The Role of the Stock Market and the Banking Sector in the Iranian Economy: Evidence from Time Series Data, 1967-2009

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfilment of the requirements for the degree of

Master
of
Business Administration

Eastern Mediterranean University
January 2011
Gazima usa, North Cyprus

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ABSTRACT

This thesis empirically investigates the relationship between the financial development and economic growth during the period between 1967- 2009 for the Iranian economy. In the light of exogenous modelling framework, the 'Augmented Solow' regression model is employed whether the financial or banking system stimulates the process of economic growth. The Ordinary Least Square (OLS) technique is applied to test the determinants of financial development which may have an impact on the Iranian economic growth.

Based on the empirical results estimated, explanatory power supports the view that financial sector can be a good promoter of domestic economy in both long and short run. Additionally, stock market prices (volatility) have a negative influence on the Iranian output and suggest that volatility in stock prices may reflect economic ambiguity. Banking sector indicator was also found that it is so effective in the short-run period.

Keywords: Economy growth, OLS Analysis, Stock market, Banking system, Iranian economy.

ÖZ

Yapılan çalı ma Ampirik olarak ran ekonomisindeki bankacılık ve menkul kıymetlerin Borsanın rolünü ölçmektedir. Bu rolü ölçerken ekonomik büyümenin borsa stok de erleri, stok fiyatlarının ve yerel banka kredilerinin ne kadar anlamlı olup olmadı ına bakar. En Küçük Kareler tekni i kullanılarak Solow büyüme modeli üzerinden yıllık verileri alınarak 1967-2009 arası dönem için finansal politikalarının rolünü ölçmeye çalı ır. Çalı ma, aynı zamanda kullanılan Solow modelinin anlamlılı ını da ortaya koymaya çalı ıyor. Elde edilen ampirik sonuçlar 1 1 ında, borsanın ran ekonomisi üzerinde önemli rol oynadı ı gözlenmektedir. Stok fiyatlarının (dalgalanmanın) ekonomi üzerinde olumsuz bir etkisi görülmemektedir. Ayrıca, ran ekonomisinde, bankacılık sektörü ise kısa dönemde etkili bulunmu tur.

Anahtar kelimeler: Ekonomik büyüme, En küçük kareler yöntemi, Borsa, Bankacılık, ran ekonomisi.

to my parents with love

ACKNOWLEDGMENTS

I would like to express my deepest gratitude and appreciation to my supervisor Assoc. Prof. Dr. Sami Fethi, for his patient guidance and encouragement throughout this study. His experience and knowledge have been an important help for my work.

I wish to express my thanks to all the members of Faculty of Business and Economics at Eastern Mediterranean University and also I would like to thank all my friends in North Cyprus, for their friendship and hospitality.

A very special thanks goes to my lovely parents for their never-ending pray and invaluable support. It is impossible for me to return their endless love and sacrifice.

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LIST OF ABBREVIATIONS

TSE: Tehran Stock Exchange

GDP: Gross Domestic Production

IRR: Iranian Rial

IMF: International Monetary Fund

IFS: International Financial Statistics

OECD: Organization for Economic Co-operation and Development

OLS: Ordinary Least Square

CBI: Central bank of Iran

Chapter 1

INTRODUCTION

1.1 Brief Introduction

This thesis empirically investigates the relationship between the financial development and economic growth during the period between 1967- 2009 for the Iranian economy. In the light of exogenous modelling framework, the Augmented Solow regression model is employed whether the financial or banking system stimulates the process of economic growth.

1.2 Scope and Objectives of This Research

Main objective is to investigate empirically the relationship between financial system and economic growth in the Iranian economy under the exogenous growth modelling framework.

1.3 Methodology of the Research

Ordinary Least Square (OLS) technique was applied to determine the effects of the banking and financial system employing annual data over the period of 1967 and 2009 based on the Solow growth model.

1.4 Findings of the Study

The findings of this thesis can be **summarized as follows;** based on the empirical results estimated, explanatory power supports the view that financial sector can be a good promoter of domestic economy in both long and short run. Additionally, stock

market prices (volatility) have a negative influence on the Iranian output and suggest that volatility in stock prices may reflect economic ambiguity. Banking sector indicator was also found that it is so effective in the short-run period.

1.5 Structure of the Study

Chapter 1 is introductory part. Chapter 2 explains the review of literate on the concept of financial development. Chapter 3 contains an overview of Iranian economy, banking system and Tehran stock market. In Chapter 4, Data and methodology are described. Chapter 5 presents the regression model and empirical results. In Chapter 6, concluding remarks, recommendations and suggestions for further studies are presented.

Chapter 2

LITERATURE REVIEW:

Financial Development and economic growth

2.1 Introduction:

It is argued that an important part of any economy is its financial structure, the combination of its financial markets and institutions the financial structure brings borrowers and lenders together and foster economic efficient and a better use of society's resources, which in general result in a higher capital stock for the economy as a whole and a better standard of living for its citizens.

Clearly, the financial reforms and liberalisation having taken place in many countries for the Last twenty years are the basic concerns of this increasing attractiveness among authors the financial structure involves institutions and markets that concentrate on the Creation, purchase and resale of financial claims this system is an essential part of the real economy an important function of the financial system is to improve the business and investment opportunities available to individuals and organisations established financial markets and institutions provide the opportunity to save and invest in mutually satisfactory ways.

This literature review seeks to examine the existing literatures about the nexus between financial sector and economic development and tries to give various roles relating to the linkage between financial markets and economic development.

2.2 The Relationship between Financial Sector and Economic Development

There is a long belief by economists that financial markets and institutions are important factors in supporting economic development at the theoretical level, the earliest formal outlines associated with the assessment of the role of finance in economic development were the ones proposed by McKinnon (1973) and Shaw (1973), also known as M-S school of thought McKinnon supposes that financial development positively affects economic development rather than the other way around Shaw's framework is also based upon the same matter at the empirical level Patrick (1966), probably the earliest effort in examining the relationship between financial development and economic growth, - proposed that at the initial stage of the development the direction of causality runs from financial to economic development – a supply-leading relationship yet, in the later stage the direction of causality is reversed – demand-following relationship.

Even though the positive relationship between financial development and economic growth has been supported by some of the recent cross-country studies (e.g. Gelb, 1989, Roubini and Sala-i-Martin, 1992; King and Levine, 1993a), the view that financial development pursues economic growth through increased demand for financial services (specifically Money), is Also in harmony with the positive cross-section correlations (see also Dehejia, R. and A. Lleras-Munney (2003)).

The causality debate that began with Patrick (1966) is still unresolved after nearly three Decades, especially in the empirical literature this is partly due to the shortage of time-series Data for a long-time period in developing countries (Demetriades and

Hussein, 1996) it may Also be attributed to the fact that the empirical studies directly try to evaluate the extent of the influence of financial development on economic growth based on the assumption that there is a supply-leading relationship.

In Addition to this, most of the studies prefer to use only the financial development variable, sometimes with an additional variable, as the Determinant of economic growth by simply ignoring other growth-determining variables Such as the share of investment in the GDP, labour force growth, and export growth.

Consequently, their findings cannot be free of doubt (Odedokun, 1996a). It is argued that financial development can facilitate the transfer of productive capacity across agents and time from less productive users to those with greater potential Also, it enables the mobilization of resources and reduces fragmented capital markets and traditional self-financed investments (Bencivenga & Smith, 1991). Banks for example, have a vital role in allocating capital to productive projects, so competitiveness of banking sector can cause differences in economic development (Guinnane, 2002) on the other hand, insufficient financial development has sometimes created a poverty trap and may become a severe obstacle to growth even in a country that has established other conditions such as educational attainment and macroeconomic stability for sustained economic development Schumpeter (1912) argued that technological innovation is the force underlying long-run economic growth and that the ability of the financial sector to extend credits to the entrepreneur is the cause of innovation. Goldsmith (1969) put that development in financial intermediation accelerates economic growth and performance to the extent that it facilitates the migration of funds to the best users in his study, Goldsmith states that commercial banks have commonly been the first financial intermediaries during the

early stages of economic development then new intermediaries, such as insurance companies and formal capital markets are expanded .to provides services to particular classes of savers.

Economic growth is affected by the emergence of financial markets and intermediaries. Financial system improves the allocation of capital as described by Greenwood and Jovanovic (1990) it may also improve management of liquidity risk.

With the financial markets, savers can hold assets; equity, bonds or demand deposits that they can turn to medium of exchange quickly and easily (Bencivenga & Smith, 1991). Beck and Levine (2004) supports this idea as they suggest big, liquid and well-functioning markets can foster growth and profit incentives, enhance corporate governance, customize and diversify risk management.

Furthermore, financial contracts, markets and intermediaries may arise to moderate the information acquisition and enforcement costs of monitoring firm managers and using corporate control Levine (2002) adds that unregulated banks can help saving costs by exploiting economies of scale and scope in gathering and processing financial information in the case that borrowers need to obtain funds from many outsiders, financial intermediaries can economise monitoring costs since the borrower is monitored only by the financial intermediaries (Bernanke & Gertler, 1989). the reduction in monitoring and acquisition cost can foster efficient investment and long run economic growth financial system can help in mobilizing savings Without financial intermediaries, access of investors to production is constrained by economically inefficient scales Financial intermediaries can pool the mass of capital from disparate savers for investment (Pagano, 1993) in this case,

there is a provision of opportunities for households to hold diversified portfolios, invest in efficient scale firms, and increase asset liquidity. Therefore, with the access of many investors, the mobilization improves resource allocation. Hence, the mobilization of savings by the financial system can affect economic development (Bandiera , Caprio , Honohan, & Schiantarelli, 2000). It is clearly known that saving is one of the sources of investment.

The famous financial researchers McKinnon (1973) and Shaw (1973) argued that financial development can positively influence economic development. Devereux and Smith (1994) argued that the ability of financial system to provide risk diversification services can affect economic growth in the long run. This is by altering resource allocation and saving rates. They continue that financial markets tend to encourage a portfolio shift toward projects with higher expected returns by easing risk diversification also financial systems can accelerate technological change and economic growth (King & Levine, 1993) In terms of long run growth, financial arrangements that improve corporate control tend to promote faster capital accumulation and growth by improving the allocation of capital (Bencivenga & Smith, 1991) It is further argued that economic development can be affected by the financial systems that is more effective at pooling the savings of individuals.

In this case, neither banks nor markets matters as they are different components of financial system (Demirguc-Kunt & Levine, 2001) Better savings mobilization has direct effect on capital accumulation and also it can improve resource allocation and boost technological innovation (Bagehot, 1873). Thus, by effective mobilization of resources for projects, the financial system may play a crucial role in permitting the adoption of better technologies and as a result encouraging growth. There are also

some opposition about the effects of financial development in economic Growth Lucas (1988) asserts that economists "badly overstress" the role of financial factors in economic growth, while development economists frequently express their uncertainty about the role of the financial system by ignoring it.

Moreover, Robinson (1952) accepts that Demands for particular types of financial arrangements can be created by economic Development There has been various conceptual arguments highlighting the potentially Positive, neutral, or even negative impacts of stock market development on economic growth.

We now turn our attention to the ways in which stock market development affects long-run Economic growth by going through the indicators of stock market

2.3 Stock Market Development, Banking Sector and Economic Growth

Volatility as a stock market indicator has taken significant attention in the literature. The Most common way of measuring volatility is described as moving or rolling Standard Deviation of the end-of-time frequency change of stock market prices, Depending upon the Data used.[1] The rational insight from the volatility measure is that a large amount of volatility does not necessarily suggest a particular degree of stock market development a certain degree of volatility in the stock market is clearly desirable, however if there exists excess Volatility in stock returns, this may exacerbate economic growth (ferderer 1993, Delong ET. Al 1989).

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[1] For example, Demirguc-Kunt and Levine (1996) and Levine and Zervos (1998) used 12-month rolling standard deviation estimate, while Arestis and Demetriades (1997) and Arestis, Demetriades, and Luintel (2000, forthcoming) used eight quarter moving standard deviation of the end-of-quarter change of stock prices.

Stock market capitalisation is also centre of attraction in the literature as an indicator of stock Market development this proxy is closely related with the volume of bank business and if an increase in the market capitalisation may go together with an increase in the volume of bank Business this indicates that the development of the stock market goes hand in hand with the Development of the banking system (Arestis and Demetriades, 1997; Arestis et al 2001).

The general insight from the studies covered thus far is that though in many time-series Studies same variables and estimation methods are used, there is a substantial lack of Correspondence between the results across countries hence, there may not be an existing "Prototype" country obtained from cross-country regressions.

Although it appears to be that both stock markets and banks can promote economic growth, The extent of the impact is an important aspect in terms of policies followed a demonstration of this is that of Arestis, Demetriades, and Luintel (2001). Utilising Time-series methods and quarterly data from five developed countries (Germany, France, Japan, UK, and US) over the various periods ranging from 1968 to 1998, they concluded that banks foster economic growth more vigorously than stock markets.

Chapter 3

AN OVERVIEW OF THE IRANIAN ECONOMY, BANKING SECTOR AND TEHRAN STOCK MARKET

3.1 The Tehran Stock Market

Tehran stock market has initiated by co-operation between Iran Melli bank and Belgian experts by writing report about opportunity to have stock market. The concept of a stock industrialization dates back to 1936 in Iran with the largest and oldest bank in Iran, Bank Melli together with Belgian experts wrote a report detailing the prospects of having an operational stock exchange in Iran. Outbreak of the World War II and other political factors delayed the implementation process until 1967 where the Government revisited the issue and ratified the "Stock Exchange Act". Consequently a small exchange, the Tehran Stock Exchange (the "TSE") began its operations in 1967. What followed was an initial trading in corporate and government bonds. The economic boom in the 1970s led to a pent-up demand for equity. Meanwhile, certain forces were changing the economic backdrop in Iran. The Government was actively involved in grant of shares to employees for large state-owned and family-owned enterprises. Market activity was reaching frenzy with many companies and high net worth vying to participate in the new found wealth associated with the TSE.

Table 1: Historical Highlights

1966	The Law for the Establishment of the Stock Exchange was approved by The parliament.
1967	The Tehran Stock Exchange commenced operation on Feb. 4.
1969	Trade of Treasury and Land Reform bills started.
1972	Stocks of 23 companies and three bonds were traded at TSE.
1983	The law for Usury-Free Banking was enacted. Trading in bonds was abandoned.
1988	Eight-year war between Iran and Iraq came to an end.
1989	Sharp increase in trade from the beginning of autumn.
1992	TSE admitted as a full member of the International Federation of Stock Exchanges.
1995	TSE joins the Federation of Euro-Asian Stock Exchanges as one of its founding members.
2002	Capital market physical development occurs; principal steps in dissemination of information, education and development of financial products.
2003	Listed companies are allowed to issue corporate bonds
2005	The TSE new law is ratified by parliament. Increase the number of Regional floors to 21.
2006	TSE Demutualization is accomplished

The Tehran Stock Exchange (TSE) is Iran's largest stock exchange, which first opened in April 1968. The TSE with a market capitalization of US$70 billion were listed on TSE. TSE which is a full member of the World Federation of Exchanges and a founding member of the Federation of Euro-Asian Stock Exchanges, has been one of the world's best performing stock exchanges in recent years. In the following

Table, General index, financial index and Industrial as well as 50 top companies indices are displayed between the year 2006 and 2009.

Table 2: TSE Index

Tehran Stock Exchange (TSE) Indices				(1990/91=100)		
					Percentage change	
2006/07		2007/08	2008/09	2006/07	2007/08	2008/09
TEPIX	9,821.0	10,082.0	7,966.5	3.8	2.7	-21.0
Financial index	20,770.4	20,882.6	20,552.8	-0.8	0.5	-1.6
Industrial index	7,751.6	7,967.0	6,172.6	4.4	2.8	-22.5
50 top companies index	695.2	559.2	291.1	-0.3	-19.6	-47.9
Main floor index	9,781.5	9,016.0	6,383.7	7.1	-7.8	-29.2
Secondary floor index	9,164.2	11,046.3	12,563.5	-6.9	20.5	13.7
Source: Securities and Exchange Organization, and the TSE						

Everything came to a standstill after the Islamic Revolution leading in a Prohibition against interest-based activities and nationalization of major Banks and industrial giants Mobilization Of all resources towards the war effort during the 8-year Iran-Iraq war did not help matters. However, the Government fully embraced economic reforms and a privatization initiative in 1989 with a surge of activity in share activity of many state-owned companies through the defined targets in the first "Five-Year Economic Reform" where the Government together with the Parliament defined the economic prospects of the country for the coming five years. Attention to promotion of the private sector and new interest in the TSE brought life back to the market. However, lack of regulation and out-of-date legal framework led to crisis in the market leading to certain "meltdowns" until today. The market has experienced its share of highs and lows in the past years including topping the World Federation of

Exchanges' list in terms of performance in 2004 to tumbling down to last place in 2007 due to political uncertainties in the region.

3.2 Overlook on Tehran Stock Exchange (TSE)

An overlook on Tehran stock market illustrate it has grew from 6 listed corporations in1967 to 105 companies in 1979 evolution. It is reopened in 1989 after war by 54 company listed since then it has dramatic growth number of companies listed which has reported 330 corporations in the beginning of 2009. The figure 3.1 illustrates the evolution of *All Share Price Index* the year between 1999 and 2009. There is an upward trend since 1999 and this means that TSE has always been developed in spite of political and economic sanctions against the current regime.
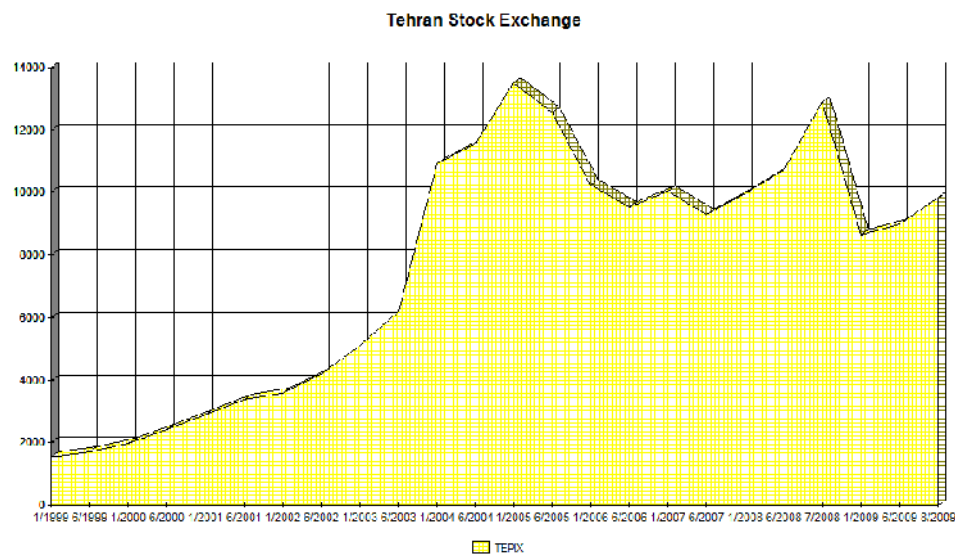
Figure 1: TEPIX All Share Price Index, Tehran Stock Exchange (1999-2009)

Tehran stock market had strong fluctuations in recent years. Between 2000-2004TSE indexes grow up by triple but after President Ahmadinejad selection in 2005 it had dramatic cut down.

In the first half of 2008/09 Due to sluggish of housing sector led to massive transfer of liquidity to stock market and positive growth of stock index. In the second half duo to world crises capital market has affected and sharp reduce in metal and steel price spillover on Iran economy and led to reduce in metal producer share price therefore decrease on general indices of TSE.

TEPIX	Main	Secondary	Financial		TEPIX(Tehran Exchange Price Index)				
2000	2001	2002	2003	2004	2005	2006	2007	2008
2,881	3,554	5,044	10,887	13,543	10,259	10,074	9,737	9,841
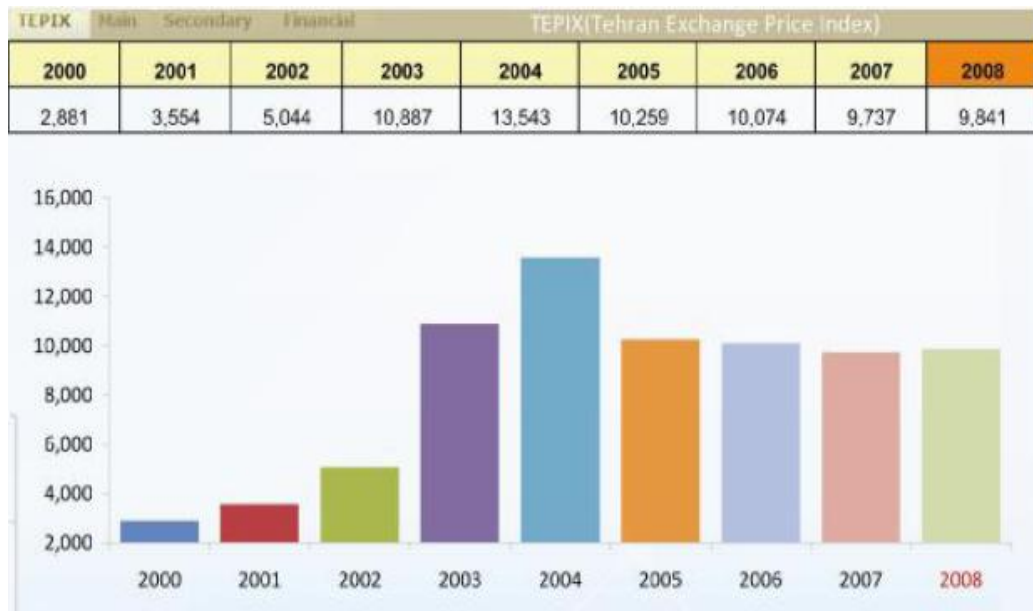
Figure 2: TEPIX Tehran Exchange Price Index

In order to have better oversee in the stock market of Iran we will introduce its missions and some goals of stock market of Iran and also we will indicate the main structure of this organization, Furthermore with below chart we can better understand managerial control also how stock market of IRAN have been governed.

Mission of TSM:

We will make every effort to increase the share of the capital markets in financing business activities; and creating value for the direct and indirect Stakeholders.

Goals of TSM:

- To provide market integrity and efficiency

- To enhance the confidence of investors

- To reduce risk

- To increase the qualitative and quantitative aspect of capital markets
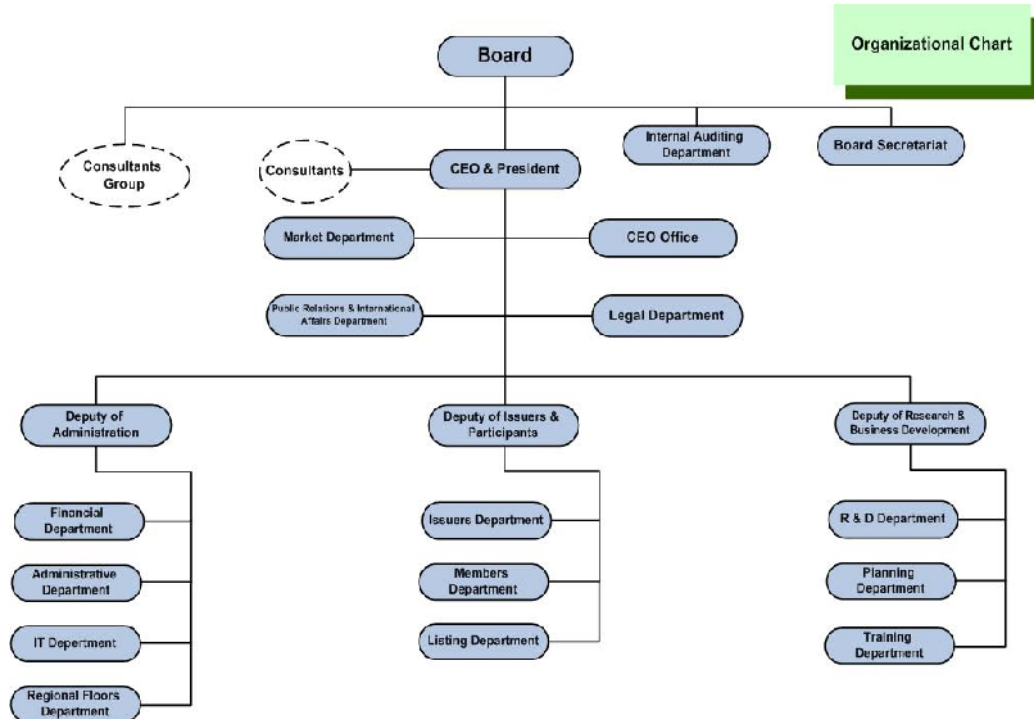
Figure 3: Organizational Chart

3.3 The Iranian Economy

In recent years development on Iran economy was consistent and very high. Now Iran is a Sixteenth largest economy of the world based on purchasing power parity (PPP) in the wake of the global economic crisis Iran has found, Its economy facing pressure from the rapidly declining price of oil, which has plummeted to $46 per barrel in early January 2009 from a high of$147 per barrel in early July 2008 as

result of the new economic reality, Iranian president Mahmoud Ahmadinejad has recently announced an ambitious new plant eliminate expensive government subsidies that have kept consumer prices artificially on critical goods and services, such as gasoline (petrol), electricity, and heating oil. Rising inflation and sudden drop in the price of oil have forced Ahmadinejad to react to the government's potential cash crisis, but it's uncertain how the Iranian public will respond to the new plan to eliminate subsidies and raise taxes on goods and services that are considered daily necessities.The economy is centrally planned, relying heavily on five-year plans.

However, the government is taking measured steps toward its espoused goals of economic liberalization and inflation-fighting Iran's chief source of foreign currency is the sale of oil and gas; as a result, the Health of its economy depends upon prices for those commodities and on the Size of its oil quotas under OPEC.

3.3.1 Iran's five "five years economic development planes"

As it mentioned above, after Islamic revolution, Iran established "five years economic development plans. The First Development Plan of the Islamic Republic (1983-88) asserted that its approach were to set up Iran's economic independence through self-sufficiency in foodstuffs and to decrease the country's dependence on oil exports. Iran's first plan focused on: getting higher education, providing the interests of the mostazafin (the disinherited), accomplishing economic independence, provide diversity in economy to achieve independence from gas and oil exports, and developing agriculture. US$166 billion was the budget traced to first economic plan, however this budget never allocated because of starting war and the war expenses got priority over other government expenditure. Shortfall in the international oil price in 1987 as well affected the first economic plan budgeting.

First economic development plan again revised in 1988 and formulated for after war in 1989-93 by the consideration of post war construction plan The first stage of plan was simplification of exchange rate and move from seven-rate system to three-rate system in 1991. It was consist of: official governmental rate, competitive rate and free market rate. This plan emphasized on foundation of industrial infrastructures achieving domestication of productions which intended to reduce dependency on import industrial manufacures.70% of investment in manufacture sector allocated in intermediate goods, 20% for capital goods and 10% for consumer goods.

Table 3: Planned and Actual Sectored Average Annual Output Growth Rate, 1989-1993

Sector	Plan	Actual
Agriculture	6.1	5.9
Oil	9.5	8.9
Industry & Mines	15.0	8.7
WGE[a]	9.1	12.7
Construction	14.7	5.5
Services	6.7	7.4
GDP[b]	8.1	7.3
GFCF[c]	11.6	14.1

a) Water, gas, and electricity.
b) Gross domestic product.
c) Gross fixed capital formation.

Source: From Pesaran, 2000, Table 1, p. 67.

The available data allows to comparison between planed and actual growth rates approach in industry sector over the plan period. The actual growth rate of plan is closer to planed growth rate in the first half of period rather than second half.

The second five-year development plan *1995-99* was launched in 1995. The main objective was to reach managed float exchange rate from unified floating exchange rate. Among this policy government tried to change foreign trade policy to enforce non-oil exports and promote domestic industries

Table 4: Planned and Actual Sectored Average Annual Output Growth Rate, (1993-98)

Sectors	Plan	Actual
Agriculture	4.3	3.4
Oil	1.6	-10.1
Industry & Mines	5.9	4.8
Services	3.1	4.3
Gross Domestic Product (GDP)	5.1	3.7
Real Gross Domestic Investment	6.2	0.2

Source: Bank Markazi Jomhuri Islami Iran, *Economic Trends*, 2001, Appendix II, p. 24.

As the table illustrates, in the terms of investment actual growth rate is consistently shorter that planned target. In spite of the stated objective of exchange rate unification, it stayed in the force in second plan, actually until 2002 and third five years plan when implemented effectively.

The Third Five-Year Plan (2000-2004) was include of significant attempts to economic reform. Supporter of privatization and trade liberalization in this program government bounded to attract foreign investment to develop Iran foreign market therefore moderated trade tax policies. Government introduced structural reforms, in March 2002 Iran moved from a multi-tiered Exchange rate to unified managed flout exchange rate policy. The exchange rate alter is considered to promote Iran's trading policy. The fourth five years plan (2005-2009) obligates government to stop investing in companies or areas which private sector can take on in. government

cannot increase ownership of companies more than 50% which government already has less than 50% of shares. Government companies obligated to perform their foreign currency transactions under Central bank acceptance through approved accounts by CBI. Government also mandated to schedule refund of all short and long foreign dept and obligations in the manner that in the last year of plan do not have obligation more than 30% of its foreign earnings. Beyond this the government foreign dept shall not be more than 30$ billion in the end year of fourth plan.

Iran now experiencing transition period by privatization Iran in 2010 started "fifth five years economic plan". According to the fifth five years economic plan 2010-2015 government has to implement policies outlined in Article 44, to set prices and ceding shares to stock market and public. Iran target for an annual growth rate of 8% until 2015 by the inflation rate of 12% and a $65/barrel price for oil, which covers Iran's 80% export Government plans to invest $20 billion a year up until 2015 to develop its oil and gas industry, by attract "foreign and private investments" to improve Iran's gas extracting capacity.

3.3.2 The development of Iranian GDP in level

Figure 4: Gross Domestic Product 1965-2007

In last 5 years despite of US and UN sanctions, Iran continues experiencing positive rate of growth. Iran's recent economic growth which has reported 5 % for 2008 and 4.6% for 2009 by IMF is attributed largely to oil windfall as a major source of revenue for country. This improves partially because of economic reform plan and agriculture recovery. Oil related real GDP growth has been 2.7%in 2006 and 2.1% for 2007 whereas its non-oil related real GDP growth has been more than 6% for both 2006 and 2007.

Among the various sectors of the economy the percentage share of the services Sector in the total GDP is the highest. It was 48.1 as in the year 2004.The percentage share of the agriculture sector in the total GDP is following Declining trend in the recent years from the given statistics, the percentage Share of the agriculture in total GDP has declined to 10.9 in the year 2004 from19.8 In 1984. The average annual growth rate of GDP of the country in 2004 Was 4.9 The major industries of the country are petroleum, petrochemicals, cement and Other construction materials, food processing, metal fabrication, armaments The percentage share of the industrial sector is somehow maintaining stagnancy From 1990s and onwards It was of 41.0 in the year 2004.

The following diagram shows the percentage share of the Economy in total GDP over the years
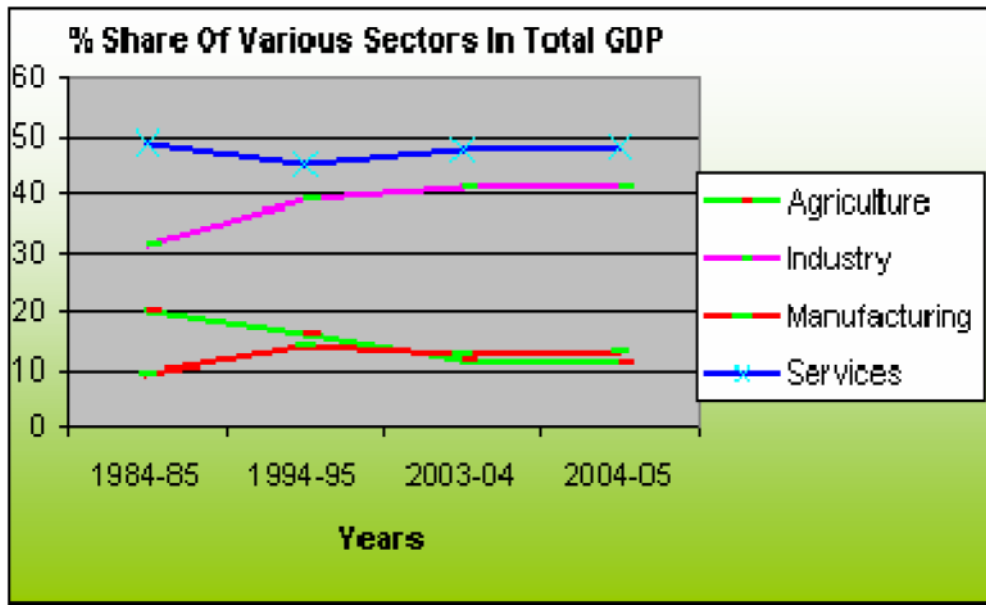
Figure 5: Percentage Share of Various Sectors in Total GDP

3.3.3 The Development of Iranian GDP in Difference

Figure 6: Gross Domestic Product (Annual Percentage)

In previous decades Iran endured many fluctuations in economy. In 1960 and 1970 decades Iran experienced one of the biggest world economy growths, when real economic growth rate has been around 10%. After Iran's 1979 revolution and beginning war against Iraq Iran faced to isolation and sanctions internationally. It

provides reason to Iran economic growth rate be negative in 1980s. By starting after war revival, Iran conducted "constructions period" after 1988 and during 1990s. As the graph shows Iran experienced upward trend in real economic growth in this period however in the recent years faced to oil price deceasing internationally which caused to downtrend of real economy growth.
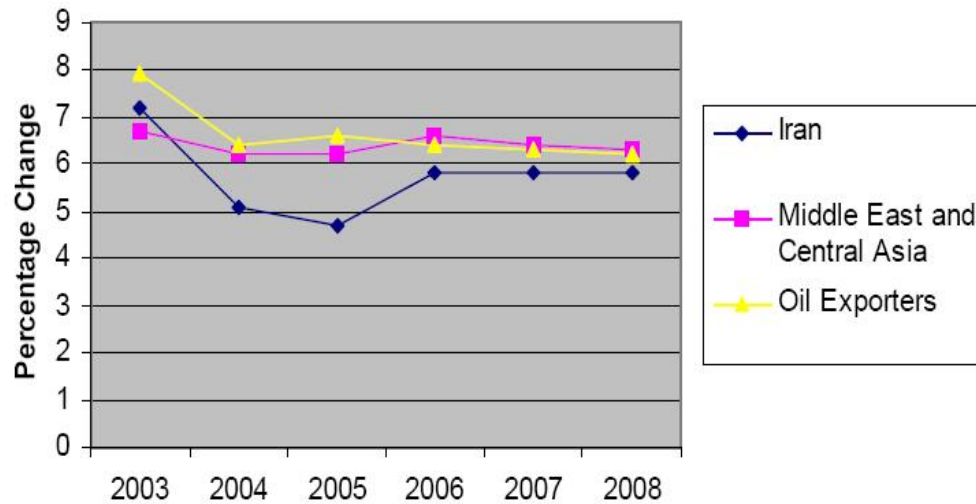
Figure 7: GDP Middle East, Central Asia and Iran

In spite of decrease in average economic trend in Middle East, Central Asia and oil exporter countries Iran kept its own upward economic growth based on "sustainable development" policy as can be observed in figure 3.6.

3.3.4 Banking Sector

Practiced in Muslim countries, Islamic banking refers to the system of banking that is in accordance with the Sharia (Islamic law). The absence of an interest mechanism forms the core of Islamic banking.

The basic foundations of the Islamic banking system are the concepts of usury and risk. Islamic law does not consider money as an asset. Hence, lending money on interest is prohibited. According to Islam, the lending of money is considered as an unjust act as it is seen as favoring the lender According to islamic finance, money is just a measuring tool for value. Therefore, 'riba' or usury or interest is prohibited. In the Sharia banking system, when an enterprise takes a loan; it shares part of its profits with the lending agency.

Also, the sale and purchase of such items is prohibited the existence of which is considered Uncertain Thus, mainstream financial instruments, such as derivatives which are used to hedge possible outcomes, are prohibited in the Islamic system of Banking and finance.

Chapter 4

DATA AND METHODOLOGY

4.1 The Data

The data I have employed in this study are yearly, covering the period 1967-2009. I have used four variables for the Iranian economy.[2] Our variables are measured as follows. Output is measured by the logarithm of real GDP per number of worker, GDPC; stock market development by the logarithm of the stock market capitalisation ratio, MCGDP, which is defined as the ratio of stock market value to nominal GDP; banking sector development by the logarithm of the ratio of domestic bank credit to nominal GDP, BCGDP; and stock market volatility is measured by an eight quarter moving standard deviation of the end-of-quarter change of stock market prices, VP[3] (see also Arestis and Demetriades, 1997).

4.2 The Method of Estimation

The OLS analysis is used to identify the direction and significance of relations between financial (and baking) sector and economic growth. The regressions are performed by utilizing the Ordinary Least Square (OLS) and to estimate the regression coefficients i.e. b_i of the model (5.1). Each regression coefficient estimated by OLS coincides with the true value on the average and they have the

---

[2] Stock market data such as price index and market value as well as domestic bank credit were obtained from International Financial Statistics (IMF, IFS).
[3] We first calculated the logarithmic first differences of the end-of-quarter stock market price index. We then computed a moving eight-quarter standard deviation as a measure of stock market volatility.

least possible variance i.e. they are efficient so that regression analysis can produce best linear unbiased estimates (BLUE) (Gujarati, 1999, p.203-206).

The results from the estimated model are explained using the followings:

(i)   Estimated coefficients (βs),

(ii)   t-ratios,

(iii) R^2

(iv)   F-statistic.

Beta coefficients corresponding to the macro variables are estimated for the dependent variable.

To test the significance of the individual coefficients, a t-test is performed. If the computed t values are larger than the critical value at a given level of significance, then the null hypothesis that the given regression coefficient is not significantly different from zero is rejected.

The R^2 is used to get the percentage of total variations in economic growth explained by the explanatory variables employed in the multiple regression equation.

Finally, F-test is used to test the overall significance of the model, that is, whether economic growth is linearly related to financial development and banking system employed.

Chapter 5

THE REGRESSION MODEL AND EMPIRICAL RESULTS

5.1 The Regression Model

Many economists and researchers used both the growth theories to emphasise the importance of relationship between financial sector and growth. This nexus between these two issues has been well investigated by Goldsmith (1969), McKinnon (1973), Shaw (1973) and others who produced considerable evidence that financial development correlates with growth.

Here, I conduct the frameworks introduced by Mankiw et al. (1992), Knight et al. (1992); (1993), Ghura and Hadjimicheal (1996) and Arestis et al. (2001) to investigate the role of stock market development, banking sector development and stock market volatility in economic growth.

I faithfully follow Fethi et. al. (2008) to construct my regression model let us consider the following Cobb-Douglas production function:

$$Y_t = K_t^{\alpha} H_t^{\beta} \left(A_t L_t \right)^{1-\alpha-\beta} \tag{5.1.1}$$

Where Y is real output, K is the stock of physical capital, H is the stock of human capital, L is the raw labour, A is a labour-augmenting factor reflecting the level of technology and efficiency in the economy and the subscript t indicates time.

We assume that $\alpha + \beta < 1$, so there are constant returns to factor inputs jointly and decreasing returns separately. Raw labour and labour-augmenting technology are assumed to grow according to the following functions:

$$L_t = L_0 e^{nt} \tag{5.1.2}$$

$$A_t = A_0 e^{gt + FDP\theta} \tag{5.1.3}$$

Where n is the exogenous rate of growth of the labour force, g is the exogenous rate of technological progress, FDP is a vector of financial development policy and the other factors that can affect the level of technology and efficiency in the economy, and θ is a vector of coefficients related to this policy and other variables.

Furthermore, in the steady state, output per worker grows at the constant rate g (the exogenous component of the growth rate of the efficiency variable A). This outcome can be obtained directly from the definition of output per effective worker as follows:

$$\frac{Y_t}{A_t L_t} = (k_t)^\alpha (h_t)^\beta$$

$$\frac{Y_t}{L_t} = A_t (k_t)^\alpha (h_t)^\beta \tag{5.1.4}$$

Let
$$y_t^* = \left(\frac{Y_t}{L_t}\right)^*$$

Taking logs both sides of Equation (5.1.4), we get Equation (5.1.5):

$$\ln\left(\frac{Y}{L}\right)^* = \ln A + \alpha \ln k^* + \beta \ln h^* \qquad (t \text{ is omitted})$$

Where $A_t = A_0 e^{(gt + FDP\theta)}$

$$\ln\left(\frac{Y}{L}\right)^* = \ln A_0 + gt + \theta \ln FDP + \frac{\alpha}{1-\alpha-\beta}\ln s^K + \frac{\beta}{1-\alpha-\beta}\ln s^H - \frac{\alpha+\beta}{1-\alpha-\beta}\ln(n+g+\delta) \qquad (5.1.5)$$

Equation (5.1.5) indicates steady state output per worker or labour productivity where a vector of financial policy proxies and the other variables exist.

We assume that *fdp* varies over time due to a considerable amount of theoretical and empirical literature has indicated that the financial sector plays a crucial role in promoting economic growth whereas s^K, s^H and n do not vary over time. This means that A_0, s^K and s^H can be consider as a constant term A_0 in Equation (5.1.6). Then, the steady-state output per worker or labour productivity (y^*) grows according to the following equation:

$$\ln\left(\frac{Y}{L}\right)^* = A_0 + A_1 t + \theta \sum \ln FDP \qquad (5.1.6)$$

Rearranging equation (3.1.6), it yields an estimation equation for a relationship between financial development and output per worker or labour productivity as follows:

$$\ln CAP = A_0 + A_1 t + \theta \sum \ln FDP \qquad (5.1.7)$$

Where *CAP is GDP* per worker, A_0 is constant, A_1 and θ *(s)* is the estimated parameters in the model. $\sum FDP$ is a vector which contains three different proxies for financial development indicators. In turn, *FDP1*: Stock market development, *FDP2*: Banking Sector development and *FDP3*: Stock market Volatility.

5.2 Analysis of the Test Results

The following issues are checked for our model:

    (1) The multicolineartiy between the explanatory variables

    (2) The autocorrelation between error terms

    (3) The normality of error terms

    (4) The heteroscedasticity

5.2.1 Multicolinearity

Broadly interpreted, multicolinearity refers to the situation where there is either an exact or approximately exact linear relationship among the X variables" Gujarati (1995:345).

To identify whether multicolinearity exist among the variables used for this study, I estimated a correlation matrix for the regression equation. Estimated correlation matrixes of the relevant dependent variable and prescribed explanatory variables are presented in Table (5.1). Here I expect to get a low correlation among explanatory variables, whilst, a high correlation between economic growth and financial and banking system variables.

Table 5: Estimated Correlation Matrix for Economic Growth

	GDPC	BCGDP	MCGDP	VP
GDPC	1	.106	.835	-.834
BCGDP	.106	1	.198	.97
MCGDP	.835	.198	1	.797
VP	-.834	.97	.797	1

Table 5 shows that the correlation between the relevant share index and other macroeconomic variables is acceptable.

5.2.2 Autocorrelation

The problem of autocorrelation stems from among the error terms when they are not independent of each other. The OLS estimators are efficient (i.e. they have minimum variance) and unbiased only when there is no correlation between error terms.

The most popular test for discovering autocorrelation is developed by Durbin Watson, known as the Durbin-Watson d statistic. I did test first order autocorrelation by testing the following null hypothesis.

$H_0 = $ No autocorrelation; if $d_U \prec d \prec 4 - d_U$

$H_A = $ Positive autocorrelation; if $d \prec d_L$

Negative autocorrelation; if $4 - d_L \prec d \prec 4$

Although it is popularly used, one of the disadvantages of the d test is that if it falls in region of ignorance where results are inconclusive, we cannot conclude whether or not autocorrelation does exist.

$d_L \leq d \leq d_U$ And $4 - d_U \prec d \prec 4 - d_L$ are regions of ignorance.

The critical values used in testing the hypothesis are as follows:

	d_L	d_U
%5	1.33	1.72

(Where n=43, k=4, computed= 1.73)

Here I compare the computed D-W d statistics with the tabular values presented above. At 5% significance level, the results show no autocorrelation among the successive residuals taking the form 1.72 <d<4-1.72. The computed d statistics of the

equation is 1.73. In general, the computed results exhibit that there is no first order autocorrelation among residuals.

5.2.3 Normality

One of the assumptions of the method of OLS is about the probability distribution of residuals. OLS estimators of the regression coefficients are best linear unbiased estimators if the residuals follow the normal distribution with zero mean and constant variance.

To check this assumption we used the Lagrange Multipliers (LM)[4] test employing the following hypotheses (Greene, 1993, pp.133-134).

$H_0 = u_t = 0$ (Residuals are normally distributed),

$H_a = u_t \neq 0$ (Residuals are not normally distributed).

Our computed value of LM version for normality is CHSQ (2) and the tabular value with two restrictions for significance level of 0.05 is $\chi^2(2) = 5.99147$. Since in both equations the computed value of LM version of normality is smaller than the tabular value, the null hypothesis of normality of the residuals are normally distributed is accepted. X_{NORM} for the regression equation is 1.53 (prob= 0.219).

5.2.4 Heteroscedasticity

Another important assumption of OLS is that residuals have the same variance i.e. they are homocedastic. If this assumption is violated, there is heteroscedasticity. I did test whether residuals have the same variance or not for the regression model. The hypothesis is conducted as follows:

---

[4] LM has a chi-squared distribution with degrees of freedom equal to the number of restrictions.

$$H_0 = \sigma^2{}_t = \sigma^2 \text{ (Homossedasticity)},$$

$$H_a = \sigma^2{}_t \neq \sigma^2 \text{ (Heteroscedasticity)}.$$

The computed value of LM version for heteroscedascity is CHSQ (1) and the tabular value with one restriction with significance level of 0.05 is $\chi^2 = 3.84146$.

Since in both estimated equations, the computed value of LM version of heteroscedasticity smaller than the tabular value, the null hypothesis of heteroscedasticity is accepted i.e. residuals are normally distributed. X_{HET} for the equation is 1.72 (prob=0.451).

5.3 Empirical Results

The empirical test results have been carried out by using Software-Microfit 4.0 (Pesaran and Pesaran, 1997). After I analysed the misspecification test results for the serial correlation, autocorrelation, normality and heteroscedasticity, I evaluated the results estimated from the regression equations using:

 (i) t- test (i.e. individual significance test of the estimated coefficients),

 (ii) F-test (i.e. overall significance test of the coefficients),

 (iii) R^2 (i.e. goodness of fit) values.

The regression results between economic growth and the chosen banking and financial sectors indicators are presented in Table (5.2) for the relevant. The numbers in parentheses in the same table are t-values that used to test the null hypothesis of no significance of the estimated coefficients associated to the sectors variables.

I hypothesize that

$H_0 : \beta_s = 0$ (Not significant)

$H_a : \beta_s \neq 0$ (Significant)

As can be seen in Table (5.2), all the variables used in the relevant equation are statistically significant on the basis of the two-tail *t*-tests at conventional levels except domestic banking credit (BCGDP) in the regression equation. The impact of market capitalization (MCGDP) and stock prices (VP) seem to be more important than the others in the equation. In addition to this, the estimated coefficients of the relevant variables have right signs, as they would be expected based on the theory. It is important to mention that I also used dummy variable to capture the effect of the war happened in the year between 1980 and 1988. It gives negative influence as expected.

The other important issue is to test the overall significance in which I utilised F-test. I did test the null hypotheses that employed macroeconomic variables together have an influence on dependent variables as follows:

$H_0 : R^2 = 0$ (Not significant)

$H_a : R^2 \neq 0$ (Significant)

Notes: $F_{k-1, n-k} = F(3,39)$ and the tabulated F-values are as follows: 4.31 at 1% significance level, and 2.84 at 5% significance level.

The calculated F-results are significant (F-cal>F-tab at 1% significance level), i.e., 45.58. I therefore, reject the null hypotheses and accept the alternative hypotheses,

which indicate that, the regression equation holds overall significance at 1 percent level.

Having conducted F-test as mentioned above, I did then consider the goodness of fit of estimated multiple regressions (i.e. multiple coefficient of determination R^2). R^2 Gives the percentage of the total variation in the dependent variable explained by the explanatory variables in the regression models The percentage of the total variation in the dependent variable economic growth explained by the utilised explanatory variables are found reasonably high with the value 77.8 percent.

Table 6: Regression Results for the Model Under Inspection

Explanatory variables	Model 1-Longrun-GDPC
C	0.70 (4.71)
BCGDP	0.45 (1.58)
MCGDP	0.15 (2.96)
VP	-0.18 (-3.65)
DUM8088	-0.23 (2.04)
R^2	0.778
F (3,39)	45.58

Notes: * indicates statistical significance at a 1% (2.70); ** indicate statistical significance at a 5% (2.02), *** indicate statistical significance at a 10% (1.68) and other are not statistically significant at conventional levels.

Finally, in order to get short-run model where economic growth can be better explained in Iranian economy, the OLS procedure is performed to choose the significant t values of the relevant variables in the regression equation (See Table 7)

Regression estimation results show that there are all statistically significant variables in determining economic growth in Iranian except, stock prices (DVP). The followings estimated results, belong to short-run period, and are displayed in Table 7:

Table 7: Significant Variables

Explanatory variables	Model 2-Shortrun-DGDPC
C	0.34 (4.73)
DDBCGDP	0.89 (2.91)
DMCGDP	0.22 (1.69)
DVP	-0.18 (-1.35)
DUM8088	-0.25 (1.70)
R^2	0.594
F (3,38)	36.06

Notes: * indicates statistical significance at a 1% (2.70), ** indicate statistical significance at a 5% (2.02) and *** indicate statistical significance at a 10% (1.68).

As can be shown in Table 7, domestic credit interestingly in the short-run period is significant at 1% or 5% significance levels; however market capitalization and dummy variable are significant at 10% significance level. Stock prices are not found statistically at the conventional level in the short run period. All coefficients have right signs and expected impact.

Table 7 also shows how significant these variables are in explaining economic growth when other variables are not included in the estimation process as such human capital, investment etc... 59 % of total variations in economic growth explained by utilising all estimated variables the R^2 value are lower in the short run compared to the previous one. Furthermore, the results of the last equation presented above implying that banking sector variable seem to have a relatively stronger ability about explaining the economic growth in Iranian economy compared to the equation utilizing the variables in the long run period.

Finally, in order for the test of overall significance, I rejected the null hypotheses and accept the alternative hypotheses at conventional levels which states that our equations hold overall significance since our F-results are higher than the tabulated F-values.

Notes: $F = F_{k-1, n-k}, F(36.06)$ and the tabulated F-values are 2.84 at 5% significance level, 4.31 at 1% significance level.

According to the results in Table (5.2), if domestic credit goes up by 1%, economic growth increases by 45 whilst other variables hold constant. Also, 1 percent increase in market capitalization results in 15% increase in economic growth. In addition, economic growth decreases by nearly 18 when stock price rises up by 1 percent.

I can conclude that, changes in stock prices have not significant negative impact on Iranian economic growth whilst changes in, BCGDP, MCGDP and DUM8088 have an influence in explaining the variations in Iranian economic growth.

Chapter 6

CONCLUSION, POLICY IMPLICATION AND

RECOMMENDATION

6.1 Conclusion

In this thesis, I aimed to investigate the empirical relations between financial development and economic growth using the Solow growth model covering the period between 1967 and 2009. I conducted the OLS method to find out the influences of banking sector and stock market both in long-run and short-run period for Iranian economy.

The results from the estimated regression in long-run suggest that there is a significant negative relationship between stock prices, exchange whereas market capitalization and the dummy variable have a positive impact on the Iranian economic growth. In Short-run, the relationship between domestic credit as well as market capitalization and the dummy variables are statistically significant and positive.

Consistent with the expectations and the findings of other studies, Iranian economic growth and financial development proxies used in this thesis are perfectly associated.

Contrary to the findings for the US, UK and some other countries, my thesis does not provide reasonable support for the view that stock prices have an effect on economic growth for the two periods. Bank credit is found to be positively insignificant in long-run period in explaining the economic growth. This may suggest that my findings do not appear to support the view that the banking sector leads to changes in the real economic activity variables.

It is noteworthy that I also found negative relationship between economic growth variable and the dummy variable. This shows that the war effect is so significant the relevant model.

As a result, explanatory power reached for the sample period supports the view that macroeconomic variables explain a significant part of the observed variations in economic growth for the sample period. Since the financial development variables have been taken into account in the model, the estimation results imply that some variables, namely banking credit, market values, and stock prices have an influence on Iranian economic growth.

6.2 Policy Implications

On the basis of the results obtained, the following conclusions can be deducted; first, our findings suggest that the Iranian financial market development sector is more likely to be a good promoter of domestic economic growth than banking sector development. Second, stock market volatility has a negative influence on the Iranian output and suggests that volatility in stock prices may reflect economic ambiguity. Third, our results can be interpreted in favour of the "finance causes growth"

hypothesis (i.e. supply-leading) as yearly data were employed in the light of exogenous modelling framework.

6.3 Recommendation

More advanced time series techniques such as Johansen co integration techniques can be applied on the same subject for further studies in order to get more accurate results. The model employed in this study can be developed using the combination of both endogenous and exogenous models rather than conducting only the one. However, due to availability of the relevant data set and the time limitation, I have been confined to do more solid research on the relevant subject. I recommend that those master students who really want to analyse this subject; they can take those points mentioned above into account.

In my thesis on the Iranian economic growth, I can derive a number of implications that may help to improve the performance of the Iranian economy under the inspection of the financial development. I am aware of the fact that aggregate analysis cannot be used in policy formulation at the micro level but it definitely provides a general guidance in the formulation of financial and banking sectors policies.

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APPENDICES

Appendix 1: Estimated Correlation Matrix of Variables

```
Estimated Correlation Matrix of Variables


******************************************************************************

           GDPC      BCGDP     MCGDP      VP

 GDPC      1.0000    .10612    .83575    -.83434



 BCGDP      .10612   1.0000    .19848    .97553



 MCGDP      .83575    .19848   1.0000     .79764



 VP        -.83434    .97553    .79764   1.0000


******************************************************************************
```

Appendix 2: Ordinary Least Squares Estimation (Long-run)

```
                       Ordinary Least Squares Estimation
******************************************************************************
 Dependent variable is GDPC
 43 observations used for estimation from 1967 to 2009
******************************************************************************
 Regressor            Coefficient        Standard Error        T-Ratio[Prob]
 C                          0.70                  6.71          4.7063[.000]
 BCGDP                    0.4593                  3.51         1.58226[.399]
 MCGDP                      0.15                  19.7          2.9610[.005]
    VP                     -0.18                 20.27         -3.6525[.001]
 DUM8088                   -0.23                  8.86         -2.0425[.001]


******************************************************************************
 R-Squared                    .77810   R-Bar-Squared                  .76103
 S.E. of Regression          16542.3   F-stat   F( 3, 39)     45.5859[.000]
 Mean of Dependent Variable  81878.8   S.D. of Dependent Variable    33839.8
 Residual Sum of Squares    1.07E+10   Equation Log-likelihood     -476.6031
 Akaike Info. Criterion -480.6031 Schwarz Bayesian Criterions   -484.1255
 DW-statistic                 1.7340
******************************************************************************




                              Diagnostic Tests
******************************************************************************
*    Test Statistics *      LM Version       *        F Version
******************************************************************************
*                   *                         *
* A: Serial Correlation*CHSQ (  1) = 1.48224[.214]*F (  1, 38) = 1.4932[.213]
*                   *                         *
* B: Functional Form  *CHSQ (  1) =  1.5372[.213]*F (  1, 38) = 1.4110[.247]
*                   *                         *
* C: Normality       *CHSQ (  2) =  1.6830[.431]*      Not applicable
*                   *                         *
* D: Heteroscedasticity*CHSQ (  1) =  1.9208[.315]*F (  1, 41) =  1.5468[.214]
******************************************************************************
```

A: Lagrange multiplier test of residual serial correlation

B: Ramsey's RESET test using the square of the fitted values

C: Based on a test of skewness and kurtosis of residuals

D: Based on the regression of squared residuals on squared fitted values

Appendix 3: Ordinary Least Squares Estimation (Short-run)

```
Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is DGDPC

 42 observations used for estimation from 1968 to 2009
*******************************************************************************
 Regressor          Coefficient       Standard Error        T-Ratio[Prob]

 C                        0.3470          13.9173            4.7308[.000]

 DDCGDP                   0.8979           3.26346           2.9170[.006]

 DMCGDP                   0.22             7.68              1.69451[.438]

 DVP                     -0.18             7.5              -1.35017[.619]

DUM8088                  -0.23             8.86             -2.0425[.001]
*******************************************************************************
 R-Squared                   .59483  R-Bar-Squared                    .53126

 S.E. of Regression          4622.8  F-stat   F(  3,  38)   36.065[.039]

 Mean of Dependent Variable  3387.0  S.D. of Dependent Variable     4959.8

 Residual Sum of Squares   8.12E+08  Equation Log-likelihood     -411.9219

 Akaike Info. Criterion -415.9219 Schwarz Bayesian Criterions   -419.3972

 DW-statistic                 1.798
*******************************************************************************



                            Diagnostic Tests
*******************************************************************************
*    Test Statistics *      LM Version        *        F Version
*******************************************************************************
*                     *                       *
* A: Serial Correlation*CHSQ (   1) =   1.0105[.103]*F (   1, 37) = 1.1059[.101]
*                     *                       *
* B: Functional Form  *CHSQ (   1) =   1.5216[.217]*F (   1, 37) =   1.3908[.246]
*                     *                       *
* C: Normality        *CHSQ (   2) =   .50491[.777]*      Not applicable
*                     *                       *
* D: Heteroscedasticity*CHSQ (   1) =   2.9869[.326]*F (   1, 40) =   2.3893[.325]
*******************************************************************************



  A: Lagrange multiplier test of residual serial correlation
```

B: Ramsey's RESET test using the square of the fitted values

C: Based on a test of skewness and kurtosis of residuals

D: Based on the regression of squared residuals on squared fitted values