Research Article

SMEs Facilitating Financing and its Effects on Egyptian Economic Growth

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Abstract

The success of SMEs depends mainly on facilitating financing, which can support them in facing economic challenges. SMEs in Egypt face fundamental problems in providing financing, which hinders their ability to grow. Research indicates that SMEs that receive adequate financing are better able to achieve sustainable growth and create new job opportunities. Research indicates that SMEs that receive adequate financing are better able to achieve sustainable growth and create new job opportunities. This research aims to evaluate the impact of SMEs financing on economic growth by using quantitative analysis, as well as a descriptive analysis of variables and presentation of results to provide a comprehensive understanding. To achieve the research's aim, the study uses annual time series data during the period from 1992 to 2022 and employs an autoregressive distribution lag (ARDL) model, a Bounds Test, and an Error Correction Model (ECM). The results indicate that there is a positive and significant relationship between financing small and medium enterprises and economic growth in Egypt. It recommends adopting integrated strategies to improve access to financing for small and medium enterprises and stresses the importance of the role that the government can play in facilitating access to financing by providing loan guarantees and tax incentives for investors in small and medium enterprises.

Keywords

Facilitating Financing, Small and Medium Enterprises, Economic Growth, Government Policies, Egypt, SMEs

1. Introduction

Small and medium enterprises (SMEs) are one of the main pillars of the Egyptian economy, as they represent a large percentage of the private sector and contribute effectively to achieving economic growth and creating job opportunities. These companies play a pivotal role in supporting sustainable development by promoting innovation, diversifying the production base, and providing products and services to the local market. However, small and medium-sized companies in Egypt face major challenges that hinder their ability to grow and expand, and one of the most prominent challenges is the

lack of financing.

In Egypt, facilitating financing for SMEs is vital to achieving economic and social development goals. The Egyptian government, banks, and other financial institutions play a major role by providing customized financial support programs, credit facilities, and financial guarantees. Facilitating or providing financing to SMEs in Egypt is not just an economic necessity but also a strategic investment in the future of the Egyptian economy. By providing the necessary financial support, these companies can realize their full potential, contributing to sustainable economic development and social prosperity in the long term.

This research aims to measure the impact of financing provided to SMEs on economic growth in Egypt, using neoclassical analysis and an empirical approach. The research focuses on clarifying the relationship between the funding provided to these companies and economic growth, and the extent to which financing affects growth. The factors affecting economic growth are diverse and include physical and human capital, technology, population, trade openness, the role of institutions, and other related elements. The research relied on these variables to measure the relationship. The research uses annual time series data from 1992 to 2022. and employs the autoregressive model with the distribution of time lags (ARDL), the cointegration test using the bounds method (Bounds Test), and the error correction model (ECM). This method has proven effective and efficient in previous studies to test short- and long-term relationships between finance and economic growth. The research makes an additional contribution by using time series data, in contrast to most previous research that relied on panel data without considering the diverse circumstances of countries.

This analysis promotes a deeper understanding of the potential impacts on SMEs in the Egyptian context, this type of analysis is rare in previous research, and the focus was on the period from 1992 to 2022 due to the availability of academically supported data during that period, which was obtained from the Small and Medium Enterprises Development Authority by official request.

This paper is divided into four sections. Section one includes a review of relevant literature. The second section focuses on providing an in-depth of facilitating financing for SMEs and a broad understanding of companies in Egypt, and the third section presents the theoretical framework of the study and explains the specifications of the model used. Finally, section four summarizes the main findings of the study and provides some recommendations.

2. Literature Review

A study by Bartolacci, et al reviewed the relationship between sustainability and the financial performance of small and medium enterprises from 1999 to 2018, it used the bibliometric approach to analyze quantitative data related to scientific publications. Most of the articles were analyzed and

it was empirically verified that there was a positive relationship between practices related to institutional sustainability and the performance of small and medium enterprises [1].

Batrancea concluded that there is a positive relationship between the density of small and medium enterprises and economic growth, which varies according to the type of institution. In addition, the effect is greater for small and medium enterprises that have a high level of innovation [2].

A study by Gherghina, et al investigated the role of small and medium enterprises (SMEs) as an engine of economic growth through investment and innovation. It used a linear regression model to estimate the relationship. The study found a positive relationship between the level of economic growth and the density of small and medium enterprises, the level of investments of small and medium enterprises, and the extent of innovation of small and medium enterprises [3].

Hasan, et al analyzed the impact of local banking market structures on the financing and performance of small and medium enterprises (SMEs) in emerging economies, using a linear regression model to estimate the relationship. The study found that there is a positive relationship between the concentration of the banking market and both the level of financing of small and medium enterprises and the performance of small and medium enterprises, resulting in the fact local banking market structures have an important impact on the funding and performance of small and medium enterprises in emerging economies [4].

Dowling, et al investigated the impact of trust on SMEs' attitudes towards equity financing in Europe, a survey was conducted on 4,200 small and medium-sized companies in 26 European countries, and a logit regression model was used to analyze the data. The study concluded a positive correlation between trust and the attitudes of small and medium enterprises toward equity financing, and institutional trust plays a more important role than personal trust in influencing the attitudes of small and medium enterprises toward equity financing [5].

Quartey, et al provided an analysis of the challenges facing financing small and medium enterprises (SMEs) in West Africa, with a focus on the countries of the Economic Community of West African States (ECOWAS). The study showed a positive relationship between administrative, financial, marketing, and technological capabilities and the performance of SMEs, and a negative relationship between the regulatory environment and the performance of SMEs [6].

SMEs in less developed countries, using data from more than 2,000 small and medium enterprises in 25 least-developed countries during the period from 2005 to 2015. The study found that 70% of SMEs use guarantees to obtain loans. Personal guarantee is the most common type of guarantee, as 60% of institutions use it. Commercial guarantees is less common, as only 40% of SMEs use it, the use of guarantees depends on the institutional environment, such as the level of development of the financial system and guarantees play an important role in lending to small and medium

enterprises in less developed countries [7].

A study by Loureiro and Castelo presented a model to evaluate the contribution of innovative small and medium enterprises (SMEs) to economic growth, with a focus on intangible assets. The study used a theoretical model to evaluate the contribution of innovative SMEs to economic growth, the model was tested using data from 25 least-developed countries, and using a linear regression method to estimate the relationship between the dependent variables (GDP growth, job creation, and innovation) and the independent variables (company characteristics, intangible assets, institutional environment, and control variables), found that innovative small and medium enterprises (SMEs) play an important role in economic growth and that innovative SMEs contribute significantly to GDP growth, create new job opportunities, and increase the level of innovation in the economy, Intangible assets play an important role in the success of innovative SMEs, and the relationship between intangible assets and the growth of innovative SMEs is stronger in countries that have strong institutions. Innovative SMEs that invest in human capital, organizational structure, and relationships are more likely to survive and grow, recommending developing a model to evaluate the contribution of innovative SMEs to economic growth and encouraging governments to support innovative SMEs by providing financing [8].

Klapper addressed the role of leasing in financing small and medium enterprises. The study expressed the dependent variable on the growth of enterprises, and this variable was measured using a set of indicators such as the rate of revenue growth, profit growth, and growth in the number of employees. As for the independent variables that used leasing, this variable was measured through the percentage of institutions that use leasing, the average amount of financing obtained through leasing, and the average cost of leasing, in addition to the control variables, using a regression model to estimate the relationship, and the study concluded that there is a positive relationship between the use of leasing and the growth of small and medium enterprises, and leasing helps in obtaining financing faster and easier than traditional sources [9].

A study by Wu and Xu analyzed the role of venture capital in loans to small and medium enterprises in China during the period from 2007 to 2019, using a regression model to estimate the relationship and expressed the variables, thus loans to small and medium enterprises as a dependent variable, investment capital, the age of the company, the size of the company, the industry in which the company operates, the location of the company, and control variables. The study found that venture capital has a positive effect on loans to small and medium enterprises [10].

Brixiová et al showed the relationship between access to finance and jobs created by small and medium enterprises in Africa. The study found that access to finance has a positive impact on job creation in SMEs [11].

Obi et al analyzed the contribution of SMEs to economic development in a country with a transitional economy using data from Indonesia. The study used a multiple regression model to estimate the relationship during the period from 1990 to 2019. It found that small and medium enterprises play an important role in economic development in Indonesia, and small and medium enterprises contribute significantly to economic growth and job creation [12].

A study by Gupta and Gregoriou analyzed the impact of market-based financing on the failure of SMEs. The conclusion is that market-based financing has a negative impact on the probability of failure of small and medium enterprises [13].

A study by Behr, et al analyzed the relationship between the periodicity of loans to small and medium enterprises and government participation in banks. The study used data from 34 countries from 1990 to 2014, and a regression model was used, expressing the dependent variable the periodicity of loans to small and medium enterprises, and the variable the change in loans provided to small and medium enterprises during periods of recession and economic prosperity, and the government's participation in banks. The study found that there is a negative relationship between government participation in banks and the periodicity of loans for small and medium enterprises. Also, the effect of government participation on the periodicity of loans for small and medium enterprises is stronger in countries with low levels of economic development. This is because banks in these countries tend to be more concentrated, giving the government greater influence over their behavior [14].

Adeosun and Shittu examined the relationship between the formation of small and medium enterprises and economic growth in Nigeria during the period from 1990 to 2016, using a multiple linear regression model, and expressed variables as follows: economic growth (Gross Domestic Product) as a dependent variable, while the independent variables are the formation of small and medium enterprises, investment and employment, infrastructure, corruption, and government policy, Finding that the formation of small and medium enterprises has a positive impact on economic growth and that this impact is because institutions create job opportunities, promote innovation, and improve social development. Investment and employment have a positive impact on economic growth, and weak infrastructure and corruption hurt economic growth [15].

3. Theoretical Background and Descriptive Framework

In the face of economic challenges facing many countries, small and medium-sized enterprises (SMEs) are a major driver of economic growth and employment. These enterprises contribute significantly to fostering innovation and enhancing competitiveness in local and international markets [16]. However, SMEs face significant challenges in accessing

finance, which negatively impacts their ability to grow and expand [17]. Difficulty in accessing finance is attributed to several factors, including lack of adequate collateral, high borrowing costs, and lack of adequate credit information that hinders risk assessment [18].

Financing facilitation strategies are crucial to improving SMEs' ability to grow. These strategies include improving the business environment, developing alternative financing instruments such as venture capital, providing government guarantees, and simplifying bank lending procedures [19].

This enhances SMEs' ability to access the financial resources needed to support and expand their operations, which in turn contributes to economic growth [20].

According to the definition of Egyptian Law No. 141 of 2014, companies are classified into small, medium and large based on the number of employees and the size of revenues. Small companies are classified as those with less than 50 employees and annual revenues of less than 10 million Egyptian pounds, while medium companies include those with between 50 and 250 employees and annual revenues of up to 200 million Egyptian pounds [21].

In the Egyptian context, SMEs face challenges in accessing finance. These challenges include weak financial infrastructure, limited access to banking services, and high borrowing costs. However, the Egyptian government and the private sector have launched initiatives to improve the financing environment, such as establishing dedicated financing funds and providing loan guarantees.

Improving SMEs financing in Egypt can significantly contribute to economic growth by increasing investments, creating new jobs, and fostering innovation. Studies showed that improving access to finance enhances economic growth and promotes sustainable development. However, challenges remain, such as the need to improve the regulatory environment and enhance financial transparency, which must be addressed to support sustainable growth of the sector [22].

However, there are still challenges that need to be addressed on an ongoing basis. Egypt needs to improve its legislative environment and enhance financial transparency to provide a more conducive environment for SMEs growth. It is also necessary to raise awareness about the importance of affordable finance and innovation in the SMEs sector to promote sustainable economic growth [19].

Therefore, improving SMEs financing in Egypt can have a significant impact on economic growth, contributing to increased investment, creating new job opportunities, and stimulating innovation, which enhances sustainable economic development in the country.

4. Methodology

4.1. Analytical Framework

Following Jr, and E. Hall and I. Jones, the study uses the Cobb-Douglas production function [23, 24]. The equation takes the following form:

$$Y_t = K_t^{\alpha} L_t^{1-\alpha} A_t \ 0 < \alpha < 1 \qquad (1)$$

Where Y represents the volume of total production, K represents capital, L represents the total labor force, A represents the level of technological progress, and T represents time.

Taking natural Log from equation (1):

$$LOGY = \alpha \, LOGK + (1 - \alpha)LOG \, L + \beta_2 LOG \, A \quad (2)$$

After adding other explanatory variables, the equation becomes:

$$LogY_t = \beta_1 \, Log \, K + \beta_2 LogL + \beta_3 LogFin + \beta_4 LogTrade \tag{3}$$

Where Y expresses economic growth, K is physical capital, L is labor, Fin is financing small and medium enterprises, and Trade is trade openness. These indicators have been used in many studies such as Beck, et al [16], Mankin, et al [25], and Layard [26].

4.2. Data

The research uses annual data for the period (1992-2022), the choice of period depends on the availability of data. Data were collected from the World Bank and the Small and Medium Enterprises Development Agency. The dependent variable is GDP per capita, which reflects economic growth. The independent variables are gross capital formation as a percentage of GDP (Log K), number of employees (Log L), SME financing (Log Fin), and trade as a percentage of GDP (Log Trade). The following table represents the description of variables, the source of variables, and their abbreviation.

Table 1. Description of Dependent and Independent Variables.

Variables	Description	Abbreviation	Source of the data
Economic growth	GDP per capita (constant US dollar terms for 2015)	Log Y	World Bank
Physical capital	Total capital formation (% of GDP)	Log K	World Bank
Labor	Number of employees	Log L	World Bank

Variables	Description		Abbreviation	Source of the data
Finance	Financing small and medium enterprises		LogFin	Micro, Small and medium enterprises Development Agency
Trade openness	trade (%of GDP)		Log Trade	World Bank

By analyzing the time series properties of the variables used in the regression model. Descriptive statistics for these variables are presented and discussed in detail in Table 2.
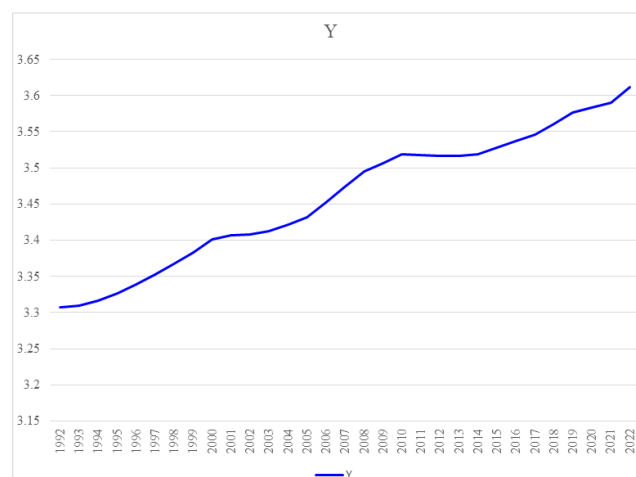
Table 2*. Descriptive Statistics.*

	Log Y	Log Fin	Log K	Log L	Log Trade
Mean	7.965	20.424	2.888	3.833	3.809
Median	7.997	20.394	2.897	3.849	3.778
Maximum	8.316	21.845	3.108	3.899	4.272
Minimum	7.614	18.105	2.613	3.728	3.396
Std. Dev	0.212	1.035	0.129	0.046	0.225
Skewness	-0.166	-0.312	-0.401	-0.700	0.161
Kurtosis	1.794	2.283	2.400	2.396	2.363
Jarque-Bera	2.019	1.165	1.297	3.003	0.658
Probability	0.364	0.558	0.522	0.222	0.719
Sum	246.9	633.158	89.553	118.847	118.087
Sum Sq. Dev	1.356	32.172	0.505	0.065	1.525
Obs	31	31	31	31	31

Table 2. shows the summary of the variables' descriptive statistics, the mean, the standard deviation, and the minimum and the maximum values of each variable. The average GDP per capita is 7.965, which is close to the median (7.998) and falls between the minimum (7.615) and the maximum (8.316). This indicates relative stability in GDP per capita during the period studied. In general, statistics indicate variation in economic performance across different variables, with indications of volatility and stability in different sectors of the Egyptian economy. The average capital value is 2.889, which

is closer to the minimum (2.613) than the maximum (3.109), indicating that invested capital was relatively low during the period studied.

The average labor value is 3.834, indicating employment stability. With the median close to the mean and with the maximum (3.899) and minimum (3.729) relatively close to each other, it can be concluded that employment was relatively constant during the period. The average financing value is 20.424, which shows an increase compared to the rest of the variables. The mean is close to the median (20.395) but closer to the minimum (18.106) than the maximum (21.845). This may indicate that financing was volatile but often tended towards lower values.

The average value of trade volume is 3.809, which indicates that the level of trade during the period studied was high. However, since the average is closer to the minimum (3.396) than the maximum (4.272), this may indicate that the trade volume at times was much lower than the period average.

Source: Data from the World Bank.

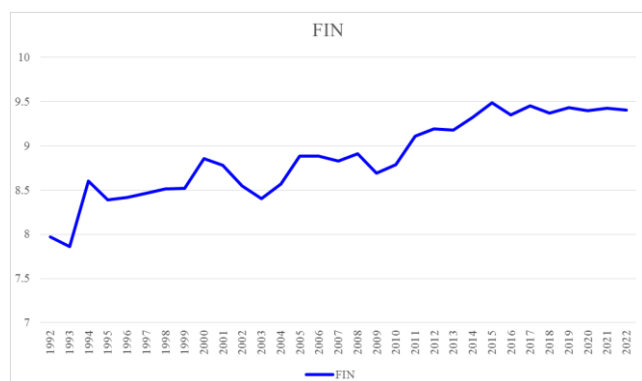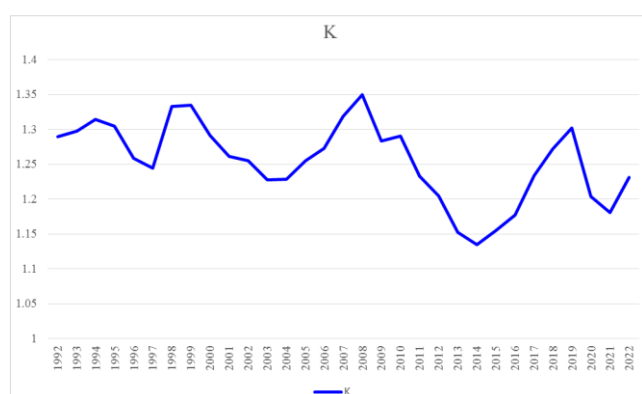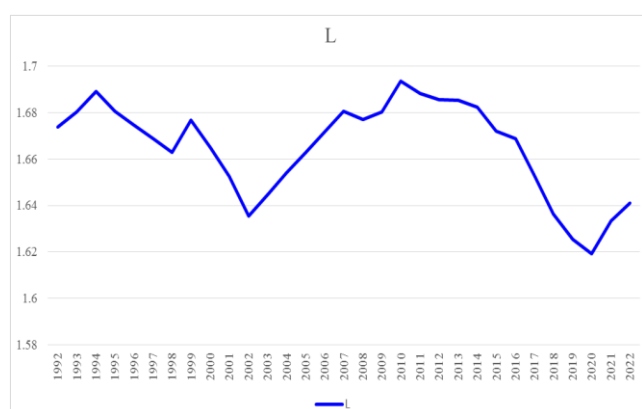***Figure 1****. Economic growth in Egypt during the period (1992-2022).*

Figure 2. Volume of financing provided to SMEs in Egypt during the period (1992-2022).

Source: Data from SME's Development Agency and Central Agency for Public Mobilization and Statistics
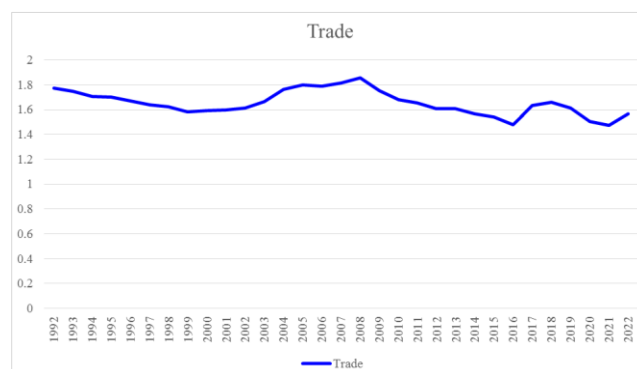

Source: Data from the World Bank.

Figure 3. Gross capital formation as a percentage of GDP in Egypt during the period (1992-2022).

Source: Data from the World Bank.

Figure 4. Number of workers in Egypt during the period (1992-2022).

Source: Data from the World Bank.

Figure 5. Trade as a percentage of GDP in Egypt during the period (1992-2022).

Figure 1. shows the change in GDP per capita from 1992 to 2022, using logarithmic values to facilitate the presentation of the data over a long period. The general trend of GDP per capita is one of continuous increase over this period.

At the beginning of the period, from 1992 to 2000, the graph shows a steady and steady increase in GDP per capita, indicating sustainable economic growth. In the first decade of the twenty-first century, growth continues but at a slightly slower rate until 2008. During the period from 2008 to 2010, there appears to be a temporary slowdown or stabilization in growth, which may reflect the effects of the global financial crisis in that period, and since 2010, GDP per capita has resumed its growth at a steady rate until 2019, reflecting a continued improvement in the economy. Then, from 2019 to 2022, a significant increase in growth can be observed, which may be the result of new economic measures or policies that contributed to boosting economic growth during this period.

In general, the graph indicates a significant and continuous improvement in GDP per capita over the past thirty years, reflecting improved economic conditions and increased income and productivity at the individual level. This data is considered a positive indicator of the economic health and economic progress of the country or region under study.

Figure 2. shows the change in the logarithmic values of the volume of financing provided to SMEs (LOG FIN) from 1992 to 2022. The graph shows relative stability in the volume of financing provided to SMEs over the past three decades, with some minor changes. From 1992 to 2000, we observe a slight increase in financing followed by a period of stability. Then, in the first decade of the twenty-first century, the slight upward trend continued with some fluctuations, reflecting a slow improvement in the volume of financing provided to these companies.

From 2011 to 2022, the graph shows relative stability in the values, with some minor increases in recent years. This stability may reflect the economic policies followed and the continuous support for SMEs by providing them with the necessary financing. In general, the graph indicates that the volume of financing provided to SMEs has remained stable

over the past thirty years, with a slight and sustainable improvement in some periods. This stability may be a positive indicator of the commitment of financial institutions and government policies to support and develop SMEs, which are the backbone of the economy and an important driver of economic growth.

Figure 3. shows the trends in gross capital formation as a percentage of GDP (LOG K) over the past 30 years, from 1992 to 2022. This indicator reflects the importance of investments in infrastructure and other fixed assets as a major driver of economic growth.
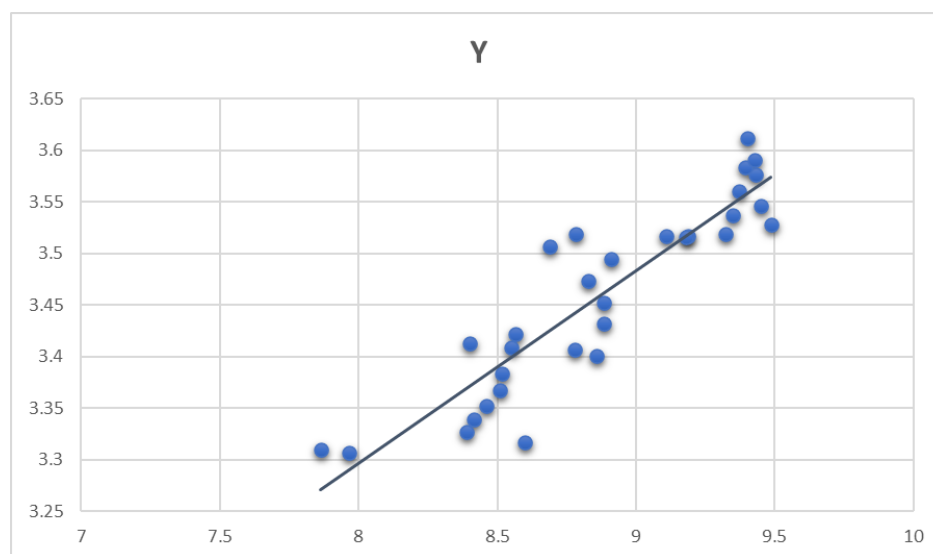
At the beginning of the time period, the ratio was around 1.3%, indicating relatively healthy investment in the economy. However, during the mid-1990s, the ratio witnessed a significant decline, reaching its lowest levels around 1997. This decline may have been due to economic factors such as financial crises or changes in investment policies. With the beginning of the new millennium, the ratio began to rise again, peaking around 2004 at 1.35%. This rise can be attributed to economic stimulus policies and increased investments in infrastructure.

The period from 2005 to 2012 witnessed significant fluctuations, with a significant decline during the global financial crisis of 2008-2009. In 2012, the ratio reached its lowest level, reflecting the effects of the financial crisis and the resulting investment constraints. From 2013 to 2018, the ratio gradually recovered, reaching its peak again in 2018, indicating a recovery in the economy and increased investment. However, after 2018, the ratio declined significantly until 2021, possibly because of the slowing economic growth or political and economic instability. In 2022, the ratio showed a slight increase, which may indicate the beginning of a new economic recovery or new investment incentive policies.

Figure 4. shows the trends in the number of workers (LOG L) over thirty years, from 1992 to 2022, reflecting significant

changes in the labor market over the years. Initially, the ratio was around 1.68%, but it gradually declined during the 1990s, with some temporary increases, reaching its lowest level around 2000. After that, the ratio rose again during the early 2000s, peaking in 2007. However, from 2008 to 2019, the ratio gradually declined, with a significant decline after 2014. In 2020, the ratio reached its lowest level during the period studied, reflecting the significant impacts of the COVID-19 pandemic on the labor market. However, in 2021 and 2022, the graph shows a slight increase, indicating the beginning of a post-pandemic labor market recovery. This chart reflects economic dynamics and their impact on employment, pointing out economic challenges such as unemployment and low wages during downturns, and improvements in employment and the labor market during upturns, providing a comprehensive view of the evolution of the labor market and its importance to the Egyptian economy over the past three decades.

Figure 5. shows the trends in trade as a percentage of GDP (LOG Trade) in Egypt over thirty years, from 1992 to 2022, reflecting changes in trade and economic activity over the years. At the beginning of the period, the ratio was around 1.8%, but it gradually declined during the 1990s and early 2000s, reaching its lowest level around 2004. After that, the ratio rose again until it peaked around 2006. During the period from 2007 to 2014, the ratio gradually declined, with some temporary increases. From 2015 to 2018, the ratio saw a slight increase again, but it declined significantly after 2018 until 2021. In 2022, the graph shows a slight increase, which may indicate the beginning of a recovery in trade activity. This chart reflects changes in trade as a share of GDP in Egypt, with periods of decline indicating a decline in trade activity due to economic factors such as financial crises or trade restrictions, while periods of increase reflect an improvement in trade activity and an increase in exports and imports.

Source: Data from the World Bank, SME's Development Agency and Central Agency for Public Mobilization and Statistics

Figure 6. *The Association between SMEs Finance and GDP per Capita.*

The scatter plot shows a positive correlation between SMEs' finance and economic growth.

4.3. Empirical Model

The research has used the ARDL bounds test, The ARDL model is used to examine the long and short run relationships between financing for SMEs and economic growth. This test involves calculating statistical values and critical values for both lower and upper bounds. Critical values for statistical significance levels of 1%, 5%, and 10% are used to determine whether the results indicate the presence of cointegration between variables. The calculated statistical values are compared to the critical values, and the hypothesis of no cointegration is rejected if the statistics exceed the critical values at a 5% significance level.

Estimation using the ARDL model divides the estimated relationship into two parts: long-run coefficients and short-run coefficients. In addition, a series of diagnostic tests will be performed to ensure the validity of the model, including normality test, serial correlation, and heteroscedasticity test. Standard hypothesis testing for serial correlation and covariance testing involves examining the presence or absence of serial correlation and heteroskedasticity in the model. Serial correlation means similarity between observations as a function of the time delay between variables and is important for identifying recurring patterns or missing underlying elements. On the other hand, heteroskedasticity denotes cases where the volatility of a variable is unequal across the set of values of the second variable being predicted.

The stationarity of the variables within the time series used in the model was checked by performing the conventional unit root test, including augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests.

Table 3. Results of the Dickey- fuller Test and the Phillips-perron Test.

Variables	Augmented Dickey Fuller Test (ADF)		Phillip-Perron (PP)	
	First Difference	First Difference	Levels	Level
Log Y	-5.31***	-5.315***	6.009	0.470-
Log Fin	-6.27***	-6.375***	3.579	-1.843
Log K	-4.31***	-4.553***	-0.433	-0.348
Log L	-3.63***	-3.649***	-0.625	- 0.515
LogTrade	-3.90***	-3.587***	-0.740	-0.759

*** denotes that significant at 5%.

The results of the unit root test indicate that all variables are stationary at the first order, and these results provide a strong basis for using the integrated lagged linear regression (ARDL) model to estimate the relationships between economic growth and financing available to SMEs. The next step in this analysis involves cointegration testing to determine long-run relationships between variables. The results are presented in Table 3, following the previously discussed methodology demonstrating the suitability of the ARDL Test for this Context.

4.4. Cointegration Test

Table 4. ARDL Bound Test for Cointegration.

ARDL Bounds Test		
K	**Value**	**Test Statistic**
4	**52.318**	**F-statistic**
Critical Value Bounds		
I1 Bound	**I0 Bound**	**Significance**
3.09	2.2	10%
3.49	2.56	5%
3.87	2.88	2.5%
4.37	3.29	1%

Table 4 Shows the results of the cointegration test to ascertain whether there is a long or short-run relationship between economic growth and access to finance by SMEs in Egypt, and the null hypothesis is that there is a long-run relationship between the variables. However, considering the results as shown in Table 4, the value of the statistics is 52.318 which is greater than the critical values at 5% for both lower and upper bound tests. The result means that the null hypothesis is accepted and therefore we conclude that there is a long-term relationship between economic growth and financing provided to SMEs in Egypt.

4.5. Long-Term Relationship

$$\text{Log } Y_t = \beta_0 + \sum_{i=1}^{p}(\beta_1 \log Y_{t-i}) + \sum_{i=0}^{p}(\beta_2 \log \text{Fin}_{t-i}) + \sum_{i=0}^{p}(\beta_3 \log K_{t-i}) + \sum_{i=0}^{p}(\beta_4 \log L_{t-i}) + \sum_{i=0}^{p}(\beta_5 \log \text{Trade}_{t-i}) + u_t$$

Where t is time period, y_t is the dependent variable, Fin, K, L, trade are the explanatory variables.

Variables	Coefficient	T-Statistic	Probability
Log Fin	0.267	15.152	0.0000
Log K	0.586	4.709	0.0002
Log L	-0.459	-2.222	0.0393
LogTrade	0.090	2.242	0.0378

The results from the ARDL model provide a fine-grained analysis of the long-run relationships between GDP per capita (the dependent variable) and basic economic variables such as finance, labor, capital, and trade. These results reveal the greater importance of these factors in determining the path of economic growth in the long term.

For example, financing, especially for SMEs, shows a strong positive impact on GDP per capita, with an impact factor of 0.267. This means that a 1% increase in the volume of finance could raise GDP per capita by 0.267%, demonstrating the vital role of finance in stimulating economic growth. Likewise, capital investment is a factor that significantly influences growth, with its strong positive coefficient of 0.5861 indicating that it significantly drives growth. As for trade, it has a moderate positive effect with a coefficient of 0.090. Reflecting that trade openness contributes positively to economic growth, albeit to a lesser extent compared to finance and capital.

4.6. Short-Term Relationship

$$\Delta \text{Log } Y_t = \beta_0 + \sum_{i=1}^{p-1}(\beta_1 \Delta \log Y_{t-i}) + \sum_{i=0}^{Q-1}(\beta_2 \Delta \log \text{Fin}_{t-i}) + \sum_{i=0}^{M-1}(\beta 3 \Delta \log K_{t-i}) + \sum_{i=0}^{N-1}(\beta_4 \Delta \log L_{t-i}) + \sum_{i=0}^{R-1}(\beta_5 \Delta \log \text{Trade}_{t-i}) + \text{¥ECT}_{t-1} + U_t$$

Variables	Coefficient	T-Statistic	Probability
D(Log Fin)	0.038	5.407	0.0000
D(Log K)	0.085	5.221	0.0001
D(Log L)	0.412	3.580	0.0021
D(LogTrade)	0.013	1.197	0.2466
ECTt-1	-0.145	-20.027	0.0000

The short-term relationship shows that finance, capital, and labor each have a positive and statistically significant effect on the dependent variable, while the effect of trade is not statistically significant. The error correction term shows that the system corrects any imbalance quickly, restoring the balance by 14.52% in each period.

4.7. Diagnostic Tests

For in-depth validation of the results extracted from the estimated model, several diagnostic tests were performed. The results of these tests are presented:

4.7.1. Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.541	Prob. F(10,18)	0.8390
Obs*R-squared	6.702	Prob. Chi-Square (10)	0.7532
Scaled explained SS	3.151	Prob. Chi-Square (10)	0.9776

The results of the heteroscedasticity test using the Brioche-Pagan-Godfrey method indicate that there is no heteroscedasticity in the model. The calculated values (0.541, 6.702, 3.151) with high probabilities (0.839, 0.753, 0.977) showed that there is homoscedasticity in the variance between the errors, which means that there is insufficient evidence to reject the null hypothesis that assumes homoscedasticity. Thus, the estimates used in the model can be relied upon as reliable, which enhances confidence in the model results.

4.7.2. Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.596	Prob. F(1,17)	0.4504
Obs*R-squared	0.983	Prob. Chi-Square (1)	0.3213

In the previous table, the results of both the F-statistic and Obs*R-squared support the null hypothesis that there is no serial correlation in the errors for the model. This means that the model does not suffer from serial correlation problems at this level of lag, which makes the model's inferential results more reliable and gives greater confidence in analyses and predictions based on this model.

4.7.3. Normality Test

Table 9. Normality test.

Normality test	
Jarque-Bera	0.318
Probability	0.852

The Jarque-Bera probability is 0.852, which indicates that the error term of the estimated model is normally distributed. The implication is that the estimated model does not suffer from any problem of bias.

In order to confirm the results of the ARDL model and its credibility, two tests are used to ensure that there is no structural change in the data that would lead to an error in the stability and consistency of the short-term model parameters with the long-term model parameters.

The first: Cumulative Sum of Recursive Residual CUSUM"

The second: Cumulative Sum of Square Residual CUSUMSQ"

Structural stability of the estimated parameters of the error correction formula of the ARDL model is achieved if the CUSUMSQ & CUSUM test histogram falls within the critical limits at the 5% level, and these parameters are unstable if the test statistic histogram moves outside the limits at this level. Figures A1 and A2 in appendix indicate that the estimated parameters for the two tests fall within the critical limits at the 5% level, and thus there is stability and consistency of the model parameters in the short and long term.

5. Discussion the Findings

The results showed that increasing the amount of financing provided to SMEs has a significant positive impact on Egyptian economic growth. This is in line with the endogenous growth theory, which emphasizes the importance of investing in innovation and productivity to achieve sustainable economic growth. According to this theory, SMEs play a vital role in stimulating innovation and enhancing productivity due to their flexibility and ability to quickly adapt to market changes. Investing more in these projects enhances their efficiency and productivity, which is reflected in enhancing overall economic growth. These results are supported by studies such as Romer [27] and Lucas which showed that investing in research and development enhances economic growth by improving innovation and increasing productivity [23].

Moreover, financing promotes the expansion of the production of these enterprises, which increases aggregate supply and stimulates demand through the multiplier effect of in-

vestment. This expansion not only contributes to increased productivity, but also promotes a more equitable distribution of income by creating new jobs, especially in less developed regions. This is in line with the findings of studies such as Aghion and Howit, which showed that investment in SMEs contributes to a more equitable distribution of resources and promotes inclusive economic growth [28].

On the other hand, the results of the model confirmed that increasing total capital significantly enhances economic growth, which is consistent with the theory of rational growth, which highlights the importance of capital in achieving sustainable economic development. Investment in total capital enhances the economy's ability to achieve long-term growth by improving technology and infrastructure and increasing productivity. This investment contributes to improving production efficiency and expanding the employment base, which increases national income and stimulates aggregate demand. This approach is supported by researchers such as Mankiw, et al who pointed out that increasing human and physical capital enhances economic growth by improving productivity and increasing employment [25].

Conversely, the results also showed that increasing the labor ratio may reduce economic growth. This negative effect can be explained by the labor cost theory and the labor market supply and demand theory. Increased labor costs may place an additional burden on firms, causing them to reduce their investments in expansion or improvement of production, thus reducing economic growth. Studies such as Ball, et al confirm that higher wage costs can negatively affect investment and economic growth [29].

The theory of supply and demand in the labor market also explains that an increase in the number of workers without a corresponding increase in the demand for labor can lead to lower wages and higher unemployment rates, which reduces aggregate demand in the economy. These findings are supported by the study of Layard, who confirmed that a surplus in the labor market can lead to lower wages and higher unemployment, which limits economic growth [30].

Finally, trade (LTrade) has been shown to have a positive effect on economic growth, which is consistent with international trade theory and economic growth theory. Opening markets and increasing trade can enhance economic efficiency by expanding markets and increasing demand for products and services. These findings are supported by studies by those by Rodrǵuez and Rodrik; and Frankel and Rose, which found that increased trade enhances economic growth by improving productivity and expanding markets [31, 32].

Based on these theories and studies, increasing financing for small and medium enterprises, investing in capital, and promoting trade are effective tools for achieving comprehensive and sustainable economic growth.

6. Conclusions and Recommendation

The research uses the ARDL model to study the impact of

SME financing on economic growth in Egypt during the period from 1992 to 2022. By analyzing the data and estimating the model, the study came to results showing a positive and moral impact of financing these projects on economic growth. The results also showed that an increase in financing for these companies is associated with a rise in GDP per capita, and investment in fixed assets and technology is necessary to strengthen their capabilities. As for the error correction factor, the model indicated the existence of an effective mechanism to quickly adjust deviations from the long-term balance, which confirms the stability of the relationship between SME financing and economic growth in the long term. The research revealed several results, the most important of which are:

Financing for SMEs shows a strong positive impact on GDP per capita, with an impact factor of 0.267. This means that a 1% increase in the volume of finance could raise GDP per capita by 0.267%, demonstrating the vital role of finance in stimulating economic growth. Likewise, capital investment is a factor that significantly influences growth, with its strong positive coefficient of 0.586 indicating that it significantly drives growth. As for trade, it has a moderate positive effect with a coefficient of 0.0903 Reflecting that trade openness contributes positively to economic growth, albeit to a lesser extent compared to finance and capital.

The Error Correction coefficient (CointEq(-1)), which shows a large negative value (-0.145) and is highly significant (p-value < 0.0000), confirms the existence of a long-run equilibrium relationship between these variables. A negative value indicates that deviations from this equilibrium are corrected quickly, with an adjustment rate of approximately 14.5% in each period.

These results underscore the great importance of financing provided to SMEs in promoting economic growth and highlight challenges related to the labor market. Trade, despite its relatively less impact, remains a supportive factor for growth. These insights provide valuable implications for formulating economic policies that focus on enhancing financing, capital investment, and improving labor market conditions with the aim of stimulating comprehensive economic growth.

The Study Recommends the Following

Facilitating financing for SMEs has a significant impact on economic growth in Egypt, and it is therefore important to take steps to improve this aspect. The government should develop financing programs dedicated to these companies, providing flexible financing terms and reduced interest rates, while providing government guarantees for loans to encourage banks and financial institutions to support this category. In addition, access to information should be improved by establishing advisory centers that provide support and advice on how to obtain financing and manage businesses, in addition to launching awareness campaigns that highlight available financing opportunities and how to benefit from them.

Facilitating administrative procedures is an important step, as bureaucratic procedures related to obtaining financing should be simplified and the required documents reduced, with the establishment of a unified electronic platform for submitting and following up financing applications. Innovation and sustainability should also be encouraged by providing incentives for companies that rely on innovation and technology and supporting projects that contribute to environmental and social sustainability. Improving financing for small and medium-sized enterprises can lead to increased productivity and expanded business scope, which contributes to increasing GDP, as well as creating new job opportunities, reducing unemployment, diversifying the economy and reducing dependence on certain sectors. In addition, it is necessary to improve the investment environment by providing tax incentives and reductions in customs duties for investors in desired economic activities and continuing to improve infrastructure. Transparency and accountability in investment processes should also be enhanced to enhance confidence among local and international investors. It is also necessary to expand cooperation with Arab countries to enhance investment flows and official development assistance and encourage foreign direct investment by providing incentives to attract it to enhance economic growth and create new job opportunities. These strategies aim to provide a supportive environment for small and medium enterprises and enhance economic growth in Egypt by improving financing, infrastructure, and local and international investments.

Abbreviations

ADF	Augmented Dickey-Fuller
PP	Phillip-Perron
ARDL	Auto Regressive Distributed Lag
ECM	Error-Correction Model
SMEs	Small and Medium Enterprises
ECOWAS	The Economic Community of West African States

Conflicts of Interest

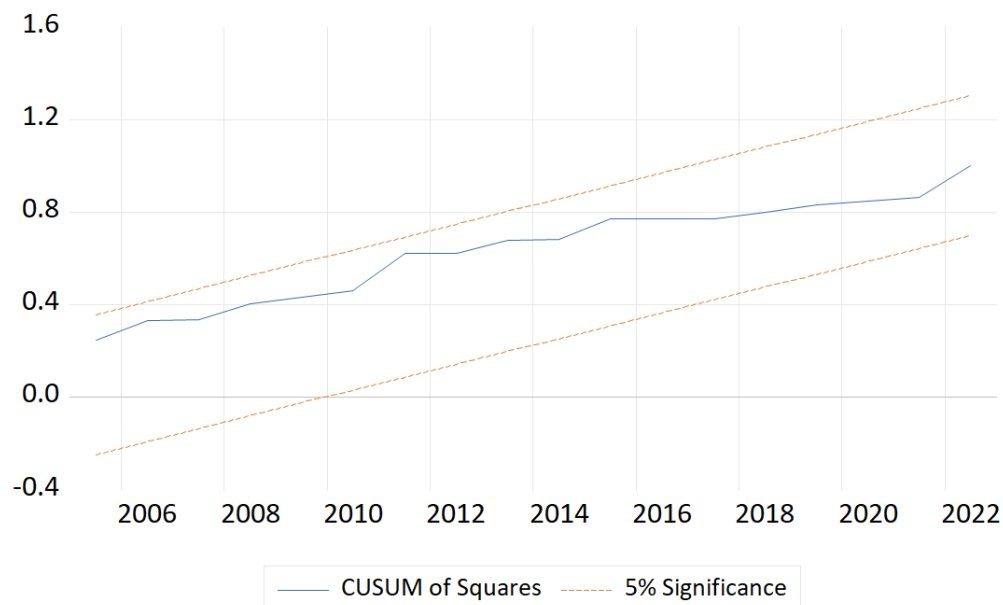The authors declare no conflicts of interest.
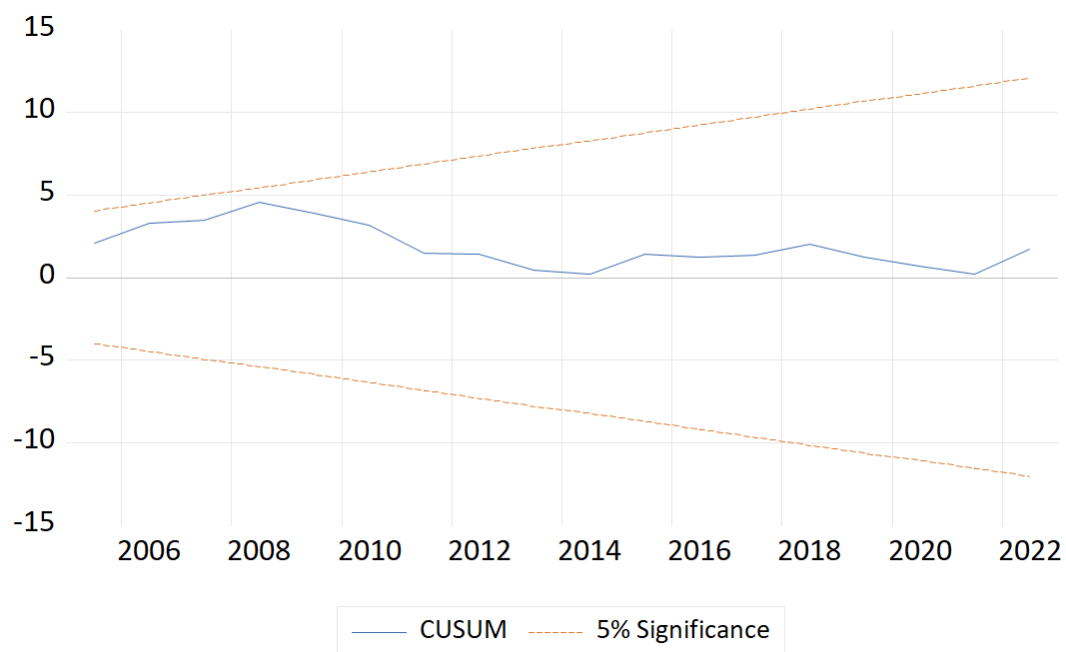
Appendix

Figure A1. CUSUM.

Figure A2. CUSUM Squares.

Micro, Small and Medium Enterprise Development Agency (MSMEDA)

spending on small and micro enterprises during the period 2000-2022

Year	Micro-Enterprises			Small Enterprises		
	Job Opportunity	Number of Projects	Financing	Job Opportunity	Number of Projects	Financing
2000	14,674	12,228	19,499,094	133,707	37,170	719,961,610
2001	23,212	19,343	32,931,655	26,335	26,335	603,923,617
2002	16,346	13,622	18,769,187	65,842	14,746	354,516,871
2003	21,186	17,655	30,652,950	38,039	9,926	251,009,292
2004	43,300	36,083	48,600,926	43,459	11,566	367,729,872
2005	147,052	122,543	229,818,158	90,802	23,879	768,326,806
2006	177,367	147,806	261,730,544	90,991	21,024	769,038,515
2007	196,514	163,762	351,850,620	79,114	15,179	675,680,986
2008	224,210	186,842	476,100,514	92,159	15,963	814,248,915
2009	232,907	194,089	543,172,620	51,147	9,619	491,127,636
2010	171,518	155,925	509,000,739	57,197	9,427	607,728,942
2011	139,703	127,003	472,261,126	78,416	18,129	1,287,469,693
2012	163,040	148,218	630,486,550	50,685	18,095	1,544,547,755
2013	191,679	174,254	863,699,939	37,973	12,565	1,512,161,189
2014	151,643	162,394	919,178,876	66,706	16,046	2,111,094,417
2015	211,507	189,057	1,415,722,911	88,166	19,336	3,071,207,966
2016	207,661	188,126	1,537,870,030	57,781	17,050	2,227,157,104
2017	277,610	236,011	2,268,403,875	64,092	16,159	2,815,406,519
2018	357,808	234,565	3,127,644,229	49,393	16,542	2,348,744,475
2019	295,361	195,096	2,817,612,402	50,124	12,673	2,696,343,863
2020	182,415	119,998	1,890,982,239	42,397	18,076	2,481,539,032
2021	388,570	164,054	4,502,198,524	42,213	34,980	2,671,084,939
2022	331,623	194,118	4,278,880,430	35.645	28,236	2,524,009,349

***Figure A3**. Spending on small and micro enterprises during the period 2000-2022.*

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