

FINANCIAL LIBERALIZATION AND ECONOMIC GROWTH IN MOROCCO: A TEST OF THE SUPPLY-LEADING HYPOTHESIS¹

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This paper develops a vector error-correction model (VECM) to explore the linkages between economic growth and financial liberalization in Morocco. The econometric results provide support for the demand-following view of financial reforms, i.e., that economic growth leads finance. Contrary to the widely held stance (e.g., IMF and World Bank), this study does not find strong evidence in favor of the supply-leading view of financial development, i.e., that financial development causes economic growth. Perhaps other institutional reforms play a more crucial role in the impact of financial liberalization on economic growth.

I. INTRODUCTION

The relationship between financial development and economic growth constitutes an important topic in the literature² on financial intermediation and economic development. Numerous studies have stressed the important role of the financial sector in economic growth beginning with the work of [Bagehot \(1873\)](#),

¹ This is a revised version of a paper presented at the Western Economic Association International 77th annual conference, Seattle, in the session on Monetary Policy. The author is grateful for useful comments made by Bilin Neyabti.

² [Levine \(1997\)](#) provides an excellent discussion of the theory on the relationship between economic growth and financial development.

Schumpeter (1911); and later on, McKinnon (1973) and Shaw (1973). However, there are scholars who argue either that causality is nonexistent or that it runs in the opposite direction, from economic growth to financial development. For example, Robinson (1952), Lucas (1988), and Stern (1989) have suggested that finance has no – or only an insignificant – role in economic growth. Recent empirical literature in support of the positive effects of financial development on savings, investment and growth includes King and Levine (1993a, 1993b), Bencivenga and Smith (1991), Beck *et al.* (2000), and Balamoune and Chowdhury (2003). In particular, King and Levine (1993a) argue that “finance seems importantly to lead economics growth” (p. 730). The authors show that the level of financial development is a predictor of productivity improvement and economic development. This suggests that finance leads the process of development. On the other hand, Demetriades and Hussein (1996) find little empirical evidence in support of the supply-leading proposition.

In theory, the premise underlying the proposition that financial liberalization (a major component of financial development)³ promotes growth is fairly straightforward. Given that investment is a primary determinant (factor) of growth, for investment to take place, firms (investors) and savers must be given incentives. Moreover, savings have to be channeled to investors. Financial liberalization (financial development) ensures that this takes place efficiently (efficient financial intermediation). As interest rates rise, the quality of investments is enhanced, since financial repression is often associated with mediocre quality investments. In addition, investment (quantity) rises, since higher deposit rates increase the supply of funds. Successful cases of financial development or liberalization in emerging economies

³ The concepts of financial liberalization and financial development are often used interchangeably.

include South Korea, Singapore, Taiwan, and Thailand. For example, South Korea's real interest rates (deposit rates) rose from -0.7% in 1960-1964 to 14.3% in 1965-69. Over the same periods, its national saving rate increased from 4.9% to 12.9% and its average growth almost doubled, rising from 5.5% to 10% (see [Dornbusch & Reynoso 1989](#)).

In general, financial development in developing countries refers to the development of money and financial intermediation, not the development of capital markets (the latter is more predominant in developed countries). Thus, in the case of developed countries, financial deepening — a major goal of financial liberalization — pertains more to the activity of capital markets, while in the context of developing (and some emerging) economies, the study of financial deepening tends to focus on expansions in the activity of financial intermediaries, such as savings institutions and commercial banks.

The primary goal of this paper is to investigate the linkages between financial development and economic growth in an emerging economy. More specifically, using Moroccan data, the paper explores whether there is empirical support for the supply-leading proposition that finance leads growth. Although the case of Morocco (along with Tunisia and Algeria) was considered in [Jbili *et al.* \(1997\)](#), who evaluated financial reforms in the Maghreb region and the effects on private savings, the present study contributes to the literature in at least two ways. First, this paper uses a set of sophisticated econometric tools to explore the time series properties of the variables. The methodology includes tests for stationarity, tests for cointegration, and vector autoregressive-Granger causality tests. The paper clearly distinguishes between long-run and short-run effects. [Jbili *et al.* \(1997\)](#) did not differentiate between short-run and long-run effects, since they did not test for unit root and cointegration. As emphasized by Granger,

using nonstationary data in levels may lead to spurious regressions. Second, by extending the period under study to 1999, whereas the work of *Jbili et al.* extends only to 1995, more recent years under *financial liberalization* are included. This is quite important, as while financial development in Morocco began to take place in the mid-1980s, significant reforms were introduced only in the early 1990s. Such reforms may produce effects with significant lags. Allowing for a longer time period can significantly enhance the model and the underlying assumptions.

During the last two decades, international financial institutions, such as the World Bank and the IMF, have very often urged developing countries to liberalize their financial sectors. However, many nations are still reluctant to allow significant financial reforms to proceed, because, they claim, the effects on economic growth are not automatic and liberalization may in certain cases be destabilizing. Exploring the relationship between financial development and economic growth in the North African country of Morocco is an important undertaking. Since Morocco, Tunisia, and Egypt are all at similar stages of financial development (Morocco is slightly more advanced), the conclusions with regards to this country may yield useful insights on the relationship between growth and financial development in North Africa.⁴

The next section discusses the issue of causality between economic growth and financial development. Section III provides a brief review of the financial reforms in Morocco. The data and methodology employed are described in Section IV. Section V reports and discusses the empirical results. Concluding remarks are presented in the final section.

⁴ From a geographical standpoint, North Africa includes Algeria, Egypt, Libya, Morocco and Tunisia. However, the financial sectors in Algeria and Libya are far less developed than those of the other three countries.

II. THE ISSUE OF THE DIRECTION OF CAUSALITY

Financial development is characterized by several dimensions and has traditionally been measured by different proxies. A widely used indicator, which measures financial depth, is the ratio of broad money (M2) to gross domestic product (GDP). Financial deepening increases the efficiency and decreases the incompleteness of markets. As financial depth strengthens, credit is expanded and financial assets are directed towards more productive uses. Both private savings and investment are expected to increase as a result of enhanced financial depth. Economists recognize here a potential driver for economic growth. However, the effectiveness of financial intermediaries is crucial. Financial intermediation effectiveness and financial deepening can be good indicators of the *depth* and the *breadth* of the impact of financial development. Together with market-determined interest rates, they can properly measure the extent of financial development. Financial reforms that enhance financial development are expected to increase private savings, which would promote economic growth.

Yet, even theoretical studies yield ambiguous conclusions about this issue. Financial development is, in general, associated with an increase in real interest rates, particularly in countries that had a repressed financial sector. An increase in real interest rates can produce two different effects. The first impact is negative and reflects an income effect. A rise in real interest rates is associated with a decline in savings since less saving may generate a given level of funds in the future. The second effect is a substitution effect (positive effect). Higher real interest rates imply higher rate of return on savings. As real interest rates rise, private savings increase.

Moreover, the effect of saving on GDP growth can be ambiguous. If investment demand falls in the short run due to

higher real interest rates, economic growth may decline. In such cases, an increase in saving (a leakage) is associated with a contemporaneous decrease in economic growth. On the other hand, the long-run effect of changes in real interest rates may be insignificant, as households reach a steady state level of saving. It is therefore important to try to determine the effects of financial development on economic growth directly, as the effect may not be exclusively through the saving channel.

In its simplest form, the theory of financial development argues that financial sector development leads to a reduction in transaction and information costs, which in turn increases both saving rates and investment, and fosters economic growth. This is the so-called supply-leading view of financial development. As mentioned earlier, the idea that financial development promotes economic growth goes back to the works of [Bagehot \(1873\)](#) and [Schumpeter \(1911\)](#). This hypothesis was further developed by [Goldsmith \(1969\)](#), [McKinnon \(1973\)](#), and [Shaw \(1973\)](#).

However, a different stance is taken by other economists. For example, [Robinson \(1952\)](#), [Stern \(1989\)](#) and [Chandavarkar \(1992\)](#) argue that financial development follows economic growth. Robinson's assertion that "where enterprise leads finance follows" ([Robinson 1952](#), p. 86), clearly implies that economic growth causes financial sector development. This is the so-called demand-following view of financial development. This proposition has been tested by only a limited number of studies. For example, in a sample of 16 developing countries [Demetriades and Hussein \(1996\)](#) could not find evidence that financial development unequivocally promotes growth, but did show that growth causes financial development. Thus, the issue of the direction of causality between financial liberalization and economic growth can only be resolved through empirical research.

III. A BRIEF REVIEW OF FINANCIAL REFORMS IN MOROCCO

Taking the lead in North Africa, Morocco began implementing financial reforms in the late 1980s. These reforms included changes in the structure of the financial system, monetary management, and prudential and supervisory regulation.

In 1980, the average levels of lending and deposit rates were raised by about 20 percent and the structure of administered interest rates was significantly simplified. In 1985, the monetary authorities liberalized interest rates on above-one-year deposits, while deposits above six months and above three months were liberalized in 1989 and 1990, respectively. In addition, a minimum interest rate aimed at promoting long-term savings replaced the fixed rate that was in place for all other deposits still subject to regulation. However, interest rates on all time deposits were not liberalized until 1992. Consequently, as of 1987 real interest rates have become persistently positive. Lending rates in Morocco were effectively liberalized in February 1996.⁵

The wave of privatization and the financial reforms that were underway in Morocco contributed to a significant turnover increase in the Casablanca stock exchange (CSE), which was privatized in 1993.⁶ The government implemented important additional institutional changes with the view to protect savers and

⁵ In general, Morocco follows French banking practices and does not use Islamic banking (Islamic banking prohibits *riba* or interest rates and uses instead the practice of profit-sharing and participation). In 1998, Morocco's Finance minister cited the inconsistency of Islamic banks' operations with the Moroccan banking law as the main reason not to grant permission to Islamic banks to open branches in Morocco.

⁶ Between 1989 and 1995, the CSE turnover increased over 35 folds (from 672 million dirhams to 24 billion dirhams) and the market capitalization rose almost 800 percent (from 5 billion dirhams to 39.0 billion dirhams).

allow smooth transactions. Notable among these changes was the creation of the *Deontologic Council of Stocks and Bonds* (Conseil Déontologique des Valeurs Mobilières). As interest rates rose during the first half of the 1990s, bank deposits increased significantly. The effects were also reflected in a decline in checking deposits.

IV. METHODOLOGY

Using annual data from Morocco (1972-1999), this paper examines the linkages between economic growth and financial development. The indicators of financial development are financial depth and financial intermediation effectiveness. The proxy for economic growth is the log of real GDP per capita (y). Financial deepening (or financial depth) is an indicator of the overall size of the formal financial sector. In general, the extent of financial deepening is measured by the ratio of liquid liabilities of financial institutions to GDP (see [Benhabib & Spiegel 2000](#)). Following [Benhabib and Spiegel \(2000\)](#) and [Baliamoune and Chowdhury \(2003\)](#), this paper uses the ratio of broad money to gross domestic product (M2/GDP) as a proxy for financial depth. Both variables are in nominal values. It is worth noting that some studies use M2/GDP as an indicator for *financial development* (see, for example, [World Bank 1989](#); [King & Levine 1993a](#)). The indicators for financial intermediation effectiveness are the ratio of reserve money to total deposits (RES/TD) and the ratio of reserve money to quasi money (RES/QM). Real interest rates (Real r) are calculated as the difference between nominal rates and inflation. The focus is mainly on financial deepening and intermediation effectiveness. Data are from International Financial Statistics CD-ROM produced by the International Monetary Fund.

An increase in M2/GDP is expected to generate an increase in per capita income; and a decline in RES/TD and RES/QM is

expected to promote economic growth. We also need to distinguish between long-run and short-run effects. Financial deepening may have a lagged effect. In the short run the impact may be negligible, as the private sector needs to be convinced of the credibility and sustainability of reforms. In fact, if the banking (financial) sector has surplus liquidity and credit issuance is low, the impact on economic growth may turn out to be negative in the short run. Financial depth, which proxies for the volume of intermediation, is an indicator of the extent of deposit mobilization by the banking sector. In Morocco, as in many developing countries, the role of deposit mobilization belongs mainly to banks and government agencies (*e.g.*, post-office saving accounts). The indicators of the effectiveness of financial intermediation, namely the ratio of reserve money to total deposits and the ratio of reserve money to quasi money measure the efficacy of the banking sector in attracting and allocating deposits, and providing loans. A decline in these ratios means higher effectiveness; therefore we expect an inverse relationship with economic growth, particularly in the long run.

The variable real interest rate is included in the model in order to capture the effect of liberalized interest rates on economic growth. As argued by [Shaw \(1973\)](#), financial liberalization causes financial intermediation between savers and investors to expand. The incentive to save and invest rises as real interest rates are allowed to rise. While an increase in real interest rates is expected to result in higher savings, it may not necessarily do so. This is because, as explained earlier, changes in real interest rates produce two opposite effects; a substitution effect that increases saving and an income effect that reduces it. Thus, depending on the net effect, economic growth may or may not improve. [Jbili *et al.* \(1997\)](#), however, suggest that, in the case of Morocco (and other

developing nations), it is reasonable to expect the net effect to be positive.

Since the data are time series, there is a need to explore their long-run properties. The stationarity of the series is tested by computing augmented Dickey-Fuller (ADF) test statistics to investigate the presence of unit roots under the alternative hypothesis that the series is stationary around a fixed time trend. ADF tests are performed using the ordinary least-squares technique (OLS) to estimate the following equation:

$$\Delta X_t = \rho_0 + \rho_1 X_{t-1} + \rho_2 t + \sum_{i=1}^n \phi_i \Delta X_{t-i} + \varepsilon_t \quad (1)$$

where t is a time trend.

The null hypothesis of nonstationarity is rejected if ρ_1 is less than zero and statistically significant. Critical values are computed based on response surface analysis reported in MacKinnon (1991). The results of the ADF tests are reported in [Table 1](#). At the 1-percent (and 5-percent) level of significance, all variables are found to be non-stationary. First differencing produced stationary data as indicated by the results reported in [Table 2](#).

The basic model formulated with the error-correction representation is specified as:

$$\Delta Y_t = \rho_0 + \rho_1 \Delta Y_{t-1} + \rho_2 \Delta X_{t-1} - \gamma Z_{t-1} + \varepsilon_t \quad (2)$$

where Z is the residual term from the static regression of Y_t on X_t . The optimal lag length is determined using the Akaike information criterion (AIC) and the Schwartz criterion (SC).

Financial liberalization leads to changes in several variables. These variables, in turn, may influence each other and affect financial development. Thus, there are endogeneity and simultaneity issues that need to be addressed and incorporated in

the econometric modeling of the linkages between financial development and economic growth. As emphasized by Sims (1980), VARs are appropriate models when we have large simultaneous equations. Due to potential effects of lags, the model becomes dynamic. In addition, in the presence of cointegration, the equations must be in the form of a vector error-correction model (VECM).

Table 1: Augmented Dickey-Fuller tests for the presence of unit root

Variable	<i>t</i> statistics for ρ_1 (levels)	<i>t</i> statistics for ρ_1 (first difference)
<i>Per capita income (log)</i>	-2.156	-8.518
<i>Real interest rate</i>	-2.779	-9.129
<i>M2/GDP</i>	1.472	-9.140
<i>Reserve money/total deposits</i>	0.004	-7.581
<i>Reserve money/quasi money</i>	-0.532	-5.202

ADF tests are performed by OLS estimation of the equation

$$\Delta x_t = \rho_0 + \rho_1 x_{t-1} + \rho_2 t + \sum_{i=1}^n \phi_i \Delta x_{t-i} + \varepsilon_t$$

(where t is a time trend).

The null hypothesis of nonstationarity is rejected if ρ_1 is less than zero and statistically significant. The test is based on critical values obtained from a response surface analysis and reported by MacKinnon (1991). The 1 and 5 percent critical values for testing the presence of unit root in levels are -4.189 and -3.497 respectively. The 1 and 5 percent critical values for testing the presence of unit root in differences are -4.216 and -3.531 , respectively.

Table 2: Johansen's cointegration test*
(Likelihood ratios for the maximal eigen value and the trace test)

A. Model 1 (variables: logy on r, M2/GDP, and Res/TD)						
$H_0: r$	eigen value	p-I	$\hat{\lambda}_{\max} = -\frac{\Gamma \log(1-\hat{\lambda}_{r+1})}{\Gamma}$ *	$\hat{\lambda}_{\text{Trace}} = -\frac{\Gamma \log \sum \log(1-\hat{\lambda}_i)}{\Gamma}$ *	$\hat{\lambda}_{\max} (0.95)$ **	$\hat{\lambda}_{\text{Trace}} (0.95)$ **
0	0.7351	4	49.15	76.35	28.14	53.12
1	0.3583	3	16.04	27.20	22.00	34.91
2	0.1616	2	6.52	10.78	15.67	19.96
3	0.1088	1	4.26	4.26	9.24	9.24

B. Model 2 (variables: logy on r, M2/GDP and Res/QM)						
$H_0: r$	eigen value	p-I	$\hat{\lambda}_{\max} = -\frac{\Gamma \log(1-\hat{\lambda}_{r+1})}{\Gamma}$ *	$\hat{\lambda}_{\text{Trace}} = -\frac{\Gamma \log \sum \log(1-\hat{\lambda}_i)}{\Gamma}$ *	$\hat{\lambda}_{\max} (0.90)$ **	$\hat{\lambda}_{\text{Trace}} (0.90)$ **
0	0.7620	4	53.11	74.04	28.14	53.12
1	0.3339	3	15.04	20.93	22.00	34.91
2	0.1215	2	4.79	5.89	15.67	19.96
3	0.0293	1	1.10	1.10	9.24	9.24

* Statistical results were obtained using CATS.

** Critical values are from Osterwald-Lenum (1992).

V. ESTIMATION RESULTS

As mentioned earlier, unit-root tests performed on the first difference of each variable show that first differencing has induced stationarity. This indicates that all the variables are $I(1)$, which requires testing for cointegration. Since the model is multivariate, there may be more than one cointegrating vector. Thus, Johansen's cointegration rank test, which is an appropriate test for multivariate models, is performed. Cointegration test results are reported in Tables 2.A and 2.B. Table 2.A shows the results associated with the model including the variable RES/TD as a proxy for intermediation efficacy. Table 2.B displays the results from the model that includes RES/QM as an indicator of the effectiveness of financial intermediation. Both the maximal eigen value (λ_{\max}) statistics and the trace test (λ_{trace}) suggest that there is a unique cointegrating vector since the hypothesis of no cointegration cannot be rejected for $r = 0$, but is rejected, at the 5-percent level of significance, for $r = 1$. The conclusions are the same for the two models.

The cointegration test results imply that there exists a long-run relationship between financial development and economic growth. In fact, these results suggest that there are linkages between all four variables, per capita income, financial depth, financial intermediation effectiveness and real interest rate.

The short-run dynamics of the relationship between growth and financial development are explored through a vector autoregressive model. The VECM is a VAR model applied to cointegrated variables and including the error correction (EC) term. The coefficient on the EC term represents the speed of adjustment. However, because this term is obtained from the cointegrating equation, it also validates the long-run causal relationship.

Two specifications are constructed and estimated. The first model (Model 1) includes RES/TD as an indicator of intermediation effectiveness, while the second model (Model 2) uses RES/QM as a proxy for the efficacy of financial intermediaries. Both models include real interest rate because it is a

Table 3: Vector-error correction (VECM) results – Model 1[†]
Dependent variable

	logy	M2/GDP	RES/TD
Constant	0.021 (0.209)	0.005 (0.501)	-0.019* (0.064)
$\Delta(\text{logy})_{t-1}$	-0.094 (0.740)	0.064 (0.667)	0.288 (0.110)
$\Delta(\text{logy})_{t-2}$	-0.126 (0.663)	0.074 (0.630)	0.201 (0.272)
Δr_{t-1}	0.000 (0.865)	0.001 (0.544)	0.004** (0.036)
Δr_{t-2}	0.001 (0.854)	-0.001 (0.796)	0.003 (0.445)
$\Delta(M2/GDP)_{t-1}$	0.541 (0.252)	-0.358 (0.155)	0.328 (0.263)
$\Delta(M2/GDP)_{t-2}$	-0.234 (0.626)	0.413 (0.111)	0.236 (0.430)
$\Delta(Res/TD)_{t-1}$	0.247 (0.376)	-0.142 (0.339)	-0.114 (0.510)
$\Delta(Res/TD)_{t-2}$	0.125 (0.624)	-0.040 (0.769)	0.244 (0.133)
$Resid_{t-1}$	-0.065 (0.835)	0.079 (0.135)	-0.183*** (0.005)

p-values are in parentheses.

[†] Model includes RES/TD as indicator of financial intermediation effectiveness.

* Indicates significance at the 10-percent level.

** Indicates significance at the 5-percent level.

*** Indicates significance at the 1-percent level.

major instrument of financial development. However, the real interest rate in the VECM is treated as exogenous. This implies that only the other three variables (per capita real income, financial depth and financial intermediation) are endogenous and are estimated simultaneously.

Table 4: Vector-error correction (VECM) results – Model 2[†]
Dependent variable

	logy	M2/GDP	RES/QM
Constant	0.017 (0.262)	0.007 (0.371)	-0.327** (0.035)
$\Delta(\text{logy})_{t-1}$	-0.036 (0.896)	0.033 (0.813)	6.523** (0.021)
$\Delta(\text{logy})_{t-2}$	-0.142 (0.641)	0.091 (0.559)	4.988* (0.097)
Δr_{t-1}	0.000 (0.916)	0.002 (0.240)	0.007 (0.784)
Δr_{t-2}	0.001 (0.699)	-0.001 (0.778)	-0.015 (0.560)
$\Delta(\text{M2/GDP})_{t-1}$	0.489 (0.299)	-0.351 (0.145)	4.782 (0.291)
$\Delta(\text{M2/GDP})_{t-2}$	-0.316 (0.527)	0.436 (0.094)	5.526 (0.255)
$\Delta(\text{Res/QM})_{t-1}$	0.007 (0.695)	-0.007 (0.463)	0.248 (0.163)
$\Delta(\text{Res/QM})_{t-2}$	-0.016 (0.368)	-0.010 (0.279)	-0.031 (0.858)
Resid_{t-1}	-0.061 (0.644)	0.136** (0.049)	-4.479*** (0.001)

p-values are in parentheses.

[†] Model includes *RES/QM* as indicator of financial intermediation effectiveness.

* Indicates significance at the 10-percent level.

** Indicates significance at the 5-percent level.

*** Indicates significance at the 1-percent level.

The VECM estimation results are reported in [Table 3](#) and [Table 4](#). The findings clearly support the demand-following view. The estimates in [Table 3](#) indicate that there is no causal effect from financial development to economic growth. On the other hand, when the dependent variable is financial intermediation effectiveness, the coefficient associated with the error correction term is significant at the 1-percent level. This suggests that economic growth influences the efficacy of financial intermediation. Similarly, the results displayed in [Table 4](#) provide evidence in favor of unidirectional causality from economic growth to financial development. These results indicate that economic growth enhances both financial depth and intermediation effectiveness.

VI. CONCLUSION

The main goal of this paper has been to explore the links between economic growth and financial liberalization. Two indicators of financial reforms were used, namely financial depth and intermediation effectiveness. The examination of the relationships between the variables was conducted by analyzing their long-run properties and short-run dynamics. The econometric results derived from estimating vector error-correction models provide support for the demand-following view of financial development.

Obviously, the choice of financial development indicators is subject to debate. M2 includes currency, which, as pointed out by [Demetriades and Hussein \(1996\)](#), is not in line with the debt-intermediation approach emphasized by [Gurley and Shaw \(1955\)](#) and [Shaw \(1973\)](#). Nevertheless, in Morocco, people still hold savings in the form of currency. This is why financial depth may not necessarily behave in the same manner as financial

intermediation effectiveness; hence the inclusion of both variables in the econometric model. The controversy concerning the second financial development indicator is more difficult to resolve. Some studies have used the ratio of financial claims on the private sector to nominal GDP (Demetriades & Hussein 1996), while others have focused on the ratio of liquid liabilities. In using RES/TD and RES/QM, this study is in line with the definition of financial intermediation in Jbili *et al.* (1997). In addition, the lack of *consistent* time series data on more appropriate indicators precludes their use.

The failure to find significant evidence in favor of the supply-side view of financial development may cast doubt on the policy recommendation from international financial institutions and policymakers advising countries to liberalize financial markets. Liberalizing the financial sector per se may not necessarily promote economic growth. As pointed out by Levine *et al.* (2000), other institutional reforms, such as legal and accounting reforms, could be vital to growth-promoting financial development.

Morocco is in the midst of negotiating a free trade agreement with the United States, which is expected to increase the flow of U.S. direct investments to this country. The results from the present study may contribute some useful insights for managers interested in conducting or setting up businesses in Morocco. Moreover, the findings suggest that economic growth leads financial development. As economic growth proceeds, the demand for financial services will cause financial development.

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