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**Impact of Financial Openness on Financial Sector
Development in the Arab Region: An Empirical
Modeling Approach**

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**Impact of Financial Openness on Financial Sector
Development in the Arab Region: An Empirical
Modeling Approach**

Contents

Abstract	4
1. Introduction	5
2. Literature review	8
3. Model and data	10
3.1. Model	10
3.2. Insights on financial development and financial openness	12
4. Econometric approach	15
5. Empirical evidence	17
5.1. Descriptive analysis	17
5.2. Unit root tests	19
5.3. Discussion of the results	20
6. Conclusion and policy recommendations	23
References	25

Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

Abstract

The study attempts to examine the effects of financial openness on the evolution of the financial sector for a set of Arab countries over the 1980-2020 period. The purpose is to assess whether the empirical findings comply with the theoretical expectations that financial openness favors financial development. The study employs the Pooled Mean Group (PMG) approach, developed by Pesaran et al. (1999), to estimate a dynamic heterogeneous model by including per capita real GDP and inflation into the analysis to obtain unbiased results and enhance the understanding of the channels through which financial openness affects financial development.

The results indicate that financial openness, economic activity, and price stability are relevant drivers of financial development in the long run. However, in the short-term, only financial openness and inflation exert a significant impact on financial development. The non-significance of the per capita real GDP implies that transitory economic changes may not influence the financial sector. Policymakers could consider these findings when establishing policies to ensure sustainability and stability of the financial sector over the long run.

Keywords: Financial openness, financial systems, PMG approach, Arab region

JEL Classification: C33, C58, E30, F36

1. Introduction

Financial openness refers to the extent to which a country allows the inflow and outflow of international capital into its economy. It encompasses measures related to allocation of capital abroad, ease of foreign investment into local markets, and absence of restrictions on international financial transactions. Various metrics can be used to assess financial openness, such as, among others, the financial openness index, developed by Chinn and Ito (2002), which measures the level of restrictions on capital movement and exchange rate systems in different countries; the financial liberalization index suggested by Abiad and Mody (2005) and based on privatization, entry barriers, interest rate controls, credit controls, international transactions, and regulations; and the constituent components of capital inflows (foreign direct investment, external debt, and portfolio equity), as introduced by Indawan (2020).

Financial development pertains to strategies and actions enhancing the depth, accessibility, efficiency, and stability of the financial sector. It encompasses the evolution of financial markets, financial institutions, laws and regulations, and financial infrastructure that enhance economic growth. Different metrics can be used to evaluate financial development, such as, among others, banking indicators, size of stock markets, availability of financial services, financial

Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

stability indicators, and the International Monetary Fund's (IMF) index that includes several financial variables.¹

Financial openness experiences many implications for sustained financial sector development. Most importantly, it improves accessibility to finance and facilitates risk diversification, allowing investors to allocate their investment portfolios across countries. In addition, financial technologies exchange enhances innovation and effectiveness within domestic financial institutions. Nevertheless, the sensitivity of financial sector development to financial openness is influenced by several factors, such as macroeconomic stability, legal and institutional frameworks,² and the ability to manage external shocks, implying that the nexus between financial openness and financial development is complex.

Previous studies on financial openness within the Arab region have mainly examined the assessment of the extent and patterns of linkages between stock markets. The current research investigates the

¹ The current study employs the Chinn-Ito's and IMF's indexes to assess the nexus between financial openness and financial development by controlling for auxiliary variables into the model.

² Financial sector requires robust legal and institutional frameworks to fully take advantage of increased financial openness (see Chinn and Ito, 2002). In this context, Chinn and Ito (2006) argue that financial systems characterized by advanced legal and institutional frameworks experience more noticeable benefits from financial liberalization in contrast with financial systems with lower levels of development.

Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

potential effects of financial openness on financial sector development within a set of selected Arab countries from 1980 to 2020. The objective is to evaluate whether the empirical findings are aligned with the theoretical hypothesis that financial openness supports financial sector development. For this purpose, we make use of the PMG approach that consists in estimating a dynamic heterogeneous model. The model uses inflation and real GDP per capita as control variables to accurately measure how the financial sector develops in response to short- and long-term changes in financial openness, thus giving Arab governments useful policy implications.

The empirical findings comply with the theoretical expectations in the long run, as financial openness, economic activity, and price stability are relevant drivers of financial sector development. In the short run, only financial openness and inflation affect the financial sector. The non-significance of per capita real GDP can be due to the fact that transitory changes in economic activity may not affect the financial sector clearly. The positive nexus between financial sector development and inflation in the short term implies that a moderate level of inflation may potentially lead to immediate financial activity. Policymakers may consider these outcomes to establish pertinent policies that enhance sustainability and stability of the financial sector in the long run.

The rest of the paper is organized as follows. Section 2 provides an overview of prior research in the field. Section 3 introduces the model, data, and some insights on financial development and financial openness in the considered countries. Section 4 outlines the econometric methodology to examine the nexus between financial development and financial openness. Section 5 discusses the empirical findings. Concluding comments and policy recommendations are provided in Section 6.

2. Literature review

This section provides a brief overview of prior research on the relationship between financial development and financial openness. Indeed, Chinn and Ito (2002) reveal a significant relationship between financial development and financial openness, with the magnitude depending on the specific metric used to assess financial development. This relationship heavily depends on the level of legal and institutional development in the emerging markets. In a similar context, Chinn and Ito (2006) show evidence of a positive nexus between financial development and financial openness from 1980 to 2000, with a more pronounced relationship in developing markets and contingency upon a threshold level of legal and institutional development. Baltagi et al. (2009) find that financial openness and economic institutions exert a significant impact on financial development for various countries.

Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

Law (2009) reveal that capital flows and trade openness play a significant role in affecting financial development in developing economies. It is also found that institutional quality and competition influence the nexus between financial development and trade openness. García (2012) points out that financial openness significantly influences the development of financial systems in transition economies. Devereux and Yu (2020) find that increased financial integration favors the occurrence of crises in specific countries. In a similar vein, Inekwe and Valenzuela (2020) indicate that capital restrictions could play a crucial role in reducing the repercussions of financial integration on the occurrence of banking crises. Using several metrics to assess capital inflows and financial development, Indawan (2020) reveal a positive relationship between financial openness and many measures of financial development.

Islamaj and Kose (2022) show evidence of a positive connection between aid flows and remittances, thus enhancing international risk sharing. However, there is evidence of insignificant linkages between enhanced risk sharing results and different metrics of capital flows. Taşdemir (2023) shows that international financial integration has a significant impact on financial development, with some potential risks especially when the level of financial integration exceeds a certain threshold for both advanced and developing countries over the 1990-2019 period.

3. Model and data

3.1. Model

To assess the responses of financial sector development to the changes of financial openness, while controlling for two macroeconomic variables into the analysis, we consider the following panel data model:

$$FD_{it} = \alpha_0 + \alpha_1 FO_{it} + \alpha_2 LRGDPC_{it} + \alpha_3 INF_{it} + u_{it} \quad (1)$$

where the cross-section index i pertains to the country, whereas the time-dimension index t corresponds to the time period associated with each country, FD_{it} is the IMF's financial development index,³ FO_{it} is the financial openness index developed by Chinn and Ito (2002),⁴ $LRGDPC_{it}$ is the log per capita real GDP (PPP), which

³ According to the IMF, *the financial development index is a relative ranking of countries on the depth, access, and efficiency of the financial markets index and the financial institutions index*. The index values range between 0 and 1, where a higher value indicates a more developed financial sector.

⁴ The financial openness index is constructed using binary dummy variables that represent the classification of restrictions on international financial transactions as suggested in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)*. The index measures the extent to which a country allows the movement of capital across borders, where a higher value refers to greater financial openness and lower values refers to more barriers.

Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

measures the level of economic development, INF_{it} is the inflation rate,⁵ and u_{it} is the error term.

We consider a panel of eight Arab countries (Algeria, Egypt, Jordan, Lebanon, Libya, Morocco, Sudan, and Tunisia) based on annual data over the 1980-2020 period. The selection of the time period is dictated by data on financial openness, which is available until 2020. On the other hand, the considered period is long enough to investigate the long run nexus between financial sector development and financial openness, by incorporating macroeconomic auxiliary factors into the analysis, within the framework of panel data models.

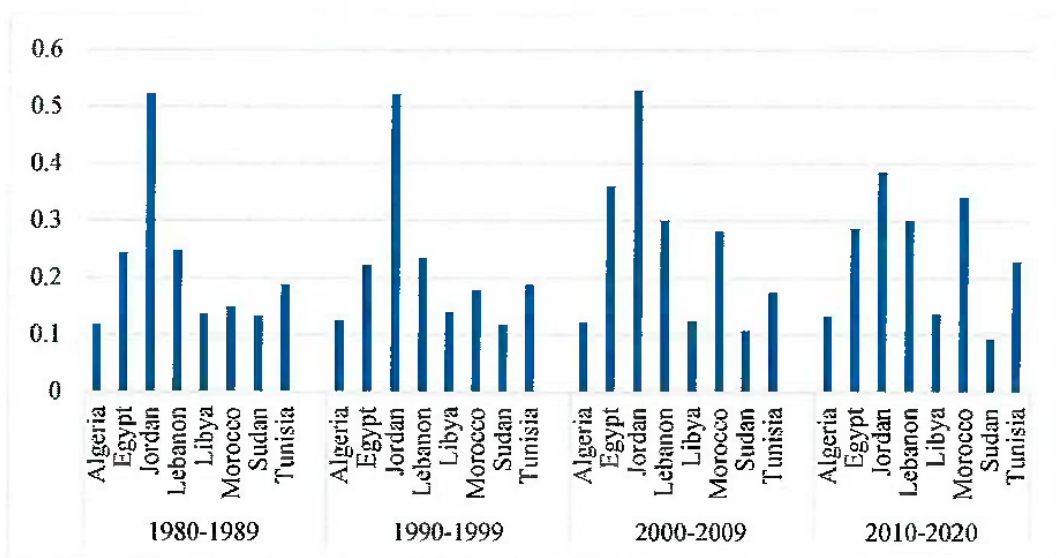
The inclusion of per capita real GDP into the analysis is aligned with prior research in the field (see, inter alia, Chinn and Ito, 2006) and allows us to understand the interaction of economic activity with financial sector development. The inflation is also considered an important auxiliary variable in examining the nexus between financial development and financial openness, as outlined in Chinn and Ito (2006). Indeed, it influences the financial decisions of the economy's players, especially in terms of saving and investment, in response to evolving economic conditions.

⁵ The per capita real GDP is collected from the IMF's database, while the inflation rate is extracted from the IMF's and World Bank's databases.

3.2. Insights on financial development and financial openness

The average values of the financial development index across the considered countries over four decades, as reported in Figure 1, reflect the evolving financial sector development over time. Jordan shows superior performance in terms of financial development over all decades, due to the favourable climate characterized by the establishment of proactive financial policies and strong regulatory frameworks and reforms, reflecting Jordan's commitment to achieving a sustainable and resilient financial sector. Lebanon and Egypt experience acceptable financial development averages, reflecting the resilience of their financial systems to external shocks. Lebanon, historically recognized for its robust banking industry, continues to maintain its standing, and Egypt establishes effective reforms aimed at enhancing its financial sector.

Figure 1. Evolution of the financial development index over time



Source: Data collected from the IMF's database

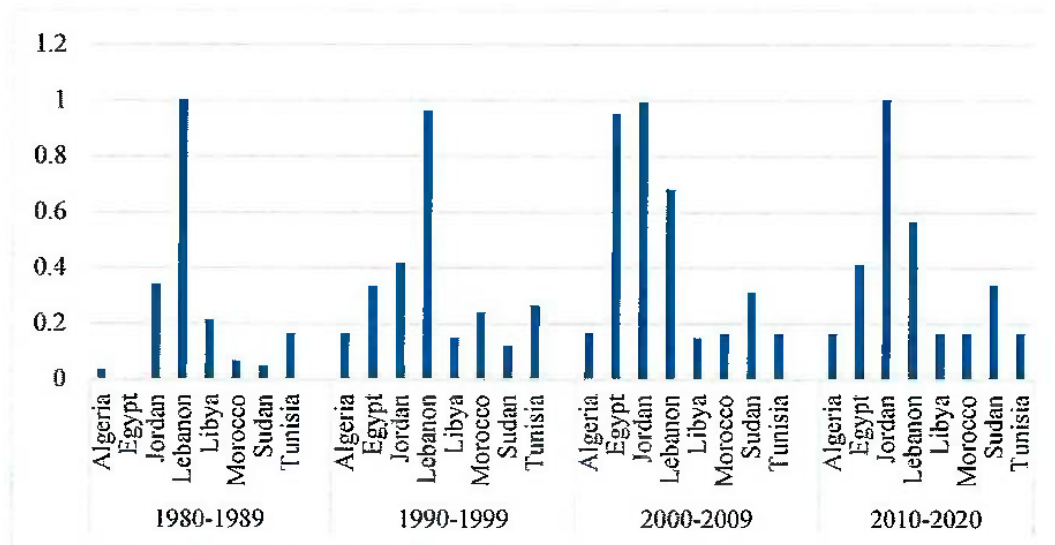
Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

Algeria and Morocco experience steady increases in their financial sector, due to economic diversification and reforms in Algeria, thus creating more advanced financial environment; and to Morocco's strategy focusing on establishing regulatory reforms. Sudan continuously has lower financial development averages, due to, among others, political instability, poor financial infrastructure, and economic crises, which prevent Sudan's efforts from implementing regulatory reforms to achieve a sustainable and resilient financial system. Similarly, the economic and political unrests occurred in Libya influence its financial system. In contrast, the political stability in Tunisia may contribute to the clear and continuous trend in its financial sector development.

The average financial openness averages across the countries under study over the considered period, as presented in Figure 2, shed some light on the degree to which the considered Arab economies are committed to cross-border financial transactions. Lebanon experiences relatively high financial openness levels across the considered period, with its maximum in the 1980s. Jordan has increasing financial openness degrees, reflecting its engagement in integrating into the international financial landscape, due to its strategic geographical positioning that significantly leads to its overall openness.

**Impact of Financial Openness on Financial Sector
Development in the Arab Region: An Empirical
Modeling Approach**

Figure 2. Evolution of the financial openness index over time



Source: Data collected from the Chinn-Ito's database: http://web.pdx.edu/~ito/Chinn-Ito_website.htm

Egypt experiences notable increases from the 1980s to the 2000s and declines in the 2010s, which may be due to policy changes or economic factors. Libya shows volatile financial openness averages, due to financial challenges. Algeria, Morocco, Sudan, and Tunisia experience comparatively lower financial openness degrees. The Algeria's historically conservative position towards international financial integration may explain the persistent low financial openness levels. Morocco and Tunisia preserve varied and moderate financial openness levels. Despite the increase in Sudan's financial openness level in the 2010s, due to sanctions removal, its total rating continues to be weak, underscoring persistent financial challenges.

4. Econometric approach

The PMG methodology developed by Pesaran et al. (1999) within the framework of dynamic heterogeneous panel data models is applied to examine the nexus between financial development and financial openness by controlling for macroeconomic auxiliary variables into the analysis. The method allows heterogeneous short run coefficients and error variances across countries, while maintaining the constraint of identical long run coefficients.

Analytically, we consider the following Autoregressive Distributed Lag, ARDL(p, q), model:

$$y_{it} = \mu_i + \delta_i t + \sum_{j=1}^p \beta_{ij} y_{i,t-j} + \sum_{j=0}^q \gamma_{ij} X_{i,t-j} + \varepsilon_{it} \quad (2)$$

where $i = 1, 2, \dots, 8$ and $t = 1, 2, \dots, 41$. Y_{it} is the financial development index (FD_{it}), X_{it} is a (3×1) vector of independent variables, namely the financial openness index (FO_{it}) as the main variable and the control variables, the log per capita real GDP, $LRGDPC_{it}$, and the inflation rate, INF_{it} , ε_{it} is the disturbance term, and p and q are the model lag lengths, which are selected by the Schwarz criterion.

In order to assess the short run dynamics and long-term effects of the linkages between financial development and financial openness in

presence of macroeconomic factors, we estimate the following error correction model:⁶

$$\Delta y_{it} = \mu_i + \delta_i t + \theta_i (y_{i,t-1} - \varphi_i' X_{it}) + \sum_{j=1}^{p-1} \beta_{ij}^* y_{i,t-j} + \sum_{j=0}^{q-1} \gamma_{ij}^* X_{i,t-j} + \varepsilon_{it} \quad (3)$$

where Δ indicates the first difference operator, $(y_{i,t-1} - \varphi_i' X_{it})$ is the long run relationship between financial development and the independent variables, $(\theta_i = \sum_{j=1}^p \beta_{ij} - 1)$ is the error correction term coefficient, which is expected to be negative and statistically significant. It measures the rate at which the financial development adjusts towards its long-term equilibrium state following any disruptions in the independent variables over the previous year. The coefficients vector $(\varphi_i = \frac{\sum_{j=0}^q \gamma_{ij}}{1 - \sum_{j=1}^p \beta_{ij}})$ measures the long run effects of the independent variables on financial development, and the coefficients $(\beta_{ij}^* = -\sum_{l=j+1}^p \beta_{il})$ and $(\gamma_{ij}^* = -\sum_{l=j+1}^q \gamma_{il})$ assess the short run reactions of financial development to the changes in the independent variables. The maximum likelihood method is employed to obtain estimators that are consistent and asymptotically normally distributed.

⁶ Note that the short-term estimates are determined by computing the average of the coefficients across different countries.

5. Empirical evidence

5.1. Descriptive analysis

The descriptive statistics presented in Table 1 provide an overview of the financial and economic conditions in the considered Arab countries over the 1980-2020 period. There is evidence of a moderate level of financial development on average, with limited variability, as indicated by the standard deviation values. Similarly, the statistics show a moderate average degree of financial openness, with higher variability, implying significant differences in financial openness policies across countries under study. The per capita real GDP experiences high variations in the economic activity level across countries in the region. Inflation demonstrates notable diversity across countries, characterized by a higher mean and standard deviation.

Table 1. Descriptive statistics

Variable	Mean	Median	Std. Dev.	Min	Max
FD	0.231	0.194	0.124	0.084	0.584
FO	0.346	0.164	0.328	0	1
RGDPC	11855.46	9244.193	9898.51	2523.973	77340.09
INF	14.635	6.073	34.867	-9.798	487.2

The correlation matrix reported in Table 2 reveals a moderate positive correlation (0.228) between financial openness and the log per capita real GDP, underscoring that multicollinearity may not be

**Impact of Financial Openness on Financial Sector
Development in the Arab Region: An Empirical
Modeling Approach**

of great significance. There is also evidence of a low positive correlation (0.111) between financial openness and inflation and a low negative correlation (-0.103) between the log per capita real GDP and inflation.

Table 2. Correlation matrix

Variable	FO	LRGDPC	INF
FO	1		
LRGDPC	0.228	1	
INF	0.111	-0.103	1

Although correlations provide preliminary insights, the Variance Inflation Factor (VIF) is employed to test multicollinearity between the independent variables. The VIF is calculated for each regressor to assess the collinearity between that regressor and the other independent variables. Indeed, if the VIF exceeds 4 (or if the tolerance, $1/\text{VIF}$, falls below 0.25), there is evidence of potential multicollinearity between the considered regressor and the other variables, and as a result, further investigation is required. A VIF greater than 10 (or a tolerance below 0.1) reveals substantial multicollinearity between the considered independent variable and the other variables, and as a result, a corrective method is required.

The VIF results reported in Table 3 show evidence of no multicollinearity between the considered variables, as the VIF values are approximately 1 (the tolerance values are above 0.9).

**Impact of Financial Openness on Financial Sector
Development in the Arab Region: An Empirical
Modeling Approach**

Accordingly, we opt for the above panel data model to examine the nexus between financial development and financial openness by considering the influence of macroeconomic auxiliary variables.

Table 3. Multicollinearity test results

Variable	VIF	1/VIF
FO	1.080	0.930
LRGDPC	1.070	0.931
INF	1.030	0.970

5.2. Unit root tests

Table 4. Panel unit root tests results

Variable	Level		First difference	
	IPS	ADF-F	IPS	ADF-F
FD	-1.09743	22.0331	-14.690 ^{***}	179.849 ^{***}
FO	-2.563 ^{***}	40.677 ^{***}	-11.370 ^{***}	128.107 ^{***}
LRGDPC	-0.293	22.396	-11.966 ^{***}	196.983 ^{***}
INF	-2.456 ^{***}	34.189 ^{***}	-15.586 ^{***}	212.077 ^{***}

Notes: IPS (Im, Pesaran, and Shin) and ADF-F (ADF - Fisher Chi-square) stand for individual unit root tests. The tests are applied based on a specification with individual intercept and trend. *** stands for stationarity at the 1% level.

The PMG method is inadequate for integrated variables of order two, I(2). For this purpose, we employ panel unit root tests to ensure that the variables are not I(2). The results presented in Table 4 reveal that financial development and log per capita real GDP are integrated of order one, I(1). However, financial openness and inflation are integrated of order zero, I(0), irrespective of the panel unit root test

applied. Consequently, the variables are either $I(1)$ or $I(0)$, suggesting the application of the PMG method to estimate the model.

5.3. Discussion of the results

Table 5 reports the estimate results of the model that examines the relationship between financial development and financial openness in presence of two additional macroeconomic factors in the long run and short run. Indeed, the results reveal a significant and positive impact of financial openness on financial development over the long run,⁷ which is in line with the fact that higher financial openness may lead to strengthen the development of the financial sector through stimulating the movement of capital and fostering the access to international financial markets.

The per capita real GDP is found to be a relevant driver of financial development over the long run, as the associated coefficient is statistically significant and positive. This outcome complies with the hypothesis that greater income and economic activity are positively linked to the development of financial systems through the involvement of individuals and businesses in financial transactions.

⁷ Chinn and Ito (2006) outline that financial openness plays a crucial role in influencing positively the stock markets of less developed and emerging economies over the 1980-2000 period. In a similar context, Hanh (2010) finds a positive nexus between financial openness and financial development in 29 developing Asian countries from 1994 to 2008.

**Impact of Financial Openness on Financial Sector
Development in the Arab Region: An Empirical
Modeling Approach**

The results also show that over the long run, inflation has the potential to affect financial development significantly and negatively. This outcome complies with the theoretical expectations that higher inflation generates uncertainty and hampers the settlement of a robust and effective financial sector, thus affecting the behaviour of economic agents who have to consider the related challenges when making saving, investment, and financial planning decisions.

Table 5. PMG estimate results

Variable	Coefficient	Std. Error
Long Run		
FO	0.015**	0.006
LRGDPC	0.046*	0.026
INF	-0.001***	0.207E-4
Short Run		
ECT	-0.214***	0.033
D(FO)	0.004**	0.002
D(LRGDPC)	0.037	0.069
D(INF)	0.001**	0.330E-4
Constant	-0.036***	0.013
Trend	-7.930E-05	0.240E-4

Notes: The estimated PMG model is an ARDL(1, 1, 1, 1); ECT stands for the error correction term coefficient; “D” stands for first difference; and the short run estimates are derived by computing the mean of the coefficients across different countries. ***, **, * stand for statistical significance at the 1%, 5%, and 10% levels, respectively.

In the short run, financial openness exhibits a significant and positive impact on financial development, suggesting that short-term changes in financial openness can immediately influence financial

Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

development. However, financial development does not respond significantly to the changes in per capita real GDP over the short run, implying that increases in per capita real GDP may not influence immediately financial development, which may be attributed to the short-term emphasis on current economic issues. There is also evidence of a significant and positive relationship between inflation and financial development over the short run, which may be explained by the fact that transitory moderate inflation can enhance financial activity. Indeed, during periods of moderate inflation, individuals demonstrate higher tendency to invest, while companies may forcibly try to find enhanced financial opportunities to effectively manage the risks imposed by inflationary pressures.⁸

As expected, the error correction term is statistically significant and negative, suggesting a stable long run relationship between financial development, financial openness, per capita real GDP, and inflation. The estimate value indicates that 21.4% of any divergence from the long run equilibrium state is corrected in the subsequent year. This outlines that the financial system responds to short run disruptions and returns to its long run equilibrium state in relation to financial openness, per capita real GDP, and inflation.

⁸ It is important to note that the positive nexus between financial development and inflation may be transitory, as persistent high inflation may have repercussions on the stability of financial systems in the long run.

6. Conclusion and policy recommendations

The study investigates the linkages between financial development and financial openness by considering two macroeconomic determinants as control variables for a set of eight Arab countries over the 1980-2020 period. The purpose is to check the theoretical hypothesis that cross-border financial transactions can play a crucial role in enhancing financial systems. The analysis is based on reliable econometric methods, thus contributing to the current debate on the nexus between financial development and financial openness.

The study reveals that financial openness, economic activity, and price stability are relevant drivers of the development of financial systems over the long run. In the short run, only financial openness and inflation exert a significant impact on financial development. Given these empirical outcomes, policymakers should prioritize actions and measures that address both short term and long-term issues.

As regards financial openness, it is important to make policies aiming at surmounting challenges to international capital flows and establishing pertinent legal and institutional frameworks to enhance sustainable economic growth, leading to support resilience and stability of financial systems. Furthermore, it is important to support sectors with high added value through the development of targeted actions and strategies. Another important factor of development of

Impact of Financial Openness on Financial Sector Development in the Arab Region: An Empirical Modeling Approach

financial systems is to ensure price stability through implementing effective monetary policies to mitigate inflationary pressures, thus creating a stable environment for financial systems to function effectively in the long run.

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**Impact of Financial Openness on Financial Sector
Development in the Arab Region: An Empirical
Modeling Approach**

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