



Slimen, R.B., Belhaj, F., & Hadriche, M. (2021). Banking short- and long-term stability: A comparative study between Islamic and conventional banks in GCC countries. *Copernican Journal of Finance & Accounting*, 10(4), 139–158. <http://dx.doi.org/10.12775/CJFA.2021.019>

RIHAB BEN SLIMEN*

Manar University, Tunisia

FETHI BELHAJ**

Manouba University, Tunisia

MANEL HADRICHE***

Manar University, Tunisia

**BANKING SHORT- AND LONG-TERM STABILITY:
A COMPARATIVE STUDY BETWEEN ISLAMIC
AND CONVENTIONAL BANKS IN GCC COUNTRIES**

Keywords: Islamic finance, Islamic banks, conventional banks, financial stability, Z-score, LADR ratio.

J E L Classification: G21, G28, G32, Z12.

Date of submission: August 2, 2021; date of acceptance: October 3, 2021.

* Contact information: benslimenrihab123@gmail.com, Faculté des Sciences Économiques et de Gestion de Nabeul, Campus Universitaire Mrezga - 8000 Nabeul, phone: +216 72 232 205, +216 72 232 133; ORCID ID: <https://orcid.org/0000-0002-5978-5311>.

** Contact information: fethipremier@yahoo.fr, Faculté des Sciences Économiques et de Gestion de Nabeul, Campus Universitaire Mrezga - 8000 Nabeul, phone: +216 72 232 205, +216 72 232 133; ORCID ID: <https://orcid.org/0000-0002-1122-9949>.

*** Contact information: manel.hadriche@yahoo.fr, Faculté des Sciences Économiques et de Gestion de Nabeul, Campus Universitaire Mrezga - 8000 Nabeul, phone: +216 55741655; ORCID ID: <https://orcid.org/0000-0003-2873-6100>.

Abstract: This research empirically assesses the contribution of Islamic finance to the financial stability of banks. The empirical analysis is based on the annual data related to 103 banks (51 Islamic banks and 52 conventional banks) operating in six countries of the Gulf Cooperation Council (GCC) region during the period 2006–2015. The LADR ratio was computed and used to measure banks stability in the short term, and the Z-score was used to assess long-term stability.

The results show that, overall, Islamic banks are financially more stable in the short-term but less stable in the long term than conventional banks. The comparative analysis of the financial stability determinants in the two systems shows that these determinants contribute differently to the short- and long-term financial stability of Islamic and conventional banks. This is due to the dissimilarities in the two operating principles.

■■■ INTRODUCTION

Since the financial crisis that shook the business world in 2008, particular interest has been given to the studies of Islamic finance as an alternative system to conventional finance. In this context, several previous theoretical and empirical studies dealt with the subject of Islamic finance in relation with the financial stability of banks (Eyih & Bouchetara, 2020; Hasan & Risfandy, 2021).

The terms “financial stability” and “the stability of the financial system” are often used interchangeably in the financial literature (Ciukaj, 2016).

So far there is no consensus on an exact definition of financial stability in its general framework. Zahra, Ascarya and Huda (2018) define it as follows: “The financial system of a country is considered stable when it is sustainable and resistant to various economic disruptions, so that it is still able to perform the function of mediation, to make payments and to distribute the risks well”. Therefore, the absence of financial crises is not enough to consider that a financial system is stable, the capacity of this system to limit and manage the appearance of imbalance, before it manifests itself, is also required. When the financial system is stable, the self-correcting mechanism and market discipline prevent problems that can become system-wide risks.

Financial stability seems to be a broad concept that covers two elements related, on one hand, to prices at the macroeconomic level and on the other hand to the financial sector (financial institutions and financial markets) at the microeconomic level. Indeed, four factors could maintain the stability of the financial system: a stable macroeconomic environment, a controlled financial institution, management of financial institutions and well-controlled security of payment systems.

As for the stability of the Islamic financial system, Muslim scholars believe that it is ensured when the allocation of deposits to investment goes smoothly, and all sources of funds are used.

In the continuity of the previous works highlighting that Islamic banks are more stable than conventional ones, this study aims to present the evidence that Islamic banks contribute positively to the financial stability of the banking sector in the short and long terms.

The objective of this article is threefold. First, it assesses the financial stability of Islamic and conventional banks in the short and long terms. Second, it tests the main determinants of banks' financial stability. Finally, it tests the differential effect of these determinants on the stability of the Islamic and conventional banking sector in GCC countries.

The paper is structured as follows. Section 2 presents the literature review. Section 3 describes the methodology and data. Finally, section 4 presents the empirical results.

THE RESEARCH METHODOLOGY AND THE COURSE OF THE RESEARCH PROCESS

Literature Review

Several previous studies examined the financial stability of Islamic and conventional banks with the aim of studying the contribution of Islamic finance to the financial stability of banks. The source of difference between Islamic and conventional banks in terms of stability can be attributed to the nature of their business practices. Islamic banks are specifically characterized by the prohibition of collecting or paying interest at a predetermined rate, features embedded with the business practices of conventional banks. Instead, Islamic banks offer various financial products complying with Shariah principles which allow profit and loss sharing (PLS) instead of fixed-rate loans. There are different opinions developed in the literature assessing whether the contribution of Islamic banks in the financial stability is significant in the presence of conventional banks or not. The financial strength of Islamic banks differs widely from country to country.

Chakroun and Gallali (2015) studied the difference between the Islamic model and the conventional model in terms of stability and banking risk, us-

ing the Z-score as an indicator of banking stability, and based on a sample of 136 banks in the Gulf countries, for the period 2003 and 2012. They showed that small Islamic banks are more stable than small conventional banks, that large conventional banks are financially more stable than large Islamic banks, and that small Islamic banks are more stable than large Islamic banks. Wahid and Dar (2016) used International Monetary Fund (IMF) financial soundness indicators (FSI) and the Z-score index to examine and compare the stability of 17 Islamic and 21 conventional banks in Malaysia over the period 2004–2013. They found that large Islamic banks are less stable and small Islamic banks are more stable than their conventional counterparts. Sakarya (2016) sought to identify the difference of stability between Islamic and conventional banks in Turkey on a sample of 42 banks, 4 of them are Islamic. They found that Islamic banks in Turkey tend to have a significantly higher level of stability than conventional banks. Rashid, Yousaf and Khaleequzzaman (2017) empirically assessed the contribution of Islamic banks to Pakistan's financial stability for 10 conventional banks, 4 full-fledged Islamic banks, and 6 autonomous Islamic branches of conventional banks in Pakistan during the period 2006–2012. They also examined the relationship between the competitive conduct of banks and the stability of the banking system. The results showed that Islamic banks are more efficient and contribute more effectively to the stability of the financial sector. Zahra et al. (2018) measured the financial stability of Islamic and conventional banks in Indonesia by referring to macro and microeconomic variables for ten years (2006–2015) and using two measurement models: the Z-score and the Bank Stability Index (BSI). They showed that Islamic banks are more stable facing macro and microeconomic shocks than conventional banks. Tekdogan and Atasoy (2021) found that Islamic banks significantly promote stability by providing liquidity during financial shocks and creating more liquidity per asset compared to conventional banks.

However, in the opposite side, other researchers in this area found that Islamic banks are less stable than conventional banks. In this context, Beck, Demirgüç-Kunt and Merrouche (2013) study the stability of 510 banks, 88 of them are Islamic, operating in 22 countries with dual banking systems during the period 1995–2009. Their results showed that Islamic banks are significantly less stable than conventional banks. Abedifar, Ebrahim, Molyneux and Tarazi (2015) revealed that Islamic banks have low credit risk relative to their conventional counterparts and showed that Islamic banks generally have a lower degree of stability than conventional banks. Kabir and Worthington (2017),

based on data for 16 developing economies over the period 2000–2012, showed that Islamic banks are less stable than conventional banks. Youssef (2017) examined the stability of Islamic and conventional banks during and after the recent global crisis, while determining its impact on bank stability. They found that conventional banks are globally more stable.

Although most previous studies came up with clear results proving the superiority of one of these two banking systems in terms of financial stability, some studies assumed that Islamic and conventional banks have the same level of stability. In this framework, Islam and Kozokov (2009) showed that there was no significant difference between the stability of Islamic banks and conventional banks and that Islamic banks were not less risky than conventional banks even during financial crises. Similarly, Khan (2010) contended that Islamic banking activities in most instances are still functionally indistinguishable from conventional banking. Ariff and Rously (2011) argued in the context of Malaysian banking system that Islamic banking is not very different from conventional banking. Moreover, Suzuki, Miah, Wanniarachchige and Sohrab (2017) raised the issue that although Islamic banks comply with Shariah principles, their mode of investment is dominant by Murabaha or mark-up lending which is close to conventional banking practice.

The novelty of this study consists in comparing both the short and long terms stability for the two types of banking systems. GCC as an economic block retains a high profile on the global economic landscape as far as the Islamic banking and finance is concerned.

Methodology and Data

The empirical study is based on annual data, for a 10-year period (2006–2015), of 103 commercial banks operating in 6 countries of the GCC countries. The sample consists of 52 conventional banks and 51 Islamic banks. The data are extracted from the Bankscope database with an annual frequency and are expressed in millions of US dollars. Only 10 years were used depending on data availability.

In this study, the LADR ratio is used to measure the stability of banks in the short term, and the Z-score to assess long-term stability.

LADR ratio captures the strength of a bank in the short-term. It indicates how solvent a bank is to avoid any abrupt and unavoidable changes of banking

environment in the short-term. Stronger banks go with higher ratios, and vice versa. The LADR ratio can be defined as follows:

$$LADR = \text{liquid assets} / \text{deposits and short-term funding} \quad (1)$$

Z-score measures the number of standard deviations a return realization has to fall to deplete equity. Higher value of z-score falls in the lower upper bound of insolvency risk. Therefore, higher value of z-score means low probability of insolvency and vice versa. The z-score can be defined as follows:

$$Z\text{-score} = \left(\frac{EQ}{A} + \mu ROA \right) / \sigma ROA \quad (2)$$

Where $\frac{EQ}{A}$ is equity capital as a percentage of total bank assets. μROA , σROA represents the average return on assets and the standard deviation of return on assets, respectively.

The main theme of this research is to test if the Islamic banking system is more stable than the conventional banking system in the short and long terms. To do this, Z-score and LADR regression were performed as a function of the number of variables by applying a random effects estimator. The regression model includes bank-specific variables as well as macroeconomic indicators.

The main determinants of banks' financial stability are tested by estimating in panel data the following regressions:

$$LADR_{it} = \beta_0 + \beta_1 INDI_{it} + \beta_2 COIN_{it} + \beta_3 LOAS_{it} + \beta_4 PTRT_{it} + \beta_5 BAZIS_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \beta_8 MRKC_{it} + \beta_9 CRRK_{it} + D_t + \varepsilon_{it} \quad (3)$$

$$Z_{it} = \beta_0 + \beta_1 INDI_{it} + \beta_2 COIN_{it} + \beta_3 LOAS_{it} + \beta_4 PTRT_{it} + \beta_5 BAZIS_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \beta_8 MRKC_{it} + \beta_9 CRRK_{it} + D_t + \varepsilon_{it} \quad (4)$$

Where (i) is the bank index and (t) is the time index expressing the selected data frequency (year t). INDI the income diversity (Non-interest income / Gross income), COIN the income ratio (Cost / Income), LOAS the loan to asset ratio (Loans / Customer deposits), PTRT the profitability ratio indicator (Net income / Total assets), BAZIS the bank asset size Log (Bank assets), GDP the gross domestic product (Annual GDP), INF the inflation (Change in consumer prices:

Inflation rate), MRKC the market concentration ratio (C4 concentration ratio), CRRK the Credit risk (Allowance for loan losses / Gross loans), D the dummy variable taking value 1 for Islamic banks and 0 for conventional banks.

After having empirically studied the main determinants of the financial stability of banks, the differential effect of these determinants on the stability of Islamic and conventional banks will be tested separately.

$$\begin{aligned}
 LADR_{it} = & \beta_0 + \beta_1 INDI_{it} \times D^{isl} + \beta_2 INDI_{it} \times D^{con} + \beta_3 COIN_{it} \times D^{isl} + \beta_4 COIN_{it} \times \\
 & D^{con} + \beta_5 LOAS_{it} \times D^{isl} + \beta_6 LOAS_{it} \times D^{con} + \beta_7 PTRT_{it} \times D^{isl} + \beta_8 PTRT_{it} \times D^{con} + \\
 & \beta_9 BAZIS_{it} \times D^{isl} + \beta_{10} BAZIS_{it} \times D^{con} + \beta_{11} GDP_{it} \times D^{isl} + \beta_{12} GDP_{it} \times D^{con} + \\
 & \beta_{13} INF_{it} \times D^{isl} + \beta_{14} INF_{it} \times D^{con} + \beta_{15} MRKC_{it} \times D^{isl} + \beta_{16} MRKC_{it} \times D^{con} + \\
 & \beta_{17} CRRK_{it} \times D^{isl} + \beta_{18} CRRK_{it} \times D^{con} + D_t + \varepsilon_{it}.
 \end{aligned} \tag{5}$$

$$\begin{aligned}
 Z_{it} = & \beta_0 + \beta_1 INDI_{it} \times D^{isl} + \beta_2 INDI_{it} \times D^{con} + \beta_3 COIN_{it} \times D^{isl} + \beta_4 COIN_{it} \times D^{con} + \\
 & \beta_5 LOAS_{it} \times D^{isl} + \beta_6 LOAS_{it} \times D^{con} + \beta_7 PTRT_{it} \times D^{isl} + \beta_8 PTRT_{it} \times D^{con} + \\
 & \beta_9 BAZIS_{it} \times D^{isl} + \beta_{10} BAZIS_{it} \times D^{con} + \beta_{11} GDP_{it} \times D^{isl} + \beta_{12} GDP_{it} \times D^{con} + \\
 & \beta_{13} INF_{it} \times D^{isl} + \beta_{14} INF_{it} \times D^{con} + \beta_{15} MRKC_{it} \times D^{isl} + \beta_{16} MRKC_{it} \times D^{con} + \\
 & \beta_{17} CRRK_{it} \times D^{isl} + \beta_{18} CRRK_{it} \times D^{con} + D_t + \varepsilon_{it}.
 \end{aligned} \tag{6}$$

Where: D^{isl} is the dummy variable which takes value 1 for an Islamic bank and zero otherwise; D^{con} is the dummy variable that is equal to 1 for conventional bank and zero otherwise.

THE OUTCOME OF THE RESEARCH PROCESS AND CONCLUSIONS EMPIRICAL RESULTS AND DISCUSSION

Measuring Financial Stability of Banks

Table 1 below provides a summary of the main descriptive statistics for Z-score and the LADR ratio for Islamic and conventional banks.

Table 1. Descriptive Statistics

		Z-score	LADR
All Banks	Mean	4.435	66.891
	Min	0.432	0.156
	Max	116.794	997.718
	St. Dev	7.691	127.640
Islamic Banks	Mean	3.636	106.594
	Min	0.432	0.156
	Max	82.028	997.718
	St. Dev	6.330	173.708
Conventional banks	Mean	5.233	27.187
	Min	0.691	0.855
	Max	116.794	186.522
	St. Dev	8.669	25.019

Source: own elaboration.

Table 1 shows that, in average, Islamic and conventional banks have an LADR ratio of 106.594 and 27.187 respectively, implying that Islamic banks are, overall, more stable than their conventional counterparts in the short term. During the study period, Islamic banks recorded higher LADR extremes than conventional banks (a maximum of 997,718 for Islamic banks versus a maximum of 186,522 for conventional banks), implying that the distribution study of this measure of stability is high, a result confirmed by the relatively high value of the standard deviation (173,708 versus 25,019 for conventional banks).

Table 1 also shows that, in average, the Z-score is 3,636 for Islamic banks and 5,233 for conventional banks, which indicates that conventional banks are more stable than their Islamic counterparts in the long run.

Determinants of Bank Financial Stability: Empirical Analysis for All Banks

The empirical study of the determinants of financial stability of banks in the short and long run is based on the estimation of models (1), (2), (3) and (4). The explanatory variables of the model (1) are: Bank size, profitability, revenue diversity, efficiency, and liquidity ratios. In model (2), credit and market concentration ratios are added to these variables. In model (3), macroeconomic variables (GDP and inflation) are integrated to test their impact on the stability of the banking system. The credit and market concentration ratios were subse-

quently removed from model (4) to test the robustness of the results associated with the macroeconomic variables.

Financial stability of banks in the short term

The results of determinants of short-term bank financial stability are presented in table 2 below.

Table 2. Determinants of Short-Term Bank Financial Stability

Variables	Model (1)	Model (2)	Model (3)	Model (4)	
PTRT	-0.059 (0.905)	-1.678 (0.001)***	-1.520 (0.000)***	-.0792 (0.836)	
COIN	0.104 (0.000)***	0.081 (0.019)**	0.125 (0.000)***	0.117 (0.000)***	
LOAS	0.160 (0.000)***	0.183 (0.000)***	0.174 (0.000)***	0.1518 (0.000)***	
INDI	0.0175 (0.824)	0.130 (0.106)	0.189 (0.002)	0.072 (0.287)	
BAZIS	8.585 (0.064)**	5.051 (0.284)	7.021 (0.077)	12.894 (0.001)***	
CRRK		-0.421 (0.143)	-0.166 (0.469)		
MRKC		0.803 (0.978)	-9.497 (0.659)		
GDP			2.186 (0.000)***	2.569 (0.001)***	
INF			0.427 (0.310)	0.433 (0.417)	
DUMMY	31.683 (0.00)***	25.130 (0.002)***	20.437 (0.003)***	27.301 (0.000)***	
Constant	-32.055 (0.117)	-17.273 (0.587)	-34.361 (0.177)	-65.980 (0.000)***	
R-squared	Within	0.021	0.045	0.154	0.071
	Between	0.459	0.504	0.568	0.508
	Overall	0.221	0.265	0.405	0.301

The figures in brackets are the p-values.

** : significant at 5%

*** : significant at 1

Source : own elaboration.

The results of model estimates (1) show a significantly positive relationship between bank size and short-term financial stability, suggesting that banks with more assets tend to have a higher LADR ratio. These results also show that the coefficient of the revenue diversity ratio is positive but not significant, and that

the profitability ratio has no significant effect on banks' financial stability in the short run. Moreover, these results show that the efficiency ratio is positively associated with the financial stability of banks in the short term. Also, the positive impact of the liquidity ratio indicates that banks with high liquidity tend to have a high LADR ratio, implying that a bank's financial stability in the short term depends, among other things, on the degree of its liquidity.

In model (2), the coefficient of the credit ratio is negative but not significant, indicating that credit risk has no impact on the financial stability of banks in the short run. In addition, the coefficient of the concentration ratio is positive but not significant, implying the significance of this determinant of bank stability.

In model (3), the significance of the bank-specific variables remains unchanged. In addition, GDP has a positive and statistically significant coefficient; a result that can be explained by the fact that a high GDP is more likely to provide an intensive environment for banks for better stability. The coefficient of the inflation variable is positive but not significant, implying that the rise in price levels in the economy has no impact on the probability of bank insolvency.

In model (4), the results obtained indicate that inflation and GDP have positive but insignificant coefficients, and that the significance of the other variables has not been affected compared with that obtained in model estimation (3).

Long-term financial stability of banks

Table 3 below provides the results of determinants of long-term bank financial stability.

Table 3. Determinants of Long-Term Bank Financial Stability

Variables	Model (1)	Model (2)	Model (3)	Model (4)
PTRT	0.167 (0.000) ***	0.216 (0.000)***	0.222(0.000) ***	0.176 (0.000) ***
COIN	0.008 (0.001)***	0.0141 (0.000)***	0.022 0.000)***	0.011 (0.000) ***
LOAS	0.007 (0.029) **	0.008 (0.007)**	0.009 (0.007)**	0.007 (0.031)*
INDI	-0.004 (0.583)	-0.013 (0.103)	-0.008 (0.374)	0.0009 (0.907)
BAZIS	1.152 (0.105)	1.452 (0.045) ***	1.192 (0.161)	0.788 (0.346)

Table 3. Determinants...

Variables		Model (1)	Model (2)	Model (3)	Model (4)
CRRK		-	0.033 (0.237)	0.037 (0.271)	-
MRKC			1.182 (0.707)	0.365 (0.914)	-
GDP		-	-	-0.004 (0.955)	-0.012 (0.858)
INF		-	-	-0.085 (0.160)	-0.091 (0.117)
DUMMY		-1.967 (0.286)	-2.490 (0.160)	-2.834 (0.102)	-2.242 (0.219)
Constant		0.208 (0.948)	-2.189 (0.594)	-0.711 (0.881)	1.745 (0.644)
R-squared	Within	0.028	0.036	0.041	0.034
	Between	0.161	0.249	0.374	0.209
	Overall	0.041	0.049	0.077	0.055

The figures in brackets are p-values.

*: significant at 10%

**: significant at 5%

***: significant at 1%

Source: own elaboration.

The results of model estimates (1) show a positive but insignificant relationship between bank size and long-term financial stability. These results also show that the coefficient of the revenue diversity ratio is negative but not significant. Regarding the profitability ratio, the results obtained show that its coefficient is significantly positive, which implies that banks with high profitability are financially more stable in the long term than those with low profitability. Moreover, these results show that the efficiency ratio is positively associated with the financial stability of banks over the long term. Similarly, the positive impact of the liquidity ratio indicates that banks with high liquidity tend to have a high Z-score.

In model (2), the coefficient of the credit ratio is positive but not significant, implying that credit risk does not have a significant impact on the financial stability of banks in the long run. Furthermore, the coefficient of the market concentration ratio is negative but statistically insignificant. The inclusion of the concentration and credit ratios in the estimated models did not significantly affect the significance of the other explanatory variables, except that none of the estimated coefficient on bank size becomes significantly posi-

tive. Thus, banks with more assets tend to have a higher Z-score; a finding that can be explained by the fact that large banks can better withstand adverse economic conditions. In addition, large banks have a higher capital base and greater strength than smaller banks, and they experience less fluctuations in income over the long term.

In the model (3), the significance of the bank-specific variables remains unchanged, and that the coefficients of the inflation and GDP variables are negative but insignificant. This implies that rising price levels in the economy and GDP have no impact on banks' financial stability in the long run.

In model (4), the significance of the other bank-specific and macroeconomic variables was not significantly affected except for the profitability ratio and GDP, which become insignificant.

Determinants of Bank Financial Stability: Differential Effects for Islamic and Conventional Banks

To test the differential effects of the determinants of short-term financial stability of Islamic and conventional banks, models (1), (2), (3) and (4) are estimated.

Financial stability of banks in the short term

The result of the panel estimates of these models are summarized in table 4 below.

Table 4. Differential effects of Short-Term Determinants of Financial Stability of Islamic and Conventional Banks

	Model (1)	Model (2)	Model (3)	Model (4)
PTRT *D ^{isl}	-0.245 (0.631)	-2.293 (0.000)***	-1.976 (0.000)***	-0.259 (0.526)
PTRT *D ^{con}	1.476 (0.508)	1.269 (0.645)	0.839 (0.647)	1.644 (0.373)
COIN *D ^{isl}	0.113 (0.000)***	0.125 (0.002)***	0.249 (0.000)***	0.136 (0.000)***
COIN *D ^{con}	0.364 (0.185)	0.194 (0.508)	0.144 (0.503)	0.437 (0.058)*
LOAS *D ^{isl}	0.199 (0.000)***	0.185 (0.000)***	0.149 (0.000)***	0.160 (0.000)***
LOAS *D ^{con}	0.115 (0.000)***	0.175 (0.000)***	0.190 (0.000)***	0.127 (0.000)***

Table 4. Differential...

		Model (1)	Model (2)	Model (3)	Model (4)
INDI*D ^{isl}		-0.010 (0.906)	0.063 (0.463)	0.132 (0.031)**	0.062 (0.379)
INDI*D ^{con}		0.170 (0.420)	0.383 (0.223)	0.330 (0.147)	0.155 (0.363)
BAZIS *D ^{isl}		12.299 (0.015)**	6.048 (0.279)	6.285 (0.183)	16.051 (0.000)***
BAZIS*D ^{con}		2.462 (0.625)	4.169 (0.562)	5.022 (0.385)	9.428 (0.030)**
MRKC*D ^{isl}			43.357 (0.239)	13.831 (0.638)	
MRKC*D ^{con}			-2.6731(0.939)	-5.893 (0.817)	
CRRK*D ^{isl}			-0.579 (0.060)**	-0.308 (0.206)	
CRRK*D ^{con}			1.461 (0.018)	1.667 (0.035)**	
GDP*D ^{isl}				3.378 (0.000)***	4.075 (0.000)***
GDP*D ^{con}				1.004 (0.112)	1.147 (0.165)
INF*D ^{isl}				0.303 (0.666)	0.248 (0.778)
INF*D ^{con}				0.574 (0.273)	0.595 (0.372)
Constant		-19.750 (0.355)	-35.613 (0.341)	-42.274 (0.147)	-60.650 (0.001)***
R-squared	Within	0.022	0.057	0.217	0.082
	Between	0.521	0.550	0.603	0.567
	Overall	0.253	0.297	0.460	0.340

The figures in brackets are p-values.

*: significant at 10%

** : significant at 5%

***: significant at 1%

Source : own elaboration.

The results of the model (1) show that the estimated coefficient of the profitability ratio (ROA) is not significant whatever the category of banks, which implies that bank profitability has no effect on the stability of Islamic and conventional banks in the short term. The results of the model estimates (1) also show that the coefficient of the efficiency ratio is significantly positive for Islamic banks but not significant for conventional banks, implying that only the financial stability of Islamic banks is positively affected by the efficiency factor in the short run. In addition, the stability of Islamic and conventional banks is positively affected by their liquidity levels as long as the coefficient of the li-

quidity ratio is significantly positive for both categories of banks. On the contrary, income diversity has no significant effect on the financial stability of banks in the short run. These results show that only the stability of Islamic banks is positively affected in the short term by the size factor, implying that large Islamic banks are more stable than small ones. On the contrary, no significant relationship between the stability of conventional banks and size was found, which could be explained by the fact that banks with more liquid assets can survive in the short term regardless of their size.

In model (2), the coefficient of the market concentration ratio is positive for Islamic banks, and negative for conventional banks but not significant in both cases. These results also show that the stability of Islamic banks in the short term is negatively affected by the credit ratio, unlike that of conventional banks, which is positively affected by this variable.

In model (3), no significant relationship was found between the inflation rate and the financial stability of Islamic and conventional banks in the short run. With respect to GDP, the results obtained show the existence of a significantly positive relationship between this variable and the financial stability of Islamic banks in the short term, and the absence of such a relationship between these two variables, in the case of conventional banks.

In the model (4), the significance is unchanged compared to that obtained from the model (3). However, the significance of some bank-specific variables is modified. Indeed, the coefficients of ROA and income diversity of Islamic banks lose their significance, and the coefficients of Islamic and conventional bank size become significant. Also, the efficiency ratio of conventional banks becomes significant.

LONG-TERM FINANCIAL STABILITY OF BANKS

Table 5 below summarizes the estimation results.

Table 5. Differential effects of the Determinants of Financial Stability of Islamic and Conventional Banks over the Long Term

	Model (1)	Model (2)	Model (3)	Model (4)	
PTRT *D ^{isl}	0.135 (0.003) ***	0.186 (0.001)***	0.194 (0.001)***	0.1402 (0.004)***	
PTRT*D ^{con}	0.092 (0.655)	0.151 (0.606)	0.171 (0.601)	0.1424 (0.537)	
COIN *D ^{isl}	0.003 (0.236)	0.0051 (0.231)	0.009 (0.162)	0.005 (0.194)	
COIN*D ^{con}	0.074 (0.014)**	0.0714 (0.028)**	0.079 (0.028)**	0.083 (0.013)**	
LOAS*D ^{isl}	0.0006 (0.864)	0.001 (0.767)	0.002 (0.706)	0.001 (0.809)	
LOAS*D ^{con}	0.009 (0.067)*	0.014 (0.029)**	0.013 (0.050)**	0.008 (0.104)	
INDI*D ^{isl}	-0.007 (0.380)	-0.01 (0.264)	-0.008 (0.406)	-0.0048 (0.590)	
INDI*D ^{con}	0.0071 (0.710)	0.005 (0.884)	0.014 (0.707)	0.0122 (0.567)	
BAZIS *D ^{isl}	0.098 (0.888)	0.429 (0.585)	0.191 (0.837)	-0.4073 (0.844)	
BAZIS*D ^{con}	-0.049 (0.944)	0.362 (0.721)	0.0730 (0.948)	-0.4073 (0.606)	
MRKC*D ^{isl}	-	1.082 (0.806)	0.531 (0.920)	-	
MRKC*D ^{con}	-	0.651 (0.870)	0.024 (0.996)	-	
CRRK*D ^{isl}	-	0.046 (0.148)	0.0521 (0.186)	-	
CRRK*D ^{con}	-	0.034 (0.762)	0.011 (0.929)	-	
GDP*D ^{isl}	-	-	-0.056 (0.613)	-0.059 (0.590)	
GDP*D ^{con}	-	-	-0.0042 (0.996)	-0.014 (0.890)	
INF*D ^{isl}	-	-	-0.041 (0.717)	-0.0530 (0.608)	
INF*D ^{con}	-	-	-0.082 (0.321)	-0.0829 (0.285)	
Constant	1.894 (0.512)	-0.795 (0.863)	0.724 (0.890)	3.204 (0.339)	
R-squared	Within	0.027	0.038	0.0394	0.0291
	Between	0.091	0.075	0.0865	0.0992
	Overall	0.068	0.060	0.0661	0.0728

The figures in brackets are p-values.

*: significant at 10%

** : significant at 5% **

***: significant at 1%

S o u r c e : own elaboration.

The results of model estimates (1) show that the coefficient of income diversity for conventional banks is positive but statistically insignificant. For Islamic banks, this coefficient is negative and statistically insignificant. Thus, for Islamic banks, a wide diversity of revenues lowers the Z-score and negatively affects their long-term financial stability, suggesting that the shift from credit-based operations to other sources of income could increase the risk of insolvency. This can be explained by the fact that Islamic banks, by applying the principle of loss sharing, may face problems of information asymmetry (Huda, 2012), which consequently leads to financial instability. For conventional banks, a wide range of revenues increases the value of Z-score, which means that non-interest activities (commissions, fees, and trading and asset management revenues) could increase the financial stability of these banks over the long term. Regarding the cost-to-income ratio, its coefficient is positive and statistically significant for conventional banks, and positive but not significant for Islamic banks, indicating that conventional banks manage their costs better in relation to their revenues. This can be explained by the fact that conventional banks are older and more experienced and have good cost control compared to Islamic banks.

The results of model estimates (1) also show that the profitability coefficient (ROA) is significantly positive for Islamic banks, which implies that banks with high profitability tend to have high Z-scores and that this profitability contributes positively to long-term financial stability; a relationship that may be due to their compliance with Sharia rules. For conventional banks, the coefficient of the profitability ratio is positive but statistically insignificant implying that profitability does not significantly affect the financial stability of these banks in the long term.

Regarding size, its coefficient is positive but not significant for Islamic banks, and negative but not significant for conventional banks. This implies that small conventional banks are more stable than large ones.

Results also show that liquidity affects the financial stability of Islamic and conventional banks differently in the long run. Indeed, the coefficient of the liquidity ratio of Islamic banks is positive but statistically insignificant for Islamic banks, and positive and statistically significant for conventional banks. The positive sign of this coefficient indicates that banks with high liquidity tend to have a high Z-score and increased long-term financial stability. In other words, the increase in loans relative to deposits increases the Z-score since the main mission of conventional banks is to grant loans that are remunerated

by interest. This implies that the high liquidity of these banks reinforces their long-term financial stability.

In model (2), the market concentration ratio coefficient is positive but not significant for both Islamic and conventional banks, and that the credit ratio does not have a significant impact on the long-term financial stability of either type of bank. Concentration and credit ratios did not affect the significance of the other bank-specific variables, except for the size variable, which changes sign but retains its significance.

In model (3), results show that the estimated coefficients of GDP and inflation rates are negative but insignificant for both categories of banks, implying that there is no significant relationship between the long-term financial stability of Islamic and conventional banks and these two macroeconomic variables.

In the model (4), the results obtained show that the significance of the macroeconomic and bank-specific variables remains unchanged in comparison with that obtained from the model (3), except for the liquidity ratio of conventional banks, which loses its significance, and the impact of size, which becomes negative for both types of banks.

As a conclusion of the empirical analysis, the effects of the determinants of banks' financial stability are different depending on whether the bank is Islamic or conventional. Thus, Islamic and conventional banks contribute differently to the financial stability of the financial system because of the dissimilarities in the operating principles of the two types of banks. Islamic banks abide by the laws of sharia, while conventional banks operate with the interest rate.

■■■ CONCLUSION

This paper dealt theoretically and empirically with the financial stability of Islamic and conventional banks to study the contribution of Islamic finance to the financial stability of banks. The empirical analysis follows a three-step approach.

In the first step, the Z-score to assess long-term bank stability and the LADR ratio are calculated to measure short-term stability. Results show that Islamic banks are financially more stable in the short run but less stable in the long run. This result is valid even during the crisis period and after controlling for bank-specific and macroeconomic variables.

Second, the main determinants of the financial stability of Islamic and conventional banks are tested. Empirical analysis of the main determinants of

banks' financial stability shows that ROA, efficiency ratio, liquidity ratio and size significantly and positively affect the long-term financial stability of banks in the GCC countries. In the short term, the financial stability of banks is positively affected by the efficiency ratio, liquidity, bank size, and GDP, but negatively affected by bank profitability.

In the third step of the empirical analysis, the differential effects of these determinants on the stability of Islamic and conventional banks in the short and long run are tested. The results show that the effects of these determinants on the financial stability of Islamic and conventional banks differ according to the nature of the bank. The origin of this difference can be attributed to the nature of business practices adopted by each category of banks. The long-term stability of Islamic banks is thus positively affected by their rate of return (ROA). Whereas the stability of conventional banks is positively associated with their degree of liquidity and efficiency.

In the short term, the financial stability of Islamic banks is positively influenced by the size factor, GDP, efficiency ratio, liquidity, and income diversity. But negatively affected by rates of profitability and credit. For conventional banks, their financial stability depends, among other things, on the size factor, credit and efficiency ratios, and bank liquidity.

The results of the paper are very important for banks' managements, investors, regulators, and policymakers. Specifically, the findings help us to better understand how bank-specific variables affect the financial stability of the banking system in the short and long term and how to strengthen its financial stability to achieve such stability of the financial system and of a country's economy in general. The results about macroeconomic variables imply that protective measures should be undertaken to enhance the positive effect of GDP on the banks stability and to lessen the negative effect of inflation on the financial system stability.

■■■ REFERENCES

- Abedifar, P., Ebrahim, S.M., Molyneux, P., & Tarazi, A. (2015). Islamic banking and finance: Recent empirical literature and directions for future research. *Journal of Economic Surveys*, 29(4), 637-670. <http://dx.doi.org/10.1111/joes.12113>.
- Ariff, M., & Rosly, S.A. (2011). Islamic banking in Malaysia: Unchartered waters. *Asian Economic Policy Review*, 6(2), 301-319. <http://dx.doi.org/10.1111/j.1748-3131.2011.01208.x>.

- Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking & Finance*, 37(2), 433-447. <http://dx.doi.org/10.1016/j.jbankfin.2012.09.016>.
- Chakroun, A.M., & Gallali, M.I. (2015). Islamic Banks and Financial Stability: An Empirical Analysis of the Gulf Countries. *International Journal of Business and Commerce*, 5(3), 64-87.
- Ciukaj, R. (2016). Managing Financial Stability By The European Central Bank In The Period 2008– 2012. *Copernican Journal of Finance & Accounting*, 5(2), 57-72. <http://dx.doi.org/10.12775/CJFA.2016.015>
- Eyih, S., & Bouchetara, M. (2020). Islamic vs. conventional banking: efficiency and stability. A critical review of the literature. *Revue d'économie et de management*, 19(2), 167-177.
- Hasan, A.I., & Risfandy, T. (2021). Islamic banks' stability: Full-fledged vs Islamic windows. *Journal of Accounting and Investment*, 22(1), 192-205. <http://dx.doi.org/10.18196/jai.v22i1.10287>.
- Huda, A.N. (2012). The development of Islamic financing scheme for SMEs in a developing country: The Indonesian case. *Procedia-social and behavioral sciences*, 52, 79-186. <http://dx.doi.org/10.1016/j.sbspro.2012.09.454>.
- Islam, M.U., & Kozokov, S. (2009). *Stability of Islamic and Conventional banks, an empirical comparative analysis*. Master thesis. Sweden: Lund University.
- Kabir, M.N., & Worthington, A.C. (2017). The 'competition–stability/fragility' nexus: A comparative analysis of Islamic and conventional banks. *International Review of Financial Analysis*, 50(C), 111-128. <http://dx.doi.org/10.1016/j.irfa.2017.02.006>.
- Khan, F. (2010). How 'Islamic' is Islamic banking? *Journal of Economic Behavior and Organization*, 76(3), 805-820. <http://dx.doi.org/10.1016/j.jebo.2010.09.015>.
- Rashid, A., Yousaf, S., & Khaleeqzaman, M. (2017). Does Islamic banking really strengthen financial stability? Empirical evidence from Pakistan. *International Journal of Islamic and Middle Eastern Finance and Management*, 10(2), 130-148. <http://dx.doi.org/10.1108/IMEFM-11-2015-0137>.
- Sakarya, B. (2016). Financial Stability of Islamic (Participation) Banks in Turkey. *Munich Personal RePEc Archive*, 69451, 1-25.
- Suzuki, Y., Miah, M.D., Wanniarachchige, M., & Sohrab, U. (2017). *Banking and economic rent in Asia: Rent effects, financial fragility, and economic development*. London, NY : Routledge.
- Tekdogan, O.F., & Atasoy, B.S. (2021). Does islamic banking promote financial stability? evidence from an agent-based model. *Journal of Islamic Monetary Economics and Finance*, 7(2), 201-232. <http://dx.doi.org/10.21098/jimf.v7i2.1323>.
- Wahid, M.A., & Dar, H. (2016). Stability of Islamic versus Conventional Banks: A Malaysian Case. *Journal Ekonomi Malaysia*, 50(1), 111-132. <http://dx.doi.org/10.17576/JEM-2016-5001-09>.
- Youssef, M.H (2017). *Financial stability of Islamic and conventional banks*. Unpublished Thesis. Sweden: Lund University.

Zahra, S.F., Ascarya, A., & Huda, N. (2018). Stability measurement of dual banking system in Indonesia: Markov switching approach. *Al-Iqtishad Jurnal Ilmu Ekonomi Syariah*, 10(1), 25-52. <http://dx.doi.org/10.15408/aiq.v10i1.5867>.