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The American University in Cairo

School of Business

The Impact of the Capital Market, the Insurance Sector and the Mortgage Finance Sector on Economic Growth in Egypt, 2005-2019

A Thesis submitted to
Department of Management

In partial fulfillment of the requirements for the degree of
Master of Science in Finance

By Hana Anis

Under the supervision of

Dr. Jasmin Fouad
Associate Professor
American University Cairo

Dr. Noha Youssef
Assistant Professor
American University Cairo

January 2021

Abstract

This thesis aims to explore the relationship between financial markets and economic growth in Egypt for the 15 years period, starting from 2005 to 2019. The study concentrates on the non-banking financial sector which includes the stock market, the debt market, the mortgage and the insurance sectors. The Vector Autoregressive (VAR) model is utilized to describe the relationship between GDP growth rate, as a proxy for economic growth, and a number of variables from the financial sector. Results of the analysis show that there is a significant relationship and statistical causality between the growth rate and the debt market, represented by credit allocations to the government and credit allocations to the private sector. Results of the causality test support the supply-leading growth hypothesis, stating that causality is unidirectional and runs from the financial market to economic growth. Yet, the study indicates that the bond market, represented by outstanding treasury instruments, has no contribution in enhancing growth. These findings are attributed to the dominance of the debt market over the equity market in raising capital. Also, a positive relationship is witnessed between stock market liquidity, measured by the turnover ratio, and economic growth; while stock market size, measured by market capitalization, is found to be insignificant to growth. The latter is explained by the speculative-based decisions on which the Egyptian stock market operates, rather than investment-based decisions. Similarly, no statistical significance is identified between economic growth and the sizes of the insurance and mortgage finance sectors, measured by insurance premiums and outstanding mortgage loans, respectively. These results are justified by the insurance market's untapped growth potential and the overlap of financial services offered by banks and financial service companies.

Keywords: Non-banking financial sector, finance, economic growth, GDP, debt market, stock market, insurance, mortgage, Egypt.

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1. Introduction

A well-operating financial system is one of the crucial fundamentals for sustainable economic growth (Demirgüç-Kunt 2006). Nevertheless, the finance-growth nexus is highly debated and no consensus agreement is reached on the relationship between finance and economic growth. Origins of this debate lay back to the work of Bagehot (1873) and Schumpeter (1911), who composed the first school of thought on the topic. The authors defend the importance of financial markets in promoting growth. They explain that financial markets permit the transfer of funds from savers to borrowers while ensuring that funds are efficiently allocated to projects with the highest growth potential. Two other main channels are detected, through which financial markets contribute in enhancing economic growth. First, the more developed and liberalized the financial market is, the more efficient credit facilities will be priced. This lowers the cost of capital for investors, fosters capital accumulation (King and Levine 1993), and stimulates investments and economic growth (Shaw 1973; McKinnon 1973; Levine and Zervos 1998). Second, financial markets offer various products that match the risk appetite of different investors; which allows a large tranche of the economy to be involved in the financial market and benefit from the services offered (Harvey 1989). Financial intermediaries also work on growing their debt facilities at a higher rate compared to the growth rate of their savings (Gurley and Shaw 1955). This increases the lending activity as well as the economic output.

Empirical investigations on the relation between finance and growth, usually consider the stock market and the debt market as segments of the financial market. A selection of papers defends the existence of a positive statistical relationship between economic growth and the stock market. This positive relation is explained by the stock market's feature of ensuring information symmetry while transferring funds from investors with excess liquidity to investors who suffer from shortage of liquidity¹. Yet, other studies fail to detect a significant relation between the stock market and economic growth. This is attributed in a number of cases to the low level of activity of stock markets in some countries and to the fact that some stock exchanges are still not fully developed (Rioja and Valev 2011; Carp 2012).

Similarly, concerning the debt market, empirical investigations discover a positive relation between economic growth and credit allocations, as a proxy for debt (Hassan et al. 2011; Jedidia et al. 2014; Musamali, Nyamongo and Moyi 2014). The opposite exists between economic growth and bonds, as a proxy for debt (Acosta and Loza 2005; Reinhart and Rogoff 2010; Dreger and Reimers 2013). Acosta and Loza (2005) explain that as the level of government debt increase, the country's perceived riskiness rises. This threatens investments, lowers economic output and justifies the negative relationship between bonds and economic growth.

Numerous studies include the insurance sector and the mortgage finance sector in their analysis of the finance-growth nexus. Starting with the insurance market, some papers demonstrate that it positively affects growth through its feature of risk sharing and the saving-substitution effect (Arena 2008; Kjosovski 2011; Chen et al. 2012; Alhassan and Biekpe 2016). On the other hand, a group of studies argues that the relationship between insurance and economic growth is negative in countries where the insurance market is not fully developed (Haiss and Sümegi 2006; Phutkaradze 2014). Moving to the mortgage finance sector, the

¹ For further information: Van Nieuwerburgh et al. 2005; Boubakari and Jin 2010; Masoud and Hardaker 2012; Kirankabeş and Başarir 2012; Marques et al. 2013; Sabariah and Norhafiza 2016; Lenée and Oki 2017; Alam and Hussein 2019.

available limited studies identify a positive statistical relation between mortgage lending and economic growth (Shahini 2014; Nwamara and Aronu 2014). The authors explain that an upsurge in mortgage loans, implies an increase in available residential and construction projects which reflects an increase in investments, and hence growth.

The relation between finance and growth differs from a country to the other and highly depends on the depth of the financial market and the country's economic stage (Rioja and Valev 2011). Further investigations of the relation between financial markets and economic growth, using different financial indicators and countries, will remarkably add to the research body on the finance-growth nexus.

The financial sector in Egypt is divided into the banking sector and the non-banking financial sector. According to data from the Central Bank of Egypt (CBE), the banking sector includes 38 registered banks that fall under the supervision of the CBE. The CBE was established in 1898 and is an independent regulator responsible for (1) formulating and implementing banking, credit and monetary policies, (2) overseeing the banking sector and ensuring its soundness, and (3) regulating the operation of the foreign exchange market and maintaining price stability.

The non-banking financial sector includes the capital market, the insurance, mortgage, leasing and microfinance sectors. To start with, the capital market includes the stock market and the fixed income market. Concerning the fixed income market, it witnessed the issuance of more than EGP 162 billion worth of securities in the primary market in 2019 and the issuance of 18 new securitization bonds worth EGP 22.1 billion. As for the Egyptian Stock Exchange (EGX), the market capitalization of shares listed in the main market valued EGP 708 billion as of December 2019. Moving to the insurance sector, it includes 39 insurance companies with a total net investments value of EGP 102 billion as of 2019. While the mortgage finance sector includes 15 companies and the value of outstanding mortgage loans amounted to EGP 2.6 billion in 2019. Lastly, the leasing sector includes 227 registered companies, that have offered financial leasing facilities worth EGP 55.9 billion in 2019. The regulator of the non-banking financial sector is the Financial Regulatory Authority (FRA); which was established in 2009 to replace the Egyptian Insurance Supervisory Authority (EISA), the Capital Market Authority (CMA) and the Mortgage Finance Authority (MFA). Among its duties, the FRA is responsible for (1) licensing and inspecting entities that operate in the non-banking financial sector, (2) regulating and developing the capital market and (3) ensuring integrity and transparency among market participants. Data presented according to figures of the FRA.

The body of research on the non-banking financial sector in Egypt is limited, to the best of our knowledge. Accordingly, this thesis intends to contribute in filling the existing gap in the research on the Egyptian financial market. Egypt is seen to have potential for higher growth rates, that the author believe is hindered by high unemployment rates, the unattained financial inclusion and the vulnerability of investments that accompany all emerging markets. That said, identification of financial markets that influence growth, will allow policy makers in Egypt to focus on the main drivers for growth and hence ensure an increase of the current growth rates.

Hence, the study aims to answer the following research question, what is the impact of the capital market, the insurance and the mortgage finance sectors on economic growth in Egypt over the period 2005-2019? This paper focuses on the non-banking financial sector, namely the capital market, the insurance sector and the mortgage finance sector, due to limitation of data on other sectors of the financial market. The period of study is from 2005

until 2019, which covers a full economic cycle for the Egyptian economy, in order to avoid any impact that could result from booms or recessions on the relation being investigated.

In order to answer the mentioned research question, the Vector Autoregressive (VAR) model is utilized to test for the relationship under investigation. The analysis is held on quarterly data to account for Fink et al.'s (2006) recommendation that using short time periods confirms theories that were found on long periods. The data is extracted from the following sources: The Central Bank of Egypt (CBE), the Financial Regulatory Authority (FRA), the Egyptian Stock Exchange (EGX) and the financial platform Bloomberg.

The significance of this thesis can be attributed to four major factors. First, it provides a detailed and concentrated analysis on the Egyptian market over a full economic cycle (2005-2019), in order to avoid any impact that could result from economic booms or recessions on the relation being investigated. The cycle starts in 2005 with an annual GDP growth rate of 4.47%, moves to a high growth figure of 7.16% in 2008, slumps to a low of 1.76% in 2011 then back to the 5% levels to record 5.60% in 2019. Second, to the best of our knowledge, this dissertation is the first to assess the impact of insurance and mortgage lending on the Egyptian economy; which is only included in Chen et al.'s (2012) study among a selection of countries, in an investigation that covered the period 1976-2005. Third, the paper includes government debt as part of the analysis on the relationship between the debt market and growth. In similar previous studies, government debt is measured either through treasury securities or through loans to the government. However, in this paper, all variables are incorporated: treasury bills, treasury bonds and loans to the government. This allows covering the largest portion of debt held by the government to avoid hindering the strength of relationship between government debt and economic growth, as a result of using a lower than actual amount of debt. Last, the selection of financial variables included in this analysis addresses different aspects of the financial market that have not been previously considered in one model; which solidifies our findings on the finance-growth nexus in the Egyptian market.

The thesis will be divided into five sections: The first section is the introduction. The second section tackles the literature review. The third section includes the research methodology and the econometric model. The fourth section presents the results and the last section is the conclusion.

2. Literature Review

The literature has focused on determining the relationship between finance and economic growth, since a developed financial market is considered an essential catalyst for growth. A developed financial market endorses efficient allocation of resources, boosts capital accumulation and offers a large selection of products with different risk appetites that attract various participants of the economy; resulting in increased economic output. The literature detects three channels through which finance promotes growth: (1) financial markets ensure efficient allocation of resources as they transfer funds from market participants with excess liquidity to participants who suffer from liquidity shortage; (2) financial intermediaries, which are main players in financial markets, offer low cost of capital which permits capital accumulation; and (3) financial markets offer different products that allow for risk diversification.

The literature on the relation between finance and economic growth started with the classical writings of Bagehot (1873), who argue that financial development is an essential factor in promoting economic growth. Schumpeter (1911) explains that financial intermediaries stimulate growth by ensuring efficient allocation of resources, as they choose to fund entrepreneurs and ventures mainly in the technical field with the highest growth potential. Technical projects serve the benefit of various sectors of the economy and hence increases economic output as a whole. King and Levine (1993) describe that financial markets contribute in promoting growth by channeling funds from savers to investors. This happens as financial intermediaries mobilize savings, evaluate the credibility and the potential profitability of requested credit facilities, while offering borrowers low cost of capital than the cost that could be offered by individual investors who have the ability of funding projects; which is reflected in increased investments, productions and higher returns.

This leads to the second channel through which finance promotes growth, which is capital accumulation. The more developed the financial market is in terms of products and size, the more credit facilities will be efficiently and competitively priced. In other words, the higher the number of financial intermediaries in the market, the higher the competitiveness will be in pricing credit facilities. This increases the lending activity and enables businesses to grow. In addition, financial intermediaries have the expertise that allows them to mitigate the effect of transaction cost efficiently and offer low cost of capital than what could be offered by individual investors; as they benefit from economies of scale. Goldsmith (1969) is the first to empirically test the relationship between finance and growth in 35 countries for the years between 1860 and 1963. The author uses financial claims issued by financial institutions and claims issued by the government as two proxies for financial development and monitors their impact on Gross National Product (GNP) as a proxy for economic growth. The analysis identifies a positive relation between financial development and growth. Shaw (1973) and McKinnon (1973) clarify that the liberalization of the financial sector reduces the burden on banks. The fewer the regulations imposed on the banking sector are, such as reserve requirements, taxation or even pricing schemes, the better banks can price the services they offer. This permits banks to reduce the cost of credit facilities offered to customers, encourages lending and investments. Levine and Zervos (1998) include the banking sector and the stock market in their study of the financial market and economic growth nexus. Taking a sample of 42 countries over the period 1976-1993, they hold banking sector development factors controlled and prove that stock market liquidity has a significant positive effect on economic growth. However, stock market size is insignificant to growth.

Risk diversification is the third channel through which financial development endorses economic growth. The availability of various products with different returns and risk levels match the appetites of different market participants. Thus, a large tranche of a country's population will be included in the financial sector in order to benefit from its saving and investment products. This runs the monetary cycle and comes to the benefit of the economy. Gurley and Shaw (1955) find that financial intermediaries push the growth rate of debt - represented by credit facilities - to increase at a higher pace than the growth rate of savings, which results in an increase in investments, consumption and consequently economic growth. This happens as banks do not rely only on external financing -which is the money they receive from depositors- but also on internal financing methods which account for the money they collect from selling or securitizing assets or their retained earnings. Accordingly, the pool of funds available for lending is larger than the savings received and with excess money, banks can lower lending rates and increase their loan portfolios; encouraging more businesses to grow. This is documented by Harvey's (1989) study on the United States of America in the

period from 1953 until 1898. The author addresses the relation between the development of financial markets and economic growth by drawing the relation between GNP and the cost of short- and long-term funding facilities. Short- and long-term credit facilities target investors with different risk levels. It concludes that low cost of debt for short maturities and high cost of debt for long maturities, raises growth rate as it incentivizes instant production. This happens as investors benefit from the low cost of capital in the short term and start implementing investments, which increase the speed of the production cycle. Harvey (1991) reconfirms the validity of his theory by applying it on the case of Germany over the period 1969-1991. The author finds that developed financial markets that offer funding facilities with different maturities have a significant contribution to economic growth.

While several authors agreed on the existence of a positive relationship between financial development and growth, no agreement was reached on the causality relation between financial development and growth. Patrick (1966) introduces two causality hypotheses: the **supply-leading growth hypothesis** and the **demand-following growth hypothesis**. The supply leading growth hypothesis claims that causality flows from financial development to economic while the demand-following growth hypothesis claims that causality flows from economic growth to financial development. The author clarifies that at the early stages of economic development, development of the financial sector helps the economy grow. Whereas as the country approaches the stage of being “developed”, its accelerating growth is what pushes the financial sector to grow to support the ongoing real sector growth. Some authors defend the supply-leading growth hypothesis (McKinnon 1973; Levine et al. 2000; Christopoulos and Tsionas 2004) while others support the demand-following growth hypothesis (Gurley and Shaw 1967; Jung 1986).

On the other hand, other researchers rejected the notion that a positive connection exists between financial markets and economic growth; and proposed different points of view. De Gregorio and Guidotti (1995) identify that the relation between finance and growth is negative in Latin American countries between 1950 and 1985. The authors attribute this to the unregulated financial liberalization that occurred over the mentioned period and to the fact that government bailouts encourage investors to take high risks. Bailouts are considered a hedge instrument for investors, who from their side take excessive risks that threatens the stability of the economy and its growth. Also, Ram (1999) shows that there is a negative relationship between financial markets development and economic growth on a sample of 49 countries over the period 1980-1991. Using the ratio of liquid liabilities to GDP, the author held his analysis on individual country basis and on cross-sectional countries and both denied the hypothesis that a positive relationship exists between finance and growth.

In the following sections, we discuss the literature that focus on specific sectors of the financial markets. The first section considers previous studies that investigate the relation between the stock market and economic growth. The second section presents studies that address the relation between the debt market and economic growth. The third section examines studies that treat the relation between insurance and mortgage sectors and economic growth.

2.1. Stock market

Poorly operated financial markets that suffer from asymmetric information among its participants represent an obstacle for economic growth (Acosta and Loza 2005). This is the important role that stock markets play within an economy: promoting information symmetry. Company disclosures ensure information sharing across all market participants, permitting investors with excess funds to invest their money in equity instruments with the highest potential growth, while also permitting investors with insufficient funds to raise low-cost capital by issuing new stocks. This will contribute in increasing companies' available capital and hence their production and investment. In this section, we focus on the effect of the stock market on economic growth.

Van Nieuwerburgh et al. (2005)'s paper on the relation between stock market development and economic growth in Belgium, find evidence that the stock market supports significantly in promoting the country's growth. The analysis covers the period from 1830 until 2000, and it detects a positive statistical relationship between stock market variables and GDP. It also detects a causality relation running from stock market to growth. The authors clarify that the relation between stock market and growth is stronger between 1873 and 1935. In the early 1870 period, restrictions on the limitations of limited liabilities companies were removed, restrictions on the trading activity on the shares of these companies were removed. This accelerated the development of the Brussels stock exchange and amplified the relation between stock market and economic growth.

In an attempt to draw a relationship between the stock market and growth in five European countries, Boubakari and Jin (2010) test the nature of the relation between the size and liquidity of the stock market and GDP; from 1995 until 2008. Empirical evidence indicates that not only stock market indicators have a significant impact on the growth of investigated economies, but also a causality relationship connects the stock market to economic growth in countries that have active and liquid stock markets. It is worth mentioning that the causality is only found in Belgium and Portugal. The authors explain that funds raised by corporates through the equity market over the years of investigation, is the reason behind the existing positive relation between stock market and growth in European countries.

Taking a sample of 42 emerging markets over the period 1995-2016, Masoud and Hardaker (2012) affirm the existence of a significant positive relationship between the stock market development and economic growth. Using an endogenous growth model, the study concludes that the improvement of stock market indicators facilitates capital mobilization, increases capital investments and boosts capital accumulation; which in return increases the country's growth rate.

Kirankabeş and Başarir (2012) investigate the relation between stock market and economic growth in Turkey for the period between 1998 and 2010. Using a VAR model, the analysis detects a positive long-term relationship between stock market and economic growth. Using the Granger Causality Test (Granger 1969), the study also identifies a causality relationship from the stock market to GDP. The authors explain that the stock market is the root between fundraising and economic activity. This happens as the stock market allows investors with excess funds to diversify their risks and invest their money in different sectors of the equity market, while allowing investors with insufficient funds to raise capital; resulting in the increase of the country's total output.

Marques et al. (2013) detect a bidirectional causality between stock market capitalization and economic growth in Portugal, in the period from 1993 until 2011. The supply-leading growth hypothesis dominates the results and casualty running from stock market to economic growth proved to be stronger than causality running from economic growth to stock market development. The analysis does not find any relation between banks development, valued by the amount of credit allocations, and economic growth. Yet, the study shows reverse causality, from economic growth to banks. The authors clarify this saying that as the economy grows, investors raise their borrowings to match the ongoing increase in terms of investment and production.

Sabariah and Norhafiza (2016) provide evidence from Malaysia on the importance of the stock market, when compared to the debt market, in promoting economic growth. Using data for the years between 1981 and 2014, the authors conclude that despite the fact that companies prefer raising funds through debt rather than through capital increase, the stock market is found to have a greater influence on economic growth compared to the debt market. This is attributed to two main factors: the first is the high activity of the equity secondary market, which permits rapid trading of shares when compared to debt instruments. The second is the free fluctuation of prices in the stock market, which reflects market conditions and any information relevant to the stock; this permits investors to have a fair valuation for the asset.

Lenee and Oki (2017) notice a strong positive relationship between capital market indicators and economic growth in MINT countries (Mexico, Indonesia, Nigeria and Turkey) for the 13-years between 2000 and 2012. The analysis concentrates on the stock market and tested the validity of three models in which the proxies used for the stock market remain unchanged, but the economic growth proxy is alternated between GDP, Gross Domestic Savings (GDS) as a ratio of GDP, and gross fixed capital formation as a ratio of GDP. Two main observations are highlighted: First, the number of listed stocks has a strong impact on all economic growth proxies. It has a significant negative impact on GDP, but a significant positive impact on GDS and gross fixed capital formation as ratios of GDP. Second, market capitalization as a percentage of GDP has a positive relationship with gross fixed capital formation as a ratio of GDP but has no significant relationship with GDP or GDS as a ratio of GDP. The stock market is a channel to financial intermediation, which boosts capital accumulation, increases productivity and hence economic growth.

Alam and Hussein (2019) study the impact of stock market on economic growth in Oman between 1993 and 2015. Using a multiple regression model, the study reveal that stock market indicators have a valuable positive statistical effect on Oman's GDP. However, the study show that market capitalization has a stronger impact on economic growth compared to the value of traded stocks; which the authors attribute to the small size of Muscat Security Market (MSM). The authors also explain that the weak relation between the value of traded stocks and economic growth could be attributed to the impact of the global financial crisis, which started in the United States of America (USA) in 2007 and have possibly affected the results of the relation under investigation.

Azarmi et al.'s (2005) paper adopts a different point of view and rejects the linkage between stock market and economic growth in India over the years from 1981 until 2001. The paper shows that during the pre-liberalization period, which was between 1981 and 1990, and was described as the period of speculations, the tests indicate that a positive relationship exists between the stock market and economic growth in India. However, post-liberalization, the tests demonstrate that the statistical relationship between stock market and growth is negative. The

authors conclude that the contradicting results question the significance of the relationship between stock market and economic growth.

Rioja and Valev (2011) analyze a sample of 62 countries over the period from 1980 until 2009, combining low- and high- income countries. The analysis fails to draw any statistical relation between stock market and growth in low-income countries. It detects a positive statistical link between stock markets and growth in high-income economies only. The authors explain that the low activity of stock markets in developing economies and the fact that they are still under development, is the main reason that hinders the stock market's contribution to growth.

Carp (2012) follows the same track and admits that stock market capitalization and total value of traded stock do not cause economic growth in Romania for the years between 1995 and 2010. The analysis only detects bidirectional causality between turnover ratio and economic growth. The author attributes these findings to the low development of the Romanian stock market; clarifying that the Bucharest Stock Exchange was still emerging in the time of the study and had not gained the required level of investors' confidence.

On the same grounds, a group of studies considers the case of Egypt in their analysis of the stock market-economic growth nexus. Bolbol et al. (2005) account for the debt market and the stock market, measured against the growth of total factor productivity as a proxy for economic growth. The study covers the period 1974-2002 and shows that both the stock and the debt market have positive effects on economic growth. The stock market's contribution is much significant than the debt market. The authors attribute this difference to the strong development and growth of the stock market relative to the banking sector in Egypt over the mentioned period, which could have amplified the stock market's impact on growth.

In their analysis of the relationship between the stock market and economic growth, Enisan and Olufisayo (2006) investigate the case of Egypt, South Africa, Côte d'Ivoire, Kenya, Morocco, Nigeria and Zimbabwe, for the years between 1980 and 2004. The authors find a positive cointegration between stock market indicators and economic growth in Egypt and South Africa while a causality relationship exists between stock market and economic growth in all investigated countries except Nigeria. The causality relationship is unidirectional in the case of Egypt and South Africa, going from stock market to economic growth; supporting the finance-leading growth hypothesis. This entails that a more liquid and efficient stock market, will act as a growth catalyst. However, in the case of Côte d'Ivoire, Morocco and Zimbabwe, the causality relationship is unidirectional, going from economic growth to stock market; supporting the growth-leading finance hypothesis. While for Nigeria, the analysis does not show any causality between stock market and economic growth.

On the contrary, Naceur and Ghazouani (2006) fail to determine a statistical relation between development of stock market and economic growth in Egypt, Bahrain, Iran, Jordan, Kuwait, Lebanon, Morocco, Oman, Saudi Arabia, Tunisia and Turkey. The authors attribute their findings to the under-development financial systems in the countries investigated which limit countries from growing at higher paces and to the inconsistent growth rates in the MENA region that could have negatively disturbed the quality of the relation being tested.

Kamal's (2013) study on the contribution of the stock market and the banking sector in promoting growth in Egypt, show that the stock market has no impact on growth over the period 1988-2012. This contradicts previous findings held on the country (Bolbol et al. 2005; Enisan and Olufisayo 2006). However, the study detects a unidirectional causality running from credit to private sector to economic growth. The author justifies the findings by the

dominance of the banking sector in the financial market and explains that results of the study have possibly been affected by the inclusion of 2011 in the analysis. Recalling that a revolution occurred in Egypt in 2011 and the stock market's nature of being sensitive to political conditions and sentiments have probably affected the strength of the relation. This could justify the unidentified relation between stock market and economic growth during the mentioned period.

Likewise, Badr's (2015) investigation that covers the period from 2002 until 2013, does not detect any causality relationship between the Egyptian stock market and economic growth. Only when assessed with foreign direct investments, the stock market starts to show a causality relationship with GDP growth. The author explains that the stock market in Egypt runs on speculation basis and not on investment basis; which prevents the stock market from contributing into the country's growth.

To summarize, the majority of studies on the relation between stock market and growth confirm the existence of a positive statistical relation between stock market variables and economic growth (Van Nieuwerburgh et al. 2005; Masoud and Hardaker 2012; Sabariah and Norhafiza 2016). Furthermore, some studies detect statistical causality going from stock market indicators to economic growth (Boubakari and Jin 2010).

However, the relation between stock market and economic growth could be negative depending on the country's economic stage (Azarmi et al. 2005) and depending on the activity and depth of the stock market (Rioja and Valev 2011; Carp 2012; Coskun et al. 2007)². Theoretically, the stock market is expected to spark a country's growth, as the funds injected to purchase shares are expected to be allocated in investments and expansion projects to grow the business. An active stock market can also permit investors to record remarkable returns that can be reinvested or used for consumption purposes, which triggers growth. Yet, as the literature shows, investigation of the relation between stock market and economic growth differs from a country to the other and cannot be generalized.

The second component of the capital market is the debt market. Studies on the relation between the debt market and economic growth are discussed in the following section.

2.2. Debt market

The financial intermediation role of banks lies within their ability of transforming savings to investments. According to Pagano (1993), savings should equal investments in a closed economy; however, investments end up being only a fraction of savings. The lost factor is absorbed by the financial institution. This factor is sometimes used to fund other investment options, to cover the required capital measures or to provision against different types of risks. Consequently, the lower the lost resources are, the more investments will be implemented and the higher the growth rate will be. Studies that test the relation between debt market and economic growth use two main variables as proxies for the debt market: credit allocations and bonds. This section will first discuss papers that employed credit allocations as a debt proxy, followed by papers that employed bonds as a debt proxy.

² Summary of the literature review on the relation between the stock market and economic growth is presented in appendix (1).

Credit allocations do not only benefit the economy through transferring funds from savers to lenders, but through the transfer of funds to investments with the highest potential returns (Pagano 1993; Schumpeter 1934). Beside the theoretical consideration of the linkage between credit allocations and economic growth, findings of empirical studies were segregated between three arguments. The first group of studies affirms the existence of a positive relationship between credit allocations and growth. The second group finds that the relationship between credit allocations and growth is negative. The third group of studies rejects the existence of a relationship between credit allocations and growth.

The first category of studies supports the theoretical work and proves a positive linkage between credit allocations and economic growth. Calderon and Liu (2003) show that unidirectional causality runs from credit allocations to growth in a sample of 109 countries. In addition, the study detects bidirectional causality. In some countries, the causality running from credit allocations to economic growth dominates and in others, the causality running from economic growth to credit allocations dominates.

The same is also reached by Habibullah and Eng (2006). The authors study the case of 13 Asian countries during the period 1990-1998, in search for the nature of the relation between credit growth and economic growth. The analysis concludes that a unidirectional causality exists within the investigated countries. It runs from credit to economic growth. The analysis supports the supply-leading growth hypothesis (Schumpeter 1934), where financial growth is an essential driver for economic growth.

In line with previous studies, Hassan et al. (2011) investigate the case of 168 countries in the period from 1980 until 2007. The authors segregate the countries under investigation according to their regional location into: East Asia and the Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia and Sub-Saharan Africa. This was then divided according to the indicators of the World Bank's World Development (2009) to: low income, lower middle income, upper middle income and high income countries. The paper proves that there exists a bidirectional causality between domestic credit allocations, domestic credit allocations to the private sector and economic growth in all countries except for Sub-Saharan and East Asia and Pacific countries. For Sub-Saharan and East Asia and Pacific countries, causality is unidirectional and moves from economic growth to credit allocations. The authors highlight that countries in these two categories had the lowest GDP growth figures within the sample, which is attributed to their undeveloped financial systems, which prevents them from benefiting from the growth of their financial markets.

Bidirectional causality between credit to private sector and economic growth is also detected in the case of Tunisia by Jedidia et al. (2014) for the years between 1973 and 2008. The authors explain the bidirectional causality, highlighting that investors request credit facilities to expand their investments and production which increases real output. Simultaneously, the increased real output urges other market participants to open credit facilities to match the growing economy.

From their side, Musamali, Nyamongo and Moyi (2014) find a positive relationship between financial development, measured by credit allocations to the private sector and money supply, and economic growth in a sample of 50 African countries over the period 1980-2008. The paper detects a strong positive statistical significance between credit to the private sector and growth, but a weaker – yet still positive – relation between money supply and growth. The analysis also finds a bidirectional causality between financial development indicators and economic growth. The weak relation between money supply and growth was justified by two reasons. The first

reason is that selected countries have undeveloped financial systems. The second reason is their limited control over money supply, which leads to high inflation instead of contributing in promoting growth.

Bist (2018) considers a selection of 16 low-income countries (15 African and one non-African) over the period 1995-2014. The author assesses the relation between credit to private sector and economic growth. Out of the 16 countries, only nine show positive relation between credit allocations to private sector and economic growth. On the other hand, three countries show negative statistical relation between credit to private sector and economic growth. While four countries display no statistical relation between credit allocations to private sector and economic growth. The author attributes the negative relationship between credit allocations and economic growth, to the low level of credit facilities given to the private sector in the investigated countries and clarified that the private sector promotes efficient allocation of resources and boosts investment across various sectors of the economy. Hence, low levels of credit allocations to the private sector entails low production and depresses economic growth. The author clarifies that his findings do not oppose the validity of the finance growth linkage, and that the results are impacted by individual country factors.

The second category of selected studies argues that the relationship between credit allocations and economic growth is not always positive, but it turns to be statistically negative after a certain threshold.

Arcand et al. (2012) oppose the linearity of the relationship between financial development and growth and claim that the relationship is U-shaped. Initially, the relationship between credit allocations and growth is positive until credit allocations reach a threshold of 80-100% of GDP. After the threshold, the statistical relationship turns to be negative and more credit allocations negatively affect economic growth. The authors attribute the negative impact exerted by the growth of credit allocations on economic growth to two factors. The first is the high probability of occurrence of financial crises as the financial market expands. The second factor concerns the probable misallocation of resources, especially during growth periods; which threatens the stability of the economy as a whole.

Similarly, Law and Singh (2014)'s paper support the U-shaped relationship between credit allocations and economic growth using data from 87 countries for the years between 1980 and 2010. They justify this saying that after the threshold, "more finance" negatively affects the economy as the financial sector starts competing with other sectors of the economy on available resources; which hinders the whole economic output. The threshold for credit allocations is set by Cecchetti and Kharroubi (2012) at 90% of GDP, when they investigate the case of 50 advanced and emerging countries during the period 1980-2009.

Ductor and Grechyna (2015) confirm the U-shaped relationship and explain that when credit allocations start to increase at a higher rate than the growth rate in the output of the real sector, then the relationship between credit allocations and economic growth turns to be negative. The authors reach this conclusion after studying 101 countries over the period 1970-2010.

The third group of selected studies completely rejects the positive linkage between credit facilities and economic growth; arguing that no statistical significance is detected. Dawson (2003)'s study on 13 Central and East European Countries find no statistical significance between the debt market and economic growth; with results coming in support of Ram (1999)'s findings.

The results are supported by Menyah et al. (2014), who study the case of 21 African countries over the years between 1965 and 2008. Out of the 21 investigated countries, 17 countries show no statistical relation between economic growth and credit allocations. Only one country's results come in favor of the demand-following growth hypothesis, where economic growth is the driver for the development of the financial market. The results of three countries come in favor of the supply-leading growth hypothesis, where the development of financial markets is the driver for economic growth. Graca and Gasdar (2014) also confirm that the increase in credit allocations negatively affect economic growth in five GCC countries from 1996 until 2011.

Similarly, Ayadi et al. (2015) reach that the increase in credit allocations to the private sector in 11 southern and eastern Mediterranean countries, negatively impacts economic growth over the period 1985-2009. The authors attribute the findings of their study to the financial repression in investigated countries; in which public banks dominate the financial sector while they have poor governance and inefficient valuation of growth promoting projects. This threatens the stability of the economic output as a whole. The authors also add that the negative relationship could rise from the poor regulation and governance of credit allocations in public banks; which assign more importance to the volume of credit allocations rather than their quality.

Likewise, limited studies concentrated on the Egyptian economy in their analysis of the relation between credit allocations and economic growth. Dobronogov and Iqbal (2005) confirm that credit to the private sector has a significant contribution to the country's growth rate from 1986 until 2003. This occurs as the private sector implements investments in diverse sectors of the economy, which runs the production cycle and increases economic output. The paper also includes credit allocated to the government as an explanatory variable for economic growth, but reached that it has no influence on economic growth.

Abu Bader and Abu Qarn (2008) find a strong bidirectional causality relationship between credit allocations and GDP in Egypt, while assessing the impact of financial development on economic growth from 1960 until 2001. The authors explain that the causality is a result of the banks' efficient allocation of resources, which permits them to allocate funds in investments with the highest growth potential and hence increase economic output.

Overall, out of the investigated papers, the majority demonstrates a positive relation and statistical causality between credit allocations and economic growth (Habibullah and Eng 2006; Calderon and Liu 2003), some of which detect bidirectional causality (Hassan et al. 2011; Jedidia et al. 2014; Musamali, Nyamongo and Moyi 2014). The bidirectional causality is explained by the fact that as some market participants increase their investments and promote economic growth, other participants follow the move and raise capital to benefit from the growing and upward-trending economic activity.

Other studies conclude that the relation is positive until credit allocations reach a certain percentage of GDP. After the threshold, the relation turns to be negative, due to the excessive risk taken by investors, which negatively impacts the economy as a whole and threatens the stability of the financial market (Arcand et al. 2012; Law and Singh 2014; Cecchetti and Kharroubi 2012; Ductor and Grechyna 2015).

Lastly some papers find a negative relation between credit allocations and growth (Graca and Gasdar 2014; Ayadi et al. 2015), and one paper fails to detect any relation between credit allocations and growth (Menyah et al. 2014).

Another instrument of the debt market that has attracted authors in their investigation of the relation between finance and growth is bonds. Hence, in the below section, we present studies that focused on drawing a relation between the bond market and economic growth.

The bond market has four important roles that positively influence the financial sector and the economy as a whole (Herring and Chtusripitak 2000; Hawkins 2002; Thumrongvit et al. 2013). Firstly, bonds set a value for the cost of capital for different maturities and risk levels, which allows investors to invest efficiently and allocate their funds to the most-rewarding investment opportunities. Secondly, the more diversified the bond market is, the more competitively bonds will be priced. This makes deposit savings less rewarding and encourage market participants with excess liquidity to invest in treasury or corporate bonds, which are set to offer higher yields than deposits depending on the bond issuer's risk level. Thirdly, the bond market protects entities from being exposed to exchange rate risks, as it authorizes issuers to issue bonds denominated in foreign currencies in the international market. Lastly, the bond market protects the economy as a whole against possible financial crises. Since banks usually have a high leverage ratio, the bond market enables fundraiser to raise funds from the bond market instead of the debt market. This permits banks to reduce their leverage ratios, reduce their risk exposure and improve their capital measures. Based on this, some studies investigated the relation between finance and economic growth while using the bond market as a representative for the financial market.

Numerous studies detect a positive relation between the bond market and economic growth. Fink, Haiss and Hristoforova (2003) conduct the analysis on the relation between bond market and economic growth on a sample of 13 developed economies for the years between 1950 and 2000 using annual data. The authors demonstrate a unidirectional causality relation running from the amount of outstanding debt securities, as a proxy for the debt market, to economic growth in the USA, Germany, Great Britain, Switzerland and Austria. Netherlands and Spain show weak causality between outstanding debt securities and economic growth. However, causality is bidirectional -moving from debt market to economic growth and from economic growth to debt market- in Japan, Italy and Finland. The authors attribute their findings to support the supply-leading growth hypothesis.

In extension of this study, Fink et al (2006) use quarterly data for the years between 1994 and 2003; claiming that holding the analysis on shorter time periods helps confirming or rejecting what is found on longer time periods. On the overall level, the authors confirm the existence of bidirectional causality between bond market and economic growth, supporting the feedback hypothesis, which states that the variables investigated are both causing the growth of each other. The study investigates 15 European countries and the USA and Japan. For the USA, no statistical causality is detected, yet a negative relation is found between the volume of issued debt securities and economic growth. As for Japan, the causality relation is identified to be in both directions. In France, Austria and Switzerland causality is unidirectional, moving from bond issuance to growth. Lastly for Belgium, Denmark, Finland, Japan, Portugal and the United Kingdom, causality is also unidirectional, but moving from economic growth to bond issuances. While Germany, Italy, Netherlands, Norway, Sweden and Spain failed to prove any significant statistical causality. The authors justify their findings in the USA by the substitution or restructuring effects, which encourage corporates and governments to revert to bank loans instead of raising funds through bond issuances. As for the European countries, the authors clarify that according to the European Central Bank's reports, European corporates rely on bank loans to occupy a large tranche of their financing, which could be the reason behind the lack of causality relation between the bond market and economic growth in some countries; or

even behind the economic growth to bond market causality detected in other countries.

Koka (2012) finds a positive relation between the amount of treasury bond issuances and economic growth in Kenya. Over the years from 2003 until 2011, the study's results adopt the supply-leading growth hypothesis, as the bond market's role of fund allocation has a significant role in supporting growth.

Said (2012) use local currency public debt, private debt and foreign currency public debt as proxies for the bond market in an attempt to draw a relation between debt market and economic growth in China, Hong Kong, Japan, South Korea and Thailand. On the regional level, results show that over the years from 2002 to 2009 local currency public and private debts have significant contributions to GDP. Whereas foreign currency public debt does not have any statistical impact on GDP. However, on the individual country levels, Japan fail to show any significance between economic growth and all bond market proxies. The author explains that the absence of finance-growth linkage in Japan, which does not match previous studies held on the country, is due to the severe fiscal deficit from which the country suffered over the period of investigation. This urged the government to direct bond proceeds to fund the budget deficit rather than being directed to investments.

Kapingura and Makhetha-Kosi's (2014) paper supports the feedback hypothesis (Fink et al. 2006) in the case of South Africa for the years between 1995 and 2012. While testing the relation between the amount of outstanding government bonds and economic growth, the authors highlight that the causality running from the bond market to growth is stronger than the causality running from growth to the bond market.

Similarly, Pradhan et al. (2016) confirm the existence of bidirectional causality between the intensity of the bond market and economic growth in a sample of 35 countries between 1993 and 2011. The authors assess the impact of bond market intensity and a selection of macroeconomic variables, on economic growth. The macroeconomic variables used are interest rate, exchange rate, inflation and degree of trade openness. The authors detect bidirectional causality between bond market intensity and growth; which they explain by the fact that the more developed the bond market is, the lower the transaction costs will be, and this increases the frequency of the trading and hedging activity. This results in an increase in the size of the bond market which then boosts the economic cycle.

Ogboi et al. (2016) observe a positive statistical relation between bonds and growth in Nigeria from 1982 to 2014. However, the study does not find proof for statistical causality. The authors assign the lack of causality to the infancy stage of the Nigerian bond market and the dominance of government bonds, which are usually directed towards funding expenditures rather than funding investments (Mahara 2018; Said 2012).

Coskun et al. (2017) test the nature of the relation between economic growth and government bonds and corporate bonds. Using data from Turkey covering the period from 2006 to 2016, results show strong cointegration between variables of the debt market and GDP. In addition, Granger Causality test and Toda-Yamamoto Causality test reveal a unidirectional causality flowing from capital market variables to GDP. Results support the supply-leading growth theory.

Similarly, Muharam, Ghazali and Arfinto (2018) analyze the cases of Indonesia, Malaysia, Thailand, Mexico, Poland, Turkey and South Africa. The analysis covers the years between 2004 and 2015, and it discovers unidirectional causality between bond market and economic

growth only in Indonesia, Mexico and Thailand. Yet, the analysis does not detect any statistical relation between bond market and GDP in the rest of the countries.

However, Mahara (2018) find unidirectional causality flowing the opposite way from economic growth to bond market while assessing the case of 10 East Asian countries over the period 2004-2016. The paper approves the demand-following growth hypothesis where economic growth is a catalyst for financial market growth; but also admits that a positive relationship connects the bond market and economic growth. The author highlighted that government bonds dominate the bond market in the countries investigated and this could be the reason behind the identified economic growth to bond market causality relation. Funds do not necessarily finance profitable investments, but government deficits (Said 2012).

Another selection of studies argues that the relation between economic growth and the bond market is negative, or turns to be negative after a certain threshold. A government that has high levels of debt could be risky for investors; resulting in capital outflows and hence threatening the country's growth (Acosta and Loza 2005).

Reinhart and Rogoff (2010) show that across a mixed sample of 44 developed and developing economies, the higher the government debt to GDP ratio, the lower the country's economic growth will be. The analysis's results support Acosta and Loza's (2005) hypothesis which states that when the government debt of a country surpasses a certain threshold of its GDP, investors' confidence in that country decline; which reduces investments and negatively impacts the country's growth. The threshold set by Reinhart and Rogoff (2010) for government debt as a ratio of GDP is at 90%. Above this level, the relation between economic growth and government debt is inverse, while below the 90% threshold, the relation between government debt and growth is statistically weak. The authors explain that as governments reach their maximum debt ceilings, the market starts to push interest rates higher as market participants request higher yields for the extra risk taken. Hence, as the government debt increases, the cost of fund increases, directly affecting investors' confidence in the country's stability.

The 90% threshold is also found in the work of Kumar and Woo (2010) of a panel of a group of developed and emerging economies. The authors explain that for every 10% increase in the ratio of initial debt ratio to GDP above the 90% threshold, GDP per capita falls by around 0.2%.

On the other side, Dreger and Reimers's (2013) study concludes that from 1991 to 2011, a sample of 16 countries witness a negative relation between government debt as ratio of GDP and growth of GDP per capita. While Abbas and Christensen's (2007) study on 93 low-income countries and emerging markets for the years between 1975 and 2004, fail to detect a significant causal statistical relation between domestic debt and economic growth.

To wrap up, the majority of studies agree on the existence of a positive statistical relation between the bond market and economic growth due to its feature of fund allocation (Koka 2012; Kapingura and Makhetha-Kosi 2014; Pradhan et al. 2016). In our view, the agreement reached on the existence of a statistical relation between bonds and growth is explained by the dominance of government bonds in the bond market. Government bonds are, in some cases, used to finance government expenditures and national projects, which are usually larger than projects implemented by the private sector. This in return amplifies the relation between government bonds and growth.

Similar to credit allocations, some papers show that the relation between bonds and growth turns to be negative if the amount of government bond surpasses a certain percentage of GDP, due to the negative sentiment it gives to investors on the credibility of the country (Reinhart and Rogoff 2010; Kumar and Woo 2010). This results in a downturn in investments and consequently economic growth. On the other hand, few papers reject the existence of a statistical relation between bonds and economic growth (Abbas and Christensen 2007)³. Theoretically, the debt market is expected to positively contribute in increasing growth by transferring funds from savers to borrowers and by funding investments and projects with the highest growth. However, the debt market could possibly have no contribution to growth, if proceeds are used to cover financial obligations or deficits.

Another sector of the financial market is occupied by financial services companies, which are institutions that perform activities similar to the banking activity, but are not classified as commercial banks (Vittas 1997). However, financial services companies specialize in a specific service or sector, which permits them to have information and cost advantage over banks. Among the sectors of financial services companies are the insurance sector, mortgage finance, leasing and microfinance sectors. Insurance companies provide clients with conditional promises against risks related to personal lives or general risks. The conditional promises are made in exchange for fees received by the insurance company that are called insurance premiums. On the other side, mortgage finance companies offer clients credit facilities, specifically entitled to the purchase of real estate assets; the loan is backed by the asset in the case of default and the borrower repays the debt in addition to the agreed upon interest at maturity. Leasing is also a liquidity providing service that occurs through renting assets. The borrower of money rents the asset to the lender, in exchange for a sum of money for a given period. The ownership of the asset is transferred to the lender of the money over the borrowing period, for which he holds the right to exploit. At the end of the period, ownership of the asset returns to its original holder and the borrower repays the rent received in addition to an agreed upon interest. On the same grounds, microfinance is a debt-based service that allows low-income individuals to raise funds in exchange for an interest, and they usually take the form of working capital loans

In this thesis, we concentrate on the insurance and mortgage finance sectors due to the pivotal roles they play in the economy. First, the insurance market encourages productions, innovations and investments, as it hedges the insured against potential risks and losses. Second, concerning the mortgage finance sector, it fills the gaps left by commercial banks as they reach clients that are not reachable by the banking sector, which promotes financial inclusion within a country. Mortgage finance companies also force banks to efficiently price credit facilities and consider the benefit of clients rather than focusing only on the bank's profitability. That said, mortgage companies and banks are considered competitors, due to the overlap of services.

Accordingly, the below sections present previous studies that focused on drawing a relation between economic growth and the insurance and mortgage sectors.

³ Summary of the literature review on the relation between the debt market and economic growth is presented in appendix (2).

2.3. Insurance

Some papers assess the relationship between the insurance market and economic growth and reach that the insurance market positively impacts economic growth through three channels. The first channel relates to the feature of risk sharing. When purchasing insurance claims, households and companies are guaranteed that they will not be solely holding the burden of potential risks and losses they are holding the insurance promise against. Consequently, they work efficiently, expand their productions, investments or even develop new products and services; this runs the economic cycle and increases economic output. The second channel is the saving-substitution effect. Instead of holding precautionary savings, households and companies refer to insurance companies to hedge against possible losses. In their turn, insurance companies invest the money received until it is required to cover a certain obligation. Hence, money is injected into the economy again instead of being kept as precautionary savings. This leads to the third channel through which the insurance market promotes growth, which is the investment of the insurers. Insurance companies collect premiums from clients without having indication on the time-frame during which risks can possibly occur. In others words, insurance companies must always have access to liquidity in order to cover losses that could rise in unexpected circumstances. Therefore, insurance companies hold diversified asset portfolios with different asset types and durations that matches their liabilities. Consequently, by holding investment in different assets classes, insurance companies contribute in enhancing economic growth and are considered major investors in the economy (Haiss and Sümegi 2006).

Arena (2008) assess the relationship between the insurance market and growth in a sample of 55 countries over the period 1976-2004. The study proves that a positive causal relationship exists between insurance penetrations (including life and non-life insurance) and economic growth. Insurance penetration is the ratio of insurance premiums to GDP. The author highlights that the relationship is stronger during low and middle stages of economic development, which are the periods of high risk.

Kjosevki (2011) studies the case of Macedonia for the years between 1995 and 2010 and concludes that premiums of the insurance market have a significant positive impact on economic growth. Yet, when segregated to life insurance and non-life insurance products, the author notes that the penetration rate of life insurance has a negative effect on growth. The negative relationship is explained by the saving-substitution effect that urges people to lock their money in life insurance products; which reduces the share of income allocated to consumption or investment, and negatively affects economic growth.

Chen et al. (2012) analyze 60 countries, including Egypt, and statistically prove that life insurance has a positive impact on growth from 1976 to 2005. The paper shows that over the investigated sample, a 1% increase in insurance penetration rates increases economic growth by 0.001% and a 1% increase in insurance density ⁴increases economic growth by 0.005%. The authors underline that the impact of insurance market on growth is stronger in low-income countries compared to high-income countries.

⁴ Life insurance density = (life insurance premiums x average period exchange rate) / (population + the U.S. consumer price index).

Alhassan and Biekpe (2016) investigate the relationship between insurance premiums and economic growth for the 20-years period from 1990 to 2010 in a number of African countries. The countries included are Algeria, Gabon, Kenya, Madagascar, Mauritius, Morocco, Nigeria and South Africa. Algeria, Madagascar and Nigeria's insurance penetration rates are below 1% of GDP, while Gabon, Kenya, Mauritius, Morocco and South Africa's penetration rates are above 1% of GDP. Despite the different levels of insurance penetrations across the sample, a causality relationship is detected between all types of insurance penetrations and economic growth across the eight countries. However, the causality direction differs. In Algeria, Madagascar, Kenya, Mauritius, Nigeria and South Africa, the analysis defends the supply-leading hypothesis, implying that causality is unidirectional and goes from the insurance market to GDP growth. For Gabon, the analysis supports the demand-following growth hypothesis, suggesting that causality goes from economic development to the insurance market. As for Morocco, causality is bidirectional.

In the study of Lee et al. (2018) on 123 countries over the period 1967-2014, there is a strong statistical relationship between the insurance market and economic growth. The countries under investigation are divided into locational groups from Asia, Europe, North America, South America and Africa. The statistical relationship is positive and stronger in Asian and African countries compared to other countries due to the untapped growth opportunities in the insurance markets of these countries. Only in South America, growth of the insurance market negatively affects economic growth. This led the authors to clarify that the impact of the insurance market on economic growth highly depends on the profitability of the investments in which insurance companies invest the funds received.

On the other hand, a group of studies finds the relationship between the insurance market and growth to be negative and statistically insignificant. Haiss and Sümegi (2006) study 29 European countries over the years from 1992 until 2004. The sample includes the 15 old members of the European Union (EU), ten new members and five EU accession countries. Total premiums and non-life premiums exert a negative impact on growth, only life insurance premiums positively influence growth.

Similar results were reached by Phutkaradze (2014) who investigates the case of 10 countries from Central and Eastern Europe from the year 2000 until the year 2012. The author realizes that the size of the insurance market has a negative impact on growth. The author attributes the negative relationship to the difference in the level of development and the structure of the insurance markets among the countries invested; which could have disturbed the results of the study as a whole.

Out of available studies on the relationship between insurance market and economic growth, the majority concludes that a strong relationship connects the insurance market to growth (Arena 2008; Kjosevki 2011; Chen et al. 2012; Alhassan and Biekpe 2016). On the other hand, two studies demonstrate a negative statistical relationship between insurance and growth; which the authors attribute to the untapped insurance potential in the countries investigated (Haiss and Sümegi 2006; Phutkaradze 2014)⁵. Theoretically, the insurance market is believed to positively influence economic growth as it encourages risk taking and investments. The body of research on the relationship between insurance market and growth is

⁵ Summary of the literature review on the relation between the insurance market and economic growth is presented in appendix (3).

short, compared to analyses of the stock and debt market's impact on growth. Therefore, further investigations of the relationship using different countries, will contribute in building a consensus agreement on the nature of the relationship between the insurance market and economic growth.

2.4. Mortgage finance

Another selection of studies assesses the relationship between mortgage finance and economic growth. Over the years, real estate properties have always occupied a portion of asset portfolios and house-owners consider their purchased properties as their store of wealth and life investment. Siyan et al. (2019) rank housing as the most important requirement for human survival, coming in a second level only after food; adding that it is one of the factors that determine the standards of living. This is the reason that encourages people to upgrade their real estate properties or to acquire more of them. Hence, the role of mortgage finance is crucial in determining the quality and the size of real estate assets. Jaffee and Renaud (1996) state that a well-functioning mortgage finance market can help raise living standards which directly affects growth of the economy. Empirical findings reached by some studies on the relationship between mortgage finance and economic growth are presented below.

Shahini (2014) addresses the relationship between mortgage loans and economic growth for the case of Albania from 2008 until 2012 and concludes that a strong positive statistical relationship connects mortgage loans to economic growth. The author explains that during the period of investigation, banks suffered from high rates of non-performing loans, which pressured their liquidity and enforced them to reduce their mortgage lending facilities. Hence, an economic slowdown is strongly correlated with a slowdown in mortgage loans.

While trying to determine the factors that impact the number of mortgage lending transactions, Nwamara and Aronu (2014) investigate the relation between GDP and mortgage lending in Nigeria from 1995 to 2012. The authors detect a strong positive relationship between GDP and the number of mortgage lending transactions. On the other hand, in the work of Siyan et al. (2019), the Nigerian economy show a bidirectional causality between mortgage financing and growth over the period 1990-2016. Causality running from mortgage lending to growth is stronger than reverse causality running from growth to mortgage lending. The authors clarify that the more effectively mortgage lending facilities are priced, the higher the demand on mortgage lending will be, the higher the demand on real estate properties will be; hence the higher the development and construction of real estate projects will be. This directly increases investments and boosts economic growth.

To the best of our knowledge, the body of research on the relationship between mortgage finance and economic growth is limited. However, available studies confirm that a positive relationship exists between mortgage lending and economic growth⁶. Theoretically, mortgage lending is expected to have a positive statistical relationship with economic growth. This occurs as the increase in mortgage lending is reflected as an expansion in residential projects; which translates a boost in investments. Accordingly, further empirical evidences are required to validate the theory.

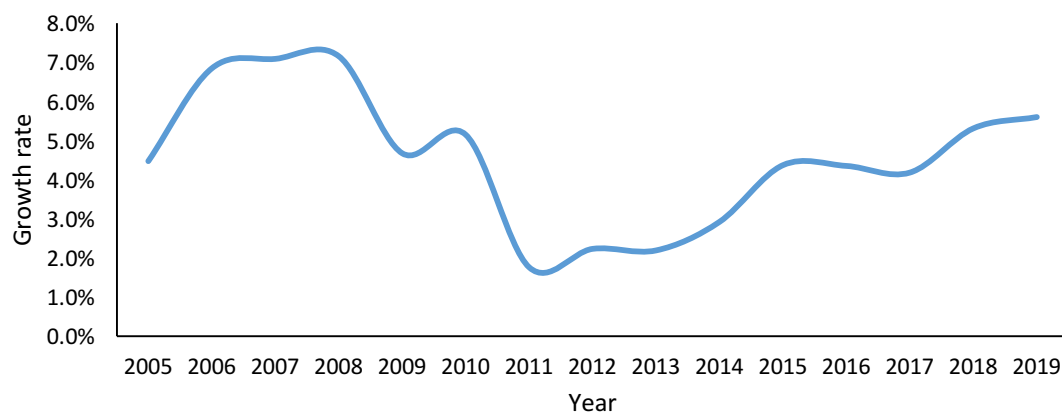
⁶ Summary of the literature review on the relation between the stock market and economic growth is presented in appendix (4).

3. Model

3.1. Data and sample size

This thesis describes the relationship between the capital market, the insurance and the mortgage finance sectors (explanatory variables) and the country's GDP growth rate (explained variable). The duration covered under the analysis is from 2005 to 2019 as it represents a full economic cycle for the Egyptian economy. As shown in figure (1), the cycle starts in 2005 with a GDP growth rate of 4.47%, moves to a high growth figure of 7.16% in 2008, drops to a low of 1.76% in 2011 then back slightly above its starting level where it records a growth rate of 5.60% in 2019. Data is recorded on quarterly basis over the mentioned period, to consider Fink et al's (2006) recommendation that using shorter time periods provides more accurate analysis over using long period data (annual data, for example).

Figure (1): Egypt annual growth rates



Data source: The World Bank

For the explained variable, the growth rate of Gross Domestic Production (GDP) reported in constant prices is used as a proxy for economic growth (Fink et al. 2006; Kirankabeş and Başarir 2012; Carp 2012; Arcand et al. 2012; Law and Singh 2014; Ductor and Grechyna 2015; Reinhart and Rogoff 2010; Muharam, Ghazali and Arfinto 2018). We chose to hold the analysis on GDP reported in constant prices and not in current prices in order to eliminate the effect of inflation, which could result in an increase in the reported GDP figure without entailing an actual increase in production.

As for the explanatory variables, they are segregated to measure different aspects of the financial markets under investigation. The first category of explanatory variables addresses the stock market. We value three aspects of this market. First, the size of the market using its market capitalization (Azarmi et al. 2005; Van Nieuwerburgh et al. 2005; Boubakari and Jin 2010; Masoud and Hardaker 2012; Sabariah and Norhafiza 2016; Alam and Hussein 2019). Second, we assess the liquidity by using the turnover ratio (Boubakari and Jun 2010; Azarmi et al. 2005; Rioja and Valey 2011; Carp 2012). Third, we value profitability by using the quarterly returns of EGX30. To the best of our knowledge, this paper is the first to include the profitability of the stock market in the analysis of the capital market-growth nexus, as we believe that the profitability of a market is an essential factor to boost its growth and activity. EGX30 is a price index launched by the Egyptian Exchange (EGX) in February 2003, and it includes 30 companies from the companies listed on EGX, but they represent the top 30 active

and liquid companies in the market. The value of the index is calculated by dividing the adjusted market value of components by a divisor; the adjusted market value of the components is calculated by multiplying the value of outstanding shares of the 30 companies, by their price and their free float percentage. Hence, EGX30 is used as a proxy to assess the profitability of the stock market.

The second category of explanatory variables targets the debt market. To value the size of this market we use the ratio of loans to private sector as percentage of GDP (Calderon and Liu 2003 ; Hassan et al. 2011; Musamali, Nyamongo and Moyi 2014; Law and Singh 2014; Menyah et al. 2014; Ayadi et al. 2015) and the ratio of loans to the government as percentage of GDP (Dobronogov and Iqbal 2005) to differentiate between the debt of the private sector and the debt of the government which is neglected in previous study and is only assessed in Dobronogov and Iqbal's (2005) study. In addition, we include a different type of government borrowings which are bills and bonds which we sum in one variable under the name of outstanding treasuries. (Fink, Haiss and Hristoforova 2003; Kapingura and Makhetha-Kosi 2014). We also use a new variable that we developed under the name of weighed yield on treasuries, as an indication on the return and the profitability of these instruments; to assess if the returns received on treasury debt instruments have an impact on growth. The weighted yield on treasuries is calculated using the quarterly average yields on treasury bills and bonds, which we multiply by the weight of each one of them. The weight is calculated using the outstanding amount of bills/ bonds over the sum of bills and bonds; to get an average weighted yield.

The third category of explanatory variables covers the insurance and the mortgage sectors. We evaluate the sizes of both markets by using the premiums of insurance companies as a proxy for the size of the insurance market (Haiss and Sümegi 2006) and the amount of mortgage loans as a reflection of the size of the mortgage activity (Shahini 2014; Siyan et al. 2019).

The factors that have an impact on economic growth are not limited to the above proposed selection of explanatory variables. A range of other variables is believed to also have an impact on a country's economic growth. Based on this, we use four variables as control variables. Some studies are dedicated to analyzing the relationship between foreign direct investments (FDIs) and economic growth (Alfaro et al. 2004; Ang 2009) and highlight that the more developed a country's financial market is the more significant is the relationship between FDIs and economic growth. Hence, FDIs are used as control variables (Boubakari and Jin 2010; Muharam, Ghozali and Arfinto 2018; Naceur and Ghazouani 2006; Badr 2015), in addition to tourism revenue, population size (Abbas and Christensen 2007; Masoud and Hardaker 2012; Cecchetti and Kharroubi 2012) and unemployment rate.

3.2. Data source

The sources from which data for the above-mentioned variables are obtained are different. First, the Central Bank of Egypt (CBE)'s monthly statistical bulletins are used to collect data for the gross domestic production (GDP), loans to the private sector, loans to the government, foreign direct investments and tourism revenue. From the CBE's historical auction reports, we collect data for the outstanding treasuries and their yields. Second, we use the Egyptian Exchange (EGX)'s reports to collect data for market capitalization and market turnover. Third, the Financial Regulatory Authority (FRA) is the source from which we gather insurance market premiums and the amount of mortgage lending. Lastly, data on EGX30 index, population size and unemployment rate are obtained from Bloomberg database.

Table (1): Definition of explanatory variables

Category	X	Variable	Variable name	Calculation	Source
Stock market	X1	Market capitalization	Market cap	N/A	EGX
	X2	Turnover ratio	Turnover	Total traded value/ market cap	EGX
	X3	EGX30 return	EGX30 return	(Index price T+1 / Index price T) -1	Bloomberg
Debt market	X4	Loans to private sector as percentage of GDP	Private loans	Loans to private sector / GDP	CBE
	X5	Loans to the government as percentage of GDP	Government loans	Loans to the government / GDP	CBE
	X6	Outstanding treasuries	Treasuries	Outstanding T-bills + Outstanding T-bonds	CBE
	X7	Weighted yield on treasuries	Yield on treasuries	[(T-bills / (T-bills +T-bonds) x Yield on T-bills] + [(T-bonds / (T-bills +T-bonds) x Yield on T-bonds]	CBE
Insurance	X8	Premiums of insurance companies	Insurance	NI	FRA
Mortgage	X9	Mortgage finance lending	Mortgage	NI	FRA
Control variables	X10	Foreign direct investments	FDI	NI	CBE
	X11	Tourism revenue	Tourism	NI	CBE
	X12	Population size	Population	NI	Bloomberg
	X13	Unemployment rate	Unemployment	NI	Bloomberg

3.3. Method of analysis

The study employs the Vector Autoregressive (VAR) model as it allows multivariate time series testing; which is the testing of more than a single time series data at the same time (Pradhan et al. 2016; Alhassan and Biekpe 2016; Mahara 2018; Siyan et al. 2019). The VAR model states that a variable is affected by its lagged values and the lagged values of the other variables included in the model. It also considers that all variables are correlated, implying that all variables affect and describe each other. Hence, the output of the VAR model is composed of an equation for each of the variables included and the rest of the variables are used as explanatory variables. In this case, the thesis concentrates only the equation of GDP growth.

Granger Causality test is also used to assess the causality relationship between the explained variable and the proposed explanatory variables. The paper also utilizes two essential functions of the VAR model which are impulse response and variance decomposition. Prior to running the VAR model, each of the variables undergo the unit root test using Augmented Dickey Fuller (ADF) test to check for stationarity. After checking for stationarity, the VAR model is applied to detect the explanatory variables that have a significant impact on GDP. This is followed by the Granger Causality test, the impulse response and the variables decomposition function. Noting that the impulse response and the variables decomposition functions are only implemented on explanatory variables that prove to have a significant statistical relation with GDP.

3.4. Econometric model

The explained variable is GDP growth rate. The explanatory variables are segregated between equity market, debt market, the insurance and the mortgage finance sectors. The control variables are: Foreign direct investments, tourism revenue, population and unemployment rate. Accordingly, this thesis focuses on testing the validity of the below model:

$$\begin{aligned} GDP\ growth_t = & \alpha + \sum_{j=1}^k \phi_{1j} GDP\ growth_{t-j} + \sum_{j=1}^k \beta_{1j} Market\ cap_{t-j} + \\ & \sum_{j=1}^k \gamma_{1j} turnover_{t-j} + \sum_{j=1}^k \delta_{1j} EGX30\ return_{t-j} + \sum_{j=1}^k \theta_{1j} private\ loans_{t-j} + \\ & \sum_{j=1}^k \eta_{1j} government\ loans_{t-j} + \sum_{j=1}^k \vartheta_{1j} treasuries_{t-j} + \\ & \sum_{j=1}^k \varrho_{1j} yield\ on\ treasuries_{t-j} + \sum_{j=1}^k \sigma_{1j} insurance_{t-j} + \sum_{j=1}^k \varphi_{1j} mortgage_{t-j} + \\ & \sum_{j=1}^k \upsilon_{1j} FDI_{t-j} + \sum_{j=1}^k \psi_{1j} tourism_{t-j} + \sum_{j=1}^k \varsigma_{1j} population_{t-j} + \\ & \sum_{j=1}^k \phi_{1j} unemployment_{t-j} + \varepsilon_t \end{aligned}$$

Where:

t = Time periods

α = Constant term

$\phi, \beta, \gamma, \delta, \theta, \eta, \vartheta, \varrho, \sigma, \varphi, \upsilon, \psi, \varsigma, \phi$ = Coefficients

j = Number of lags {1, 2, 3,, κ }

κ = Maximum lag number

ε = Error term

4. Results

Prior to proceeding with the data analysis, some of the variables undergo disaggregation to match the analysis's desired data frequency; recalling that the analysis is based on quarterly basis over the period from 2005 to 2019.

Insurance premiums and mortgage loans are the two explanatory variables that were available on annual basis only and hence had to undergo disaggregation to be converted to quarterly basis. As explained by Sax and Steiner (2013), disaggregation of data is a statistical interpolation method that permits the discovery of an unknown high frequency series, for which the sum, average, last or first value are coherent with those of the existing low frequency series. By high frequency we refer to the series with the shorter time period (quarterly, for example) and low frequency we mean the series with the longer time periods (annual, for example). The authors summed the estimation of missing variables using disaggregation in two steps. The first step consists of the development of a preliminary quarterly series using the annual data available as a reference. The second step consists of taking the difference between the annual values from the preliminary series of data and the annual actual data observed, and distributing the difference obtained among the preliminary quarterly series. The sum of the preliminary data series and the distributed annual differences, represent the final estimation of the high frequency data, which is the quarterly series in our example.

In this study, the disaggregation is performed using an R package called "tempdisagg" which stands for temporal disaggregation of time series data and using the Denton-cholette method. The Denton-cholette method uses one indicator as a reference for building the high frequency data, which in our case is the available annual data, and performs the disaggregation based on a simple additive basis (Sax and Steiner 2013).

4.1. Descriptive statistics

The below table (2) provides a summary of descriptive statistics of the data under investigation. The descriptive statistics include the mean, standard deviation, minimum and maximum values. The sample size is 60, except for mortgage loans and insurance premiums. These two variables had only 15 actual annual observations available, and they are disaggregated to match the quarterly reporting needed. Further details on the statistic of each variable are presented hereunder.

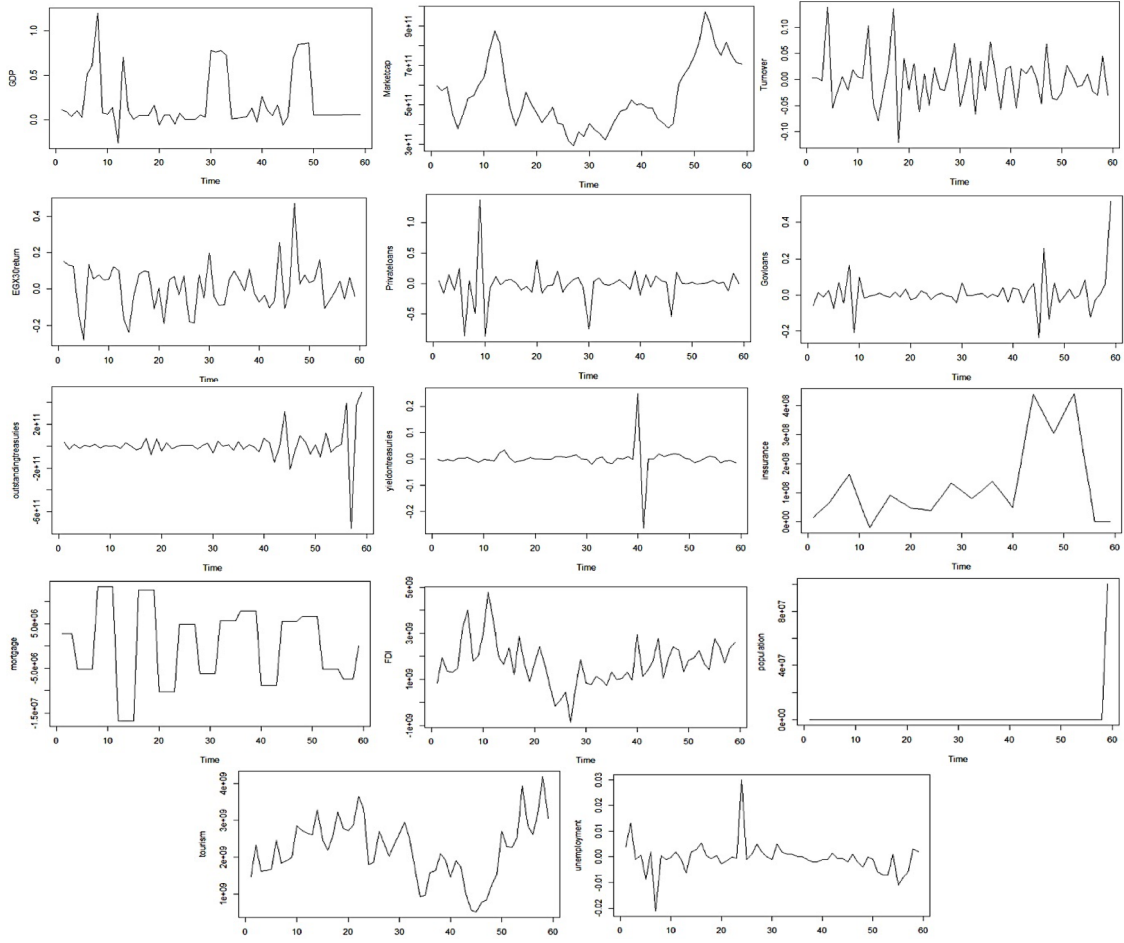
Table (2): Descriptive statistics

Variable	Mean	Standard deviation	Min	Max	Sample size
GDP growth	0.193	0.309	-0.262	1.198	60
Market cap	5.45E+11	1.67E+11	2.94E+11	9.74E+11	60
Turnover	0.119	0.043	0.042	0.257	60
EGX30 return	0.014	0.126	-0.281	0.472	60
Private loans	1.433	0.401	0.805	2.445	60
Government loans	0.222	0.142	0.082	0.600	60
Treasuries	1.66E+11	1.54E+11	2.10E+10	8.14E+11	60
Yield on treasuries	0.132	0.048	0.067	0.375	60
Insurance	4.06E+09	2.53E+09	1.14E+09	9.06E+09	60
Mortgage	2.22E+08	1.78E+08	1.48E+07	6.80E+08	60
FDI	1.70E+09	9.76E+08	-8.58E+08	4.80E+09	60
Tourism	2.19E+09	8.11E+08	5.10E+08	4.19E+09	60
Population	8.64E+07	7.83E+06	7.45E+07	1.00E+08	60
Unemployment	0.109	0.018	0.075	0.134	60

Source: Author, based on R program output, December 2020

Figure (2) represents plots for all variables included in the analysis. Plotting permits instant detection of stationary and non-stationary data before statistically checking for it using the ADF test. From below graphs, the following can be interpreted. GDP growth, market cap, EGX30 return, private loans, government loans, outstanding treasuries, yields on treasuries, mortgage and unemployment rates are expected to be stationary. While, turnover ratio, insurance premiums, FDI, population and tourism, are expected to be non-stationary.

Figure (2): Plots



4.2. Augmented Dickey Fuller test

Using the Augmented Dickey Fuller (ADF) test, we investigate the stationarity of each variable. Two indicators are assessed from the ADF output: the p-values of $z.lag.1$ which is the coefficient of the lagged term $y(t-1)$ and tt which is the linear trend coefficient. The null hypothesis of the ADF test states that the roots are inside the unit circle and data are non-stationary. In order to reject H_0 , the p-value of $z.lag.1$ has to be significant while the p-value of linear trend (tt) coefficient has to be insignificant, using a 5% significance level. In other words, p-value of $z.lag.1$ must be lower than 5% and p-value of tt has to be larger than 5%.

H_0 : Roots are inside the unit circle and data is non-stationary

H_1 : Roots are outside the unit circle and data is stationary

Some of the variable succeeded in rejecting H_0 and proved to be stationary while others failed. Hence taking the first and second differences is required to make the data stationary. Results of the ADF test for each variable and the differencing required are summarized in table (3).

Table (3): Results of the Augmented Dickey Fuller test

Variable name	z.lag.1	tt	Stationarity status	Difference required	z.lag.1 of differenced data	tt of differenced data
GDP growth	0.0006	0.9159	Stationary	N/A	N/A	N/A
Market cap	0.0107	0.2522	Stationary	N/A	N/A	N/A
Turnover ratio	0.0000	0.0314	Non-stationary	Diff = 1	1.06E-10	0.2970
EGX30 return	0.0000	0.6240	Stationary	N/A	N/A	N/A
Loans to private sector	0.0004	0.0062	Non-stationary	Diff = 1	2.25E-09	0.5000
Loans to government	0.3464	0.0280	Non-stationary	Diff = 2	1.89E-14	0.7508
Outstanding treasuries	0.0238	0.0203	Non-stationary	Diff = 2	3.33E-15	0.9280
Yield on treasuries	0.0000	0.0001	Non-stationary	Diff = 1	1.22E-10	0.9333
FDI	0.0008	0.7508	Stationary	N/A	N/A	N/A
Population	0.0006	0.0007	Non-stationary	Diff = 2	3.56E-08	0.0660
Tourism	0.0068	0.8724	Stationary	N/A	N/A	N/A
Unemployment	0.5440	0.3570	Non-stationary	Diff = 1	0.00004	0.6220
Insurance	0.1786	0.0747	Non-stationary	Diff = 1	1.95E-09	0.0621
Mortgage	0.6380	0.1940	Non-stationary	Diff = 1	2.28E-08	0.0511

Source: Author, based on R program output, December 2020

4.3. VAR model

With reference to the number of lags in the Akaike's Information Criteria (AIC)⁷ a 2 lagged model is applied. Larger lags could not be used, due to the fact that the product of the number of lags and the number of explanatory variables is larger than the difference between the number of observations and the number of lags. This prevents the statistical program used from determining coefficients. Accordingly, lag (2) is the maximum to be used in order for the output to provide coefficients for all criteria. Hence, the model structure proposes that the behavior of variables in the past 2 years, will contribute in impacting their current values.

Table (4) shows the p-value and the Adjusted R-squared of each equation of the VAR model⁸; the equations present the statistical relationship between each of the variables and the rest of the variables included in the model. In other words, it indicates to what extent the variables included in the analysis can impact each other; the main concern of this paper is to test the strength of the first equation which is the GDP growth equation. From the output, we note that the yield on treasuries' equation and the unemployment's equation are insignificant at the 5% significance level with p-values of 0.8893 and 0.1572, respectively. This indicates that yields on treasuries and the unemployment rate are not significantly affected by the variables included in the model.

⁷ R output of the selection criteria is presented in appendix (6)

⁸ R output of the VAR model is presented in appendix (7)

Table (4): VAR model output

Estimation results for the equation of :	Adjusted R ²	p-value	Significant	Significance level
GDP growth	0.5350	0.0009	Yes	***
Market cap	0.9930	0.0000	Yes	***
Turnover ratio	0.2707	0.0689	No	.
EGX30 return	0.5752	0.0003	Yes	***
Private loans	0.5143	0.0015	Yes	**
Government loans	0.5797	0.0003	Yes	***
Outstanding treasuries	0.7090	0.0000	Yes	***
Yield on treasuries	0.2238	0.8893	No	
FDI	0.8581	0.0000	Yes	***
Population	0.5359	0.0009	Yes	***
Tourism	0.9364	0.0000	Yes	***
Unemployment	0.1851	0.1572	No	
Insurance	0.9681	0.0000	Yes	***
Mortgage	0.3070	0.0454	Yes	*
Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1				

Source: Author, based on R program output, December 2020

The VAR output for the GDP growth equation is presented in table (5) and is referred to as the initial model. The GDP growth equation is significant with a p-value of 0.0009 which is below 5% and a satisfactory R-squared value of 0.5350. This means that the X variables employed in the model can predict 53.50% of the change in GDP growth. Yet, on individual basis, only 2 out of the 13 explanatory variables employed, have a significant statistical relationship to GDP growth; which are lag 1 of mortgage loans and lag 2 of insurance premiums. Consequently, we apply the backward elimination technique, which consists of gradually eliminating insignificant variables from the GDP growth equation and analyze the impact of its removal on the model's credibility, until reaching the best fit model with the significant variables.

The model reached after backward elimination⁹ is shown in table (6), with turnover ratio, private loans as percentage of GDP and government loans as percentage of GDP, end up being the significant variables that can predict 52.51% of the change in the dependent variable GDP growth. Despite that the Adjusted R-squared witnessed a minimum drop to 52.51% from 53.50% in the initial mode, the last model is more reliable compared to the initial one. This is due to the high number of explanatory variables which were used at the beginning having without having any significance over the explained variable. The initial model was composed of 13 explanatory variables and could predict 53.50% of the change in GDP growth. While the last model is composed of 3 explanatory variables only and could predict 52.52% of the change in GDP growth. Thus, the variables removed had no significance and used to reduce the model's degree of freedom. Also, the final model has a more significant p-value, of 2.05E-07, compared to 0.9178E-03 in the initial model; which proves that the model is more significant at the 5% significance level.

⁹ Appendix (8): VAR output of the GDP equation after backward elimination

Table (5): Results of the equation of GDP growth before backward elimination

Variables	p-value	significance	Variables	p-value	significance
GDP growth L1	0.1291		GDP growth L2	0.2633	
Market Cap L1	0.7173		Market Cap L2	0.6881	
Turnover ratio L1	0.2889		Turnover ratio L2	0.4372	
EGX30 return L1	0.9669		EGX30 return L2	0.3834	
Private loans as % of GDP L1	0.2554		Private loans as % of GDP L2	0.1814	
Government loans as % of GDP L1	0.1161		Government loans as % of GDP L2	0.1645	
Outstanding treasuries L1	0.3141		Outstanding treasuries L2	0.2615	
Weighted yield on treasuries L1	0.8862		Weighted yield on treasuries L2	0.9841	
FDI L1	0.3864		FDI L2	0.2093	
Population L1	0.4860		Population L2	0.2047	
Tourism L1	0.2634		Tourism L2	0.5925	
Unemployment L1	0.6315		Unemployment L2	0.1072	
Insurance L1	0.4015		Insurance L2	0.0698	
Mortgage L1	0.0481	*	Mortgage L2	0.7728	
Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					
R squared				0.5350	
p-value				0.0009178	

Source: Author, based on R program output, December 2020

Table (6): Results of the equation of GDP growth after backward elimination

Variables	p-value	significance
GDP growth L1	0.0070	**
Turnover ratio L1	0.0125	*
Private loans as % of GDP L1	0.0571	.
Government loans as % of GDP L1	0.0015	*
GDP growth L2	0.1780	
Turnover ratio L2	0.2054	
Private loans as % of GDP L2	0.0033	**
Government loans as % of GDP L2	0.0053	**
Significance codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1		
R squared	0.5251	
p-value	2.05E-07	

Source: Author, based on R program output, December 2020

4.4. Granger Causality

The Granger Causality test is applied to test for statistical causality between each of the explanatory variables and GDP growth. It is a model based on predictions, claiming that if the past value of a variable granger causes its current value, then the current value can be used to estimate the future values of this variable (Bist 2018; Lenee and Oki 2017; Menyah et al. 2014; Kamal 2013). Values that have proved to be insignificant to growth in the VAR model are expected to have no causality with the GDP growth figures. Table (7) provides a summarized output of granger causality test¹⁰; noting that we test for causality going from the explanatory variables to GDP growth as well as the opposite direction. Output of the test show that government loans and unemployment rate granger causes GDP growth. Yet, both causalities are statistically weak, insignificant as their p-values exceed the 5% significance level. However, the granger causality test does not provide any statistical evidence for the existence of inverse causality running from GDP growth to financial markets. Hence, none of the variables included in the model significantly granger causes GDP growth.

¹⁰ Appendix (9): Output of Granger causality test

Table (7): Summary of Granger Causality test

Causality direction	P-value	Comment
Market cap → GDP	0.1201	No causality
Turnover ratio → GDP	0.1845	No causality
EGX30 return → GDP	0.2671	No causality
Private loans → GDP	0.3201	No causality
Government loans → GDP	0.09114	Insignificant
Outstanding treasuries → GDP	0.8696	No causality
Yields on treasuries → GDP	0.9856	No causality
FDI → GDP	0.4566	No causality
Population → GDP	0.9197	No causality
Tourism → GDP	0.3818	No causality
Unemployment → GDP	0.07122	Insignificant
Insurance → GDP	0.2541	No causality
Mortgage → GDP	0.1829	No causality
Causality direction	P-value	Comment
GDP → Market Cap	0.7574	No causality
GDP → Turnover ratio	0.3484	No causality
GDP → EGX30 return	0.5063	No causality
GDP → Private loans	0.2976	No causality
GDP → Government loans	0.8037	No causality
GDP → Outstanding treasuries	0.9623	No causality
GDP → Yields on treasuries	0.9688	No causality
GDP → FDI	0.8510	No causality
GDP → Population	0.8483	No causality
GDP → Tourism	0.7033	No causality
GDP → Unemployment	0.9762	No causality
GDP → Insurance	0.5551	No causality
GDP → Mortgage	0.1240	No causality

Source: Author, based on R program output, December 2020

4.5. Impulse response

The impulse response is an analytical tool in VAR models that describes the change in a variable's future movement in reaction to a shock in another variable (Siyan et al. 2019; Pradhan et al. 2016; Badr 2015; Hassan et al. 2011). In this paper, the impulse response function is applied between the explanatory variables of the best-fit model reached after backward elimination and the explained variable, GDP growth. In all figures, the horizontal axis represents the future 10 periods and the vertical axis represents the shock magnitude on GDP growth.

Figure (3) depicts the future evolution of GDP growth in response to shocks in the stock market's turnover ratio, which is seen to have a positive impact on future GDP growth figures. However, the impact is strong in early stages and reduces on the long run.

On the other side, figure (4) portrays a negatively affected GDP growth following shocks in private loans as percentage of GDP. The effect is also stronger in early stages but turns to be minimal on the long run; reaching almost zero.

Similarly, shocks in government loans as percentage of GDP pressures downward future GDP growth figures as illustrated in figure (5). The magnitude of the shock is severer in the short term and reduces at the later stages.

Accordingly, future GDP growth figures are positively influenced by shocks in the turnover ratio. Conversely, growth figures are demolished by shocks in private sector loans and government loans, measured as percentages of GDP.

Figure (3): Impulse response from turnover ratio to GDP

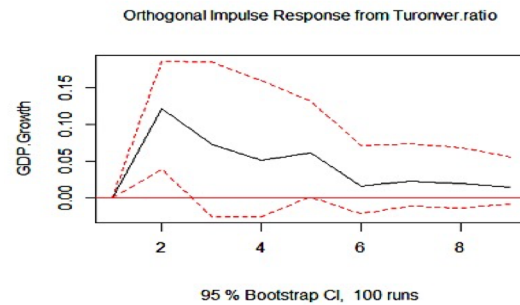


Figure (4): Impulse response from private loans to GDP

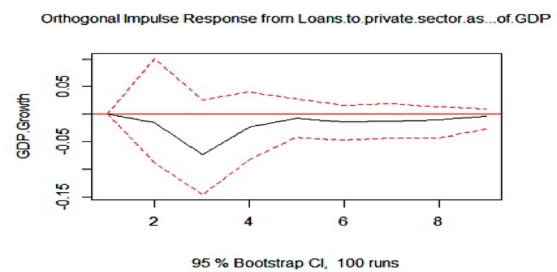
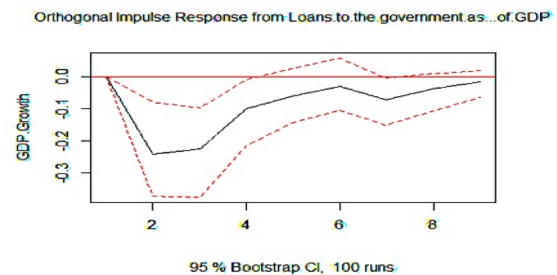


Figure (5): Impulse response from government loans to GDP



4.6. Variance decomposition

Variance decomposition is another analytical tool used in VAR analysis on the best-fit model (Siyan et al. 2019; Sabariah and Norhafiza 2016; Badr 2015; Hassan et al. 2011). It determines the contribution of each of the explanatory variables in determining the forecasted values of the explained variable, GDP growth. Table (8) provides a summary of the variance decomposition of GDP growth. Over the 16 forecast periods, the contribution of turnover ratio in explaining the variation of GDP growth moved from a minimum of 8.85% in the 2nd forecast period, and stabilized around the mid-10% levels starting the 5th period and until the end. While loans to the private sector as percentage of GDP had almost no contribution in determining GDP growth's first forecast, but showed a stable contribution in forecasting GDP growth from the 2nd period until the end of the forecast horizon at around 2.5%. On the other side, loans to the government as percentage of GDP have witnessed a remarkable increase in its contribution in forecasting future GDP growth figures. Its contribution increased from 37.82% in the 1st forecast period, to a maximum of 49.25% starting from the 12th forecast period and until the end. To conclude, the forecast period can be divided into early and later stages, where the early stages are from period 1 to 6 and the later stages are from 6 to 16. Over the whole forecast period, loans to the government has the highest contribution in predicting future GDP growth figures with an average of 45.27%, followed by the turnover ratio which has a contribution average of 9.63%. Lastly loans to the private sector measured as percentage of GDP was found to have the lowest contribution which averaged at 1.70%, over the whole forecast period.

Table (8): Variance decomposition of GDP growth

Periods	GDP Growth	Turnover ratio	Loans to the private sector as % of GDP	Loans to the government as % of GDP
[1,]	1.0000	-	-	-
[2,]	0.5245	0.0958	0.0014	0.3782
[3,]	0.4066	0.0885	0.0249	0.4800
[4,]	0.3892	0.0939	0.0256	0.4914
[5,]	0.3837	0.1052	0.0247	0.4864
[6,]	0.3854	0.1049	0.0253	0.4844
[7,]	0.3795	0.1042	0.0252	0.4910
[8,]	0.3774	0.1048	0.0254	0.4924
[9,]	0.3772	0.1054	0.0254	0.4921
[10,]	0.3771	0.1054	0.0254	0.4920
[11,]	0.3769	0.1054	0.0254	0.4923
[12,]	0.3766	0.1054	0.0255	0.4925
[13,]	0.3766	0.1055	0.0255	0.4925
[14,]	0.3766	0.1055	0.0255	0.4924
[15,]	0.3766	0.1055	0.0255	0.4925
[16,]	0.3766	0.1055	0.0255	0.4925

Source: Author, based on R program output, December 2020

4.7. Analysis of the results

Results of the VAR model show that not all aspects of financial markets have an impact on the growth of the Egyptian economy.

Starting with the debt market, results of the analysis demonstrate that government loans and private loans, measured as percentages of GDP, stimulate economic growth. However, government loans have a more significant contribution over private sector loans. The analysis also identifies unidirectional causality running from government loans to GDP growth; in support of the supply-leading growth hypothesis (Schumpeter 1934; Habibullah and Eng 2006; Calderon and Liu 2003). Nonetheless, the study finds no evidence to support the demand-following growth hypothesis or the feedback hypothesis. The strong positive relationship detected between economic growth and government and private loans is attributed to two main aspects. First, it is more common in the Egyptian market to raise funds through debt rather than equity (Kamal 2013). Accordingly, investments and expansions are, in most of the cases, funded by debt borrowings, which makes the connection between credit allocations and economic output substantial. Second, the fact that government loans have a stronger relationship to GDP compared to private loans, could be attributed to the fact that national projects implemented by the government are usually larger than private sector projects.

On the other hand, the amount of outstanding treasury instruments is found to be insignificant to GDP (Abbas and Christensen 2007), as well as yields on treasuries. The latter were expected to positively influence growth as high yielding treasury instruments attract investors; which should increase the proceeds of treasury instruments, enhance investment and consumption. However, the absence of relationship between economic growth and outstanding treasuries and yields on treasuries could be explained by the allocation of treasury proceeds to cover government expenditures rather than funding investments (Said 2012).

Findings of the analysis on the debt market confirm the existence of a positive relationship between growth and government and private loans in Egypt (Dobronogov and Iqbal 2005; Bolbol et al. 2005; Abu Bader and Abu Qarn 2008; Kamal 2013).

As for the stock market, results show that a positive relationship exists only between stock market liquidity, measured by the turnover ratio, and economic growth (Levine and Zervos 1998; Carp 2012). The contribution of stock market liquidity in enhancing growth is lower than the contribution of the debt market. This results from the inactivity of trading mechanisms and the absence of derivative instruments in the Egyptian market, which is destructive to market liquidity figures. Equity short selling has been recently introduced into the Egyptian stock market in late 2019 and is activated only on a selection of securities. Trading mechanisms and derivatives improve the trading activity as they allow investors to hedge against possible risks; especially in the case of emerging markets like Egypt. This will boost market liquidity to record highs and advances growth figures.

Conversely, no statistical association is identified between GDP growth and stock market capitalization (Azarmi et al. 2005; Rioja and Valev 2011) and returns of the EGX30. Results of the analysis come in line with previous studies who fail to draw a relation between stock market and growth in Egypt (Naceur and Ghazouani 2006; Kamal 2013; Badr 2015). The lack of a statistical relationship between GDP growth and stock market size and profitability is attributed to the under-development stage of the Egyptian stock market, which prevents it from achieving its potential contribution to growth (Naceur and Ghazouani 2006).

Lastly, concerning the mortgage and insurance sectors, the study does not detect any statistical significance or causality between economic growth and the sizes of the insurance and mortgage finance sectors in Egypt.

The lack of a statistical relationship between GDP growth and insurance premiums supports previous work of Phutkaradze (2014). Yet, it opposes the majority of findings that validate the insurance market's importance in stimulating growth (Arena 2008; Kjosevki 2011; Chen et al. 2012; Lee et al. 2018). Results of the analysis could be allocated to two factors. First, the untapped potential in the Egyptian insurance market hinders its contribution in promoting growth. Second, the contribution of the insurance market in endorsing growth highly depends on the profitability of the investments in which insurance companies allocate their funds (Lee et al. 2018).

As for mortgage lending, the results oppose existing findings that demonstrate a positive relationship between mortgage finance and economic growth (Shahini 2014; Nwamara and Aronu 2014; Siyan et al. 2019). This is justified by the fact in Egypt, mortgage loans are offered by banks as well as mortgage finance companies. Accordingly, due to the fact that banks dominate the financial market in Egypt, we expect banks to occupy the larger portion in offering mortgage loans over mortgage lending companies. While in this thesis, we only accounted for mortgage loans offered by mortgage companies and this could be the reason behind the lack of a statistical relation between mortgage lending and growth.

5. Conclusion

This thesis analyzes the relationship between financial markets and economic growth in Egypt. Using time-series data over the period 2005-2019, the study concentrates on the relation between the non-banking financial sector and economic growth over a full economic cycle. This is to assure that the results are not impacted by economic booms or recessions. The study incorporates the stock market, the debt market and the insurance and mortgage finance sectors as explanatory variables of the financial market. On the other side, GDP growth rate is used as a proxy for economic growth. The Vector Autoregressive (VAR) model is used to examine the existence of a statistical relation between the variables under investigation and the Granger Causality is utilized to test for statistical causality. To the best of our knowledge, this paper is the first to assess the relation between economic growth and the insurance and mortgage finance sectors in Egypt. It is also the first to consider the effect of the capital market's profitability on economic growth.

Results of the study reveal that the capital market positively contributes in promoting economic growth in Egypt, but the debt market is more significant.

The positive relationship detected between the debt market, represented by credit allocations to the private sector and credit allocations to the government, and economic growth defends earlier findings (Habibullah and Eng 2006; Abu Bader and Abu Qarn 2008; Kamal 2013; Bist 2018). The results support the supply-leading growth hypothesis, implying that causality is unidirectional and runs from the financial market to economic growth. This positive effect matches the author's expectation mentioned earlier and is attributed to the debt market's main role of transferring funds from savers to investors (Pagano 1993; Schumpeter 1934); in addition to its feature of allocating funds to private sector projects with the highest growth potential (King and Levine 1993).

Concerning the stock market, only its liquidity, measured by the turnover ratio, exerts a positive effect on economic growth (Levine and Zervos 1998). Stock market size and profitability are not catalysts for growth. The absence of a relationship between the stock

market size and economic growth in Egypt defies the author's expectation of a positive relation between stock market and growth. Yet, this is associated to three main reasons. First, the under-development stage of the Egyptian stock market (Naceur and Ghazouani 2006). Second, the dominance of the debt market over the stock market in raising capital (Kamal 2013). Third, the fact that the Egyptian stock market runs on speculative basis rather than investment-based decisions (Badr 2015). As of the fourth quarter of 2019, total buy and sell deals executed on listed stocks by institutional investors valued EGP 37.0 billion, while deals executed by retail investors valued EGP 44.0 billion, according to data from the EGX. Thus, individual investors occupy 54% of total trades; a stake that indicates that speculative trading occupies a significant share of the Egyptian stock market.

As for the insurance and mortgage sectors, the unidentified statistical relationship confronts the author's theory as well as previous studies that find a positive impact from insurance (Arena 2008; Kjosovski 2011; Chen et al. 2012; Alhassan and Biekpe 2016) and mortgage finance (Shahini 2014; Nwamara and Aronu 2014), on growth. The lack of a relationship between growth and the insurance and mortgage sectors is attributed to two main factors: first, the untapped potential in the insurance market in Egypt hampers its contribution in boosting economic growth. Egypt's life insurance penetration rate stood at 1% in 2019, compared to a global average of 6% and an average of almost 3% in African countries (Oxford Business Group 2019). The second is the dominance of commercial banks in offering mortgage loans over mortgage lending companies. As of November 2019, the number of mortgage loans offered by mortgage companies were 11,312 contracts, while mortgage loans offered by banks were 25,070 contracts (Abd-El Hamed 2019); letting banks occupy almost a 69% stake of the mortgage market.

The following policy recommendations can be derived from this study. First, the government should work on activating the stock market's different trading mechanisms and introducing new instruments, such as derivatives. This will increase the market's attractiveness to investors as it permits hedging against the risk of emerging markets, like Egypt. Consequently, the stock market's trading activity will upsurge as well as its turnover ratio, which positively affects economic growth figures. Second, regulatory segregation of the financial activity of banks and non-banking financial service entities is required to allow both parties of the financial market to increase economic growth through specialized services. Third, the government should consider facilitating the process and reducing the costs associated with the registration of residential units. The residential unit acts as a collateral for mortgage loans, which if not registered, the mortgage loan can not be offered. In addition, beside offering low-cost lending initiatives entitled to support the real estate sector, regulatory authorities should focus on the presence of more specialized banks in the market, to support specific sectors. Among the 38 banks, only one bank is specialized in real estate services.

On the aggregate level, the paper provides empirical evidence to affirm the existence of a positive relation between finance and economic growth. However, the strength of the relation depends on the sector of the financial market that is under investigation, its depth and activity. That said, future consideration of financial services, including insurance, mortgage finance, leasing and microfinance services, on a larger sample of countries would fill the research gap on the contribution of the non-banking financial sector in stimulating economic growth. In Egypt, data limitation remains the major constraint.

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Appendix

Appendix 1: Summary of literature review on the stock market

Study	Country(ies)	Years	Explained variable(s)	Explanatory variable(s)	Study outcome
Van Nieuwerburgh et al. (2005)	Belgium	1830 to 2000	GDP	-Stock market capitalization	-A positive relationship exists between market capitalization of the stock and economic growth. -A causality relationship exists between market capitalization and economic growth
Boubakari and Jin (2010)	Belgium, France, Portugal, Netherlands and the United Kingdom	1995 to 2008	GDP	-Total traded value of stocks -Turnover ratio -Market capitalization -FDI	-A positive relationship exists between the stock market and economic growth. -A causality relationship exists between stock market and economic growth in Belgium and Portugal.
Masoud and Hardaker (2012)	42 emerging markets	1995 to 2006	GDP per capita growth rate	-Stock market capitalization -Total value traded -Turnover ratio -Assets of the banking sector -Credit to the private sector -Control variables: population growth rate, secondary school enrollment, Investment ratio, GDP per capita in USD	A positive relationship exists between indicators of the stock market, indicators of the banking sector and growth rate.

Kirankabeş and Başarir (2012)	Turkey	1998 to 2010	GDP growth rate	-Istanbul Stock Exchange 100 Index	A positive relationship exists between stock market and economic growth, as the stock market bridges the gap between fund raising and economic activity.
Marques et al. (2013)	Portugal	1993 to 2011	Real GDP	-Stock market capitalization as ratio of GDP -Domestic credit as ratio of GDP -Control variables: inflation and total investments as ratio of GDP	-Bidirectional causality exists between stock market capitalization and economic growth; but causality running from stock market to growth is stronger than causality running from growth to stock market. -Unidirectional causality running from growth to banks.
Sabariah and Norhafiza (2016)	Malaysia	1981 to 2014	Constant GDP per capita	-Sum of public debt and private debt -Market capitalization	A positive relationship exists between stock and debt market indicators, and economic growth; but stock market was found to have a greater influence on growth compared to the debt market.
Lenée and Oki (2017)	Mexico, Indonesia, Nigeria and Turkey	2000 to 2012	- GDP - Gross domestic savings as a ratio of GDP -Gross fixed capital formation as a ratio of GDP	-Stock market capitalization as a ratio of GDP -Number of listed securities -Value of transactions as a ratio of GDP -Value of transactions as a ratio of gross fixed capital formation.	-A positive relationship exists between the three proxies of economic growth and the value of transactions as a ratio of GDP and as a ratio of gross fixed capital formation. -A negative relationship exists between the number of listed securities and GDP as a proxy for economic growth; but it is positively related to gross domestic savings and gross fixed capital formation as a ratio of GDP.

					-A positive relationship exists between market capitalization as a ratio of GDP and gross fixed capital formation as a ratio of GDP but had no relationship to GDP or gross domestic savings as a ratio of GDP.
Alam and Hussein (2019)	Oman	1993 to 2015	Real GDP	-Stock market capitalization -Value of traded stock	A positive relationship exists between indicators of the stock market and economic growth, but market capitalization has a stronger positive impact compared to the total value traded due to the small size of the Muscat Security Market (MSM) and the impact of the global financial crisis which started in 2007.
Azarmi et al. (2005)	India	1981 to 2001	Real GDP per capita	-Stock market capitalization -Value of traded stocks -Turnover ratio	-No significant relationship exists between stock market and economic growth.
Rioja and Valev (2011)	62 countries	1980 to 2009	Productivity growth	-Turnover ratio -Value traded -Stock market capitalization	-No relationship between stock market and economic growth in low-income countries. -A positive relationship exists between stock market and growth in high income economies.
Carp (2012)	Romania	1995 to 2010	GDP growth rate	-Stock market capitalization -Value traded -Turnover ratio	-No causality relationship between market capitalization, value traded and growth rate. -Bidirectional causality exists between turnover ratio and growth rate.

Appendix 2: Summary of literature review on the debt market

Study	Country(ies)	Years	Explained variable(s)	Explanatory variable(s)	Study outcome
Habibullah and Eng (2006)	Bangladesh, India, Indonesia, South Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippine, Singapore, Sri Lanka and Thailand	1990 to 1998	Real GDP per capita	Domestic credit as ratio to GDP	Causality relationship exists going from domestic credit to economic growth.
Calderon and Liu (2003)	109 industrial and developing countries	1960 to 1994	Growth rate of real GDP per capita	-Credit to the private sector as ratio of GDP -Broad money supply (M2) as ratio of GDP	-Unidirectional causality exists, going from credit allocations to economic growth in all countries. -Bidirectional causality exists in developing countries, while causality going from credit allocations to growth dominates over causality going from growth to credit allocations. -Bidirectional causality exists in industrial countries, while causality going from growth to credit allocations dominates over causality going from credit allocations to growth.

Hassan et al. (2011)	168 countries	1980 to 2007	Growth rate of GDP per capita	<ul style="list-style-type: none"> -Domestic credit as ratio of GDP -Domestic credit to the private sector as ratio of GDP -M3 -Gross domestic savings as ratio of GDP -Trade as ratio of GDP -Government consumption as ratio of GDP 	<ul style="list-style-type: none"> -Bidirectional causality exists between domestic credit allocation, domestic credit allocations to the private sector and economic growth in all countries except for Sub-Saharan and East Asia and Pacific countries. -Unidirectional causality exists in Sub-Saharan and East Asia and Pacific countries; it runs from economic growth to credit allocations.
Jedidia et al. (2014)	Tunisia	1973 to 2008	Growth rate of real GDP per capita	<ul style="list-style-type: none"> -Credit to the private sector -Stock market turnover ratio -Banks securities as ratio of GDP 	<ul style="list-style-type: none"> -A positive relationship exists between credit growth and growth of the Tunisian economy. -Bidirectional causality exists between credit to private sector and economic growth.
Musamali, Nyamongo and Moyi (2014)	50 African countries	1980 to 2008	Growth rate of real GDP per capita	<ul style="list-style-type: none"> -Credit to private sector as ratio of GDP -Broad money supply (M2) as ratio of GDP -Control variables: Gross domestic investments as ratio of GDP, Inflation, Government consumption as ratio of GDP, Trade of goods and services as ratio of GDP 	<ul style="list-style-type: none"> -A positive relationship exists between credit allocated to the private sector and economic growth. -Bidirectional causality exists between credit to the private sector and economic growth.

Bist (2018)	Benin, Burkina Faso, Burundi, Central African Republic, Chad, Guinea-Bissau, Madagascar, Malawi, Mali, Mozambique, Nepal, Niger, Senegal, Tanzania, Togo and Uganda.	1995 to 2014	Real GDP	<ul style="list-style-type: none"> -Credit to private sector -Gross fixed capital formation -Trade openness -Control variables: Inflation and labor force 	<ul style="list-style-type: none"> -A positive relationship exists between credit allocations and growth in 9 countries. -A negative relationship exists between credit allocations and growth in 3 countries. -No relationship exists between credit allocations and growth in 4 countries.
Arcand et al. (2012)	-	-	Growth rate	Credit to private sector	<ul style="list-style-type: none"> -A positive statistical relationship exists between credit allocations and growth rate until credit allocations reaches a threshold of around 80-100% of GDP. -A negative statistical relationship exists between credit allocations and growth rate after the threshold.
Law and Singh (2014)	87 countries	1980 to 2010	Growth rate	<ul style="list-style-type: none"> -Domestic credit to private sector as ratio of GDP -Total domestic credit as ratio of GDP -Liquid liabilities as ratio of GDP 	-The relationship between financial indicators and economic growth is U-shaped and not linear. It is positive until a certain threshold after which the relation turns to be negative.

Cecchetti and Kharroubi (2012)	50 advanced and emerging countries	1980 to 2009	Growth rate of GDP per capita	<ul style="list-style-type: none"> -Domestic credit to private sector -Control variables: growth of working population, imports and exports as ratio of GDP, government consumption and inflation 	-The relationship between credit allocations and growth is U-shaped and not linear. Hence, after a certain level of credit allocations, more credit facilities negatively impact economic growth.
Ductor and Grechyna (2015)	101 countries	1970 to 2010	Growth rate	<ul style="list-style-type: none"> -Financial development variables: total private credit as ratio of GDP, private credit by banks as ratio of GDP and Liquid liabilities as ratio of GDP -Real sector output variables: growth of industrial value added and expenditures on research and development as ratio of GDP. -Control variables: initial real GDP per capita, government spending as ratio of GDP, human capital index, openness to trade and inflation 	-A positive relationship exists between credit allocations and economic growth, only when the growth of credit allocations is equal to the growth of real sector output. When growth of credit allocations exceeds the growth of real sector output, the relationship turns to be negative.
Menyah et al. (2014)	21 African countries	1965 to 2008	Real GDP per capita	<ul style="list-style-type: none"> -Total domestic credit as ratio of GDP -Domestic credit allocated to private sector as ratio of GDP 	-No statistical significance exists between total domestic credit, domestic credit to private sector and economic growth in 13 out of the 21 countries.

				<ul style="list-style-type: none"> -Money supply (M2) as ratio of GDP -Liquid liabilities as ratio of GDP 	<ul style="list-style-type: none"> -Unidirectional causality exists between total domestic credit, domestic credit to private sector and economic growth in 1 country only, it was running from growth to the financial market. -Unidirectional causality exists between total domestic credit, domestic credit to private sector and economic growth in 3 countries, it was running from financial market to economic growth.
Ayadi et al. (2015)	11 southern and eastern Mediterranean countries	1985 to 2009	Real GDP per capita	<ul style="list-style-type: none"> -Credit to private sector as ratio of GDP -Bank deposits as ratio of GDP -Stock market capitalization as ratio of GDP -Value traded as ratio of GDP -Market Turnover as ratio of GDP 	-A negative relationship exists between credit allocations and economic growth.
Graca and Gasdar (2015)	Bahrain, Kuwait, Qatar, Saudi Arabia and UAE	1996 to 2011	Growth rate of real GDP per capita	<ul style="list-style-type: none"> -Credit to private sector -Total Sukuk issued -Assets/deposits ratio of the banking sector -Control variables: initial income per capita, trade openness, secondary school enrollment and government consumption. 	-Negative relationship exists between credit allocations to private sector and economic growth.

Fink, Haiss and Hristoforova (2003)	USA, UK, Japan, Italy, Spain, Portugal, France, Sweden, Finland, Germany, Austria, Switzerland and Netherlands	1950 to 2000	Real GDP	<ul style="list-style-type: none"> -Amount of outstanding debt securities by the government -Amount of outstanding debt securities by the public sector -Amount of outstanding debt securities by the private sector 	<ul style="list-style-type: none"> -A unidirectional causality relation exists between the amount of outstanding debt securities and economic growth in USA, Germany, Great Britain, Switzerland, Austria, Netherlands and Spain. -A bidirectional causality exists between outstanding debt securities and economic growth in Japan, Italy and Finland.
Fink et al. (2006)	Belgium, Denmark, Germany, Finland, France, Italy, the Netherlands, Norway, Austria, Portugal, Sweden, Switzerland, Spain, the United Kingdom, the USA, and Japan	1994 to 2003	Economic growth rate	<ul style="list-style-type: none"> -Net issue volume of aggregate bonds -Net issue volume of government bonds -Net issue volume of public sector bonds -Net issue volume of private sector bonds 	<ul style="list-style-type: none"> -A two-ways causality relation exists in Japan, from bond market to economic growth and from economic growth to the bond market. -A one-way causality from bond issuance to growth is found in France, Austria and Switzerland. -A one-way causality from economic growth to bond issuance is found in Belgium, Denmark, Finland, Japan, Portugal and the United Kingdom. -No statistical causality exists between bond issuance and economic growth in Germany, Italy and Spain. -No causality exists in USA between bond market and growth, yet a negative relation exists between them.

Koka (2012)	Kenya	2003 to 2011	GDP growth rate	<ul style="list-style-type: none"> -Market capitalization of tradable government bonds -Value of traded government bonds -Total new issuances 	-A positive relationship exists between government bonds and Kenyan economic growth.
Said (2012)	China, Hong Kong, Japan, South Korea and Thailand	2002 to 2009	GDP per capita growth rate	<ul style="list-style-type: none"> -Local currency public debt -Local currency private debt -Foreign currency public debt 	<ul style="list-style-type: none"> -A positive relationship exists between local currency public and private debts and economic growth. -No relationship detected between foreign currency public debt and economic growth.
Kapingura and Makhetha-Kosi (2014)	South Africa	1995 to 2012	GDP	-Outstanding government debt securities	-A bidirectional causality relation exists between bond market indicator and growth; yet causality running from bond market to GDP is stronger than causality running from GDP to bond market.
Pradhan et al (2016)	35 countries	1993 to 2011	Growth rate of real GDP per capita	<ul style="list-style-type: none"> -Public sector bond Intensity -Private sector bond intensity -International bond intensity -Real interest rate -Real effective exchange rate -Inflation -Degree of trade openness 	-A bidirectional causality relation exists between the bond market and economic growth on the group level.

Coskun et al. (2017)	Turkey	2006 to 2016	GDP	<ul style="list-style-type: none"> -Stock market capitalization -Stock market traded value -Bonds market capitalization -Total value of mutual and pension funds 	<ul style="list-style-type: none"> -A positive relation exists between variables of the capital market and growth. -A unidirectional causality moves from development of capital market variables to growth.
Mahara (2018)	China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Thailand and Vietnam	2004 to 2016	GDP per capita	<ul style="list-style-type: none"> -Composite index of foreign and local bond market size -Control variables: domestic credit provided by financial institutions as a ratio of GDP, credit to the private sector as ratio of GDP and value of traded stocks as ratio of GDP 	<ul style="list-style-type: none"> - A positive long-run relation exists between bond market and economic growth. -A unidirectional causality relation exists moving from economic growth to bond market. -A bidirectional causality relation exists between credit to private sector and economic growth. -A bidirectional causality exists between domestic credit provided by financial institutions and economic growth.
Abbas and Christensen (2007)	93 low-income and emerging countries	1975 to 2004	GDP per capita based on PPP	<ul style="list-style-type: none"> -Domestic debt as ratio of GDP -Control variables: Income, population growth, budget balance, investments, inflation external debt and openness to trade 	<ul style="list-style-type: none"> -No significant statistical causality between domestic debt and economic growth.
Ogboi et al. (2016)	Nigeria	1982 to 2014	Gross national income	<ul style="list-style-type: none"> -Outstanding bonds -credit to the private sector 	<ul style="list-style-type: none"> -No causality relation exists between bond market size and credit to private sector and economic growth.

Muharam, Ghozali and Arfinto (2018)	Indonesia, Malaysia, Thailand, Mexico, Poland, turkey and South Africa	2004 to 2015	GDP growth rate	-Bond market growth rate -Foreign investments	-A unidirectional causality between bond market and economic growth only in Indonesia, Mexico and Thailand. No evidence for causality in the rest of the countries. -No bidirectional causality exists between bond market and growth in any of the countries.
Reinhart and Rogoff (2010)	44 developed and developing economies	1946 to 2009	GDP growth rate	-Government debt -Inflation	-An inverse relationship exists between government debt and GDP growth when government debt ratio to GDP exceeds a threshold of 90%; below this ratio the relation between the variables is insignificant.
Kumar and Woo (2010)	Panel of advanced and emerging economies.	1970 to 2007	GDP per capita	-Primary debt	-A negative relationship exists between GDP growth and primary debt.
Dreger and Reimers (2013)	Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Denmark, Sweden, the United Kingdom and Turkey.	1991 to 2011	Growth rate of real GDP per capita	-Government debt as ratio of GDP -Share of gross fixed capital formation to GDP -Trade openness -Population growth -Real interest rate	-A negative relationship exists between government debt as ratio of GDP and growth of real GDP per capita.

Appendix 3: Summary of literature review on the insurance market

Study	Country(ies)	Years	Explained variable(s)	Explanatory variable(s)	Study outcome
Arena (2008)	55 countries	1976 to 2004	Average growth rate of real GDP per capita	-Total insurance penetration -Life insurance penetration -Non-life insurance penetration -Control variables: secondary school enrollment, inflation, government consumption, sum of exports and imports,	-A positive causal relationship exists between insurance market and economic growth in all countries. -Both life insurance and non-life insurance have positive effect on economic growth; their impact is higher during low and middle economic stages.
Kjosevki (2011)	Macedonia	1995 to 2010	Growth rate of GDP per capita	-Total insurance penetration -Life insurance penetration -Non life penetration -Control variables: private credit, government spending, exports, investments and inflation	-A positive relationship exists between total insurance penetration and economic growth.
Chen et al. (2012)	21 European countries, 13 American countries, 12 Asian countries and 14 African and Middle east countries	1976 to 2005	Growth rate of GDP per capita	-Life insurance penetration -Life insurance density -Control variables: Inflation, government consumption, trade openness, human capital investment	A positive relationship exists between penetration and density of life insurance and economic growth.
Alhassan and Biekpe (2016)	Algeria, Gabon, Kenya,	1990 to 2010	GDP growth rate	-Aggregate insurance penetration -Life insurance penetration	-A causality relationship exists between all types of insurance penetrations and economic growth.

	Madagascar, Mauritius, Morocco, Nigeria and South Africa.			-Non life insurance penetration	-Causality is unidirectional and runs from insurance market to economic growth in Algeria, Madagascar, Kenya, Mauritius, Nigeria and South Africa. -Causality is unidirectional and runs from economic growth to insurance market in Gabon. -Causality is bidirectional in Morocco.
Lee et al. (2018)	123 countries	1967 to 2014	GDP per capita	-Life insurance penetration -Non-life insurance penetration -Life insurance density -Control variables: trade as ratio of GDP, interest rate, stocks traded value, inflation, domestic credit to private sector by banks and foreign direct investments.	-A positive relationship exists between insurance market and economic growth in Asian, European, African and North American countries; The statistical relationship is stronger in Asian and African countries. -A negative relationship exists in South American countries only between insurance market and growth.
Phutkaradze (2014)	10 countries from Central and Eastern Europe	2000 to 2012	Growth rate of GDP per capita	-Total insurance penetration -Control variables: GDP per capita, investments, private credit, exports and government spending	-A negative and insignificant relationship exists between the insurance market and economic growth.
Haiss and Sümegi (2006)	29 European countries	1992 to 2004	Real GDP	-Gross premium income -Life insurance premiums -Non-life insurance premiums -Control variables: physical capital stock, human capital stock, interest rate and inflation	-A negative relationship exists between gross insurance premiums, non-life insurance premiums and economic growth. -A positive relationship exists between life insurance premiums and economic growth.

Appendix 4: Summary of literature review on mortgage finance

Study	Country(ies)	Years	Explained variable(s)	Explanatory variable(s)	Study outcome
Shahini (2014)	Albania	2008 to 2013	Growth rate	Mortgage loans	A strong positive statistical relationship exists between mortgage loans and growth.
Nwamara and Aronu (2014)	Nigeria	1995 to 2012	Number of mortgage lending transactions	-GDP -Control variables: money in circulation, lending rate and inflation	A positive relationship exists between numbers of mortgage transactions and GDP, but it runs from GDP to mortgage transactions. GDP contributes to the increase of the number of mortgage transactions.
Siyan et al. (2019)	Nigeria	1990 to 2016	GDP per capita	-Aggregate housing finance by banks and non-banks -Control variables: money supply, interest rate and stock market capitalization	Bidirectional causality exists between housing finance and growth.

Appendix 5: Summary of literature review on the Egyptian market

Study	Country(ies)	Years	Explained variable(s)	Explanatory variable(s)	Study outcome
Dobronogov and Iqbal (2005)	Egypt	1986 to 2003	Growth rate of GDP per capita	-Credit to private sector -Credit to the government -Government consumption -Growth rate of OECD countries	A positive and significant relationship exists between credit to private sector and economic growth. -No significant relationship detected between credits allocated to the government and economic growth.

				-Share of working age population/working population	
Bolbol et al. (2005)	Egypt	1974 to 1992	Total factor productivity	<ul style="list-style-type: none"> -Credit to private sector/GDP -Stock market capitalization/GDP -Turnover ratio -Assets of commercial banks/total assets of banking sector -Per capita income -Private net resources inflows/GDP -Control variables: black market premium, Inflation, government expenditures and change in real effective exchange rate 	Credit allocations and stock market indicators both have a positive contribution in promoting growth measured by total factor of productivity. The contribution of stock market indicators is higher than the debt market.
Enisan and Olufisayo (2006)	Egypt, South Africa, Côte d'Ivoire, Kenya, Morocco, Nigeria and Zimbabwe	1980 to 2004	Nominal GDP per capita	<ul style="list-style-type: none"> -Market capitalization as ratio of GDP -Value of traded shares as ratio of GDP 	<ul style="list-style-type: none"> -A positive cointegration exists between stock market and economic growth in Egypt. -A unidirectional causality exists from stock market to economic growth in Egypt.
Abu Bader and Abu Qarn (2008)	Egypt	1960 to 2001	Real GDP per capita	<ul style="list-style-type: none"> -Credit to private sector/GDP -Credit to non-financial private firms/GDP -M2/GDP 	A strong bidirectional causality exists between credit allocations and economic growth

Kamal (2013)	Egypt	1988 to 2012	Growth rate of GDP per capita	<ul style="list-style-type: none"> -Market capitalization /GDP -Total value of traded stocks/GDP -Domestic credit to private sector/GDP -M2/GDP -Net FDI/GDP 	<ul style="list-style-type: none"> -A unidirectional causality relationship exists, running from credit to private sector to growth -No causality exists between stock market and economic growth.
Naceur and Ghazouani (2006)	Bahrain, Egypt, Iran, Jordan, Kuwait, Lebanon, Morocco, Oman, Saudi Arabia, Tunisia and Turkey	1979 to 2003	Real GDP per capita	<ul style="list-style-type: none"> -Stock market capitalization -Value traded -Turnover ratio -Stock market index -Credit to private sector -Liquid liabilities -Bank development index -Initial income per capita -Trade openness -FDI -Inflation rate -Government consumption 	No statistical relationship exists between stock market indicators and economic growth.
Badr (2015)	Egypt	2002 to 2013	Real GDP	<ul style="list-style-type: none"> -Stock market capitalization -FDIs 	<ul style="list-style-type: none"> -No causality relationship exists between stock market and economic growth -a causality relationship exists between stock market and economic growth, when FDI is considered in the analysis.