

# On financial development and economic growth in Egypt

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## Abstract

**Purpose** – This paper aims to discuss the evolution of the Egyptian banking sector and the main trends in financial development in Egypt. The purpose of this study is to examine empirically the relationship between the development of the financial sector and economic growth in Egypt between 1980 and 2016.

**Design/methodology/approach** – The paper draws comparisons based on critical financial indicators between Egypt and selected emerging markets and developing economies. It uses a new data set of financial development indexes released by the International Monetary Fund. This paper uses econometric time series modelling of bivariate regressions for real growth per capita and measures of financial development to assess the relationship between financial development and economic growth in Egypt.

**Findings** – There are three specific findings based on the empirical analysis. First, there is a strong association between real growth per capita and financial development measured by money supply to GDP. Second, access to and the efficiency of banking services are not associated with real per capita income. Third, the Financial Markets Access Index – which compiles data on market capitalization outside of the top ten largest companies and the number of corporate issuers of debt – indicates a robust association with real per capita GDP.

**Originality/value** – The paper uses advanced empirical investigation techniques and new data sets available to assess the critical relationship between finance and growth in Egypt. The main policy implications of the empirical results of this paper suggest a stronger focus on promoting a more proactive role for the financial services industry in Egypt. In particular, there is a critical role for bank financing to support

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**JEL classification** – C32, C52, E41, E65

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the private sector to maintain an inclusive growth momentum. Further development of the capital market will promote sustainability of such economic growth.

**Keywords** Egypt, Financial development and growth, Time series models, Autoregressive distributed lag model

**Paper type** Research paper

## 1. Introduction

The origin of the “financial development” concept goes back to the early work of [Gurley and Shaw \(1955, 1956, 1960, 1967\)](#), who argued that financial development is a positive function of real wealth: as countries’ income and wealth grows, their financial structures tend to become more sophisticated in terms of institutions and financial assets available. “During economic development, as their incomes per capita increases, countries usually experience more rapid growth in financial assets than in national wealth or national product,” they wrote:

Financial growth in excess of real growth is apparently a common phenomenon around the world over time, for any one country as its income per capita increases, financial assets rise relative to national real wealth. ([Gurley and Shaw, 1967](#), p. 257)

The theoretical work of Gurley and Shaw found support in the quantitative study by [Goldsmith \(1969\)](#), who concluded that in most of the 35 countries investigated (both developing and developed), the financial ratio tends to increase with higher real income and wealth.

A powerful and influential school of thought pioneered by [McKinnon \(1973\)](#) and [Shaw \(1973\)](#) introduced financial development as a process and strategy for achieving faster economic growth. The importance attached to money and financial structure as determinant factors in economic development shifted thinking about the role of money and financial policies. Both McKinnon and Shaw claimed that liberalization from restrictions such as interest rate ceilings, high reserve requirements and selective credit programs facilitates economic development, because when the interest rate is below equilibrium, higher rates of interest increase savings and lead to a greater efficiency of capital allocation. They argued that higher interest rates resulting from financial liberalization induce households to increase savings and stimulate financial intermediation, thereby increasing the supply of credit to the private sector, stimulating investment and economic growth. In addition, positive real interest rates lead to more efficient credit allocation, which provides an additional impact on growth.

The McKinnon–Shaw hypothesis was influenced to a large extent by the poor development record in the 1960s of many developing countries characterized by intensive government intervention. The financial liberalization perspective exerted increasing influence over international organizations such as the International Monetary Fund (IMF) and the World Bank. Consequently, implementation of financial liberalization policies became popular in many developing countries during the past 25 years. The results of these reforms have been mixed.

Egypt is an ideal case study to examine the relationship between finance and economic growth. Its economy came under the influence of socialism between 1959 and 1972. Since 1973 it has been moving toward capitalism. These changes directly affected the structure and policies of the financial sector in Egypt over the past four decades.

The Egyptian financial sector was heavily repressed between 1960 and 1990, in the sense that the government intervened and distorted its market mechanisms. The government set ceilings on nominal deposit and lending interest rates, imposed a relatively high ratio of

required reserves, determined the allocation of credit to particular projects and intervened in the portfolio composition of banks. In January 1991, in accordance with the IMF and the World Bank, Egypt started an economic reform program that included a financial liberalization policy.

This paper examines the empirical relationships between financial development and economic growth in Egypt between 1980 and 2016. It is organized as follows. Section 2 presents an overview of the analytical literature on finance and growth. Section 3 describes the Egyptian financial sector over the past three decades. Section 4 discusses the econometric methodology and modelling strategy. Section 5 presents the empirical results. Section 6 summarizes the paper's main conclusions.

## 2. The literature on financial development and economic growth

Studies of many countries and regions provide both theoretical and empirical evidence showing that financial development affects economic growth by mobilizing saving, exerting control, allocating resources and improving innovation (Kamal, 2013) (although some economists, such as Herwartz and Walle [2014], argue that there is no meaningful relationship between financial development and economic growth). Development of the financial sector is vital for economic growth and transformation. The absence of deep, efficient financial markets constrains economic growth. Limited access to finance reduces welfare and hinders the alleviation of poverty and the emergence of a vibrant middle class. Implementing monetary policy in a context of shallow markets is costly and inefficient. A developed financial sector increases access to financial services and offers a full range of financial products and services to different economic sectors (Chavula *et al.*, 2017).

Studies have also provided evidence that economic growth can affect financial development, implying that the relationship between financial development and economic growth may be bi-directional. Economic growth is a complex process that is influenced by many factors other than financial development, however, making it difficult to establish and isolate the causal relation between financial development and economic growth theoretically.

Theoretical links between financial development and economic growth can be traced back to the work of Schumpeter (1911), who emphasized the importance of financial services in promoting economic growth and highlighted circumstances in which financial institutions can actively encourage innovation and promote future growth by determining and funding productive investments. Robinson (1952) argued that as the economy grows, the demand for financial services also grows, which positively affects financial development, suggesting that the causation runs from economic growth to financial development.

According to Patrick (1966), there are two possible patterns in the causal relationship between financial development and economic growth. The first is demand pull: the demand for financial services by investors and savers leads to the creation of modern financial institutions, financial assets, liabilities and related services. Financial development supports the process of economic growth; the expansion of the financial system is thus seen as a consequence of growth.

The second pattern is supply push. The creation and supply of financial services spurs growth. Resources are transferred from sectors that do not drive growth to sectors that do so. Developed financial markets also promote economic growth by mobilizing savings and facilitating investment (Goldsmith, 1969).

McKinnon (1973) and Shaw (1973) argue that financial development is a prerequisite for economic growth. They point out that financial development can affect growth positively through its influence on saving and investment.

The endogenous growth models of the 1990s provided additional theoretical support to the relationship between financial development and economic performance (see, for example, [Bencivenga and Smith, 1991](#); [Greenwood and Jovanovic, 1990](#); [King and Levine, 1993](#)). These models assume that financial intermediaries provide the economy with various types of services, reducing investment risks (liquidity and productivity risks), collecting information and offering better share diversification. These financial services improve the efficiency and volume of investment. The endogenous growth models assume that the level of investment and productivity growth are the channels of transmission from financial intermediation to economic growth. Numerous empirical studies find strong evidence to support the casual relationship between financial development and growth (see, for example, [Demirgüç-Kunt and Levine, 2008](#); [King and Levine, 1993](#); [Demetriades and Hussein, 1996](#); [Khan and Senhadji, 2000](#)).

Shaw emphasizes on financial deepening and financial liberalization, noting that “liberalization and deepening of finance contribute to the stability of growth in output and employment” ([Shaw, 1973](#), p. 11). He argues that financial deepening reduces the velocity of circulation, eases the strain on taxation, reduces dependency on foreign savings and obstructs capital flight. Such depth requires financial liberalization and the elimination of distortions in financial prices. Liberalization in financial markets, which implies higher real interest rates, would stop savers from owning inflation hedges and/or reduce current consumption as a substitute of financial assets. As a result, financial assets would grow relative to income, causing financial institutions to provide more credit and give savers more incentive to save. The extended financial sector would reduce the real costs to investors by reducing risk by diversifying, lowering information costs to both savers and investors and improving operational efficiency through specialization. It would also encourage the creation of innovative investment projects, as bank credit would be allocated to competing proposals.

Many researchers and economists have empirically investigated the link between financial development and economic growth. [Hussein \(1999\)](#) examines the hypothesis of the financial liberalization school that financial development that comes from increases in interest rates toward the long-run equilibrium level and the efficient allocation of resources affected economic growth in Egypt. Using the autoregressive differenced lag (ARDL) model, he shows that financial sector development is important for economic growth. A rise in the private credit to total credit ratio leads to a rise in real GDP per capita in the long run. The results indicate that interest rates have a positive impact on savings and an ambiguous effect on economic growth. Hussein concludes that an increase in the real rate of interest is not the essential route through which to develop and enhance Egypt’s financial sector. Other measures – such as developing the stock market, encouraging competition and participation of the private sector and offering a variety of financial assets – may play more important roles in boosting the financial sector, according to Hussein, although he provides no empirical evidence of the effectiveness of these instruments in boosting financial sector and thereby driving growth.

[Rioja and Valev \(2004\)](#) examine whether the level of financial development affected the relationship between financial development and economic growth. They divided 74 countries into three groups on the basis of the level of financial development. Using generalized method of moments dynamic panel techniques, they show that a certain threshold of financial development is required for a meaningful nexus between financial development and economic growth. [Herwartz and Walle \(2014\)](#) attribute this finding to the economies of scale that financial intermediaries enjoy from the accumulation of savings and the financing of high-return investments. The findings indicate that the financial

development–economic growth nexus is weaker in economies with lower levels of financial development, implying diminishing marginal returns to developments in the financial sector. These findings have been criticized for lacking robustness. [Ketteni et al. \(2007\)](#), for example, argue that Rioja and Valev may have ignored the nonlinear relationship between growth and its drivers in their estimations. [Wolde-Rufael \(2009\)](#) re-examines the causal relationship between financial development and economic growth in Kenya using the autoregressive (VAR) methodology on time series data for 1966–2005. She includes imports and exports as the other variables in the model specification. Using the money supply (M2) to GDP ratio, the liquid liabilities (M3) to GDP ratio, the domestic bank credit to private sector to GDP ratio and the total domestic credit by the banking sector to GDP ratio as proxies for financial development, she documents bi-directional Granger causality between economic growth and all the indicators of financial development except the M2 to GDP ratio. She concludes that financial development promoted economic growth in Kenya.

[Chowdhury \(2016\)](#) studies the effect of financial development on the nexus between remittances and economic growth using a dynamic panel estimation for 33 remittance-receiving developing countries between 1979 and 2011. She uses four proxies/indicators of financial development: the ratio of domestic credit to private sector GDP, the ratio of total domestic credit provided by the banking sector to GDP, the degree of monetization in the economy and the M2 to GDP ratio. This study goes beyond the usual direct effects of remittances on growth, estimating the interactive effects of both remittances and financial development. It shows that remittances had a significant effect on the economic growth of the recipient countries but that the financial development variables had statistically insignificant effects. These findings contradict the rich body of literature that suggests that financial development that comes as a result of financial reform initiatives in developing countries has a positive effect on output growth. Financial sector reform initiatives aim to deepen the financial sector relative to output, thereby increasing private and overall saving and investment and improving the quality of investment. These outcomes are expected to translate into output growth. This study is the first to examine such relationship among the top remittance-recipient developing countries.

### 3. Financial development and economic growth in Egypt

As in many emerging markets, banks in Egypt are the dominant financial institutions. They control most of the financial flows and possess most of the financial assets in Egypt.

Egypt's banking sector evolved as the economy went through various revolutions and reforms. The changes affected bank ownership and operations. The Egyptian economy went through several periods of economic management. They include the period of British occupation, before the early 1950s; a period of socialism (the wave of nationalization), from 1959 to 1972-1973; a period known as the open door (*Infatah*), from 1973 to 1980-1981; and the economic reform period, from 1981 to today ([Bolbol et al., 2005](#)).

Under British occupation, foreign banks dominated the Egyptian banking sector. During the waves of nationalization that began in 1959-1960, the government owned the banks. Following implementation of the first five-year economic plan, which aimed at achieving economic development, the number of banks fell to five commercial banks, three specialized banks and the Central Bank of Egypt. Massive investments in long-maturing projects took place during this period. Commercial banks had to bring their credit policies in line with the national plan. They had to secure the requisite resources to finance planned projects. Each bank was restricted to a specific group of state-owned companies, but the banks were able to compete for private sector business with other banks. Additional controls and repressive measures included interest rate ceilings on loans and deposits; preferential rates and

allocations of credit to public, industrial, and agricultural enterprises; and high reserve requirement ratios.

The “open-door” policy introduced in 1973-1974 was informed by the need to improve the efficiency and competitiveness of the banking sector to mobilize the private and foreign resources required to accelerate economic development. It led to the establishment of private and joint venture banks, foreign bank branches and offshore institutions. Several changes were introduced to allow private banks to operate on an equal footing with state banks. Foreign investors were granted tax concessions and allowed to repatriate all of their profits without restriction. Stock market laws tried to increase the number of joint stock and limited liability companies. Interest rates payable on deposits were market based and followed the trends in international financial markets. In contrast, the central bank continued to regulate interest rates on domestic currency deposits. As a result, investments in the financial sector increased, with the number of banks rising to 39 commercial banks and 31 investment banks. The annual average bank credit to GDP ratio increased from 54 per cent in 1961-1974 to 97 per cent in 1975-1990. Over the same period, lending to the private sector rose from an annual average of 19 per cent of GDP to 28 per cent. The relatively large network of branches of public sector banks enabled them to dominate the banking sector, however, making the sector highly segmented and lacking in competition and innovation (Bolbol *et al.*, 2005).

The economic reform program adopted in 1990-1991 included major banking reforms. Financial sector changes included the elimination of repressive measures, which led to liberalization of lending and deposit rates; the removal of ceilings on bank-lending to the private sector, which resulted in a rise in lending to the private sector from an annual average of 28 per cent of GDP in 1975-1990 to 42 per cent of GDP in 1991-2002; a focus on developing indirect monetary instruments (such as the auctioning of treasury bills); and the enhancement of the attractiveness of holding domestic currency. The financial reforms also enhanced prudential measures in the banking sector. The regulatory framework also improved in terms of foreign exposure, capital adequacy, asset classification, investment concentration abroad, auditing, banking liquidity and credit concentration, among other guidelines. Transparency improved, too, as banks were required to publish their financial reports in line with international accounting standards. The government also undertook a privatization program in the banking industry, with the aim of enhancing competition and reducing market concentration.

Capital market development is considered an important component of financial development; it may also play a key role in the process of economic growth. The Egyptian Stock Market is among the oldest in the world. It is made up of the stock markets of Cairo and Alexandria, which until 1997 were separate stock markets. (The Cairo Stock Exchange was founded in 1903; the Alexandria Stock Exchange was founded in 1883.) Egypt’s capital markets were revitalized following the 1991 national economic reform program, which resulted in a surge in market activities and increased demand for more modern market policies, regulations, and institutional support.

The reforms were followed by the establishment of the Egypt Capital Markets Development Project (CMD) in the late 1990s. It aims to improve efficiency, transparency and stability; strengthen the institutional capabilities of both public and private capital market institutions; improve the regulatory environment; and develop secondary trading in new financial instruments. The CMD led to many developments in the capital market, including automation of trading, clearing and settlement; better dissemination of market information through the Internet and electronic data; greater self-regulation and better

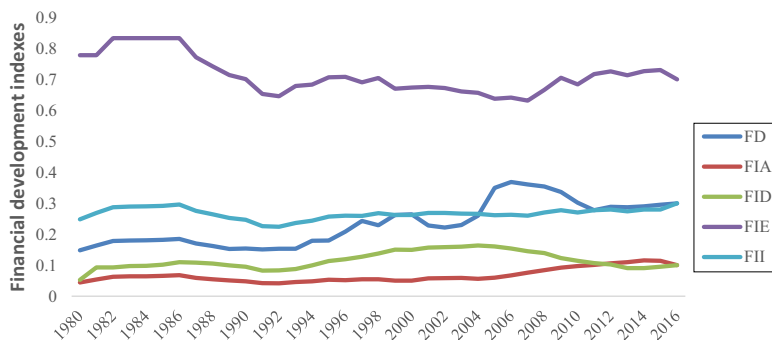
disclosure; the modernization of market institutions, systems and procedures; and increased market diversity and flexibility.

In February 2014, a new set of listing rules was introduced, aiming at facilitating the procedures of new offerings for companies and improving market transparency and minority protection rights. The new rules addressed, among other things, the capital increases resulting from mergers, the necessary disclosure regarding the use of proceeds of the capital increase, the board of directors' independence and related party transactions. In 2015/2016, further amendments and additions were integrated in the listing rules to ensure wider application of corporate governance and more investor protection. These changes notwithstanding, the development of primary capital markets in Egypt remains below potential, and the securities market as a source of investment financing is still limited (IFC, 2014). At the end of February 2017, 224 companies were listed on the Egyptian market, with total market capitalization of \$37.22bn; participation by foreign investors represented about 30 per cent of the value traded on the main market. Trading on the Egyptian Stock Exchange increased several fold in recent years. In 2017, an average 9 billion securities were traded, for a total value of about \$2bn a month (Egyptian Stock Exchange, 2018).

Overall, financial development has continued to improve in Egypt, as reflected by the indicators shown in Figures 1-4. The political and economic turmoil Egypt faced in recent years affected the overall economy and the performance of the financial sector, however. The banking system must be sound and efficient to effectively play its role. A healthy and stable financial system, underpinned by sound macroeconomic management and prudential regulations, is essential for sustained growth.

### 3.1 Trends in financial development indexes in Egypt

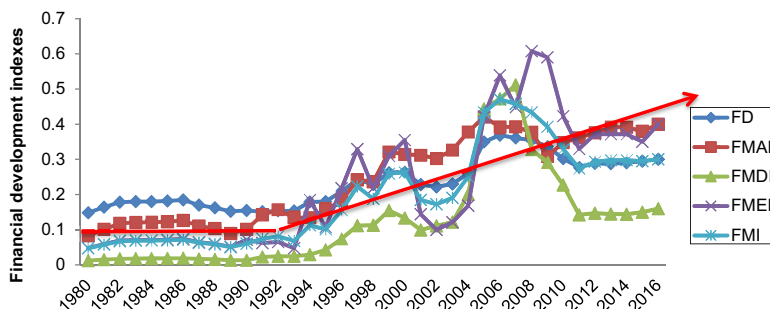
The importance financial institutions and financial markets play in an economy depends on a country's level of political freedom, the rule of law and property rights protection. Households are more likely to save more and free up resources for investment if banks are efficient, transparent and trustworthy; banks that are likely to swindle savers' wealth through bad loans and/or irregular transactions are less likely to attract household savings



**Figure 1.** Financial institution indexes in Egypt, 1980-2016

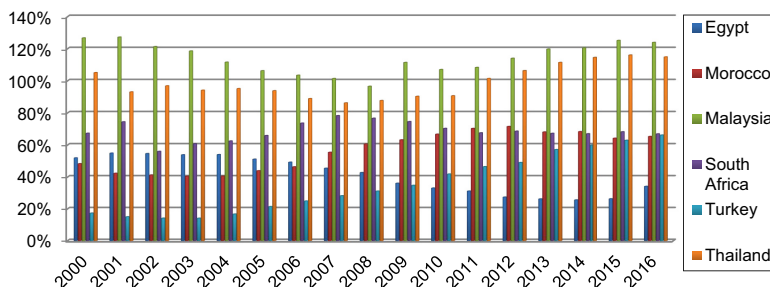
**Notes:** FD: Financial Development Index; FIA: Financial Institutions Access Index; FID: Financial Institutions Depth Index; FIE: Financial Institutions Efficiency Index; FII: Financial Institutions Index

**Source:** Data from IMF (2017)



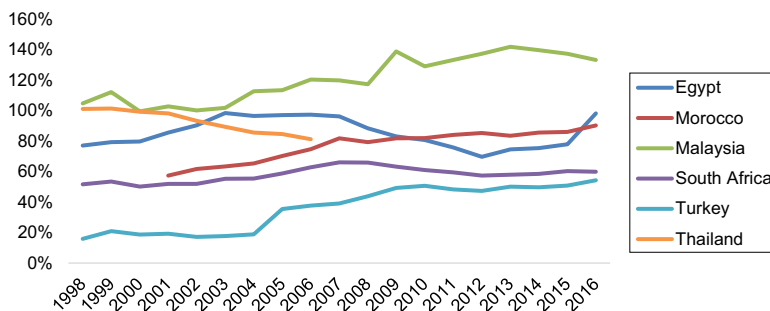
**Notes:** FD: Financial Development Index; FMAI: Financial Markets Access Index; FMDI: Financial Markets Depth Index; FMEI: Financial Markets Efficiency Index; FMI: Financial Markets Index  
**Source:** Data from IMF (2017)

**Figure 2.** Financial market indexes in Egypt, 1980-2016



**Source:** Data from IFS (2017)

**Figure 3.** Ratio of private bank credit to GDP in six middle-income countries, 2000-16



**Source:** Data from IFS (2017) and WDI (2017)

**Figure 4.** Ratio of M2 to GDP in six middle-income countries, 1965-2016

(Aghion and Howitt, 2009). Financial institutions and financial markets also help pool and optimally allocate risks and returns. Financial institutions can help eliminate the agency problem by monitoring investors and ensuring that credit is used in productive activities rather than on private consumption (Adu *et al.*, 2013).

The IMF has developed several indexes that can be used to measure financial development in an economy (Svirydzenka, 2016 and Appendix for details). Its overall Financial Development (FD) Index is divided into financial institution indexes and financial market indexes. The financial institution indexes (the Financial Institutions Efficiency [FIE] Index, the Financial Institutions Depth [FID] Index and the Financial Institutions Access [FIA] Index) measure the level and progress of development of financial institutions in terms of access, depth and efficiency. The financial market indexes (the Financial Markets Efficiency [FMEI] Index, the Financial Markets Depth [FMDI] Index, and the Financial Markets Access Index [FMAI]) measure the level and progress of development in the financial markets along the same parameters.

Egypt's FD Index rose over the past two decades, increasing from 0.18 in 1994 to 0.30 in 2016, with slight fluctuations between 2001 and 2010; it peaked at 0.37 in 2006 (Figure 1). This trend seems to have depended more on financial market development than financial institution development. In contrast, the financial market development indexes closely followed the trend of the financial development index (Figure 2). These findings suggest that financial markets in Egypt contributed more to financial development than financial institutions did.

The FII has been constant, at about 0.3, for the past three decades (Figure 1). Its components – the FIA, the FIE and the FID – also remained generally constant until about 2006, when both the FIE and the FIA begin to rise whereas the FID deteriorated. In contrast, after stagnating in the 1980s, financial market development increased (albeit with fluctuations) through the early 1990s. The FMI rose from 0.07 in 1993 to 0.30 in 2016, peaking at 0.47 in 2006. All of its components (the FMEI, the FMDI and the FMAI) followed similar trends over this period.

### 3.2 Indicators of financial development in Egypt and some comparators

There is no disagreement over whether financial development is good for economic growth; it is the transmission channels through which financial development affects economic growth that are debated. Using different indicators of financial development, researchers have reached diverse conclusions. The relevance of each channel and the indicators are country specific, as countries have different political, legal and institutional frameworks.

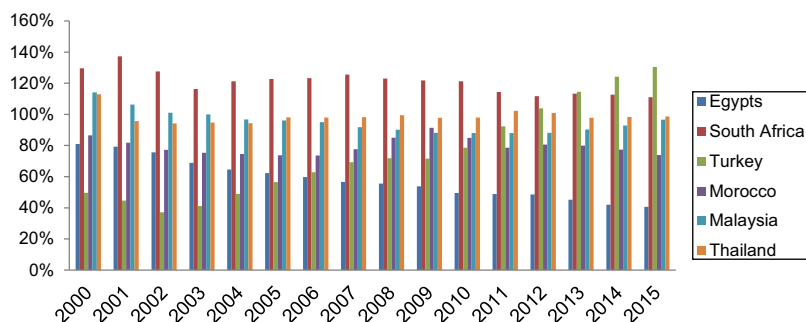
Egypt outperforms comparator countries in financial depth (as measured by the M2 to GDP ratio) but lags in competitiveness (as measured by the spread between lending and deposit rates) as well as the ratios between private bank credit and GDP and between credit and deposits (Table I). Malaysia has the lowest level of competitiveness (as measured by the spread between lending and deposit rates) but is the second-best performer in terms of the loans to deposit ratio. Thailand performs best on the liquid liability – GDP ratio. (Figures 3-7 show the trends in these indicators.) Egypt liberalized its interest rates in 1990/1991,

**Table I.**  
Financial depth, efficiency, and competitiveness indicators in six Middle-income countries, 2015/16

Country	Private bank credit/GDP	M2/GDP	Credit/deposit	Liquid liabilities/ GDP	Lending rate less deposit rate
Egypt	34.1	90	40.59	72.8	5.7
Malaysia	65.3	90	111.0	42.2	1.5
Morocco	123.9	130	130.3	42.8	n.a.
South Africa	66.9	60	73.8	108.6	3.11
Thailand	114.8	n.a.	96.5	132.5	3.1
Turkey	66.1	50	98.6	109.2	n.a.

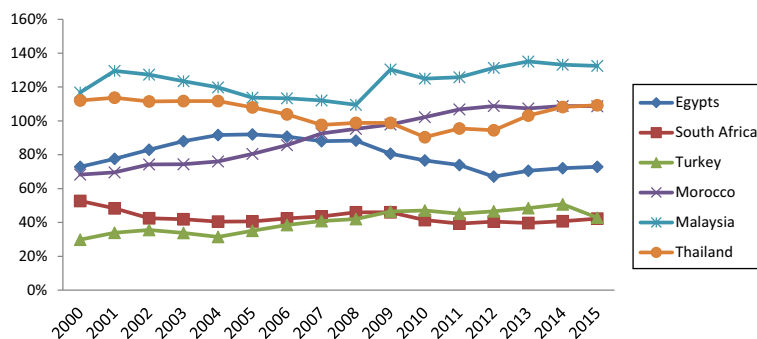
**Note:** n.a.: not available

**Source:** Data from IMF (2017), IFS (2017) and WDI (2017)



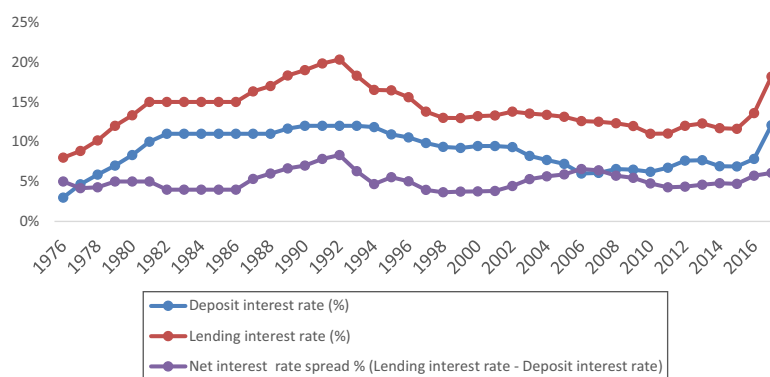
Source: Data from the World Bank's Financial Structure Database (2017)

Figure 5. Ratio of loans to deposits in six middle-income countries, 2000-16



Source: Data from the World Bank's Financial Structure Database (2017)

Figure 6. Ratio of liquid liabilities to GDP in six middle-income countries, 2000-15



Source: Data from IFS (2017)

Figure 7. Net interest rate spread in Egypt, 1976-2016

following adoption of its economic reform programs. In spite of the liberalization, the interest rate spread remained almost constant, fluctuating by only about 5 per cent (Figure 7).

*3.2.1 Ratio of private bank credit to GDP.* The private bank credit to GDP ratio followed different trends across six countries (Figure 3). Malaysia had the highest ratios, followed by Thailand and South Africa. Financial development remained constant in Morocco over the years, improving slightly in the past decade.

Egypt had the lowest ratios of the six countries in the past decade. These ratios were lower in 2009-2016 than they were before 2009, reaching a trough between 2012 and 2015. The decline can be attributed partly to the political crisis that hit the country in 2011 and extended past 2014.

*3.2.2 Ratio of money supply to GDP.* The M2 to GDP ratio differed across the six countries over the past two decades (Figure 4). Malaysia had the highest ratio throughout the period; it generally rose over time, with few fluctuations. Turkey had the lowest ratio, but it increased over the period. Egypt's financial development began to decline in 2007, reaching a low of 0.70 in 2012 before beginning to pick up in 2015.

*3.2.3 Ratio of loans to deposits.* The loans to deposits ratio is a measure of the liquidity of financial institutions as well as the ability of the banking sector to use available resources. These ratios were highest in South Africa for most of the period (Figure 5). They were very low and declining in Egypt. The ratio rose consistently in Turkey over the period, increasing from 37.1 in 2002 to about 130.4 in 2015.

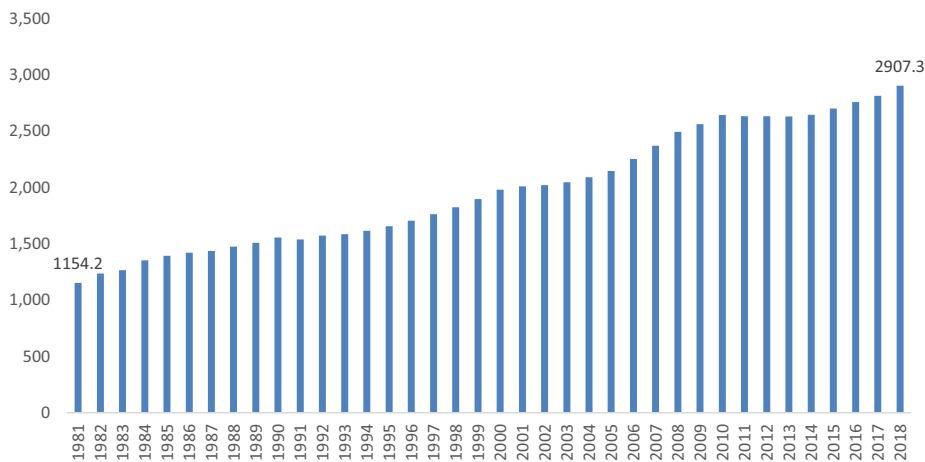
*3.2.4 Ratio of liquid liabilities to GDP.* The ratio of liquid liabilities to GDP declined in Egypt between 2008 and 2012 (Figure 6). It was higher than the ratio in Turkey and South Africa. Malaysia had the highest ratio. Morocco experienced a continuous increase in the ratio between 2000 and 2015.

*3.2.5 Competitiveness of the Egyptian banking sector.* The spread between the lending and the deposit rate fluctuated by about 5 percentage points in Egypt over the past four decades (Figure 7). The largest spread was 8.3 per cent, in 1992; the smallest was 3.7 per cent, in 1998. These figures suggest that in spite of reforms and the liberalization of the banking sector, the sector's competitiveness has remained steady.

*3.2.6 Economic growth in Egypt.* Economic growth in Egypt fluctuated between 1981 and 2015 (Figure 8). It plummeted from about 7 per cent in 2008 (before the global financial crisis) to about 1.8 per cent in 2011, before beginning to recover thereafter. The recovery is expected to continue, as recent investment and industrial licensing laws are likely to boost investment. Security concerns and the political situation could slow growth, however. According to the government's economic reports, the economy is expected to expand by 4.3 per cent in 2018 and by 4.7 in 2019 (Egyptian Ministry of Finance, 2017). In contrast to total growth, GDP per capita (measured in constant 2010 dollars) rose consistently over the past three decades, from about \$1,154 in 1981 to about \$2,907 in 2018 (WDI, 2017).

#### 4. Econometric methodology and modeling strategy: auto regressive distributed lag model

Economic analysis proposes that there is a long-run relationship between variables and that the means and variances are constant and not dependent on time. In the case of time-series variables, this stationarity of variables is not always satisfied. To account for nonstationarity, cointegration test is used to examine how time series data, which may be individually nonstationary and drift extensively away from equilibrium, can be paired so that the workings of equilibrium forces will ensure that they do not drift too far apart.



Economic growth in Egypt

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Figure 8.

GDP per capita in Egypt, 1981-2016

**Note:** Figures are in constant 2010 dollars

**Source:** Data from IMF (2017)

The ARDL represented by the equation:

$$y_t = \beta_0 + \beta_1 y_{t-1} + \dots + \beta_p y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \dots + \alpha_q x_{t-q} + \varepsilon_t$$

where:  $y_t$  = dependent variable;  $y_{t-p}$  = lagged values of  $y_t$ ;  $x_{t-q}$  = successive lags of  $x$  explanatory variables; and  $\varepsilon_t$  a random disturbance term – is a type of cointegration test that incorporates both I(0) and I(1) orders of integration in a single equation set-up and allows for different lag lengths to be assigned as they enter the model. These features give the ARDL model an advantage over other cointegration tests, such as the [Engle and Granger \(1987\)](#) test.

## 5. Empirical results

We tested the association between financial development and economic growth using the time-series techniques of the ARDL procedure developed by [Pesaran \*et al.\* \(1999\)](#), [Pesaran and Smith \(1995\)](#) and [Pesaran and Shin \(1999\)](#). We performed bivariate ARDL regressions for the indexes of financial development detailed above with a measure of economic growth (the log of real per capita GDP). Detailed results are available upon request.

We estimate the following unrestricted error correction model for the economic growth equation:

$$\Delta LRGDPPC_t = \varnothing_0 + \varnothing_{1,i} LRGDPPC_{t-i} + \varnothing_{2,j} FDIIndex_{t-j} + \sum_{t=1}^k \theta_k \Delta LRGDPPC_{t-k} + \sum_{t=1}^n \theta_n \Delta FDIIndex_{t-n} + \varepsilon_t,$$

where *LGDP* is the log of real GDP per capita, and the FD Index is the Financial Development Index[1].

The optimal lag length test confirmed that three lags are optimal for the M2 to GDP model and two lags are optimal for the FMI and FMAI specification. Annex B provides detailed empirical evidence on the testing for the existence of a long-run relationship between LGDRPC and the three measures of financial development. The results provide sufficient evidence to support the existence of a long-run relation; the null hypothesis of no cointegration is rejected for the three measures.

### 5.1 Error-correction equations

Having established the existence of a long-run bivariate association between LGDP and M2/GDP, the FMI and the FMAI, we can use the unrestricted ECM model to estimate the long-run parameters. We find that the deterministic trend is insignificant only in the M2/GDP model. However, the trend is insignificant for the FMI and the FMAI. These results show that within the three bivariate equations, the financial development proxies are all statistically significant and have a positive influence on real per capita income in the long run:

*Error-correction equation for M2/GDP:*

$$ECM = LRGDPPC - 9.09552 - 0.172701 * M2gdp - 0.0236099 * Trend$$

$$WALD \text{ test: } Chi^2(5) = 1484.49 [0.0000] **$$

*Error correction for FMI:*

$$ECM = DLRGDPPC - 0.821779 + 0.0867412 * LRGDPPC - 0.136949 * FMI \\ + 0.03141 * dumm1986 + 0.0300578 * dumm1987 + 0.0342097 * dumm1991$$

$$WALD \text{ test: } Chi^2(5) = 84.5788 [0.0000] **$$

*Error correction for FMAI:*

$$ECM = DLRGDPPC - 0.720434 + 0.0780651 * LRGDPPC - 0.157068 * FMAI$$

$$WALD \text{ test: } Chi^2(2) = 7.07392 [0.0291] *$$

### 5.2 Autoregressive differenced lag equations

Estimation of the ECM model, in which the error term is based on the long-run coefficients, shows that financial development proxied by M2/GDP has a causal impact on financial savings in the short term: A 1 per cent rise in the interest rate causes a 0.07 per cent increase in real per capital income[2].

*ARDL for M2/GDP:*

$$DLRGDPPC = + 3.21 - 0.353 * LRGDPPC_3 + 0.0746 * m2gdp_2 + 0.00847 * Trend \\ (SE) \quad (0.559) (0.062) \quad (0.0232) \quad (0.00147)$$

There is clear and strong statistical evidence that financial development in general (proxied by the three indicators elaborated above) has a causal effect on economic growth in both the

short and long run. The ARDL model indicates that on average, a one-unit increase in the FMI Index is associated with a 0.13 per cent increases in real growth.

*ARDL for the FMI Index:*

$$\begin{aligned} \text{DLRGDPPC} = & +0.822 - 0.0867 * \text{LRGDPPC}_2 + 0.137 * \text{FMI}_1 - 0.0314 * \text{dumm1986} \\ (\text{SE}) & \quad (0.111) \quad (0.0121) \quad (0.0211) \quad (0.00938) \\ & - 0.0301 * \text{dumm1987} - 0.0342 * \text{dumm1991} \\ & \quad (0.00933) \quad (0.00934) \end{aligned}$$

We also looked for time-series dynamics between real growth and financial markets subindexes. Our results indicated that on average, a one-unit increase in the FMAI Index is associated with a 0.16 per cent change in real growth. This result is a bit stronger than the result for the broader FMI Index.

*ARDL for the FMAI Index:*

$$\begin{aligned} \text{DLRGDPPC} = & +0.72 + 0.249 * \text{LRGDPPC}_1 - 0.327 * \text{LRGDPPC}_2 + 0.157 * \text{FMAI}_2 \\ (\text{SE}) & \quad (0.28) (0.151) \quad (0.137) \quad (0.0591) \end{aligned}$$

## 6. Conclusion

This paper investigates the association between financial development and economic growth in Egypt by analysing trends between 1980 and 2016, using the new data set on financial sector development indexes introduced by [Svirydzenka \(2016\)](#).

Modelling of bivariate regressions for real growth per capita with the measure for financial development that is broadly used in the literature (M2/GDP) provides strong support for the association between real income growth and financial development. However, the regressions do not yield statistically significant results regarding the presence of time-series dynamics between real income growth and indexes relating to financial institutions and banking or error correction. This finding can be attributed to the low credit growth to the private sector.

The Financial Markets Index used in this paper shows a strong association with real economic growth. This index is an aggregate index of three subindexes, on financial market depth, efficiency, and access. Bivariate modelling for real growth confirms that the financial markets access index – which includes data on the percentage of market capitalization outside the top 10 largest companies and the total number of issuers of debt (domestic and external, nonfinancial and financial corporations) per 100,000 adults – is associated with real income growth. Capital market development yields statistically significant results for an association with economic growth.

The main policy implications of the empirical results of this paper suggest a stronger focus on promoting a more pro-active role for the financial services industry in Egypt. In particular, there is a critical role for bank financing to support the private sector to maintain an inclusive growth momentum. Further development of the capital market will promote sustainability of such economic growth.

## Note

1. M2 to GDP, FMI and FMAI were interchangeably used as financial development indicators.
2. The M2 to GDP equation is a log-log specification; the estimated coefficients are elasticities. The FMI and FMAI equations are log-level equations.

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<https://ssrn.com/abstract=1081783>

### Appendix. Indexes of financial development

The FD Index ranks countries based on the depth, access and efficiency of their financial institutions and financial markets. It is an aggregate of the Financial Institutions Index and the Financial Markets Index (Sviryzdenka [2016] for details). The full data set is available at: [www.imf.org/en/Publications/WP/Issues/2016/12/31/Introducing-a-New-Broad-based-Index-of-Financial-Development-43621](http://www.imf.org/en/Publications/WP/Issues/2016/12/31/Introducing-a-New-Broad-based-Index-of-Financial-Development-43621)

The Financial Institutions Index is an aggregate of the following three subindexes:

- (1) the Financial Institutions Depth Index, which compiles data on bank credit to the private sector, pension fund assets, mutual fund assets and insurance premiums (life and non-life) as percentages of GDP;
- (2) the Financial Institutions Access Index, which compiles data on the number of bank branches and the number of automatic teller machines per 100,000 adults; and
- (3) the Financial Institutions Efficiency Index, which compiles data on the banking sector's net interest margin, the lending–deposits spread, the ratios of non-interest income to total income and overhead costs to total assets and the returns on assets and equity.

The Financial Markets Index is an aggregate of the following three subindexes:

- (1) the Financial Markets Depth Index, which compiles data on the ratios of stock market capitalization, stocks traded, the value of the international debt securities of the government, and the value of the total debt securities of financial and nonfinancial corporations to GDP;
- (2) the Financial Markets Access Index, which compiles data on the per cent of market capitalization outside of the top ten largest companies and the total number of issuers of debt (domestic and external, nonfinancial and financial corporations) per 100,000 adults; and
- (3) the Financial Markets Efficiency Index, which compiles data on stock market turnover ratio (the ratio of stocks traded to capitalization).

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