Department of
Economics and Finance

UŇ

$Ù   UPŇ

1. Introduction

The finance-growth nexus has been extensively investigated in the literature, with mixed evidence: some studies reach the conclusion that financial development boosts

growth nexus, whilst the latter is relevant for the current debate on macro-prudential policies and the attempt by the BIS to identify the best EWIs. Our analysis also seeks to contribute to the on-going debate on whether the profit-and-loss sharing (PLS) paradigm of Islamic banking might lead to an optimal distribution of funds (Siddiqi, 1999), and on the role of Islamic finance in promoting economic growth rather than causing an increase in the price level by linking all financial transaction to real economic activities (Chapra, 1992; Mills and Presley, 999; Gulzar and Masih, 2015; Kammer et al., 2015).

In brief, our findings highlight significant differences between the two sets of countries. Specifically, the time series analysis provides evidence of long-run causality running from credit to GDP in countries with Islamic banks only. This is confirmed by the panel causality tests, although in this case short-run causality in countries without Islamic banks is also found. The layout of the paper is as follows: Section 2 briefly reviews the principles of Islamic banking; Section 3 describes the data; Section 4 outlines the methodology; Section 5 discusses the empirical results; finally, Section 6 offers some concluding remarks.

2. Islamic Banking

The principles of Islamic finance are based on the Quran, hadith[1] and Islamic jurisprudence (Sharia). The first is the prohibition of interest payment (Riba), defined by some Islamic scholars as usury, and by others as any pre-determined interest rate (Chong and Liu, 2009). In the Holy Quran, ten statements/verses condemned the practice of Riba or charging pre-determined interest rate. For example, the Surah/chapter al-Baqarah says: "O you who believe! Fear God and give up whatever remains of Riba (usury), if you are believers" (Quran 2:278). Another verse in the Surah al-Baqarah distinguishes between Riba and trading: "Allah has allowed trading and forbidden Riba (usury)" (Quran 2:275). Accordingly, many financial contracts are constructed on the basis of the difference between trading and Riba as well as Islamic jurisprudence (Sharia), for instance Musharaka (partnership), Mudharabah (profit-sharing), Murabahah (cost plus) and Ijarah (leasing) contracts[2]

existing or potential real ass

3. Data Description

We investigate the causal relationship between real credit to the private sector and real GDP in fourteen emerging countries with sufficiently long time series. These are divided into two groups (see Table 1): the first includes countries without Islamic banks, specifically Latin American countries with a similar level of development to those with Islamic banks, and without recent long periods of colonial history affecting their institutions (namely, Argentina, Brazil, Chile, Costa Rica, Ecuador, Guatemala, and Peru); the second includes countries with both Islamic and conventional banks according to the Bankscope database (Malaysia, Indonesia, Turkey, Iran, Jordan, Singapore and Tunisia). Oil exporting countries with Islamic banks are excluded from the sample since their economic growth might be mainly driven by oil revenues rather than financial development or credit. However, Iran has been included because its economy has many other industrial sectors and does not depend solely on oil revenues.

Table 1. Sample of Countries

Data Set 1 7 countries without Islamic Banks	Period	Data Set 2 7 countries with Islamic Banks	Period
Argentina	1993Q1-2013Q1	Indonesia	2001Q4-2013Q1
Brazil	2001Q4-2013Q1	Turkey	2001Q4-2012Q4
Chile	1997Q4-2013Q1	Iran	1994Q1-2007Q4
Costa Rica	2001Q4-2012Q4	Singapore	2003Q1-2013Q1
Ecuador	2001Q4-2012Q2	Jordan	1992Q1-2012Q4
Guatemala	2001Q4-2012Q4	Tunisia	2000Q1-2012Q4
Peru	1996Q1-2012Q4	Malaysia	2001Q4-2012Q4

The data source is the International Monetary Fund (IMF) database. The (seasonally adjusted) series are credit to the private sector (Cr), gross domestic product (GDP) and the consumer prices index (CPI). These have been logged and real credit (RCr) and GDP (RGDP) series have been created using the price deflator. Following the IMF definition of credit,[3] we calculated credit aer5] TJ0 1 181.34 244.61 Tm[(c)4(re09(pr4nTTBTd(c)4 0 0 1Tmnb4(re)-2t[(a]

Table 2 reports descriptive statistics and the Jarque-Bera test (JB) for normality for the two series in both sets of countries. Of those with Islamic banks, Jordan and Indonesia respectively have the lowest and highest economic output and volume of credit to the private sector (see Table 2, Panel B). The corresponding countries among those without Islamic banks are Costa Rica and Brazil (see Table 2, Panel B). In addition, the standard deviations for both series are higher in the countries with Islamic banks.

On the basis of the JB test the null of normality cannot be rejected for credit in Brazil, Chile, Costa Rica, Ecuador, Guatemala, Indonesia, Singapore and Malaysia; on the other hand, it is in the case of Argentina, Peru, Iran and Jordan at the 1% level. As for GDP, normality is rejected in four countries, namely Argentina, Peru, Iran and Jordan. Credit to the private sector exhibits excess kurtosis and skewness in three countries (Argentina, Peru and Iran), and so does GDP in two cases (Argentina and Iran). Skewness is positive in all cases, the only exception being Singapore, whose GDP is negatively skewed (see Table 2).

3. **Methodology**

In the cointegration analysis, if the Engle-Granger (1987) and Johansen (1988, 1995) tests produce contradictory results, more weight is attached to the former given the poor finite sample properties of the latter (see Banerjee et al., 1986; Demetriades and Hussein, 1996) and the fact that, being a two-stage residual-based test, any error occurring in the first stage is passed directly onto the second stage (Asteriou and Hall, 2015). In the case of causality inference, we follow Demetriades and Hussein (1996): if the findings from the VECM and VAR specifications differ, we place more weight on the former.

Time-series techniques have been criticised because small sample distortions can affect the power of standard unit root and cointegration tests (see Christopoulos and Tsionas, 2004). These issues can be addressed using panel approaches (Ang, 2008) to carry out cointegration tests with higher power (Persyn and Westerlund, 2008). With this in mind, we apply various panel methods as well to check the robustness of our findings (see below).

5. Empirical Analysis

5.1 Unit root tests

As a first step, we carry out a battery of unit root tests to examine the stochastic properties of the individual series using Augmented Dickey-Fuller (ADF

8

The results from the diagnostic tests for the residuals are displayed in Table 4. The LM tests provide no evidence of any remaining serial correlation (see both Panels A and B). Further, the null hypothesis of both homoscedasticity and normality cannot be rejected in any cases. Thus, we conclude that the VAR models are data congruent and carry out the Johansen cointegration tests using the optimal lag length reported in Table 4.

Table 4. VAR lag length and diagnostic tests

Panel A: Countries without Islamic Banks.

Country	Argentina	Brazil	Chile	Costa Rica
	[$k=5$]	[$k=5$]	[$k=3$]	[k

possible estimators one could use, such as OLS, Fully Modified OLS (FMOLS) and Dynamic OLS (DOLS). In their comprehensive study, Kao and Chiang (2000) found that

There is evidence of short-run bidirectional causality in three out of the seven countries with Islamic banks (Iran, Singapore and Tunisia), and short-run unidirectional causality from real credit to the private sector to real GDP in Malaysia (see Table 11, Panel A). The weak exogeneity tests indicate that both variables are weakly exogenous at the 1% level in all countries with Islamic banks (at the 10% level in Indonesia only). Long-run causality from real GDP is found only in Jordan at the 5% level. The strong exogeneity tests imply bidirectional causality except for Indonesia and Turkey (see Table 11). It is noteworthy that in the long run real GDP causes real credit to the private sector in the countries without Islamic banks, while causality runs in the opposite direction in the countries with Islamic banks. In brief, our results provide strong evidence of long-run causality running from real credit to real GDP and weak evidence of bidirectional short-run causality in countries with Islamic banks. In contrast, for the countries without Islamic banks there is strong evidence of long-run causality running from real GDP to real credit.

Table 11. ECM test with Johansen cointegrating vectors for countries with Islamic banks

Panel A :Ho: Cr

		SR Granger non-causality test ($H_0: \beta_1 = 0$)		LR Weak-exogeneity test ($H_0: \alpha_1 = 0$)			SR+LR Strong-exogeneity test($H_0: \alpha_1 = \beta_1 = 0$)
Country	K	F-statistic[a]	*p*-values	Coeff ECT(-1)	t-statistic	*p*-values	F-statistic

16

As for countries with Islamic banks, causality runs from real credit to real GDP in Singapore, and in the opposite direction in Malaysia; there is bidirectional causality in Iran and Tunisia, and no causality in either directions in Indonesia, Turkey and Jordan. These results are consistent with those from the ECM tests. There is no sign of misspecification according to the diagnostic tests (not reported).

The panel causality test results are shown in Table 13. As already mentioned, the lag length is selected according to the Schwarz Bayesian Criterion subject to the removal of the serial correlation in the error term. In the countries with Islamic banks, long-run causality from real credit to real GDP is found at the 5% level while the F-statistic fails to reject the null hypothesis of no causality in the short run (see Table 13, Panel A2). By contrast, short-run causality from real credit to GDP is found for countries without Islamic banks (see Table 13, Panel A1). There is strong evidence of long-run causality from real GDP to real credit in both sets of countries, but no evidence of short-run causality (see Table 13, Panel B). However, bidirectional causality in the long run is found in the countries with Islamic banks. The diagnostic tests (not reported) suggest data congruence.

Table 12. Causality tests between real GDP and real Credit bTJET EMC *P* &CID P an6.385le

On the whole, the long-run results obtained from the two approaches are rather similar: both suggest that real GDP causes real credit in the countries without Islamic banks except for Ecuador, whereas there is causality in the opposite direction in the countries with Islamic banks. Bidirectional long-run causality is found in two countries without Islamic banks (Chile and Ecuador, at the 1% level) and one with Islamic banks (Jordan, at the 5% level). However, there are differences between the two sets of short-run results: the panel tests suggest that short-run causality runs from real credit to real GDP in countries without Islamic banks (and that there is bidirectional causality in three of them, i.e. Iran, Singapore and Tunisia), whilst the time-series ones do not detect any.

Table 13. Results of the Panel causality tests

	Panel A :*Ho:* *Cr*					
	SR Granger non-causality test ($_0$: $_{1,,}$ = 0)		LR Weak-exogeneity test ($_0$: $_1$=0)		SR+LR Strong-exogeneity test($_0$: $_{1,,}$ = $_{1,}$ = 0)	
K	F-statistic	*p*-values	t-statistic	*p*-values	F-statistic[a]	*p*-values
Panel A1. Countries Without Islamic banks						
5	5.315	0.000***	-0.495	0.620	5.240	0.000***
Panel A2. Countries With Islamic banks						
5	0.875	0.453	-2.471	0.014**	2.119	0.078*

Panel A2. All Countries

6. Conclusions

This paper has examined the relationship between real credit to the private sector and real GDP in two sets of emerging countries, with and without Islamic banks, with the aim of shedding light on the effects of Islamic banking on economic growth. Our extensive cointegration and causality analysis provides strong evidence of long-run causality running from real credit to real GDP and weak evidence of short-run causality in both directions in the countries with Islamic banks. In contrast, long-run causality appears to run in the opposite direction, i.e., from real GDP to real credit, in the countries without Islamic banks. These differences between the two sets of countries can be plausibly attributed to the distinctive features of Islamic banks, which provide loans to projects that are directly linked to real economic activities and are not allowed to engage in speculative transactions, in this way improving the allocation of resources in the economy and boosting long-run economic growth.

Therefore one could argue that policy makers aiming to stimulate growth should regulate commercial banks to increase the proportion of credit to productive investment and impose limits on engaging in speculative transactions; this is clearly an important issue, given the current debate on the causes of the global financial crisis, and the mounting evidence that excessive credit growth to finance speculative, unproductive activities was one of its main causes (see Bernanke, 2009 and Turner, 2009). In addition, they should favour a bigger market share for Islamic banks in the countries where they are present.

Future research should also consider possible nonlinearities in the relationship between credit and growth, and examine the robustness of the results by using other measures of credit such as total credit, the credit-to-GDP gap, credit to non-financial sector etc. (see Drehmann et al. 2011, and Drehmann and Tsatsaronis, 2014).[11]

---

[11] Note, however, that the new data set constructed by the BIS (Total credit to the non-financial sector) is only available for 40 advanced and emerging economies.

References

Abduh, M. & Omar, M.A. (2012) "Islamic banking and economic growth: the Indonesian experience", *International Journal of Islamic and Middle Eastern Finance and Management,* 5(1), 35-47.

Ang, J.B. (2008) "A survey of recent developments in the literature of finance and growth", *Journal of Economic Surveys,* 22(3), 536-576.

Ang, J.B. & McKibbin, W.J. (2007) "Financial liberalization, financial sector development and growth: evidence from Malaysia", *Journal of Development Economics,* 84(1), 215-233.

Ariff, M. (1988) "Islamic Banking", *Asian-Pacific Economic Literature*, 2(2), 48-64.

Askari, H. (2012) "Islamic finance, risk-sharing, and international financial stability", *Yale Journal of International Affair,* 7(1), 1–8.

Asteriou, D. & Hall, S. (2015) *Applied econometrics,* 3nd edn, Palgrave Macmillan, Basingstoke.

Banerjee, A. (1999) "Panel data unit roots and cointegration: an overview", *Oxford Bulletin of Economics and Statistics,* 61(S1), 607-629.

Banerjee A, Dolado J.J., Galbraith JW. & Hendry DF. (1993), *Co-integration, Error Correction, and the Econometric Analysis of Non-Stationary Data.* Oxford University Press: Oxford.

Banerjee, A., Dolado, J.J., Hendry, D.F. & Smith, G.W. (1986) "Exploring equilibrium relationships in econometrics through static models: some Monte Carlo evidence", *Oxford Bulletin of Economics and Statistics,* 48(3), 253-277.

Basel Committee on Banking Supervision (BCBS) (2010) Guidance for national authorities operating the countercyclical capital buffer Basel Committee, Switzerland, December.

Beck, T., Degryse, H. & Kneer, C. (2014) "Is more finance better? Disentangling intermediation and size effects of financial systems", *Journal of Financial Stability,* 10(0), 50-64.

Berg, N. & Kim, J. (2014) "Prohibition of Riba and Gharar: A signaling and screening explanation?", *Journal of Economic Behavior & Organization,* 103, S146-S159.

Bernanke, B.S. (2009)"The crisis and the policy response", *Speech at the Stamp Lecture, London School of Economics, London, 13 January.*

Berthelemy, J. & Varoudakis, A. (1996) "Economic growth, convergence clubs, and the role of financial development", *Oxford Economic Papers,* 48(2), 300-328.

Breitung, J. & Pesaran, M.H. (2008) *Unit Roots and Cointegration in Panels,* Springer Berlin Heidelberg. 23

Johansen, S. (1988) "Statistical analysis of cointegration vectors", *Journal of Economic Dynamics and Control,* 12(2), 231-254.

Johansen, S. (1995) *Likelihood-based inference in cointegrated vector autoregressive models,* Oxford University Press, Oxford; New York.

Johnson, K. (2013) "The role of Islamic banking in economic growth", CMC Senior Theses. Paper 642. Available at http://scholarship.claremont.edu/cmc_theses/642.

Juselius, K. & MacDonald, R. (2004) "International parity relationships between the USA and Japan", *Japan and the World economy,* 16(1), 17-34.

Majid, S.A. & Kassim, S. (2010) "Islamic finance and economic growth: The Malaysian experience". Paper presented in Kuala Lumpur Islamic Finance Forum, Kuala Lumpur, 2-5 August 2010.

McKinnon, R.I. (1973) *Money and capital in economic development,* the Brookings Institution, Washington, D. C.

Mills, P.S. & Presley, J.R. (1999) Islamic Finance: Theory and Practice. St. Martins Press, New York.

Mohieldin, M. (2012) "Realising the potential of Islamic finance", *World Economics,* 13(3), 127-142.