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The American University in Cairo

School of Business

**Determinants of Egypt's Economic Growth
For the period 1985-2007**

A Thesis Submitted to
Economics Department

in partial fulfillment of the requirements for
the degree of Master of Arts in Economics

by Rasha Mostafa Hammam

under the supervision of Dr. Abeer El-Shennawy & Dr. William Mikhail

Spring 2010

The American University in Cairo

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For the period 1985-2007**

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ABSTRACT

The main aim of this research is to examine the significance of several economic growth determinants to gauge their impact on Egypt's economic growth. This research uses annual time series analysis to assess the significance of several important variables on economic growth in Egypt for the period 1985-2007, and applies Ordinary Least Square method of estimation, with an autoregressive specification. The estimation results reveals positive and significant effect of gross fixed capital formation, foreign direct investment, investment in infrastructure, household consumption expenditure, exports and taxes on international trade on economic growth in Egypt, while the government consumption expenditure shows negative and significant effect on Egypt's economic growth. The main policy implications are the catalytic effect of gross fixed capital formation on economic growth as represented by the public and private investment, in addition, the significance of foreign direct investment in transferring technology, and providing source of finance, where the investment in infrastructure is considered a corner stone for attracting both domestic investments and foreign direct investments and boosting economic development in Egypt. Further, the exports enlarge the domestic capacity utilization and exploit economies of scale. However, the negative significance of government consumption expenditure implies the non productive spending that should be minimized and reallocated to productive spending.

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CHAPTER I

INTRODUCTION

Achieving high and sustained rates of growth in per capita income and identifying the main factors influencing growth are considered as two of the most important goals preoccupying economists and policy makers in both developed and developing countries. Neo-Classical models consider capital and labor as the main determinants of economic growth. However, the empirical literature reveals that differences in economic growth across countries may be due to additional factors. The aim of this research is to identify the main sources of economic growth in Egypt over the period 1985-2007.

The growth performance of the Egyptian economy varied over this period. Real GDP growth rate averaged 4.48% during the period 1985 to 2007; while real GDP per capita averaged 2.37 %¹. On the other hand, unemployment averaged 9.57%. This period has thus been - on average - characterized by low rates of per capita income and high rates of unemployment compared to many developing countries at the same stage of development as Egypt.

Hence, it is crucial to find out the main factors that contribute to economic growth in Egypt. The literature addressing economic growth in Egypt has two main limitations. Firstly, in some of these studies, Egypt is included as one of several countries listed in a panel data, to investigate the significance of different economic indicators on economic

¹ Calculated using data of World development indicators (WDI) online

growth, disregarding the special characteristics, features and economic conditions of each country. Secondly, there are papers which deal with the Egyptian economy singularly; however, these papers studied the significance of very few variables which is inadequate in giving an integrated view of the main sources of Egypt's economic growth.

Most of the empirical work done on the economic growth in the Egyptian economy focused on physical capital accumulation, government spending and trade openness as determinants of economic growth. However, the literature on economic growth includes other factors that affect economic growth, like for instance human capital, infrastructure, macroeconomic stability, and democracy; the significance of which will be examined in this thesis.

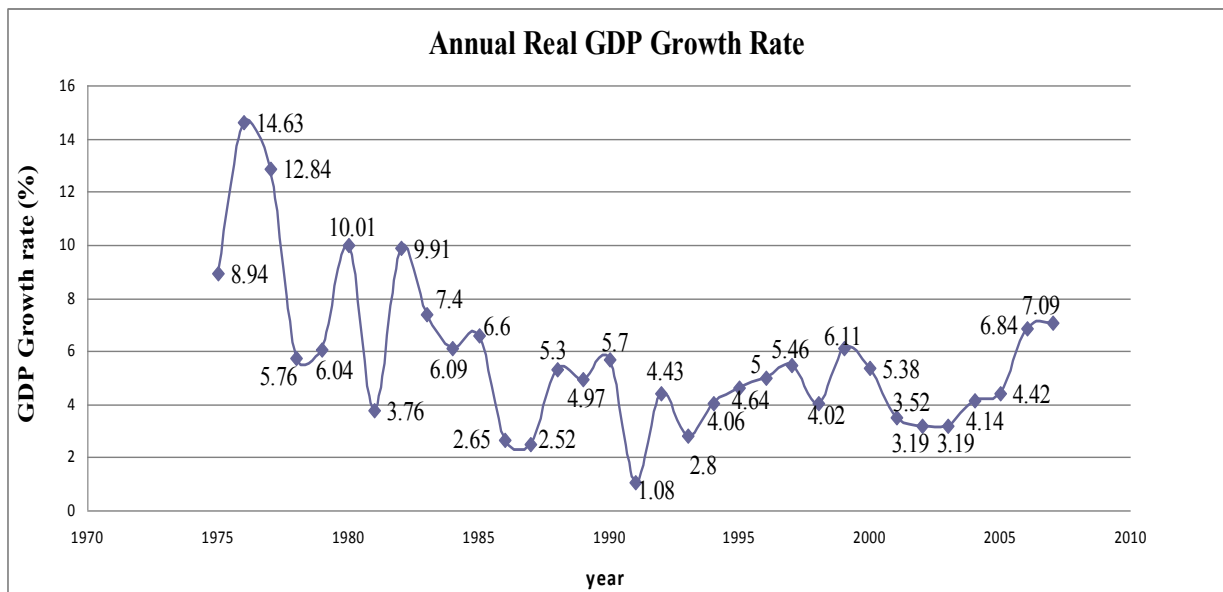
Therefore, this research attempts to examine the significance of several determinants to gauge their impact on Egypt's economic growth. This involves studying the significance of the factors that have not been examined before, in order to have an integrated view of the main sources contributing to Egypt's economic growth.

This research is organized as follows; Chapter II is concerned with reviewing the historical background of Egypt's economic growth performance, and Chapter III presents the literature review which is divided into three parts: the first part reviews the theoretical literature, the second part outlines the empirical work done on economic growth, and the third part discusses the empirical work done on the Egyptian economy. Chapter IV presents the methodology and the empirical results. Chapter V presents policy implications and recommendations, and finally Chapter VI presents the conclusion.

CHAPTER II

HISTORICAL BACKGROUND OF EGYPT'S ECONOMIC GROWTH PERFORMANCE

Figure (1): Annual Real GDP Growth Rate



During mid 1970s to mid 1980s, Egypt experienced rapid economic growth, where the growth rate of GDP averaged 8.5%; stimulated by high oil prices, increased worker remittances, tourism revenues and substantial foreign borrowing (Al -Mashat and Grigorian 1998). However, the collapse in windfall revenues following the 1985-86 oil price was followed by a drop in income, and so as shown in Figure (1) the GDP growth rate dropped from 6.6% in 1985 to 1.08% in 1991. These factors among others as the huge foreign debt compelled the Egyptian government to sign the Economic Reform and Structural Adjustment Program (ERSAP) with the International Monetary Fund (IMF)

and the World Bank in November 1991. Before that with the IMF approval, the Egyptian government formulated a reform package for the years 1987/1988 to 1991/1992, focusing on five elements of reform. The first element was fiscal restraint, aiming at reducing aggregate expenditure and controlling inflation. Second was reform of the exchange rate to reduce the balance of payment deficit and effect efficient resource allocation throughout the economy. Third, increasing the interest rate in order to achieve a positive real rate of interest rate, hence, encourage saving and attract a larger inflow of workers remittances from abroad. The fourth reform element was reduction of subsidies and elimination of price control in order to reduce waste and misallocation of resources. Fifth, privatization of public sector companies so that they can liquidate inefficient units, set their own pay rate and set their own selling price (Parfitt 1993). Yet, the 1987 agreement collapsed, as did later negotiations in 1988 for a replacement. This was obvious as Egypt failed to meet the intended targets of the reform; where the budget deficit fell from 18.5% of GDP in 1989 to just 17.2% in 1991, in addition, inflation rate rose from 16% in 1989 to 21.1 % in 1991 (Korayem 1997).

Meanwhile, the real exchange rate depreciated by 30% from 1989 to 1991 (Submarine 1997), resulting in increase in exports from 18% of GDP in 1989 to 28% of GDP in 1991, however, the imports averages about 34% of GDP during this period, contributing the current account deficit. In addition, gross fixed capital formation declined from 30% of GDP in 1989 to 22.2% of GDP in 1991(World development indicators WDI online). Consequently, real GDP growth rate declined from 4.97% in

1989 to 1.08% in 1991, moreover, real GDP per capita growth rate declined from 2.65% in 1989 to -0.9 % in 1991 (World development indicators online).

Social unrest has been the main factor behind the piece-meal nature of the reform (Bush 1999). However, the persistent deficits in the balance of payments and the government budget, and high inflation rate forced Egypt to sign an agreement with the IMF and World Bank in 1991 aiming to rectify the macro imbalances between the demand and supply sides of the economy, and so launched the ERSAP. The agreement covered much the same ground as the 1987 agreement, where restraints on government expenditure were imposed, with interest rising to above 20%, and the government had to boost revenues through adopting a sales tax. In addition, exchange rates had to move from the three tier system to a unified exchange rate based on free market rates. Also, industrial prices had to be liberalized and trade restrictions had to be reduced to open the economy to international trade. Furthermore public sector companies were subjected to reforms that allow them to operate on the same basis of private sector companies, some public sector companies were selected for privatization. Moreover, the Egyptian government has approached the Paris club creditors for comprehensive debt relief following the approval of the Fund stand by arrangement (Korayem 1997).

In consequence of implementing the ERSAP, both the budget deficit as percentage of GDP and inflation rate dropped to 1.5% and 7.1% respectively in 1996. Also, the current account showed a surplus of 1.1% of GDP (Subramanian 1997). However, gross fixed capital formation dropped to 17.3% of GDP in 1996, real GDP growth rate rose to 5% in

1996, while, real GDP/capita growth rate rose to only 3% for the same year (WDI online). Further, the unemployment rate dropped from 9.6% in 1992 to 8.4% in 1996. Accordingly, the Egyptian government hoped to achieve higher level of economic growth and better living standards; thus Egypt signed an agreement with the IMF and the World Bank in 1996 aimed at consolidating the gains of the earlier reforms. This agreement was built on the U.S. Egyptian Partnership for Economic Growth and Development, which intended to remove blockages of economic reforms and to rationalize decision-making and promote private sector growth. Accordingly, the 1996 agreement was sought to increase economic growth of 5-6% of GDP between 1996 and 1998 from the sale of public companies (Bush 1999).

Unfortunately, this short-lived recovery (1992-1996) brought to a standstill due to internal and external shocks that stroke the Egyptian economy. These shocks were Luxor terrorist attack in 1997, the adverse effects of East Asian crisis in 1998 and the drop in the oil prices in 1998. These events had severe implications on the Egyptian economy resulting in a decelerating growth phase, accompanied with the adverse shocks of September 11 attack (2001) and the invasion of Iraq (2003) (khaier el Din and El-Laithy 2006).

Consequently, the Egyptian government responded to these successive shocks by expansionary fiscal policies through clearance of debts in order to stimulate the private sector, and increased public investment in “mega” projects, worsening fiscal position, as the budget deficits increased from 0.9% of GDP in 1997 to average 3.9% in 1999-2000, and further to average 6.1% in 2002-2003 (Dorbonogov and Farrukh 2005). The inflation

rate dropped from 4.6% in 1997 to 2.7% in 2002, but then rose to 4.5% in 2003 after allowing the Egyptian pound to float and subsequent invasion of Iraq. Also, the deficit in the current account increased from 0.8% of GDP in 1997 to 1.72% in 1999, and then showed a surplus of 3.4% of GDP in 2003. In addition, though, gross fixed capital formation increased from 17.9% of GDP in 1997 to 20.8% in 1999, however, it then declined to 16.3% of GDP in 2003. Accordingly, real GDP growth rate dropped from 5.46% in 1997 to 3.19% in 2003, while real GDP per capita growth rate dropped from 3.5% in 1997 to 1.3% in 2003 (WDI online).

However, by year 2004, Egypt engaged in an economic reform program aiming at emphasizing the role of private sector in driving the Egyptian economy and minimizing government interventions in the market. Further, the economic reform agenda included trade liberalization; where the government reduced the weighted average tariff rate from 14.6 % in 2005 to 6.9 % in 2007. Moreover, the government removed General Agreement on Tariffs and Trade (GATT) inconsistent service fees, eliminated import fees, and carried out a reform for the tax system and embarked on institutional reforms. As a consequence, the investment climate in Egypt became friendlier, where Egypt was ranked as top reformer in Doing Business 2008 (IMF 2007).

Accordingly, real GDP growth rate jumped from 4.14% in 2004 to 7.09% in 2007, and real GDP/capita climbed from 2.27% in 2004 to 5.24% in 2007. Exports increased from 28.2% of GDP in 2004 to 31.3% of GDP in 2007, however, imports jumped from 28% of GDP in 2004 to 39% of GDP in 2007 resulting in decline in the current account

surplus from 4% of GDP in 2004 to 0.4 % in 2007. In addition, budget deficit averaged 7.8% during 2004-2007 (Rabobank 2008), yet, inflation rate declined from 11.27% in 2004 to 9.32% in 2007. Moreover, gross fixed capital formation jumped from 16% of GDP in 2004 to 21% of GDP in 2007. According to IMF report (2007), real fixed capital formation is expected to continue to be a major contributor to growth in Egypt, owing to broad success with the government's reform policies.

Egypt's inability to have a steady growth rate – as evident from the above discussion – is attributed to the successive internal & external shocks that Egypt has faced; in addition to the inefficiency in dealing with these shocks has exacerbated their adverse effects. However, growth resumed over the period 2004-2007, where GDP per capita growth rate in 2007 experienced the highest growth rate (5.24%) in over two decades, as the Egyptian economy has benefited from a far-reaching economic reform program that was introduced in 2004.

In fact, Egypt experienced uneven growth where periods of growth are unsustainable; varying between periods of growth accelerations and periods of growth decelerations.

CHAPTER III

Literature review

This chapter is divided into three parts: the first part reviews the theoretical literature. The second part outlines the empirical work done on economic growth. Lastly, the third part discusses the empirical work done on the Egyptian economy.

A) THEORETICAL LITERATURE

Modern growth theory started with the classic article of Ramsey (1928) on the household optimization over time. Then, Harrod (1939) and Domar (1946) applied the Keynesian analysis through making use of economic growth elements, by employing production functions with small inputs substitutability, aiming to illustrate the instability of capitalist system.

This was followed by the contribution of Solow (1956) and Swan (1956), which is based on a neoclassical production function; assuming constant return to scale, diminishing return to each input, and positive elasticity of substitution among inputs .

Given the assumption of diminishing returns to capital, the Solow-Swan model has two predictions. Firstly, is conditional convergence; the lower the starting level of real per capita GDP, relative to the long run or steady state position, the faster is the growth rate where the convergence is conditional due to the dependence of the steady state levels of capital and output per worker on the saving rate, the population growth rate and the production function position and characteristics that differ across countries. Secondly,

the per capita growth will cease under the lack of technology improvements (Barro and Martin 1995).

Accordingly, economic growth theorists of the 1950s and 1960s assumed that technological improvement is taking place exogenously. This assumption resolved the theory with a long run positive constant per capita growth rate, while maintaining the prediction of conditional convergence. However, a noticeable limitation is that the long run per capita growth rate is determined by an exogenous variable.

The theory of economic growth has experienced a new era in the mid 1980s, where the growth theorists were anxious to determine the long run growth endogenously, as with the case of endogenous growth models which introduced the assumption of increasing returns in the production function (Barro and Martin 1995).

There are two different types of endogenous growth theory, which visualize different sorts of increasing returns; endogenous broad capital models and endogenous innovation models (Martin and Sunley 1998).

The endogenous broad capital models included externalities to investment as a remedy to the conventional neoclassical production function. For instance, Romer (1986) argued that investment in capital creates "learning by doing" and "spillovers" of knowledge and accordingly technology is considered a public good through out these externalities; resulting in technological progress becoming endogenous to the growth

process. However, this approach was criticized for portraying technological progress as side effect of other actions rather than being the result of intentional actions by economic agents (Romer 1994; Crafts 1995).

Thus, a second series of endogenous broad capital models was introduced by Lucas (1988) depicting technological progress as an outcome of intentional research and education and employed human capital into the production function. Accordingly, human capital investments generate spillover effects that enhance the productivity of both physical capital and the wider labor force. However, these human capital models were criticized for the inconvenience of proving that capital has a constant or increasing returns rather than diminishing returns.

Later, endogenous innovation models were introduced and came to be known as Schumpeterian endogenous growth theory; implying that profit-seeking improvements in technology are the main drivers to a better living standard. Accordingly, firms are encouraged to undertake research and development, in order to produce new products, and consequently earn temporary monopoly profits (Romer 1990; Grossman and Helpman 1991; Aghion and Howitt 1993). Therefore, these innovations became the intermediate inputs to other firms, and determined the overall growth rate. This implies that long-term growth rate depends on costs and benefits of research, resources allocated to innovation, which accordingly depends on government's regulations as taxes, intellectual property rights, provision of adequate infrastructure and many other aspects of the economy.

These innovation models were extended to include diffusion of technology, where new technological progress of leading edge economies diffuses to follower economies through imitation. Thus, results in a model that merges the endogenous growth theory through making use of the new discoveries of the leading edge economies, with the convergence prediction of the neoclassical growth models of the follower economies.

According to Barro and Martin (1995) “The clear distinction between the growth theory of the 1960s and that of the 1980s and the 1990s is that the recent research pays close attention to empirical implications and to the relation between theory and data”

B) EMPIRICAL WORK

The empirical work on economic growth mainly involves regressing rate of economic growth on economic and political factors that are assumed to be determinants of economic growth.

The concept of capital in the neoclassical model can be usefully broadened from physical goods to include *human capital* in the forms of education, experience, and health (Barro 1996). As for the relationship between health and economic growth, Preston (1975) presented data on per capita income and on population health status as measured by life expectancy, for a cross section of countries and found a concave relationship between health status and income and showed that this relationship is becoming stronger over time. Also, Gallup and Sachs (2001) found a strong correlation between the level of population health and income growth. Bloom et al (2004) extended the Gallup and Sachs methodology for 13 studies that employed cross-country regressions and all showed positive significant effect of health on growth.

Education is placed at centre stage as one of the main determinants of economic growth. Mankiw et al (1992) added human capital to the Solow model using a proxy percentage of the working-age population that is in secondary school which was positively significant in affecting growth. Barro (1996) carried out an investigation for the main determinants of economic growth using a panel data for 100 countries , where Barro (1996) incorporated initial human capital as one of the variables affecting the

economic growth and used the average years of attainment for males aged 25 and over in secondary and higher schools and life expectancy at birth as proxies for human capital, where the empirical results showed a positive significant relationship between the proxies for human capital and economic growth.

Furthermore, Hanushek and Kimko (2000) have used the results of international tests administered by the International Association for the Evaluation of Educational Achievement (IAE) and the International Assessment of Educational Progress (IAEP) to build a measure of cognitive skills in order to evaluate the impact of workforce quality on national output and growth. Hanushek and Kimko (2000) found a significant positive impact of cognitive skills on economic growth in 1960-1990. Similar results were reported by Hanushek and Woessmann (2009) who extended the measures developed in Hanushek and Kimko (2000) to add new international tests of math, science, or reading that were administered to a voluntarily participating group of 50 countries.

A further approach used by Hanushek and Woessmann (2009) was the time-series evidence on performance within each country identifying the impact of skills on growth. The empirical evidence revealed that countries which improve the skills of their population –no matter how it is done – will realize corresponding improvements in their rate of growth.

Another crucial determinant of economic growth is *physical capital*, Bond et al (2004) examined the relationship between the growth of output per worker and

investment in physical capital using pooled annual data for a large sample of countries, using pooled data for five-year periods. The empirical results revealed that the share of investment in GDP has a large and significant effect, not only on the level of output per worker, but more importantly on its long-run growth rate. Similar results were found by Pahlavani (2005) in Iran, as well as Harvie and Pahlavani (2007) in the Korean economy.

Foreign direct investment (FDI), is considered as one of the main determinants of economic growth. Balasubramanyam (1996) used cross-section data for forty-six developing countries and found that the beneficial effect of FDI, in terms of enhanced economic growth, is more robust in outward oriented countries than inward oriented ones. The author argued that countries adopting outward oriented trade policy and have free market forces broaden the opportunity for competition and provide an appropriate climate for the utilization of the potential of FDI to promote growth.

Karbasi et al (2005) analyzed the role of FDI and trade on the economic growth of developing countries within endogenous growth-theory framework; using cross-section data relating to a sample of forty-two developing countries over three decades, and showed that FDI and trade contribute significantly toward enhancing economic growth in developing countries. Also, the empirical results of Karbasi et al (2005) revealed that the contribution of FDI to economic growth is enhanced by its positive interaction with human capital and sound macroeconomic policies and institutional stability. Besides; FDI stimulates domestic investment and facilitates institutional improvement in the host

countries. Similar results for the positive effect of FDI on economic growth were reported by Asheghian (2004) in U.S.A and Tang et al (2008) in China.

Infrastructure is another influential factor on economic growth, Esfahani and Remiraz (2002) developed a structural model of infrastructure and output growth that takes account of institutional and economic factors that mediate in the infrastructure–GDP interactions. Cross country estimates of the model indicate that the contribution of infrastructure services to GDP is substantial and, in general, exceeds the cost of provision of those services.

Nevertheless, Fedderke et al (2006) examined the relationship between investment in economic infrastructure and long-run economic growth by examining the experience of South Africa in a time-series context (1875-2001). The empirical results revealed a robust positive significant impact of investment in infrastructure -electricity generation- directly on economic growth in South Africa and indirectly- roads, transportation, and housing - by raising the marginal productivity of capital. Similar results for the positive impact of investment in infrastructure on economic growth were report by Boopen (2006) on a sample of Sub Saharan African countries, Enowbi (2008) and Fredrico et al (2009) in Brazil.

Furthermore, *trade liberalization* is considered one of the main determinants of economic growth. Yannikkaya (2003) demonstrated the relationship between *trade liberalization* and growth using a large number of *openness* measures for a cross section

of countries over three decades. The author used two groups of trade openness measures. The first group used “trade openness” which are the ratio of exports plus imports to GDP, import penetration ratios and exports shares in GDP in order to measure openness of a country. The empirical results found were statistically significant and positively correlated with growth. The other group of trade openness measures is based on “trade restrictions” including measures of trade barriers such as average tariff rates, export taxes, total taxes on international trade, and indices of non-tariff barriers (NTBs). The estimation results showed that trade barriers are positively and significantly associated with growth especially for developing countries as they are protecting their domestic industries, similar results were reported by O’Rourke (2000). However, a great majority of the empirical studies concluded that there exists a significant and negative relationship between trade restrictions and growth, for instance; Lee (1993), Harrison (1996), and Edwards (1998) and Romalis (2007).

However, Rodriguez and Rodrik (2001) criticized the conclusion of a number of recent multi country statistical studies that openness is associated with higher growth rates, arguing that they have methodological problems with the empirical strategies used due to the inappropriateness of the indicators of openness used or due to their high correlation with other variables, and that openness simply in the sense of liberal trade policies seems to be no guarantee of faster growth.

Chang et al (2005) studied how the effect of trade openness on economic growth depends on complementary reforms that help a country take advantage of international

competition. Chang et al (2005) used an unbalanced panel dataset that comprises 82 countries; 22 developed countries and 60 developing ones of non overlapping 5-year averages spanning the 1960-2000 period declaring that the growth effect of openness depends on a variety of structural characteristics. For this purpose, the authors uses a non-linear growth regression specification that interacts a proxy of trade openness (ratio of real exports and imports to real GDP) with proxies of educational investment (average rate of secondary school enrollment), financial depth (average ratio of private credit to GDP), inflation stabilization, public infrastructure (average number of main telephone lines per capita), governance, labor-market flexibility, ease of firm entry, and ease of firm exit. They found that the growth effects of openness are positive and economically significant if certain complementary reforms are undertaken.

Additionally, *inflation rate* can have a considerable effect on economic growth. There are two views in this relationship; where structuralists believe that inflation has a positive impact on economic growth through inducing savings (Georgescu–Roegen 1970, Taylor 1979). While, monetarists believe that inflation has a negative impact on growth (Harberger 1963; Vogel 1974).

Barro (1996) employed the inflation rate as one of the explanatory variables of economic growth in a cross section regression analysis, where the estimation revealed a negative impact of inflation rate on economic growth. Barro (1996) argued that businesses and households perform inappropriately with high and unpredictable inflation rate. Similar results were reported by Ghosh and Phillips (1998) and Arai et al (2004)

Moreover, *government spending* faces a debate between Classicals who prefer small size of governments for promoting economic growth, and Keynesians who favor larger size of government in order to promote growth. Government spending is divided into government consumption spending and government investment spending.

Regarding government consumption, Folster and Henrekson (1999) examined the effect of government consumption on economic growth in OECD countries, and found significant negative impact of government spending on growth. This result is in accordance with the results of (Landau, 1983; Grier and Tullock, 1989; Barro 1991). However, Devarajan et al (1996) investigated the impact of government consumption on economic growth for 43 developing countries where the empirical results revealed positive significant impact of government consumption on economic growth. Similar results were reported by Tulsidharan (2006) in India, and Kweka and Morrissey (2000) in Tanzania.

As regards government investment spending, Aschauer (1989) and Barro (1990) provided empirical evidence that public investment has positive impact on economic growth, arguing that public investment affect and crowds in private investment and thus enhances economic growth.

Furthermore, Gupta et al. (2005) investigated the impact of government expenditure composition on economic growth for a sample of 39 low-income countries during 1990s

and found that countries where spending is concentrated on wages, i.e. non productive spending, tend to have lower growth. While, countries that allocate higher share to capital and non-wage goods and services, i.e. productive spending, tend to record faster growth.

Rigobon and Rodrik (2004) estimated the effect of *economic institutions*, and *political institutions* on income levels by splitting cross-national dataset into two subsamples; colonies versus non-colonies and continents aligned on an East- West versus those aligned on a North-South axis. The empirical results for the two subsamples indicated an improvement in democratic institutions – measured by Polity IV indicators² of democracy – improves income significantly and an improvement in economic institutions – measured by the rule of law – also increases the income level, with much stronger impact on incomes statistically and quantitatively.

Aghion et al (2007) analyzed the effect of *democracy* on economic growth, the empirical results indicated that there is no robust effects of democracy (aggregate indicators from the Polity IV database and Freedom House measures of civil liberties and political rights were used as proxy) on growth rates for manufacturing in a fixed-effects regression at the country level (obtained through aggregation of the UNIDO sectorial data at country-year level). However, Aghion et al (2007) introduced in specification at the country-industry level an interaction term between democracy and distance from the technological frontier – measured by the logarithm of the value added per worker of a sector divided by the maximum of the log of the same variable in the

² The Polity IV indicators are published by the Polity IV Project that provides coding for the authority characteristics for the nations all over the World for the sake of comparative and quantitative analysis.

same sector across all countries in each year and take one minus this ratio as a proxy for distance to frontier – accordingly the empirical results revealed that the interaction has a negative and significant coefficient; indicating that when close to the technological frontier, the effect of democracy on growth is positive. However, far away from the technological frontier the effect of democracy may be growth-diminishing, implying that the democratic institutions favor growth in sectors of the economy that are particularly advanced in terms of value added per worker (close to the world technological frontier). Aghion et al (2007) interpretation is that it is in sectors close to the technological frontier that democracy is more beneficial, possibly through fostering entry, competition, and innovation, which are relatively more important for growth in those sectors.

C) EMPIRICAL WORK DONE ON THE EGYPTIAN ECONOMY

Turning to the empirical literature on economic growth in Egypt, Morley and Perdakis (2000) investigated the influence of growth of *exports* and *government expenditure* as well as *investment* on economic growth in Egypt during the period 1955-1996. The empirical results revealed a significant and positive effect of the government expenditure and investment on economic growth in the long run; however, a negative significant effect of the exports on output in the long run. Thus, they concluded by rejecting the export-led-growth theory (ELG), attributing this to the absence of essential infrastructure during the examined period, where this opposes the study of Abou-Stait (2005) who used a time series data for Egypt during the period 1977-2003, and found that ELG theory is applicable to the Egyptian economy.

Abu Bader and Abu Qarn (2003) used multivariate co-integration to investigate the causal relationship between *government expenditures* and economic growth for Egypt, Israel, and Syria over three decades. The empirical results showed bidirectional causality between government spending and economic growth, with a negative long-run relationship in the cases of Israel and Syria, and a unidirectional negative short-run causality from economic growth to government spending in the case of Egypt. Abu Bader and Abu Qarn (2003) argued that military burdens might be the cause of these findings, so they broke down overall government expenditures into civilian and military expenditures and tested for causality within a trivariate framework. The estimation revealed that military burdens negatively affected economic growth in the three countries, while, civilian government spending positively affected economic growth in Israel and Egypt but negatively affected long-run economic growth in Syria.

Dorbonogov and Farukh (2005) examined some determinants of growth in Egypt for the period 1986 to 2003, where the authors found that trends in *government consumption* as percentage of GDP negatively affects economic growth, while *credit to the private sector* and growth rate of *the working age population* share positively affect economic growth.

Mansuori (2008) applied a time series analysis to assess the impact of *private investment, public investment, public consumption* and *labor force* on economic growth in Egypt, Morocco and Tunisia during the period 1970-2002. The empirical results showed that private investment, public investment and labor force positively affect

economic growth in the three countries. However, public consumption negatively affects economic growth in the three countries.

Naguib (2009) compared the effects of *FDI* and *privatization* on economic growth in Egypt and Argentina. The author used a time-series model for Egypt over the period 1971-2000, and employed an augmented neoclassical growth model, with a production function that included domestic *physical capital* and foreign capital (using annual flow data), *human capital* (using constant growth rate in the secondary enrolment ratio over each 5 year interval as a proxy), *labor* (using population as a proxy), in addition to other factors as privatization (using International Finance Corporation IFC privatization database), level of *openness* (using exports as a proxy) and *external debt* (using external debt ratio to GDP).

The estimation showed positive significant effect of growth in domestic current capital per capita on growth, while the growth of current FDI stock per capita has a negative significant effect on economic growth in Egypt. Naguib (2009) attributed the immediate negative effects of FDI on the economic growth to the fact that the majority of FDI inflows to Egypt are directed to the petroleum/primary sector.

In addition, the empirical evidence revealed that privatization has significant positive effects on both short- and long run economic growth in Egypt, attributing this to that most of the privatization in Egypt took place in the manufacturing sector.

Also, the estimation showed a positive significant effect of the level of openness on economic growth, while the growth in external debt ratio has significant negative effects on short-run and long run economic growth in Egypt. Further, the empirical results indicated that growth in human capital has positive significant effects on short-run economic growth in Egypt, however a significant negative effect on economic growth in the long run, where Naguib (2009) attributed this to missing observations in the proxy used that had to be linearly estimated.

The literature addressing economic growth in Egypt studied the significance of different variables on economic growth, and found that, *credit to the private sector, investment, capital accumulation* and *human capital* and *trade openness* are considered significant determinants of economic growth. However, there are some contradictions in the empirical results of some papers. Also, the literature tackling economic growth in Egypt studied the significance of very few variables which are inadequate in giving an integrated view of the main sources of Egypt's economic growth.

CHAPTER IV

METHODOLOGY

A) THE MODEL

In light of the limitations of the empirical literature on economic growth in Egypt, this research is going to use annual time series analysis to assess the impact of several important variables on economic growth in Egypt. Due to data availability, the sample is constrained to 1985-2007.

The model used is based on the seminal work of Barro (1991) and Barro (1996), but modified to fit time series regression rather than cross section regressions and with some changes in the explanatory variables.

The dependant variable is economic growth measured by the real GDP per capita growth rate, which reflects the change in the standard of living (*Y*). The explanatory variables are physical capital accumulation measured by gross fixed capital formation (*gfcf*), foreign direct investment (*fdi*), human capital using secondary school enrollment ratio as a proxy (*sec*), health using proxy life expectancy at birth (*life*), investment in infrastructure (*infra*), general government final consumption expenditure (*gov*), household final consumption expenditure (*hh*), trade openness using a proxy exports (*expr*), barriers to international trade using a proxy taxes on international trade (*taxes*), macroeconomic stability using inflation rate as a proxy (*infl*), democracy using

democracy indicator³ (*democ*) published by the Polity IV indicators and dummy variable (*dm*) for the economic reforms that took place in Egypt, where all the observations prior to the ERSAP in 1991 will take the value of zero and the year 1991 in which the ERSAP is implemented will take the value of 0.25, the following year will take the value of 0.5, the next year 0.75, and then all the following years will take the value of unity until 1996, and the observations during the period 1998-2003 will take the value of zero due to the successive internal and external shocks that Egypt faced, and then the observations during the period 2004-2007 will take the value of unity due to the new economic reforms initiated in 2004.

The source of the data for the gross domestic product, gross fixed capital formation, foreign direct investment, general government final consumption expenditure, household final consumption expenditure and exports is the World Development Indicators Online. These variables are calculated in constant 2000 Egyptian pounds using the GDP deflator.

The source of the inflation rate is the World Development Indicators Online, while the source of secondary school enrollment ratio and life expectancy at birth is the Human Development Reports. Further, the source of investment in infrastructure is the Ministry of Economic Development, and the source of taxes on international trade is the Government Finance Statistics.

³ The Democracy indicator is an additive eleven-point scale (0-10). The operational indicator of democracy is derived from codings of the competitiveness of political participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive.

Unit root test is conducted to the variables to test for the stationarity of the variables' series; to determine whether the variables' series are stationary I(0), or non-stationary I(1), I(2)...etc. Accordingly, the non-stationary series will be de-trended to avoid spurious regression. The unit root test is applied using Augmented Dickey Fuller (ADF) test to the series of each variable.

Table (1): The unit root test results

| Variable | ADF test Statistic | MacKinnon (1996) one-sided p-values | | | I |
|--------------|-----------------------------------|-------------------------------------|-----------|-----------|------|
| | | 1% | 5% | 10% | |
| <i>Y</i> | -7.351219 | -2.679735 | -1.958088 | -1.607830 | I(1) |
| <i>gfcf</i> | -2.779329 | -2.679735 | -1.958088 | -1.607830 | I(1) |
| <i>fdi</i> | -2.344991 | -2.685718 | -1.959071 | -1.607456 | I(0) |
| <i>sec</i> | -5.112840 | -2.679735 | -1.958088 | -1.607830 | I(1) |
| <i>life</i> | -5.278342 | -2.685718 | -1.959071 | -1.607456 | I(2) |
| <i>infra</i> | -7.155193 | -2.679735 | -1.958088 | -1.607830 | I(1) |
| <i>gov</i> | -2.129116 | -2.685718 | -1.959071 | -1.607456 | I(2) |
| <i>hh</i> | -5.503990 | -2.685718 | -1.959071 | -1.607456 | I(2) |
| <i>expr</i> | -4.937035 | -2.685718 | -1.959071 | -1.607456 | I(2) |
| <i>taxes</i> | -5.602108 | -2.679735 | -1.958088 | -1.607830 | I(1) |
| <i>infl</i> | -8.239718 | -2.679735 | -1.958088 | -1.607830 | I(1) |
| <i>democ</i> | Near singular matrix ⁴ | | | | |

Then after applying the unit root test and de-trending the non-stationary series, comes the estimation of the model using Ordinary Least Squares (OLS). However, some of the explanatory variables were omitted due to their insignificance in the estimation runs, which are the secondary school enrollment ratio and life expectancy at birth- where this is attributed to the quality of data- , inflation rate, democracy indicator and the dummy variable for economic reforms.

4 The democracy indicator for Egypt according the Polity IV indicators takes the value of zero during the period (1985-2003), and then takes the value of unity during the period (2004-2007), therefore it is omitted from the model of this research.

Therefore the final model to be estimated is:

$$Y_t = \beta_0 + \beta_1 gfcf_t + \beta_2 fdi_t + \beta_3 gov_t + \beta_4 hh_t + \beta_5 infra_t + \beta_6 expr_t + \beta_7 taxes_t + \mu_t$$

The dependant and explanatory variables are as previously defined while the μ_t is an error term. The results of the estimated model will help in gauging the determinants of economic growth, and accordingly, provide policy makers with the possible routes towards enhancing economic growth.

B) THE EMPIRICAL RESULTS

Table(2): Regression results

| Dependent Variable: Y | | | | |
|------------------------------|--------------------|------------------------------|--------------------|--------------|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -0.24927 | 0.05994 | -4.158643 | 0.0016 |
| <i>Gfcf</i> | 4.69E-05 | 9.38E-06 | 5.001825 | 0.0004 |
| <i>Fdi</i> | 0.000199 | 3.69E-05 | 5.402217 | 0.0002 |
| <i>Infra</i> | 0.000697 | 7.74E-05 | 8.999787 | 0.0000 |
| <i>Gov</i> | -0.000216 | 7.71E-05 | -2.797415 | 0.0174 |
| <i>Hh</i> | 0.000252 | 4.03E-05 | 6.262924 | 0.0001 |
| <i>Expr</i> | 1.57E-10 | 1.93E-11 | 8.139125 | 0.0000 |
| <i>Taxes</i> | 0.000235 | 8.02E-05 | 2.933994 | 0.0136 |
| AR(1) | -0.835927 | 0.096177 | -8.691523 | 0.0000 |
| R-squared | 0.975285 | Mean dependent var | 0.255777 | |
| Adjusted R-squared | 0.95731 | S.D. dependent var | 1.768803 | |
| S.E. of regression | 0.365463 | Akaike info criterion | 1.126858 | |
| Sum squared resid | 1.469192 | Schwarz criterion | 1.574937 | |
| Log likelihood | -2.268576 | Hannan-Quinn criter. | 1.214327 | |
| F-statistic | 54.2585 | Durbin-Watson stat | 2.612575 | |
| Prob(F-statistic) | 0.00000 | | | |
| Inverted AR Roots | -.84 | | | |

It is clear from table (2), the high significance of the individual coefficients as pointed out by the prob. and the t-statistics. In addition, the R-squared and the adjusted R-squared are quite high. Besides, the estimated model as a whole is significant as indicated by the F-statistic. Regarding the Durbin Watson statistic it lies in the indeterminate range though of the presence of autoregressive specification, where adding an autoregressive integrated moving average (ARIMA) specification to the model didn't help in curbing down the Durbin Watson Statistic.

Gross fixed capital formation (*gfcf*) showed a positive highly significant effect on economic growth, as gross fixed capital formation includes land improvements (fences, ditches, drains, etc.); plant, machinery and equipment purchases; and the construction of roads, railways, schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Thus, these investments have a catalytic effect in enhancing the development and economic growth

Foreign direct investment (*fdi*) showed a highly positive significant effect on economic growth. This is attributed to that the FDI embody a significant vehicle for technology, and knowledge transfers which stimulates domestic competition (Borensztein et al., 1998). In addition, FDI acts as source of finance to local enterprises, which boosts investments domestically (Neuhaus 2006). Thus, the Egyptian economy benefits from the positive externalities provided by the FDI.

Investment in infrastructure (*infra*) showed a positive and a highly significant impact on economic growth due to the fact that investment in infrastructure crowds in private investment and thus has positive impact on economic growth (Fedderke et al 2006). Therefore, investment in infrastructure is considered a corner stone in boosting economic development in Egypt (Intesa Sanpaolo 2008).

General government consumption expenditure (*gov*) showed a negative and a highly significant effect on economic growth. Government consumption expenditure includes “spending for purchases of goods and services (including wages and salaries) by all levels of government, excluding most government enterprises, it also includes most expenditure on national defense and security” (World Bank development indicators). Dorbongov and Faroukh (2005) attributed the negative coefficient of the government consumption expenditure to the inflexibility of the budget process in Egypt and to the lack of regular reviewing where the fiscal rules are not linked to the contemporaneous growth trends. Also, Barro (1996) attributed the negative coefficient to non-productive government spending. Actually, the Egyptian government subsidizes basic commodities and provides social security services to large portion of the population. Though this spending is beneficial, but over spending negatively affects the savings.

Household final consumption expenditure (*hh*) showed a robust positive significant effect on economic growth. Household final consumption expenditure is composed of “market value of all goods and services, including durable products (such as cars, washing machines, and home computers) purchased or received as income in kind by

households and nonprofit institutions. It excludes purchases of dwelling but includes imputed rent for owner-occupied dwellings” (World development indicators). Thus, the household consumption expenditure stimulates demand effect boosting aggregate income and consequently, accelerates Egypt’s economic growth.

Exports of goods and services (*expr*) have a positive highly significant impact on economic growth. Trade openness represented by the exports has a robust effect on trade balance and consequently affect economic growth (Abou -Stait 2005).Also, exports enlarge the capacity utilization, and permits exploiting economies of scale and thus widens spillover effects (Feder 1982).

Taxes on international trade include import duties, export duties, profits of export or import monopolies. Taxes on international trade (*taxes*) showed positive highly significant effect on economic growth. Yannikkaya (2003) attributed this positive coefficient to that developing countries can benefit from trade restrictions as they are protecting their domestic industries especially the infant industries.

CHAPTER V

POLICY IMPLICATIONS

The attained results are very crucial in portraying the determinants of economic growth in Egypt. It is important to note that gross fixed capital formation represented by public and private investments are necessary determinants in catalyzing the economic growth in Egypt. Actually, private investment was significant in the period of 1992-1996, after the implementation of ERSAP and the privatization of about one-third of state owned enterprises (Khattab 1999). This was reflected in the jump in the growth rate of GDP from 1.08% in 1991 to an averaged of 4.39% during the period 1992-1997.

Moreover, despite that the period 1998-2003 passed through a decelerating phase of economic growth, however, the period 2004-2007, witnessed a boom, and GDP growth rate jumped to 7.09% attributed to the reforms that took place in the taxes & tariffs, where Egypt was ranked as top reformer in Doing Business, and the gross fixed capital formation had great role in this boom as claimed by IMF (2007), which was actually highly significant in the estimation results.

Additionally, it is important to note that investments can't take place without the presence of adequate infrastructure that alleviates and facilitates the investment opportunities. Therefore, investment in infrastructure has a robust effect on promoting economic growth in Egypt.

Accordingly, it is recommended that the Egyptian economy proceed in investing in infrastructure to provide a friendly investment climate in order to attract investors domestically, besides, crowding in foreign investors in the form of FDI. Also, the Egyptian government might apply build-operate-transfer (BOT) schemes to shift the burden of massive infrastructure plans to the private sector as a way to speed this process.

Furthermore, the positive and high significance of exports and foreign direct investments on economic growth; are signs towards the success of government policies towards liberalizing the market. It is essential to notify that exports provide the economy with foreign currency and integrate the economy with the global market. Also, foreign direct investment provides the economy with foreign currency, besides transferring the know-how of applying new technology that boosts production and upgrades the skills of the host countries.

Thus, it is recommended to keep up the flow of both exports and FDI through emphasizing as mentioned before the presence of adequate infrastructure as it is considered a corner stone for attracting investors. In addition, the government has to simplify the regulations of starting up a business and avoid red tape. Besides, it is recommended to upgrade the quality of domestic products to boost the foreign demand on Egyptian products.

Regarding the taxes on international trade, though it might provide protection for infant industries and contribute to government revenue, it leads to misallocation of resources and can jeopardize the sustainability of growth. So, these taxes should be eliminated once they have achieved their objectives.

As regards household consumption expenditure, it boosts the aggregate demand and thus encourages more investments to meet this increasing demand. Thus, the government should reduce the personal income taxes to in order to help increase household income given that FDI is attracted to the large market in Egypt

However, government consumption expenditure has an adverse effect on economic growth in Egypt, thus it should be minimized and reallocated in a way that benefits the economy, for instance; government consumption might be diverted towards investment infrastructure, and also investment in health care and education in order to boost human capital accumulation.

CHAPTER VI

CONCLUSION

Economic growth expressed in growth in per capita income is extremely important in enhancing people's standard of living and providing a decent and prosper life. Economic growth in Egypt is unsustainable and fluctuating passing through periods of accelerations and decelerations. Therefore, this research sheds the light on the factors contributing to economic growth in Egypt, and accordingly the policies that can boost growth in the Egyptian economy.

After studying the theoretical literature and the empirical work done on economic growth and studying specifically the studies tackling economic growth in the Egyptian economy; one recognizes the limitations and the narrow view of the studies done on the Egyptian economy as these studies examined the significance of very few variables on economic growth. Accordingly, this research expanded the scale of the variables to be studied to include the factors that were not previously examined, in order to have a broader and integrated view of Egypt's economic growth determinants.

This research used annual time series analysis to assess the significance of several important variables on economic growth in Egypt for the period 1985-2007, and applied Ordinary Least Square method of estimation, with an autoregressive specification. The estimation results revealed the positive and significant effect of gross fixed capital formation, foreign direct investment, investment in infrastructure, household

consumption expenditure, exports and taxes on international trade on economic growth in Egypt, while the government consumption expenditure had a negative and significant effect on Egypt's economic growth.

The empirical results imply the significance of the public and private investments in catalyzing the process of economic growth in Egypt, in addition, the significance of foreign direct investment in transferring technology, know-how of establishing and operating a successful business and providing source of finance. While, this would not work well without the presence of an adequate infrastructure that crowds in domestic and foreign investments, and acts as corner stone in enhancing growth.

Further, the significance of foreign direct investments and exports imply that success in liberalizing the economy and integrating it with the global economy, besides increasing the capacity utilization, makes it possible to exploit economies of scale, all of which have spillover effects on economic growth. However, though taxes on international trade have positive and significant effect on economic growth, one cannot ignore the fact that it contributes to misallocation of resources.

Moreover, the household consumption expenditure has a great role in boosting the demand side in the economy and attracting domestic and foreign investments, while government consumption expenditure adversely affects Egypt's economic growth.

Table (3): Correlation Analysis between the dependant variable and the explanatory variables

| | <i>dm</i> | <i>democ</i> | <i>expr</i> | <i>fdi</i> | <i>y</i> | <i>gfcf</i> | <i>gov</i> | <i>hh</i> | <i>infl</i> | <i>infra</i> | <i>life</i> | <i>sec</i> | <i>taxes</i> |
|--------------|-----------|--------------|-------------|------------|----------|-------------|------------|-----------|-------------|--------------|-------------|------------|--------------|
| <i>Dm</i> | 1 | 0.489965 | 0.577303 | -0.38731 | 0.304922 | 0.067002 | 0.371273 | 0.415518 | -0.16191 | 0.225549 | 0.448683 | 0.106311 | -0.13574 |
| <i>Democ</i> | 0.489965 | 1 | 0.857712 | -0.077 | 0.466868 | 0.708024 | 0.696484 | 0.646323 | -0.1963 | 0.030101 | 0.546176 | 0.387435 | -0.50931 |
| <i>Expr</i> | 0.577303 | 0.857712 | 1 | -0.42657 | 0.520362 | 0.768106 | 0.914336 | 0.911925 | -0.46551 | 0.339173 | 0.852741 | 0.625778 | -0.35295 |
| <i>Fdi</i> | -0.38731 | -0.077 | -0.42657 | 1 | -0.05286 | -0.10487 | -0.38263 | -0.59712 | 0.58613 | -0.47341 | -0.69619 | -0.45637 | -0.02264 |
| <i>Y</i> | 0.304922 | 0.466868 | 0.520362 | -0.05286 | 1 | 0.539273 | 0.429411 | 0.401034 | -0.37017 | 0.374571 | 0.325427 | -0.02189 | 0.233935 |
| <i>Gfcf</i> | 0.067002 | 0.708024 | 0.768106 | -0.10487 | 0.539273 | 1 | 0.804975 | 0.728907 | -0.35729 | 0.216723 | 0.617326 | 0.48966 | -0.30411 |
| <i>Gov</i> | 0.371273 | 0.696484 | 0.914336 | -0.38263 | 0.429411 | 0.804975 | 1 | 0.961112 | -0.62731 | 0.518255 | 0.912314 | 0.727146 | -0.25137 |
| <i>Hh</i> | 0.415518 | 0.646323 | 0.911925 | -0.59712 | 0.401034 | 0.728907 | 0.961112 | 1 | -0.71617 | 0.533829 | 0.982564 | 0.773116 | -0.21558 |
| <i>Infl</i> | -0.16191 | -0.1963 | -0.46551 | 0.58613 | -0.37017 | -0.35729 | -0.62731 | -0.71617 | 1 | -0.72831 | -0.76301 | -0.47659 | -0.30527 |
| <i>Infra</i> | 0.225549 | 0.030101 | 0.339173 | -0.47341 | 0.374571 | 0.216723 | 0.518255 | 0.533829 | -0.72831 | 1 | 0.592348 | 0.207733 | 0.393992 |
| <i>Life</i> | 0.448683 | 0.546176 | 0.852741 | -0.69619 | 0.325427 | 0.617326 | 0.912314 | 0.982564 | -0.76301 | 0.592348 | 1 | 0.748349 | -0.12629 |
| <i>Sec</i> | 0.106311 | 0.387435 | 0.625778 | -0.45637 | -0.02189 | 0.48966 | 0.727146 | 0.773116 | -0.47659 | 0.207733 | 0.748349 | 1 | -0.42184 |
| <i>Taxes</i> | -0.13574 | -0.50931 | -0.35295 | -0.02264 | 0.233935 | -0.30411 | -0.25137 | -0.21558 | -0.30527 | 0.393992 | -0.12629 | -0.42184 | 1 |

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