672)	(143.148)	(25.567)	(1.387)
TO_FO	−0.16*	−0.15	−0.16	−0.01
	(0.085)	(0.722)	(0.164)	(0.008)
Deposits_ta	0.01	0.56*		
	(0.021)	(0.280)		
ROAA			0.31***	−0.01
			(0.076)	(0.022)
NPLGL	0.08***	−0.26**		
	(0.026)	(0.097)		
NIIGR	−0.08***	0.11	−0.00	−0.01**
	(0.015)	(0.073)	(0.015)	(0.003)
log_TA	4.55**	6.25	−3.77*	−0.50*
	(1.864)	(8.632)	(1.909)	(0.281)
GTA	0.01	−0.05	−0.01	0.00
	(0.005)	(0.047)	(0.011)	(0.001)
CIR	0.03		−0.00	−0.00
	(0.020)		(0.009)	(0.002)
GDP	0.17**	1.04**	0.13	−0.03
	(0.074)	(0.438)	(0.077)	(0.017)
Inf	−0.14	0.84	0.01	0.04**
	(0.176)	(0.763)	(0.131)	(0.014)
Bank-concentration	0.13	−0.15	−0.19	−0.02
	(0.118)	(0.957)	(0.139)	(0.021)
Constant	−141.30	−196.29	71.30	17.28**
	(103.057)	(507.420)	(97.672)	(8.162)
Observations	67	67	147	101
Number of indexnumber	20	20	31	19
Adjusted R-squared	0.81	0.45	0.71	0.49

This table presents the effects of trade and financial openness on cost, loan behavior, and stability of banks using the fixed-effect model. Net interest margin (NIM), Gross loan to total asset, Z-score (Zscore), and Merton distance to default (DD) are the dependent variables while trade openness (TO), Financial openness (FO), and their joint effect (TO_FO) are the main explanatory variables. Banks specific variables are deposit to total assets (Deposits_TA), Non-performing loans to gross loans, return on average assets (ROAA), Non-interest income to gross revenue (NIIGR), log of total assets (log_TA), growth of total assets (GTA) and cost to income ratio (CIR), while bank concentration (Bank-concentration), growth of gross domestic product (GDP) and inflation (inf) are the country-specific variables.
Robust standard errors in parentheses.
Significance codes: *** indicate statistical significance at 1 %, ** at 5 % and * at 10 %, respectively.

Second, banks with higher capital ratios might attract deposits at a lower cost and lend them at a higher rate, affecting bank net interest margin. This is more crucial for Islamic banks since they have higher capital ratios. Therefore, we split the data of Islamic banks with capital ratios above the median value. Our results remain the same as earlier findings, especially in NIM, as reported in Table 11.

Lastly, we use a two-step system GMM model to address the endogeneity problems (unobserved dynamic endogeneity, simultaneity, heterogeneity), which are typical concerns in firm-level studies (Paltrinieri et al., 2020; Arellano and Bover, 1995; Blundell and Bond, 1998). Further, we also introduce the variable of regulatory restriction (Reg), which controls the level of restriction within each country in terms of different financial services (f.i. trading, brokerage). The results of GMM estimations are shown in Table 12. Our results further reiterate the earlier findings that a country with simultaneous openness to trade and financial markets reduces the profitability and volume of loans of Islamic banks. Moreover, the results suggest that trade and financial openness also reduce Islamic banks' stability. We mostly find these results insignificant for conventional banks; nonetheless, the direction of the relationship is the same as of earlier findings.

5. Conclusion

Over the last two decades, Islamic finance has rapidly increased. It has its significant and robust presence in GCC countries and worldwide, including non-Muslim countries. This phenomenon called for evaluating this sector and its impact on overall financial development and the real economy. The main objective of this paper is to assess the role of trade and financial openness on financial development by using micro-level data of both Islamic and conventional banks from 2007 to 2015.

Our analysis shows that the simultaneous openness of GCC countries to trade and capital accounts reduces the profitability of Islamic banks. This is arguably true since Islamic banks are very reluctant to participate in profit and loss sharing mode of financing due to the high presence of asymmetric information and moral hazards in such contracts. Moreover, we find that trade and financial openness also decrease the volume of loans and the stability of Islamic banks.

Table 12
Openness impact on Banks- Two-step GMM approach.

Variables	NIM			GLTA			Z_Score			DD		
	All Bank	Islamic Banks	Conventional Banks	All Banks	Islamic Banks	Conventional Banks	All Banks	Islamic Banks	Conventional Banks	All Banks	Islamic Banks	Conventional Banks
l.nim	0.116*** (0.0281)	0.0543 (0.0442)	0.495*** (0.0197)									
l.glta				0.425*** (0.0352)	0.326*** (0.0537)	0.721*** (0.0395)						
l.z_score							−0.126*** (0.0270)	−0.123*** (0.0400)	−0.178*** (0.0330)			
l.dod										0.126*** (0.0434)	0.242*** (0.0717)	0.211*** (0.0541)
TO	−0.000520 (0.00739)	0.0483** (0.0214)	−0.00577 (0.00933)	−0.269** (0.117)	−0.461* (0.254)	0.0772 (0.131)	0.00224 (0.0197)	0.0169 (0.0394)	0.00770 (0.0171)	0.0126* (0.00721)	0.0510*** (0.0115)	0.00278 (0.00844)
FO	−0.856 (1.010)	−2.816 (2.073)	−0.692 (0.583)	−2.791 (5.007)	−17.00* (10.19)	10.71* (5.532)	0.161 (0.843)	0.900 (1.594)	0.605 (0.700)	0.686** (0.304)	1.821*** (0.461)	0.300 (0.349)
TO_FO	0.000689 (0.00338)	−0.0226** (0.00913)	0.00284 (0.00398)	0.0788 (0.0510)	0.185* (0.107)	−0.0699 (0.0570)	−0.000152 (0.00857)	−0.00802 (0.0166)	−0.00406 (0.00733)	−0.00679** (0.00313)	−0.0211*** (0.00481)	−0.00239 (0.00365)
Deposits_ta	10.46*** (2.215)	14.41*** (5.406)	5.782*** (1.763)	0.0310 (0.0404)	−0.144*** (0.0512)	0.112** (0.0474)	0.00400 (0.00642)	0.0115 (0.00770)	0.00340 (0.00500)	−0.000525 (0.00352)	−0.000769 (0.00246)	0.00818** (0.00330)
NPLGL	−0.0071*** (0.00269)	−0.00764 (0.00655)	−0.00401** (0.00177)	−0.394*** (0.0396)	−0.366*** (0.0507)	−0.194*** (0.0684)	−0.00794 (0.00653)	0.00541 (0.00763)	−0.00644 (0.00957)	−0.00602** (0.00241)	−0.0076*** (0.00221)	−0.0103** (0.00494)
ETA	0.0376*** (0.0100)	0.0358*** (0.0110)	0.0363*** (0.00384)	−0.0377 (0.0954)	−0.268*** (0.0936)	0.362*** (0.0945)	0.227*** (0.0163)	0.258*** (0.0191)	0.292*** (0.0132)	0.0170*** (0.00462)	0.0182*** (0.00425)	0.00366 (0.00545)
NIIGR	−0.0167*** (0.00159)	−0.0201*** (0.00157)	−0.0161*** (0.00310)	−0.088*** (0.0196)	−0.151*** (0.0255)	0.00143 (0.0315)	0.0127*** (0.00318)	−0.000769 (0.00347)	0.0338*** (0.00446)	−0.0037*** (0.00118)	−0.00283** (0.00115)	−0.000321 (0.00185)
log_TA	0.0376*** (0.0100)	0.0358*** (0.0110)	0.0363*** (0.00384)	3.081*** (0.623)	3.096*** (0.961)	0.795 (0.490)	−0.0933 (0.0918)	−0.0109 (0.132)	−0.154** (0.0668)	0.0574 (0.0359)	0.124*** (0.0390)	1.90e-05 (0.0388)
GTA	−0.0167*** (0.00159)	−0.0201*** (0.00157)	−0.0161*** (0.00310)	−0.00473 (0.00905)	−0.0336** (0.0153)	−0.0431*** (0.0149)	0.00362** (0.00145)	0.00316 (0.00203)	0.00547*** (0.00210)	7.19e-05 (0.000676)	−0.00177* (0.000965)	2.96e-05 (0.000997)
CIR	0.0114*** (0.00433)	0.0211*** (0.00462)	0.000278 (0.00265)	0.0110* (0.00645)	0.0147* (0.00804)	−0.119*** (0.0353)	−0.005*** (0.00108)	−0.0025** (0.00126)	−0.0159*** (0.00463)	−0.0013*** (0.000409)	−0.0012*** (0.000452)	0.000642 (0.00225)
GDP	−0.433*** (0.129)	−0.458 (0.285)	−0.164*** (0.0569)	−0.104* (0.0580)	−0.0928 (0.139)	−0.116* (0.0631)	−0.0190* (0.00968)	−0.0351* (0.0213)	−0.0104 (0.00871)	−0.00651* (0.00360)	−0.00903 (0.00689)	−0.00359 (0.00413)
INF	0.00334*** (0.000695)	0.00396*** (0.000955)	0.00161** (0.000747)	0.386*** (0.0969)	0.332 (0.232)	0.203* (0.105)	−0.0312* (0.0164)	−0.0590 (0.0363)	0.0138 (0.0148)	0.0164*** (0.00623)	−0.00405 (0.0117)	0.0232*** (0.00723)
Bank-concentration	−0.000102 (0.00476)	0.0304** (0.0125)	−0.00482 (0.00360)	−0.147*** (0.0393)	−0.167** (0.0766)	−0.132*** (0.0371)	0.00397 (0.00648)	0.00363 (0.0118)	−0.00747 (0.00519)	0.00299 (0.00263)	0.00133 (0.00353)	0.00651** (0.00276)
Reg	0.00384 (0.00356)	−0.00634 (0.00746)	0.0104*** (0.00210)	−9.729*** (1.080)	−6.483*** (2.268)	−5.062*** (1.083)	0.346** (0.161)	−0.0278 (0.353)	0.0824 (0.137)	0.210*** (0.0540)	0.416*** (0.104)	0.150** (0.0606)
Observations	473	158	315	558	195	363	560	197	363	429	146	283
Number of indexnumber	81	33	48	82	34	48	82	34	48	60	23	37
AR1	0.000	0.150	0.000	0.000	0.000	0.000	0.004	0.000	0.424	0.000	0.000	0.000
AR2	0.106	0.215	0.194	0.744	0.744	0.204	0.000	0.283	0.000	0.059	0.025	0.611
Hansen test	0.000	0.876	0.004	0.001	0.928	0.339	0.000	0.000	0.000	0.000	0.611	0.682

This table presents the effects of trade and financial openness on profitability, loan behavior, and stability of banks using a two-step GMM approach. Net Interest Margin (NIM,) Gross loan to total asset (GLTA), Z_score, and Distance to Default (DD) are the dependent variables, while trade openness (TO), Financial openness (FO), and their joint effect (TO_FO) are the main explanatory variables. Banks specific variables are deposit to total assets (Deposits_TA), Non-Performing loans to gross loans (NPLGL), Equity to total assets (ETA), Non-interest income to gross revenue (NIIGR), log of total assets (log_TA), growth of total assets (GTA) and cost to income ratio (CIR) while bank concentration (Bank_concentration), growth of gross domestic product (GDP), inflation (inf), Regulatory restriction (Reg) are the country-specific variables. Robust standard errors in parentheses.
Significance codes: *** indicate statistical significance at 1 %, ** at 5 % and * at 10 %, respectively.

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This study has several implications. It extends the ongoing debate on the role of trade and financial openness in financial development. It contributes to the growing literature dealing with the impact of Islamic banks on economic growth. Being the hub of Islamic finance, the results of this study call for reforms in the Islamic finance industry of GCC countries and are of particular interest to regulators and policymakers to establish an institutional framework that adhered to the basic theme of Islamic finance.

More specifically, the negative impact of trade and financial openness on the profitability of Islamic banks is against Islamic finance theories and practices. Islamic banks have the equity participation mode of financing on their asset side of the balance sheet. In that case, it will increase overall profitability and increase the resilience capability of Islamic banks to absorb losses during bad times, which will protect the economy from the recession at the country level. Furthermore, management in Islamic banks should also launch research and development programs to architect and bring innovative partnership-based products in their overall portfolio.

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