



## **Finance-Growth Nexus in the Framework of Democratic Construction: Empirical Evidence from Egypt**

**Dr. Ramy Hosny Elazhary**

**Department of Economics - Faculty of Commerce**

**Zagazig University**

[ramyazhary@zu.edu.eg](mailto:ramyazhary@zu.edu.eg)

***Scientific Journal for Financial and Commercial Studies  
and Researches (SJFCSR)***

Faculty of Commerce – Damietta University

Vol.3, No.2, Part 1., July 2022

**APA Citation:**

**Elazhary, R.H. (2022).** Finance-Growth Nexus in the Framework of Democratic Construction: Empirical Evidence from Egypt, ***Scientific Journal for Financial and Commercial Studies and Research***, Faculty of Commerce, Damietta University, 3(2)1, 551 - 584.

**Website:** <https://cfdj.journals.ekb.eg/>

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Democratic Construction: Empirical Evidence from Egypt**

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**Abstract:**

This study examines the effect of institutions' quality on Egypt's relationship between financial development and economic growth. However, literature intensively explores the relationship's shape; the proponents overlook the crucial relationship validity determinants. Thus, misleading and biased estimates results are expected due to neglecting structural aspects affecting the nature of the finance-growth nexus. Therefore, considering democratic construction to the finance-growth nexus is crucial.

Among others, a specific threshold regression approach has been applied to determine institutional quality's threshold level at which financial development positively impacts economic growth. The econometric analysis aimed to verify the robustness of the threshold effect and the strength of the measures. Moreover, intensive measures are applied, whereby (i) the control variables are expressed using variables that influence the finance-growth nexus. (ii) Another alternative threshold approach is applied by finding the marginal impact of financial development associated with the quality of the institutional environment.

Using different threshold regression approaches shows the importance of the democratic construction threshold on the relationship between financial development and economic growth in Egypt; this gives policymakers priority to support the endeavors of democratic construction in light of their efforts to stimulate economic growth through financial development and provides a deeper insight into the nature of the relationship between financial development and economic growth

**Keywords:** Financial development, Economic growth, Democracy, Institutions, Threshold Autoregression, Egypt.

**JEL classification:** G2, O43, P48

## **1 Introduction:**

Finance-growth nexus, despite its importance, remained questionable. A large body of literature investigates the relationship between financial development (FD) and economic growth. However, skepticism still exists. While literature examines the existence of such relationship, the direction of causality, the optimal financial structure, and tipping points, results are distracting. This stresses the monotonic nature of this relationship. This flaw calls for more investigation to eliminate skepticism and generalize more facts regarding the FD-growth nexus.

Despite the importance of the broader view of financial development versus the narrow traditional view, attention to various aspects of financial development is still largely neglected. This may be due to the disastrous financial development results that the global financial crisis has confirmed (Girgin, Nguyen, & Karlis, 2017). Thus, it becomes essential to reconsider the FD-growth nexus in the light of institutions' quality to draw precise and generalizable clues. Institutions' quality influences the long-run economic growth and development from several dimensions (Fernández & Tamayo, 2017; Law, Kutan, & Naseem, 2018). Accordingly, literature paid growing attention to its moderator role in many economic relationships. Therefore, democratic power, absence of corruption, free competition, law enforcement found a vast rebound in the literature to influence growth. There is a general consensus on democracy as a useful indicator for expressing the institution's quality.

This paper examines the democratic construction effect on the finance-growth nexus to extract the pivotal level of democratic construction in which the relationship between financial development and economic growth can be enhanced.

The paper's remaining part is structured as follows: the next section presents the background and the related theoretical and empirical literature. Section [3](#) outlines the econometric methodology, including model construction in section [3.1](#), data in section [3.2](#), descriptive statistics in section [3.3](#), section [3.4](#) shows the empirical analysis and results, where section [3.5](#) presents an additional robustness check. Section [4](#) concludes.

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## **2 Background:**

Theoretical literature stresses the substance of the finance-growth nexus. Over several decades, there has been a significant development in the empirical literature studying this relationship, which has significantly evolved. The prolonged evolution in literature encompasses various aspects that constitute a proper relationship that can be subtle.

The development extended to incorporate the mechanism channels, namely, capital accumulation and total factor productivity. They represent the financial system's ability to mobilize savings for productive investments and innovative technologies. Although Schumpeter (1911) emphasized the greater importance of the innovation channel, this does not negate their role in influencing growth.

Literature gradually broadened during the 1990s to investigate the causality directions, while some literature supports the demand-following<sup>1</sup> hypothesis following (Patrick, 1966; Robinson, 1952), a significant tendency supports the supply-leading hypothesis (Beck, Levine, & Loayza, 2000; King & Levine, 1993a, 1993b) following the seminal works of (McKinnon, 1973; Shaw, 1973). By the 2000s, the debate has heightened due to conflicting outcomes over countries. Unlike literature that proven the generalized finance-growth nexus, several authors (Beck et al., 2000; Levine, Loayza, & Beck, 2000) argued that financial development enhances economic growth in the developed countries rather than developing countries, which later supported by (Apergis, Filippidis, & Economidou, 2007; Pradhan, Arvin, Bahmani, & Hall, 2019; Stolbov, 2017). Regarding finance-growth nexus at the level of developing countries, several literature argued that developing countries are promising to enhance economic growth through financial development (Aizenman, Jinjarak, & Park, 2015; Arayssi, Fakih, & Kassem, 2019; Bittencourt, 2012; Xu, 2000). However, at the level of the developing countries,

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<sup>1</sup> In contrast to supply-leading hypothesis, the demand-following hypothesis or the growth-led finance hypothesis, means that causality runs from economic growth to financial development. Thus, high economic growth would enhance financial development.

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conflicting results revealed, for instance; (Naceur & Finance, 2007) affirmed that financial development significantly does not affect economic growth in 11 MENA countries, while (Kar, Nazlıoğlu, & Ağır, 2011) reported that economic growth stimulates financial development in 9 MENA countries.

Linearity has recently received substantial interest since increasing scholars asserted that the finance-growth nexus is subject to a nonlinear relationship. (Deidda & Fattouh, 2002) reported a non-monotonic relationship in 119 countries. In a similar vein, several studies affirmed that financial development positively enhances economic growth under a certain threshold (Arcand, Berkes, & Panizza, 2015; Law & Singh, 2014). However, inconsistency still exists, whereas (Cournède, Boris, Oliver Denk, 2015; Samargandi, Fidrmuc, & Ghosh, 2015) reported a U-shaped relationship (Khan & Senhadji, 2003; Law et al., 2018) affirmed an inverted U-Shaped relationship.

Despite the fact that both theoretical and empirical literature development deepened our perception of the finance-growth nexus, skepticism still exists due to conflicting results among different countries. Nevertheless, different results extend to include countries with converging economic development levels. Thus, the finance-growth nexus is questionable, and the validity and applicability of the relationship's conclusions. Although, attentive application of a country's unique characteristics would draw a realistic visualization of financial development's impact on economic growth. Besides, it is expected to illuminate divergences over countries.

Financial development and economic growth are subject to several moderating variables representing unique characteristics and would affect both sides, financial development and economic growth (Ehigiamusoe & Samsurijan, 2020). Although, literature to some extent tested plentiful variables such as economic stability (Rousseau & Wachtel, 2002), economic development level (H. C. Huang & Lin, 2009; Rioja & Valev, 2004), financial structure (Naceur & Finance, 2007; Peia & Roszbach, 2015), and the level of financial development (Fernández & Tamayo, 2017), the quality of institutions and democracy is promising.

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A large body of the literature confirmed that adequate institutions and democracy are prerequisites to yield the positive impact of financial development on economic growth (Demirgüç-Kunt & Maksimovic, 1998; Doucouliagos & Ulubasoglu, 2008; Ishtiaq, Majeed, & Sohail, 2016; Yang, 2011). Whereas, somewhat literature conceived that democracy restrains economic growth since autocratic regimes can curb various struggles and inhibit interest groups' tensions (Rao, 1984). Also, democratic regimes comply with public demand since they lend themselves at the expense of profitable investment (Acemoglu, 2008; Blanchard & Shleifer, 2001). In contrast, democracy proponents defended its existence in several strands. First, democracy enhances property rights protection. Therefore, wealth expropriations are minimal (North & Weingast, 1989; Rodrik, 1999). Second, it boosts the contract's enforcement and effectively monitoring officials (Clague, Keefer, Knack, & Olson, 1996; La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998), which affect both creditors and shareholders positively (Y. Huang, 2010; La Porta et al., 1998). Third, democratic regimes consolidate political stability, which provides transparency and a favorable economic and legal environment (Girma & Shortland, 2008; Siegle, Weinstein, & Halperin, 2004). Fourth, (Baum & Lake, 2003; Rodrik, 2000) reported that democracy strengthens long-run and stable growth. Besides, several literatures extracted more evidence supporting the positive impact of democracy on both financial development and economic growth. Therefore, including democracy as a threshold to the finance-growth nexus would enhance our perception of the relationship. Moreover, it would eliminate the conflicting results over the nexus and provide policymakers with adequate provision to the requirement that supports their endeavors to stimulate economic growth through financial development (Demetriades & Law, 2006; Fernández & Tamayo, 2017; Law et al., 2018).

From the preceding, it is clear that the literature that dealt with finance-growth nexus in general, or those interested in Egypt, have neglected the factors that affect the nature of this relationship, which led to great inconsistency in results from one country to another. This confirms the

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necessity of examining the factors that affect the nature of this relationship. However, little literature examined the democratic construction as the most important factor affecting the nature of the finance-growth nexus inaccurately, by applying traditional regression or applying a separate variable to express democracy without applying simultaneous equations, which is expected to yield ineffective results.

### **3 Econometric methodology and data sources**

The empirical analysis will focus on time series regressions using the discrete threshold regression (TR) model, particularly the threshold autoregressive (TAR) model proposed by Tong (1983). This section discusses model specification and the estimation strategy, besides data used to estimate the nonlinear relationship between financial development and Egypt's economic growth based on democracy.

#### **3.1 Model Construction:**

To investigate the link between financial development and economic growth, primarily, the study adopts the model suggested by King & Levine (1993a, 1993b) and Levine & Zervos (1998) to construct the general model within growth equation in a linear form as follow:

$$\mathbf{GROWTH}_t = \mathbf{C} + \beta \mathbf{FD}_t + \gamma \mathbf{X}_t + \epsilon_t \quad (1)$$

Where  $\mathbf{GROWTH}_t$  represents the level of economic growth at time  $t$ , and  $t = 1, 2, \dots, n$ ,  $\mathbf{C}$  represents a constant,  $\mathbf{FD}_t$  represents the level of financial development in Egypt, while  $\mathbf{X}_t$  refers to the vector of the control variables, which are per-capita stock of physical and human capital, level of government spending, and trade openness, finally  $\epsilon_t$  represents the error term.

Following on from the literature review on finance-growth literature, the role of institutions and democracy have been examined in four primary forms, namely:

- (1) Controlling institutional variables in the regression model (Hamdi, Hakimi, & Sbia, 2017), since controlling the level of institutions'

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quality enhances the financial development's impact on economic growth.

- (2) Identifying the marginal impact of financial development related to the quality of the institutional environment such as (Gazdar & Cherif, 2015; Ishtiaq et al., 2016; Williams, 2017, 2019), whereas the marginal impact of financial development is expected to be positive in countries with a high level of institutional quality, and vice versa. This approach incorporates an interactive variable representing the multiplication of institutions in financial development as the effect of financial development should regularly interact with political institutions' quality. Nevertheless, this approach suffers from the problem of determining an appropriate characterization of the model<sup>2</sup>.
- (3) The clustering approach, whereas the impact of financial development on economic growth is investigated through countries clustered due to its institutional quality level (Grassa & Gazdar, 2014; Law & Habibullah, 2009). Thus, it is expected that countries with good governance and democracy will positively impact and vice versa. However, this approach could suffer from arbitrary and bias since clustering is based on personal choice.
- (4) Detecting the maximizing level of financial development function due to the institutional environment, following (Law, Azman-Saini, & Ibrahim, 2013), as the beneficial effects of financial development are expected to dominate its harmful effects at higher levels of institutions' quality and democracy, and vice versa. That can be tested through thresholds regression, which determines the threshold level at which financial development positively impacts economic growth.

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<sup>2</sup> For instance, (Williams, 2017) based on an interactive variable and linear relationship, concluded that democracy does not strengthen the relationship between financial development and economic growth in developing countries. Conversely, (Williams, 2019) using almost the same sample with a non-linear relationship (quadratic form) findings are reflected.

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Therefore, the fourth method is the most appropriate approach to achieve the objective of the study. Finding the optimum level of financial development on economic growth function within the framework of democratic construction following the threshold regression approach suggested by (Hansen, 2000)<sup>3</sup>. Thus, function (1) can be developed into the following form:

$$\text{GROWTH}_t = C + \begin{cases} \beta_1 \text{FD}_t & \text{if } \text{dem} < \lambda \\ \beta_2 \text{FD}_t & \text{if } \text{dem} \geq \lambda \end{cases} + \gamma X_t + \epsilon_t \quad (2)$$

Where **dem** (the level of democracy) represents the threshold variable used to divide the sample into systems or groups, it is an external variable not included in the list of the explained variables.  $\lambda$  is the unknown value of the threshold parameter, which is estimated using the least square approach<sup>4</sup>. Thus, the coefficient  $\beta_1$  will reflect the effect of financial development on growth in Egypt in the non-democratic periods, while the coefficient  $\beta_2$  will reflect the same effect but in the high democratic periods. It is clear that under the null hypothesis ( $H_0; \beta_1 = \beta_2$ ) the model becomes linear and reduces to the functional form (1). Thus, the final form of the study model becomes:

$$\text{GDP}_{C_t} = \beta_0 + \beta_1 \text{FD}_t I(\text{dem}_t < \lambda) + \beta_2 \text{FD}_t I(\text{dem}_t \geq \lambda) + \beta_3 k_t + \beta_4 h_t + \beta_5 G_t + \beta_6 O_t + \epsilon_t \quad (3)$$

Where  $\text{GDP}_{C_t}$  represents the real gross domestic product per-capita growth rate in time t, and t refers to the period applied (1960-2017) with a total of 58 annual observations.  $\beta_0$  represents the function constant  $\text{FD}_t$  represents the level of financial development, where the following coefficients represent the controlling variables, which are  $k_t$  per-capita share of physical capital stock,  $h_t$  per-capita share of human capital,  $G_t$  the level of government spending,  $O_t$  trade openness. Here,  $I(.)$  is the indicator

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<sup>3</sup> This will allow to display the contradictory/different effects of financial development on economic growth based on the prevalent democracy

<sup>4</sup> In function (1) the parameter ( $\beta$ ) can be positive, negative or statistically insignificant, meaning that linear regression gives only one possible relationship between the variables. But the slope of the thresholds enables us to accommodate all these contradictory possibilities in a private regression.

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function, which takes 1 if the expansion of the pointer function is valid and 0 otherwise. This modeling strategy allows for various funding roles depending on whether the level of democracy is below or above an unknown level of  $\lambda$ .

### **3.2 Data:**

The study utilizes annual data for Egypt covering the period from 1960 to 2017. The dependent variable is represented by the economic growth rate and measured by the real GDP per-capita growth rate. As for the independent variable, which is financial development; It was measured using three proxy indicators (all expressed as ratios to GDP), namely, private sector credit, liquid liabilities, and domestic credit (which represents the banking sector development due to the dominant role of the banking-based view rather than the market-based view in developing countries and Egypt<sup>5</sup>).

The study employs indicators representing the primary sources of economic growth regarding the control variables, where it includes accumulation in both physical and human capital at the per-capita level. The per-capita share of physical capital accumulation is calculated by dividing the population's stock of real physical capital. As for the per-capita share of human capital, a calculation is made based on the average number of years of schooling and the education benefits. Besides, two indicators are extensively applied in literature, namely, the government spending and trade openness indicators (both as a percentage of GDP).

As for the threshold variable, which is the level of democracy, it was measured using five proxy indicators, which are:

- Polity IV index issued by the Center for Systemic Peace; It is widely employed in literature, in which the evaluation of the political system (level of democracy) of any country is based on an assessment of that country's elections for competitiveness, openness, and the level of participation. The "political system score" is ranging from (-10) to (+10),

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<sup>5</sup> In addition, stock market indicators are insufficient to conduct a threshold regression.

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from (-10) to (-6) corresponding to autocracies regimes, from (-5) to (5) to anocracies, and from (6) to (10) for democracies.

- Political Regimes Index, issued by the Center for Systemic Peace; It is based on a classification of the political system of each country each year, where (0) means a closed autocracy; (1) means electoral autocracy; (2) Includes electoral democracy. While (3) includes liberal democracy.

- Freedom in the world index issued by Freedom House; countries are classified according to political rights and civil liberties derived mainly from the Universal Declaration of Human Rights. The degree of democracy for each country is evaluated on a scale from 1 (a free country) to 7 (not a free country). Based on this evaluation, countries are classified into "free", "partly free", and "not free".

- Democratic Accountability Index issued by the (PRS Group); It is a measure of how well a government responds to its citizens, on the grounds that the less responsive it is, the more likely the government will fall. Points are awarded in this component based on the type of government the country in question has. Whether it is Alternating Democracy, a Dominated Democracy, a De Facto One-Party State, and De Jure One-Party State or Autarchy. The value of the index ranges from 1 (the least democratic) to 6 (the most democratic).

- Voice and Accountability Index issued by World Governance Indicators; It captures perceptions of the ability of a country's citizens to participate in electing their government, and freedom of society associations and free media. Its value ranges from 0 (lowest) to 100 (highest).

The proxy indicators were obtained from various sources as mentioned above, to ensure the strength and reliability of the results. To enable comparability, the study standardizes all the democracy proxy variables to range between (0-10), as higher values indicate more outstanding quality. Both indicators, Polity IV and Political Regimes, require substantial and fundamental changes in the level of democracy and are not sensitive to superficial improvements, unlike other indicators. However, applying several proxy indicators of democracy with each indicator's different

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methodology would enhance and deepen our perception of the actual quality of a country's institutions and its democracy level.

The financial development's data obtained from the World Bank's Financial Structure Database. The dependent variable, government spending, and trade openness, were also obtained from the world development indicators (WDI). Where the factors' accumulation data acquired from (Penn World Table 9.1) database. Finally, democracy proxy variables from various sources, as follow; Political Regimes from Center for Systemic Peace, Freedom in the World from Freedom House, Democratic Accountability from the PRS group, Voice and Accountability from World Governance Indicators.

### **3.3 Descriptive Statistics and Correlations:**

Tables 1 and 2 present the descriptive statistics and a correlation matrix for the analysis variables, respectively. As shown in the tables, Egypt achieves an annual economic growth rate of 2.8% on average. The financial development level is relatively modest since the private sector credit as a percentage of GDP averaged around 25.6% and reached 50.8% as maximum during the period, as it is less than its counterpart in developing countries. In addition to financial development indicators, control variables may also reflect the ground for modest economic growth, as the per-capita share of physical capital accumulation is still low. Egypt is considered one of the countries of medium human development. Its trade openness is relatively small, equivalent to 46.9 % of GDP on average. Moreover, the level of democracy is modest, given various indicators of democracy.

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**Table 1: Descriptive statistics for variables, 1960 - 2017:**

	Unit of measurement	Obs.	Mean	Std. Dev.	Min	Max	Jarque-Bera
<b>Dependent variables:</b>							
Real GDP per-capita growth	%	57	2.8506	2.673	4.0765	10.769	(3.957)
<b>Independent variables:</b>							
Private credit	% of GDP	58	25.567	11.83	10.255	50.770	(5.609)*
Liquid liabilities	% of GDP	57	62.259	20.06	28.721	92.837	(6.583)**
Domestic credit	% of GDP	22	40.979	10.79	25.607	54.931	(2.179)
<b>Control Variables:</b>							
Stock capital per-capita	US\$ 2011 constant price	58	7122.8	4622	1779.3	16209	(4.798)*
Human capital	Years of schooling & its returns	58	1.6817	0.487	1.1121	2.6177	(5.108)*
Government expenditure	% of GDP	58	15.239	4.754	10.092	25.746	(7.892)**
Trade openness	% of GDP	58	46.992	11.96	29.263	74.459	(3.156)
<b>Threshold Variables:</b>							
Polity IV	Scaled from 1 to 10	58	2.9474	0.622	2.35	4.6	(12.32)***
Political regimes	Scaled from 1 to 10	58	3.1207	1.377	1	4	(11.32)***
Freedom in the world	Scaled from 1 to 10	45	2.0333	0.880	1	4	(2.866)
Democratic accountability	Scaled from 1 to 10	34	4.1688	1.923	1.9	8.2	(4.137)
Voice and accountability	Scaled from 1 to 10	22	1.7766	0.385	1.33	2.582	(1.972)

Note: \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

**Table 2: Correlation matrix between variables:**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Real GDP per-capita growth (1)	1							
Private credit (2)	<b>0.1891</b> [1.428]	1						
Liquid liabilities (3)	<b>0.1334</b> [0.989]	<b>0.5591</b> [4.955]***	1					
Domestic credit (4)	<b>0.4055</b> [1.984]*	<b>0.2392</b> [1.102]	<b>0.2554</b> [1.151]	1				
Stock capital per-capita (5)	<b>0.2707</b> [2.066]**	<b>0.1851</b> [1.384]	<b>0.1448</b> [1.065]	<b>0.0749</b> [0.336]	1			
Human capital (6)	<b>0.1729</b> [1.291]	<b>0.0975</b> [0.720]	<b>0.1154</b> [0.846]	<b>0.2818</b> [1.313]	<b>-0.0814</b> [-0.601]	1		
Government expenditure (7)	<b>-0.2257</b> [-1.718]*	<b>0.0430</b> [0.319]	<b>0.0411</b> [0.302]	<b>0.1600</b> [0.725]	<b>-0.2491</b> [-1.889]*	<b>0.1989</b> [1.491]	1	
Trade openness (8)	<b>-0.0450</b> [-0.334]	<b>-0.1037</b> [-0.773]	<b>0.1508</b> [1.122]	<b>0.3115</b> [1.466]	<b>0.2934</b> [2.255]**	<b>-0.0286</b> [-0.210]	<b>-0.1029</b> [-0.768]	1

Note: \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

### 3.4 Empirical analysis and interpretation of results:

Prior to modeling, all variables are checked for stationarity using ADF and PP tests. The results of stationarity are mixture of I(0) and I(1), as reported in **Table A** in the appendix. The study's primary model is estimated where a private credit indicator is used to express financial development.

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Empirical results are presented in **Table 3** illustrate appealing outcomes. For regression in **Eq. 1**, which represents the linear form (i.e., without taking the thresholds in the regression), it shows that private credit positively enhances economic growth. An increase in the private credit ratio by 1% will increase the GDP per-capita by 0.24% on average in the long run.

Moreover, human capital significantly enhances growth. In contrast, both government spending and trade openness having a demoting effect on growth. While per-capita physical stock insignificantly affects growth positively.

The threshold regression applied in **Eq.3**, clarifies the impact of institutions represented by the democratic construction on financial development's relationship to economic growth. The regressions from (2) to (6) in **Table 3** use different proxy indicators of democracy.

Regression (2), in which the Polity IV index represents the threshold indicator, shows a nonlinear relationship between private credit and economic growth based on the status of democracy. This nonlinear relationship takes the form of U-shaped; that is, the effect of financial development on economic growth is negative when the democracy status falls below the threshold level, which corresponds to 2.8 degrees on the Polity IV index (see **Table 3**). Moreover, the effect of financial development on growth becomes positive above that threshold.

The following regressions from (3) to (6) confirm this nonlinear relationship, where the only difference between these regressions is the threshold level. This difference may be due to the differences in periods from one regression to another, the methodology of constructing the democracy indicators, and democratic, semi-democratic, and non-democratic levels in each indicator.

Furthermore, the positive impact of the financial development coefficient above the threshold level increases gradually by moving regression from (2) to (6), which means that the positive effect increases with the period's

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decrease<sup>6</sup>. As for the auxiliary variables in regressions from (2) to (6), to some extent, it matches the results of the regression (1). Which affirms the results' consistency and stability regardless of both different periods and threshold indicators applied.

Finally, the coefficient of determination increases, as the applied regressions explain, from 32.5% to 89.4% of the variation in the GDP per-capita. Moreover, Fisher's test indicates the significance of the overall model across all regressions.

**Table 3: Private credit, Economic growth, and Democracy: Empirical results**

	Reg (1) Linear model OLS without threshold	Reg (2) Polity IV $\lambda = 2.7999$	Reg (3) Political Regimes $\lambda = 4$	Reg (4) Freedom in the world $\lambda = 1.75$	Reg (5) Democratic Accountability $\lambda = 3.8799$	Reg (6) Voice and Accountability $\lambda = 1.9172$
Private credit (without threshold)	0.2357 [2.156]**					
				<b>Threshold Variables</b>		
Private credit (when democracy < $\lambda$ )		-1.2262 [-1.849]*	-0.1902 [-1.514]	-0.1156 [-0.474]	-0.2144 [-1.727]*	-0.4913 [-2.397]**
Private credit (when democracy $\geq \lambda$ )		0.1636 [3.579]***	0.1953 [4.561]***	0.2271 [1.778]*	0.2514 [3.018]***	0.4304 [2.821]**
				<b>Non-Threshold Variables</b>		
Stock Capital per-capita	0.0036 [1.159]	0.0013 [7.049]***	0.0012 [7.162]***	0.0061 [1.842]*	0.0052 [2.159]**	0.0071 [2.590]**
Human Capital	165.42 [2.841]***	60.405 [3.238]***	52.536 [2.927]***	158.52 [2.546]**	108.69 [1.724]*	-49.062 [-0.458]
Government Expenditure	-1.2591 [-4.829]***	0.0652 [0.647]	-0.0091 [-0.090]	-1.1375 [-2.957]***	-0.9296 [-2.635]**	-0.5424 [-0.865]
Trade openness	-0.0893 [-2.233]**	-0.0239 [-2.034]**	-0.0339 [-3.942]***	-0.1023 [-2.400]**	-0.5682 [-0.499]	0.0130 [0.210]
Constant	2.3032 [8.535]***	0.2317 [2.926]**	0.2396 [3.184]***	2.6016 [7.233]***	1.8326 [8.348]***	1.6136 [4.702]***
				<b>Effects Specification</b>		
Obs.	56	56	56	45	31	22
Adjusted R <sup>2</sup>	%51.5	%88.3	%89.4	%35.3	%32.5	%48.5
No. of threshold variable lags	-	(-1)	(-1)	-	(-3)	-
Fisher test (F-stat.)	(6.851)***	(70.15)***	(78.12)***	(4.996)***	(3.408)**	(4.297)**
Weighted	no	yes	yes	no	no	no

**Notes:** - **dependent variables:** real GDP per-capita growth

- **financial development:** private credit by deposit money banks to GDP (%)
- **method:** discrete threshold regression
- \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.
- results correspond to a trimming percentage of 25%.

<sup>6</sup> Although the increasing cut-out of the sample size moving from regression (2) to regression (6), all regressions have the same sample of the present time.

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Here, the main conclusions about the nonlinear relationship that takes the U-shaped between financial development and economic growth in Egypt remain stable by moving to **Table 4**, in which liquid liabilities are used to express financial development. In regression (7) and similar to regression (1) in the previous table (i.e., without taking into account thresholds), it becomes clear that there is no effect of liquid liabilities on the growth of real per-capita GDP in Egypt. Nevertheless, after considering the thresholds based on the level of democracy in regressions from (8) to (12), the nonlinear relationship exists, especially in regressions (10), (11), (12), which have an explicit U-shaped. The results of the control variables are broadly identical to the results of **Table 3**.

Given that the government sector crowding out the bank credit may affect the final inference of financial development, financial development has been expressed in **Table 5** using the gross domestic credit index. Here, regression (13) (similar to the regression 1, 7 that is, without taking the thresholds into account) shows a positive effect of gross domestic credit on the growth of the real GDP per-capita in Egypt, even though the impact factor (0.069) is much lower than the private credit coefficient on growth (0.236).

In contrast, applying the threshold regression to the domestic credit in regressions from (14) to (17) led to the emergence of a shallow nonlinear structure between financial development and economic growth, but without reaching the U-shaped. The results confirm that the effect of domestic credit on economic growth is positive either below or above the threshold level, with a relatively more considerable increase above the democracy threshold level.

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**Table 4: Liquid liabilities, Economic growth, and Democracy: Empirical results**

	Reg (7)	Reg (8)	Reg (9)	Reg (10)	Reg (11)	Reg (12)
	Linear model OLS without threshold	Polity IV $\lambda = 2.7999$	Political Regimes $\lambda = 4$	Freedom in the world $\lambda = 1.75$	Democratic Accountability $\lambda = 3.8799$	Voice and Accountability $\lambda = 2.18849$
Liquid liabilities (without threshold)	0.0699 [ 1.104]					
				<b>Threshold Variables</b>		
Liquid liabilities (when democracy < $\lambda$ )		0.0384 [0.274]	0.1496 [1.564]	-0.2940 [-1.846]*	-0.1623 [-1.908]*	-0.2857 [-2.917]**
Liquid liabilities (when democracy $\geq \lambda$ )		0.0481 [2.928]***	0.0575 [3.872]***	0.1087 [2.008]**	0.0197 [ 0.332]	0.5759 [2.529]**
				<b>Non-Threshold Variables</b>		
Stock Capital per- capita	0.0066 [1.963]*	0.0018 [ 4.744]***	0.0018 [4.737]***	0.0034 [1.228]	0.0082 [3.589]***	0.0054 [2.277]**
Human Capital	168.96 [2.583]**	58.458 [2.666]**	51.143 [2.396]**	161.06 [3.036]***	134.46 [2.285]**	-52.015 [-0.537]
Government Expenditure	-1.1776 [-4.071]***	0.1994 [1.925]*	0.1689 [1.734]*	-1.0863 [-3.326]***	-0.4843 [-1.082]	-0.6675 [-1.161]
Trade openness	-0.0846 [-1.864]*	-0.0419 [-1.915]*	-0.0561 [-3.586]***	-0.0608 [-1.545]	-0.0230 [-0.600]	0.0319 [0.503]
Constant	2.2688 [7.537]***	0.0232 [0.298]	-0.0078 [-0.117]	2.4189 [8.229]***	2.4356 [10.20]***	3.0606 [10.87]***
				<b>Effects Specification</b>		
Obs.	55	52	55	44	31	21
Adjusted R <sup>2</sup>	%40.2	%88.1	%87.6	%54.3	%44	%68.1
No. of threshold variable lags	-	(-5)	(-1)	-	(-2)	-
Fisher test (F-stat.)	(6.184)***	(63.77)***	(64.72)***	(7.386)***	(3.949)***	(5.755)***
Weighted	no	yes	yes	no	no	no

**Notes: - dependent variables:** real GDP per-capita growth

- **financial development:** liquid liabilities to GDP (%)

- **method:** discrete threshold regression

- \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

- results correspond to a trimming percentage of 25%.

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**Table 5: Domestic credit, Economic growth, and Democracy: Empirical results**

	Reg (13)	Reg (14)	Reg (15)	Reg (16)	Reg (17)
	Linear model OLS without threshold	Polity IV $\lambda = 2.8$	Freedom in the world $\lambda = 1.75$	Democratic Accountability $\lambda = 2.7999$	Voice and Accountability $\lambda = 2.11538$
Domestic credit (without threshold)	0.0921 [ 3.403]***				
		<b>Threshold Variables</b>			
Domestic credit (when democracy < $\lambda$ )		0.0961 [2.639]**	-0.0216 [-0.357]	0.0656 [2.121]*	0.0862 [2.941]**
Domestic credit (when democracy $\geq \lambda$ )		0.1058 [3.798]***	0.1036 [3.016]***	0.0833 [4.399]***	0.0937 [3.377]***
		<b>Non-Threshold Variables</b>			
Stock Capital per-capita	0.0064 [2.521]**	0.0063 [2.382]**	0.0042 [1.490]	0.0037 [2.042]*	0.0062 [2.390]**
Human Capital	77.599 [ 0.932]	82.299 [0.965]	62.843 [ 0.668]	74.682 [1.431]	77.105 [ 0.907]
Government Expenditure	-1.5210 [-2.689]**	-1.3744 [-2.379]**	-0.3019 [-0.450]	-2.1771 [-5.391]***	-1.5527 [-2.679]**
Trade openness	-0.1498 [-2.951]***	-0.1444 [-2.737]**		-0.1753 [-5.520]***	-0.1494 [-2.885]**
Constant	-1.4814 [-1.301]	-1.8434 [-1.579]	-1.4886 [-1.072]	-1.1409 [-1.345]	-1.3610 [-1.154]
		<b>Effects Specification</b>			
Obs.	22	22	22	22	22
Adjusted R <sup>2</sup>	%52.9	%50.9	%41.4	%82.2	%51
No. of threshold variable lags	-	-	-	-	-
Fisher test (F-stat.)	(5.723)***	(4.629)***	(3.475)**	(11.78)***	(4.936)***
Weighted	no	no	no	no	no

**Notes: - dependent variables:** real GDP per-capita growth

- **financial development:** domestic credit to the private sector (% of GDP)
- **method:** Discrete threshold regression
- \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.
- results correspond to a trimming percentage of 25%.

Accordingly, the above results show that economic growth responds differently to financial development indicators taking institutional differences into account. Economic growth has a much stronger relationship with private credit than liquid liabilities and gross domestic credit. This result is in line with (Levine et al., 2000), who confirmed a strong relationship between private sector credit and economic growth. They also point out that the preferred financial development measure is the private sector credit, which is probably the most important financial indicator. This measure more accurately reflects the efficiency of banking institutions in providing credit sources to the private sector. The empirical results affirm that the credit channel appears to drive the results because private sector credit is a statistically significant determinant of growth.

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Better institutional quality plays a pivotal role in ensuring that financial institutions can facilitate effective borrowing. Thus, preventing credit diversification for unproductive investment activities.

### **3.5 Additional robustness check:**

The primary analysis aimed from the beginning not only to identify the impact of financial development on the Egyptian economic growth within the framework of democratic construction but also to verify whether this effect is robust (i.e., the effect does not differ according to the method used for the analysis, the applied period, proxy indicators, or the structure of the model used). Therefore, empirical findings are robust against the choice of the financial and economics proxies used as well as the time horizon. In particular, several strengthen measures have been used; (i) three indicators to express the level of financial development. (ii) five macro indicators to express the state of democracy in Egypt. (iii) four distinct periods in the threshold regression analysis.

Despite the extended stability of the results, more intensive measures were applied whereby the control variables are expressed using variables that influence the finance-growth nexus. These variables include net direct foreign investment flows (as a percentage of GDP), flows of net aid received (as a percentage of GDP), inflation, and population growth, as shown in Tables **B1**, **B2**, **B3**. Results support, to a large extent, the existence of a nonlinear structure in the finance-growth nexus based on the level of democracy in Egypt. (v) instead of applying the (Law et al., 2013), the study applied another alternative approach by finding the marginal impact of financial development associated with to the quality of the institutional environment, following (Gazdar & Cherif, 2015; Ishtiaq et al., 2016; Williams, 2017, 2019); by creating an interaction variable, as a multiplication of the level of financial development by the level of democracy, this is shown by Tables **C1**, **C2**, **C3**. The result supports the primary approach of the study since the marginal effect of financial development becomes positive when the level of democracy increases. This is affirmed by the positive effect of the interactive variable in the three tables, excepting the insignificant interaction term of multiplying the level of financial development by democratic accountability index.

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#### **4 Conclusion:**

Democracy affects, to a large extent, the shape and direction of the financial development-economic growth nexus. Neglecting the mediating role of democracy in the regression model would result in biased estimators and misleading results. While the relationship of financial development represented by private credit tends to negatively affect economic growth under a linear relationship, it positively affects economic growth, taking democracy as a threshold in regression, following the U-shaped form. Moreover, the liquid liabilities effect appears beyond the threshold level, albeit to a lesser extent than private credit. In the same context, although the threshold led to the emergence of a slight nonlinear structure at the level of domestic credit, it did not take the U-shaped form.

These conclusions provide a deeper insight into the nature of the relationship between financial development and economic growth in Egypt, upon which policymakers can make the right decisions to stimulate economic growth throughout financial development. Therefore, improving the democratic environment is expected to enhance private credit, liquid liabilities, and human capital on economic growth. These results are consistent with the proponents of democratic constructions viewpoint, as democracy can stimulate respect for the law, contract enforcement, and protect property rights. Thus, it will support efforts to achieve economic growth through financial development.

Nonetheless, these results must be interpreted in light of some limitations. First, the proxy variables of the financial development did not cover all dimensions of financial development due to the absence of long time-series. Including different dimensions of financial development would provide a comprehensive visualization of the financial development concept. Second, the contradiction in the indicators of democracy may give a different evaluation of the state's democratic status. In addition, delving deeper into examining how the finance-growth nexus is affected by the diversified democracy indicators, or investigating the other dimensions of institutions, such as corruption, financial transparency, political stability, and government quality, might prove an essential area for future research.

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## Appendix

*Table A: ADF- PP Unit root test results*

	ADF			PP		
	Intercept	Intercept & trend	None	Intercept	Intercept & trend	None
<b>Real GDP per-capita growth</b>	-4.5258 (0.001)***			-4.5362 (0.001)***		
<b>Private credit</b>	-1.9515 (0.307)	-3.0516 (0.128)	-0.4834 (0.502)	-1.4250 (0.563)	-1.8195 (0.682)	-0.3030 (0.572)
<b>D(Private credit)</b>	-2.5966 (0.099)*			-4.2015 (0.002)***		
<b>Liquid liabilities</b>	-1.4635 (0.544)	-2.5021 (0.326)	0.9386 (0.905)	-1.3040 (0.622)	-1.7965 (0.693)	0.5893 (0.841)
<b>D(Liquid liabilities)</b>	-3.1116 (0.032)**			-6.5021 (0.000)***		
<b>Domestic credit</b>	-3.0511 (0.049)**			-0.7401 (0.815)	-2.7673 (0.223)	-0.5249 (0.477)
<b>D(Domestic credit)</b>				-2.7992 (0.076)*		
<b>Stock capital per-capita</b>	1.6693 (0.999)	-1.9179 (0.632)	2.5469 (0.997)	2.6580 (1.000)	-1.8776 (0.653)	6.6637 (1.000)
<b>D(Stock capital per-capita)</b>	-2.2450 (0.193)	-3.1697 (0.101)	-0.4013 (0.535)	-1.9924 (0.289)	-2.8481 (0.187)	-0.5738 (0.464)
<b>D(Stock capital per-capita,2)</b>	-5.7981 (0.000)***			-5.7896 (0.000)***		
<b>Human capital</b>	-0.1557 (0.938)	-2.8457 (0.188)	1.3820 (0.957)	3.5833 (1.000)	-2.4032 (0.374)	9.7163 (1.000)
<b>D(Human capital)</b>	-1.6094 (0.471)	-1.4368 (0.839)	-0.1511 (0.627)	-1.6398 (0.456)	-1.5757 (0.790)	-0.1905 (0.613)
<b>D(Human capital,2)</b>	-6.7549 (0.000)***			-6.7549 (0.000)***		
<b>Government expenditure</b>	-1.3636 (0.593)	-2.8049 (0.202)	-0.7756 (0.376)	-0.9075 (0.779)	-2.3009 (0.427)	-0.7388 (0.392)
<b>D(Government expenditure)</b>	-6.0013 (0.000)***			-6.1171 (0.000)***		
<b>Trade openness</b>	-2.8413 (0.059)*			-2.5462 (0.110)	-2.5553 (0.302)	-0.5137 (0.489)
<b>D(Trade openness)</b>				-5.9426 (0.000)***		

Note: - \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

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**Table B1: Financial development, Economic growth, and Democracy: Robustness check**

**Dependent Variables:** Real GDP per-capita growth

**Financial development:** Private credit by deposit money banks to GDP (%)

**Method:** Discrete threshold regression

	Reg (18)	Reg (19)	Reg (20)	Reg (21)	Reg (22)	Reg (23)
	Linear model OLS without threshold	Polity IV $\lambda = 2.7999$	Political regimes $\lambda = 4$	Freedom in the world $\lambda = 1.75$	Democratic accountability $\lambda = 3.8799$	Voice and accountability $\lambda = 1.4423$
Private credit (without threshold)	0.2511 [2.641]**					
	<b>Threshold variables</b>					
Private credit (when democracy < $\lambda$ )		-0.0058 [-0.008]	-0.0017 [-0.005]	0.2821 [1.811]*	-0.0802 [-0.529]	-0.1796 [-1.029]
Private credit (when democracy $\geq \lambda$ )		0.2629 [2.772]***	0.2741 [2.812]***	0.3747 [3.141]***	0.2630 [3.300]***	0.4252 [3.709]***
	<b>Non-threshold variables</b>					
FDI, net flow (% of GDP)	0.5561 [4.249]***	0.5725 [6.267]***	0.5794 [6.495]***	0.6521 [4.992]***	0.4619 [4.536]***	0.6422 [7.336]***
Net aid received (% of GDP)	0.2347 [2.841]***	0.2468 [5.384]***	0.2497 [5.133]***	0.2473 [6.459]***	0.0589 [0.542]	0.1986 [0.502]
Inflation	0.0200 [0.414]	0.0190 [0.373]	0.0209 [0.399]	0.0544 [1.132]	-0.0129 [-0.353]	0.0395 [0.949]
Population growth	7.6738 [2.044]**	8.1969 [1.704]*	8.0523 [1.856]*	10.463 [2.853]***	-5.4997 [-1.301]	-3.1185 [-0.607]
Constant	0.7352 [1.633]	0.6444 [1.704]*	0.6437 [1.773]*	0.5212 [1.114]	0.7223 [1.861]*	0.2143 [0.391]
	<b>Effects specification</b>					
Obs.	48	48	48	44	32	22
Adjusted R <sup>2</sup>	%53.6	%52.7	%53.1	%62.9	%63	%78.2
No. of threshold variable lags	-	(-1)	(-3)	(-1)	(-2)	-
Fisher test (F-stat.)	(8.753)***	(7.553)***	(7.659)***	(9.124)***	(7.603)***	(11.78)***
Weighted	no	no	no	no	no	no

**Notes:** - \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

- Results correspond to a trimming percentage of 25%.

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**Table B2: Financial development, Economic growth, and Democracy: Robustness check**

**Dependent Variables:** Real GDP per-capita growth

**Financial development:** Liquid liabilities to GDP (%)

**Method:** Discrete threshold regression

	Reg (24)	Reg (25)	Reg (26)	Reg (27)	Reg (28)	Reg (29)
	Linear model OLS without threshold	Polity IV $\lambda = 2.7999$	Political regimes $\lambda = 4$	Freedom in the world $\lambda = 1.75$	Democratic accountability $\lambda = 3.8799$	Voice and accountability $\lambda = 2.18849$
Liquid liabilities (without threshold)	0.0351 [ 0.614]					
			<b>Threshold variables</b>			
Liquid liabilities (when democracy < $\lambda$ )		-0.5101 [-2.329]**	-0.5207 [-2.425]**	-0.2928 [-2.827]***	-0.1425 [-1.486]	-0.3960 [-4.405]***
Liquid liabilities (when democracy $\geq \lambda$ )		0.0742 [ 1.256]	0.0752 [ 1.279]	0.1098 [ 2.352]**	0.0071 [ 0.107]	-0.2473 [-1.158]
			<b>Non-threshold variables</b>			
FDI, net flow (% of GDP)	0.3575 [2.814]***	0.4004 [3.111]***	0.3973 [3.107]***	0.2968 [2.265]**	0.3375 [3.045]***	0.1859 [1.818]*
Net aid received (% of GDP)	0.1708 [3.611]***	0.1544 [3.309]***	0.1529 [3.313]***	0.1719 [5.628]***	-0.0418 [-0.323]	0.5661 [1.586]
Inflation	0.0445 [0.715]	0.0188 [ 0.301]	0.0192 [ 0.309]	0.0452 [ 0.881]	0.0357 [ 0.537]	0.1628 [2.636]**
Population growth	5.8156 [1.426]	6.6954 [1.609]	6.7305 [1.628]	0.4368 [0.118]	-8.4398 [-1.754]*	-23.786 [-4.100]***
Constant	1.3074 [2.763]***	1.1693 [2.412]**	1.1985 [2.496]**	1.5792 [3.088]***	1.6207 [ 3.269]***	1.6938 [2.562]**
			<b>Effects specification</b>			
Obs.	47	47	47	44	33	21
Adjusted R <sup>2</sup>	%46.7	%45.1	%45.7	%58.5	%54.1	%77
No. of threshold variable lags	-	(-1)	(-1)	-	-	-
Fisher test (F-stat.)	(6.754)***	(6.389)***	(6.537)***	(7.730)***	(5.719)***	(9.392)***
Weighted	no	no	no	no	no	no

**Notes:** - \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

- Results correspond to a trimming percentage of 25%.

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**Table B3: Financial development, Economic growth, and Democracy: Robustness check**

**Dependent Variables:** Real GDP per-capita growth

**Financial development:** Domestic credit to the private sector (% of GDP)

**Method:** Discrete threshold regression

	Reg (30)	Reg (31)	Reg (32)	Reg (33)	Reg (34)
	Linear model OLS without threshold	Polity IV $\lambda = 2.8$	Freedom in the world $\lambda = 1.75$	Democratic accountability $\lambda = 2.7999$	Voice and accountability $\lambda = 2.11538$
Domestic credit (without threshold)	0.0115 [0.601]				
		<b>Threshold variables</b>			
Domestic credit (when democracy < $\lambda$ )		0.0546 [1.392]	0.0306 [1.289]	0.0206 [1.210]	0.0178 [0.840]
Domestic credit (when democracy $\geq \lambda$ )		0.0666 [2.286]**	0.0461 [1.586]	0.0714 [4.172]***	0.0783 [3.659]***
		<b>Non-threshold variables</b>			
FDI, net flow (% of GDP)	0.5858 [7.666]***	0.4241 [3.566]***	0.4911 [4.653]***	0.4294 [6.312]***	0.5066 [6.393]***
Net aid received (% of GDP)	1.6002 [4.283]***	0.8705 [1.622]	1.8633 [3.393]***	-0.0943 [-0.286]	-0.2198 [-0.551]
Inflation	0.1056 [2.415]**	0.0245 [0.372]	0.1152 [1.947]*	0.0218 [0.586]	0.0372 [0.823]
Population growth	8.8121 [2.029]*	0.0193 [0.003]	8.2663 [1.458]	-3.8661 [-1.024]	1.7133 [0.398]
Constant	-1.4305 [-1.559]	-2.0888 [-1.395]	-2.4577 [-1.839]*	-0.1003 [-0.115]	0.0265 [0.025]
		<b>Effects specification</b>			
Obs.	22	22	22	22	22
Adjusted R <sup>2</sup>	%79.3	%45.6	%65.5	%82.4	%76.9
No. of threshold variable lags	-	(-1)	(-1)	(-3)	-
Fisher test (F-stat.)	(11.06)***	(3.939)**	(6.701)***	(17.43)***	(9.770)***
Weighted	no	no	no	no	no

**Notes:** - \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

- Results correspond to a trimming percentage of 25%.

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**Table C1: Financial development, Economic growth, and Democracy:  
Another robustness check**

**Dependent Variables:** Real GDP per-capita growth

**Financial development:** Private credit by deposit money banks to GDP (%)

**Method:** Least squares

	Reg (35)	Reg (36)	Reg (37)	Reg (38)	Reg (39)
	Polity IV	Political regimes	Freedom in the world	Democratic accountability	Voice and accountability
Private credit	-0.6021 [-1.899]*	-15.161 [-7.784]***	-0.4459 [-1.525]	0.0696 [ 0.307]	-2.2481 [-3.964]***
Stock capital per-capita	0.0017 [2.575]**	-0.0009 [-0.224]	0.0078 [2.553]**	0.0054 [2.029]*	0.0063 [2.750]**
Human capital	-16.421 [-0.773]	289.34 [4.379]***	123.04 [2.194]**	131.12 [2.068]**	-68.883 [-0.756]
Government expenditure	0.1087 [ 1.283]	0.0339 [ 0.094]	-0.7323 [-1.918]*	-0.8997 [-1.678]	-0.7210 [-1.425]
Trade openness	-0.0623 [-6.003]***	0.1452 [3.717]***	-0.0999 [-2.642]**	-0.0536 [-1.387]	-0.0024 [-0.047]
Democracy	-0.1691 [-0.691]	0.9595 [3.717]***	0.7707 [2.092]**	-0.1777 [-1.268]	1.2611 [ 1.624]
(Private credit * Democracy)	0.1996 [1.933]*	4.4071 [6.281]***	0.3464 [2.454]**	-0.0091 [-0.177]	1.1976 [4.161]***
Constant	0.9635 [1.342]	-1.4684 [-1.771]*	1.2212 [1.605]	2.9170 [4.751]***	-0.6127 [-2.459]**
	<b>Effects specification</b>				
Obs.	56	53	45	34	22
Adjusted R <sup>2</sup>	%91.8	%93.4	%49.9	%40.7	%64.8
Fisher test (F-stat.)	(89.17)***	(106.3)***	(6.485)***	(3.513)***	(5.828)***
Weighted	yes	yes	no	no	no

**Notes:** - \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

- Results correspond to a trimming percentage of 25%.

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**Table C2: Financial development, Economic growth, and Democracy:  
Another robustness check**

**Dependent Variables:** Real GDP per-capita growth

**Financial development:** Liquid liabilities to GDP (%)

**Method:** Least squares

	Reg (40)	Reg (41)	Reg (42)	Reg (43)	Reg (44)
	Polity IV	Political regimes	Freedom in the world	Democratic accountability	Voice and accountability
Liquid liabilities	-0.2275 [-2.412]**	-0.4861 [-2.114]**	-0.4818 [-2.915]***	-0.2343 [-1.691]	-2.0102 [-4.023]***
Stock capital per-capita	0.0019 [ 2.555]**	0.0002 [ 0.098]	0.0073 [ 2.743]***	0.0066 [ 2.871]***	0.0107 [ 4.306]***
Human capital	-14.633 [-0.675]	114.07 [ 2.079]**	125.00 [ 2.559]**	116.43 [ 1.925]*	-66.554 [-0.701]
Government expenditure	0.1638 [ 1.999]*	-0.3891 [-1.612]	-0.5403 [-1.552]	-0.9826 [-1.989]*	-1.2769 [-2.165]*
Trade openness	-0.0602 [-5.735]***	0.0076 [ 0.264]	-0.0755 [-2.061]**	-0.0171 [-0.456]	-0.1940 [-2.491]**
Democracy	-0.3677 [-2.423]**	-0.2520 [-1.452]	0.7271 [ 2.223]**	-0.2698 [-1.992]*	2.7239 [ 2.748]**
(Private credit * Democracy)	0.0684 [ 2.401]**	0.1523 [ 2.518]**	0.2258 [ 3.534]***	0.0333 [ 1.362]	1.2033 [ 3.878]***
Constant	1.5391 [ 3.095]***	1.3406 [ 3.095]***	1.3504 [ 2.036]**	3.4066 [ 5.716]***	-2.7537 [-1.469]
<b>Effects specification</b>					
Obs.	52	52	44	33	21
Adjusted R <sup>2</sup>	%92.8	%18.9	%62.9	%52.1	%64.5
Fisher test (F-stat.)	(94.24)***	(2.697)**	(8.303)***	(4.863)***	(5.548)***
Weighted	yes	yes	no	no	no

**Notes:** - \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

- Results correspond to a trimming percentage of 25%.

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**Table C3: Financial development, Economic growth, and Democracy:  
Another robustness check**

**Dependent Variables:** Real GDP per-capita growth

**Financial development:** Domestic credit to the private sector (% of GDP)

**Method:** Least squares

	Reg (45)	Reg (46)	Reg (47)	Reg (48)
	Polity IV	Freedom in the world	Democratic accountability	Voice and accountability
Domestic credit	-0.3144 [-1.875]*	-0.2127 [-4.243]***	0.1013 [0.442]	-0.0981 [-0.979]
Stock capital per-capita	0.0034 [ 1.520]	0.0057 [4.754]***	0.0041 [1.735]	0.0047 [ 2.436]**
Human capital	51.121 [ 0.785]	106.91 [2.685]**	48.683 [0.695]	77.063 [1.320]
Government expenditure	-1.5115 [-3.169]***	-0.9943 [-3.427]***	-1.5886 [-3.366]***	-2.1191 [-4.734]***
Trade openness	-0.1485 [-3.549]***	-0.1857 [-7.469]***	-0.1446 [-3.315]***	-0.1889 [-5.114]***
Democracy	-5.1957 [-2.499]**	-7.8475 [-6.290]***	1.0539 [0.354]	-4.8230 [-2.342]**
(Domestic credit * Democracy)	0.1137 [2.421]**	0.1930 [ 6.283]***	-0.0064 [-0.077]	0.1141 [2.117]*
Constant	17.381 [2.269]**	11.078 [5.277]***	-4.1813 [-0.523]	6.1592 [1.665]
<b>Effects specification</b>				
Obs.	22	22	22	22
Adjusted R <sup>2</sup>	%71.7	%89.8	%67.8	%78
Fisher test (F-stat.)	(7.657)***	(24.03)***	(6.531)***	(9.280)***
Weighted	no	no	no	no

**Notes:** - \*\*\*, \*\*, \* indicate significance at 1%, 5% and 10% respectively.

- Results correspond to a trimming percentage of 25%.

## العلاقة بين التمويل والنمو في إطار البناء الديمقراطي: دليل تجريبي من مصر

رامي حسنى الأزهرى

مدرس الاقتصاد بكلية التجارة

جامعة الزقازيق - مصر

ramyazhary@zu.edu.eg

### الملخص:

استحوذت العلاقة بين التنمية المالية والنمو الاقتصادي على مساحة كبيرة من الاهتمام في الأدبيات الاقتصادية، وعلى الرغم من ذلك لم يتم التوصل إلى علاقة حاسمة لآلية يمكن بمقتضاها الاعتماد على دعم النمو الاقتصادي من خلال التنمية المالية، وهذا ما يرجع إلى إهمال الطبيعة الخاصة لهذه العلاقة والعوامل الهيكلية التي يمكن أن تؤثر عليها. وتعد جودة المؤسسات وعلى رأسها البناء الديمقراطي من أهم العوامل التي يمكن لها أن تؤثر على العلاقة بين التنمية المالية والنمو الاقتصادي، وإهمال هذا الدور الوسيط للبناء الديمقراطي سيؤدي إلى تقديرات متحيزة ونتائج مضللة إلى حد بعيد.

وبفحص المنهجيات المختلفة لانحدار العتبات تم استخدام منهجية تعظيم دالة التنمية المالية بالنسبة للبيئة المؤسسية، والذي يُحدد مستوى العتبة التي تُمثل الحد الأدنى من المستوى المؤسسي اللازم لكي تظهر الآثار المفيدة للتنمية المالية على النمو الاقتصادي. كما أن التحليل القياسي لم يستهدف فقط التعرف على أثر التنمية المالية على النمو الاقتصادي المصري ففي إطار البناء الديمقراطي، ولكن التحقق مما إذا كان هذا الأثر مستقر وقوى أي لا يختلف الأثر باختلاف الطريقة المستخدمة للتحليل أو الفترة الزمنية المستخدمة أو المؤشرات الوكيلية المستخدمة أو هيكل النموذج المستخدم. ولذلك اشتمل التحليل القياسي على بعض إجراءات القوة مثل؛ (i) استخدام ثلاثة مؤشرات وكيلية للتعبير عن مستوى التنمية المالية. (ii) استخدام خمسة مؤشرات وكيلية للتعبير عن حالة الديمقراطية في مصر. (iii) استخدام أربع فترات زمنية مختلفة في تحليل انحدار العتبات. وعلى الرغم من ثبات النتائج بشكل كبير في الإجراءات السابقة، إلى أنه تم دعمها بمزيد من إجراءات القوة، والتي تتمثل في تغيير النموذج المستخدم، حيث تم التعبير عن المتغيرات الضابطة باستخدام مؤشرات مؤثرة في علاقة التنمية المالية بالنمو الاقتصادي، كذلك تم إتباع منهجية بديلة في انحدار العتبات من خلال إيجاد التأثير الحدي للتنمية المالية المرتبطة بنوعية البيئة المؤسسية. وكانت النتائج مستقرة كذلك. وهو ما يؤكد قوة وفعالية النتائج المستخلصة من الدراسة.

وتشير نتائج الدراسة إلى أن أخذ الديمقراطية كعتبة للانحدار يوفر نظرة أعمق لطبيعة العلاقة بين التنمية المالية والنمو الاقتصادي وهذا ما يمكن متخذي القرارات من صياغة برامج فعالة لدعم النمو الاقتصادي من خلال التنمية المالية. حيث أكدت الدراسة على طبيعة العلاقة غير الخطية بين التنمية المالية والنمو الاقتصادي والمتأثرة بدعم البناء الديمقراطي بالتطبيق على الاقتصاد المصري، كما توصلت الدراسة إلى حدود البناء الديمقراطي المُعظمة لتأثير دعم النمو الاقتصادي من خلال التنمية المالية.

**الكلمات الرئيسية:** التنمية المالية، النمو الاقتصادي، الديمقراطية، المؤسسات، عتبة الانحدار الذاتي، مصر.