Determinants of Financial Development in Iran: Do Financial Repression Policies Hinder Financial Development?

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ABSTRACT

It has been widely discussed in the financial development literature that repressive financial policies have an adverse impact on financial development process in developing countries. Against this backdrop, the purpose of this thesis is to investigate the determinants of financial development in Iran in its post-revolution era and to assess whether financial repression has a significant impact on financial development using annual data spanning the period between 1965 and 2006. For this purpose, the time-series econometric technique of Johansen Cointegration analysis has been used.

The results of the cointegration tests suggest that trade openness, savings and economic growth are statistically significant with a positive coefficient, which means that these variables have a positive impact on financial development in the case of Iran. On the other hand, financial repression index and reserve requirement ratio have a negative coefficient, which suggest that repressive financial policies have indeed a negative impact on financial development process in the case of Iran. An interesting finding of the thesis is that inflation has a positive impact on financial development in the case of Iran. This is an interesting result as theoretically inflation is expected to inhibit financial development process. Nevertheless, this finding is in line with the theory that there is a critical inflation rate, below which a modest rise in inflation can encourage real activity and promote financial development rather than obstructing financial development.

Keywords: Financial Development, Financial Repression, Johansen Cointegration.

ÖZ

Finansal baskı politikalarının finansal kalkınma sürecini olumsuz etkilemesi finansal kalkınma literatüründe sıkça tartışıl maktadır.

Dolayısıyla, bu tez İran'daki finansal kalkınma sürecinin belirleyicilerini araştırmak ve finansal baskı politikalarının finansal kalkınma sürecine istatistiksel olarak anlamlı bir etkisi olup olmadığını 1965 ve 2006 yıllarını kapsayan yıllık verilere dayanarak Johansen eş-bütünleşme testi ile araştırmayı amaçlamaktadır.

Johansen eş-bütünleşme testi sonuçlarına gore ticari açıklık, tasarruflar ve iktisadi büyüme İran'daki finansal kalkınma sürecini olumlu etkilemektedir. Öte yandan, yine Johansen eş-bütünleşme testi sonuçlarına gore finansal baskı endeksi ve mevduat munzam karşılığı oranının İran'daki finansal kalkınma sürecini olumsuz etkilediği sonucuna varılmıştır.

Tezin ilgi çekici bir sonucu olarak enflasyonun finansal kalkınma sürecini olumlu etkilediği tespit edilmiştir. Teorik olarak enflasyonun finansal kalkınma sürecini olumsuz etkilemesi öngörülmesine rağmen bu tez ile İran için bunun tersi bir sonuç elde edilmesi, alternatif bir sav olan belli bir eşik değerin altındaki enflasyonun finansal kalkınma sürecini engellemek yerine destekleyici bir rol oynadığını öne süren teori ile izah edilebilmektedir.

Anahtar Kelimeler: Finansal Kalkınma, Finansal Baskı, Johansen Eş-Bütünleşme.

To my parents and my lovely wife

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INTRODUCTION

Iran is located on the north-eastern cost of Persian Gulf and the Hormuz Strait, a vital pathway for transportation of crude oil. The neighboring countries of Iran are Iraq and Turkey in the west, Pakistan and Afghanistan in the east, and, Armenia, Azerbaijan and Turkmenistan in the north (Jones, 2009).

Iran is one of the largest countries in the Middle East with a great history. The geographical and strategic position of Iran, as well as its huge potential in gas, oil, and mine reserves has placed this country in an important position in the Middle East. Iran's economy mainly depends on its fuel and gas reserves (Aftab, 2009).

While international attention has been given to the politics of Iran, compared to other countries, little attention has been paid to either the country's financial policy or its economic growth in its post-revolutionary period. In particular, there exist only a few empirical studies on the financial development issue in the case of Iran.

Iran is among the countries which have a repressed financial system. Among repressive financial policies in Iran are reserve requirement ratios, interest rate controls and directed credit programs.

It has been widely discussed in the financial development literature that repressive financial policies have an adverse impact on financial development process in developing countries.

Against this backdrop, the purpose of this thesis is to investigate the determinants of financial development in Iran in its post-revolution era and to assess whether financial repression has a significant impact on financial development using annual data spanning the period between 1965 and 2006. For this purpose, the time-series econometric technique of Johansen Cointegration analysis has been used. The present thesis is structured as follows: The next chapter analyses the economic and financial development in Iran with special emphasis on the Iranian banking sector. Chapter 3 reviews the literature on financial development. Chapter 4 sets out the theoretical framework. Chapter 5 introduces the data and the methodology. Chapter 6 presents the empirical results, and Chapter 7 provides the conclusions.

Chapter 2

AN ANALYSIS OF THE POST-REVOLUTION

IRANIAN ECONOMY AND THE BANKING SECTOR

This chapter provides an analysis of Iranian economy in its post-revolution era with special emphasis on the country's banking sector and discusses the reasons for Iran's failure in reaching sustained economic growth. These problems are interesting for any Iranian and foreign researcher as Iran is a rich country with abundant natural resources. An analysis of the economic problems of Iran and the impact of government and foreign policies on economic indicators seems necessary to identify the factors which prevent economic and financial development in Iran.

2.1 Analysis of the Iranian Economy

Iran has a young population. According to the World Bank (Country Brief, June 2009), Iran has a population of 73 million. Most of these people are young people and Iran's health and education levels are one of the best in the region. At the same time, the number of women participation in the labor market force continues to increase in this society with a large number of young people with high level of education. Hence, one of the most challenging problems in Iranian economy is to facilitate and create new jobs for those who are ready to enter the labor market (see figure 2 for unemployment position in Iran).

As obvious from the Figure 1 the population growth has fluctuated until 1993 but then it has been steady around 1 % growth rate till today.
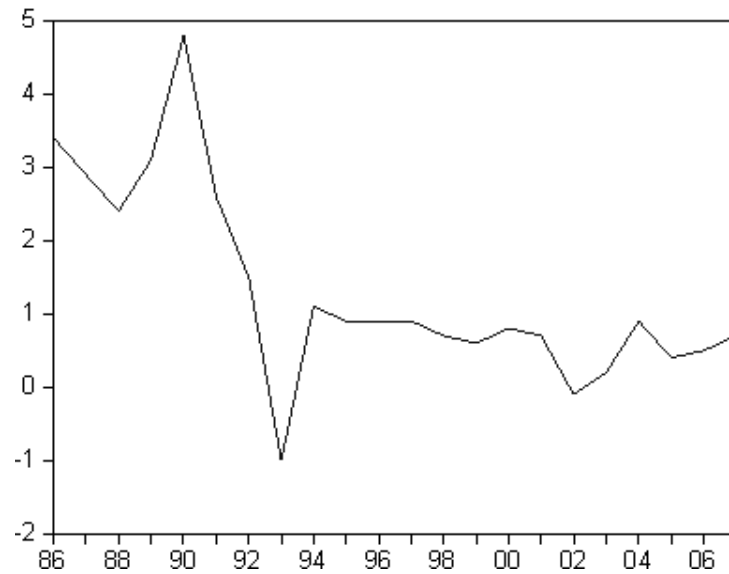
Figure 1: Population growth rate (%) in Iran, 1986-2006
Source: US Census Bureau, International Data Base, Country Data

As can be seen in Figure 2, it seems that the rate of unemployment has fluctuated from 1986 till 2007 between 10-15%, which is quite high.

Figure 2: Unemployment rate (% of total labour force) in Iran, 1981-2007
Source: World Bank World Development Indicators

With a brief review of economy of Iran, especially after 1960, we can easily identify that Iran's economy has experienced many periods of high inflation, stagnation,

expansion and recession. In the period of Mohammad Reza Shah Pahlavi Kingdom, with the policy focus on the oil sector, the sale of oil was very beneficial for the government in terms of budget revenue as well as for the economy as a whole. During the 1960s, the economy of Iran has experienced almost its best time. The rate of economic growth was quite high in this decade. The IMF Country Report (2004) states that during 1960-1976, the rate of growth of Iranian economy was the fastest in the world with a real economic growth rate of 9.8 on average and a real per capita income growth of 7 percent on average.
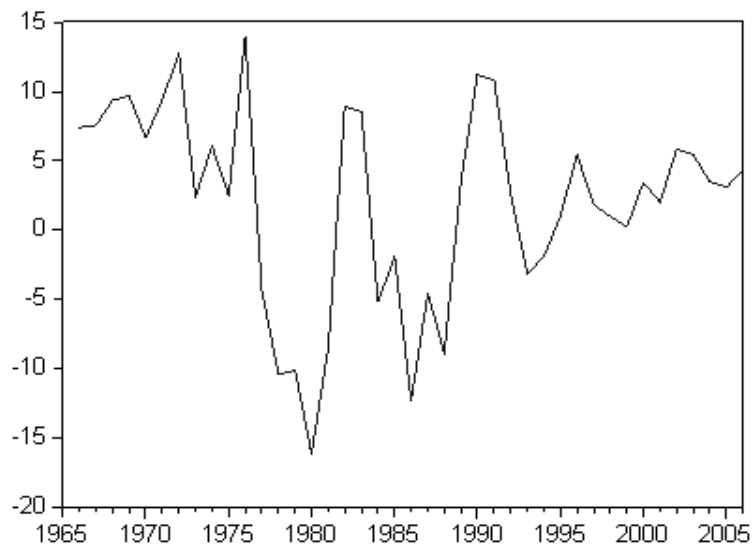
Figure 3: GDP growth rate (%) in Iran, 1965-2005
Source: International Monetary Policy and World Bank World Development Indicators

As can be seen from the graph of GDP growth in Figure 3, economic growth has fluctuated from 1966 till today. These fluctuations have been approximately between a range of -13% and 18%. As it is clear in Figure 3, economy of Iran had the lowest GDP growth rate in 1979 which was -13.29% and the highest GDP growth rate in 1976 which was 17.73%. Therefore, it is obvious that the highest GDP growth rate

occurred at the end of Pahlavi regime and the lowest GDP growth occurred after

Islamic revolution, during the war between Iran and Iraq.[1]

In 1973, because of a fall in international oil prices, the economy of Iran quickly

plunged into a crisis.[2]
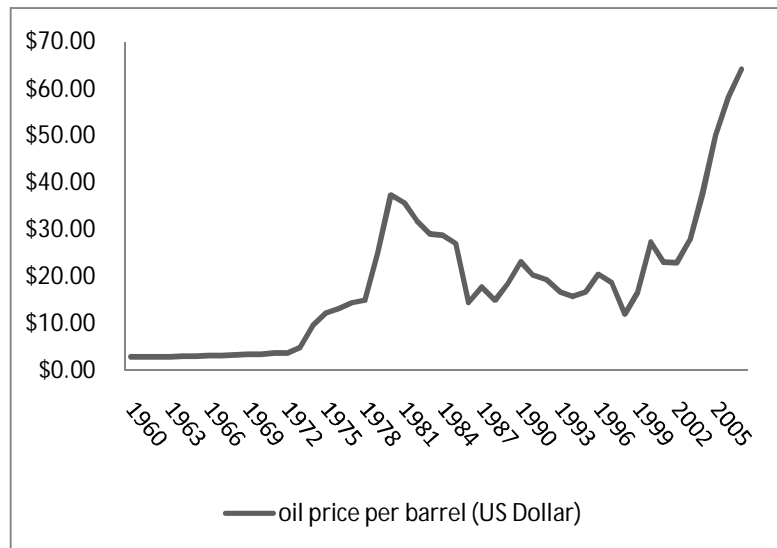
Figure 4: Oil price per barrel (US dollars) in Iran, 1960-2005
Source: www.inflationdata.com/inflation/Inflation_Rate/
Historical_Oil_Prices_Table.asp

Regarding the price of oil per barrel, as shown in Figure 4, oil prices were stable

starting from 1960 around $3 per barrel until 1972, and then it has fluctuated widely

till 2007. These fluctuations have been between a range of $5 and $65 per barrel.

[1] As reported by Alizadeh (2000), during the 1960s and the early1970s, Iran's GDP and consumption rates were between the ranges of 10-12 percent. Also, in 1970s especially the private investment growth was even faster and the government spent much of its revenue from oil on the public investment and consumption .During the same period, the government expenditure on public investment exceeded the private investment by 50%, and the public consumption was 50% of private consumption (Alizadeh, 2000).
[2] The world faced three major oil shocks in the last three decades: 1973-1975 (the Yom Kippur-Arab-Israeli-war), 1979-1980 (Iranian revolution and ensuing Iran-Iraq war) and 1990-1991 (Iraq's invasion of Kuwait and the Gulf War) (RIS, 2004).

This instability has not been favorable for the Iranian economy, which is an exporter of oil.

Between 1977 and 1988, Iran experienced its Islamic revolution and the Iran-Iraq war, which have had significant negative impact on the country's economy, reversing the direction of economic growth (Ilias, 2008).

Ilias (2008) states that Islamic revolution which occurred in 1979 changed the economic history of Iran and also its modern political history. She argues that Iran's economy changed into a public sector-dominated economy and, during the eight years of war between Iran and Iraq, the economy of Iran suffered to a great extent (Ilias, 2008).

After the Iran and Iraq war, the Iranian government tried to restructure and rebuild the economy, which was damaged during the war. It also tried to redistribute the wealth by a series of Five-Year Development Plans. For this purpose, they removed the allotments and subventions after 1989 through changes on the rules of the exchange rates and prices. Moreover, the size of government participation in the economy was reduced by privatization between the years 1989 and1993. As the Iranian government tried hard to reconstruct and recover the oil production, the growth reached an annual average of 4.7 percent between the years 1989-2002 (see Figure 3). Although this period was marked by frequent fluctuations in growth rate, the economy was affected by a decline during 1993-1994 when the price of oil decreased significantly due to the economic boycott (see Figure 4). The crisis of debt with improper policies had a great detrimental effect on growth by a 3.6 percent fall during the years 1995-2000 (IMF, 2004). Subsequently, in the third Five-Year

Development Plan, the Iranian economy had an impressive development: By the year 2005, the government successfully smoothed the path of exports and consolidated exchange rates (Salarpour, 2007).

During 2007-2008, progress was significant and, in the face of fast expansion of the labor force, unemployment decreased (see Figure 2). Since 2005-2006, economic growth of the non-oil sector increased by 7.3 percent. The oil sector, nevertheless, registered only little development caused by inadequate foreign investment in 2007-2008 (IMF, 2008).

Parallel to these developments, inflation rate has been relatively stable in the last decade. As can be seen from the graph of inflation in Figure 5, inflation rate fluctuated widely from 1980 to 2007. This fluctuation has been approximately between a range of 4.37 percent and 49.11 percent.
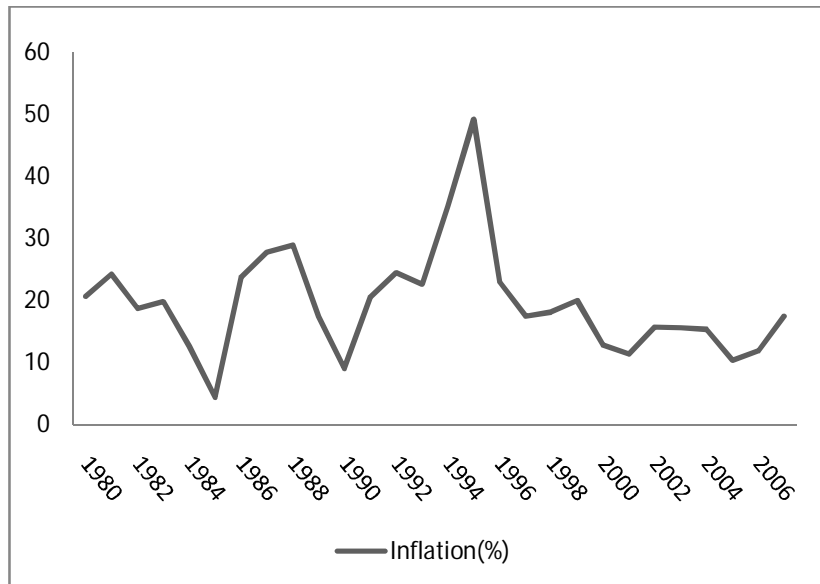
Figure 5: Inflation rate (Annual %) in Iran
Source: International Monetary Policy and World Bank Country Data's

2.2 Financial Development in Iran

One of the main barriers to economic and financial development in Iran is the shortage of adequate productive investment. Increasing competency of financial market and improving the position of financial growth may solve these complications. However, financial markets in Iran are not uniform and organized. Significant shares of savings are transmitted to borrowers via unauthorized market and economy. Due to financing with poor-quality loans, most of the investment projects are not profitable. Furthermore, a large volume of credits allocated to private sector are channeled by direct command of the government (Taghavi and Ismailzadeh, 2009).

One of the economic policies of the Iranian government has been to inculpate private-public proprietorship system of the banking sector of the pre-revolution period and to accomplish nationalization of the sector. As the banking system is directed by the tight control of the government, it has a number of limitations regarding interest rate and on branch expansion (Hosseini and Shabbani, 2003).

After the 1979 Islamic Revolution, financial system of Iran has developed in different periods. In early 1980s, it experienced widespread nationalization. In 1990s, it experienced a reconstruction of the financial system, concentrating on reforming the regulatory conditions (Taghipour, 2009). For instance, during the years 1995-2000, in the Second Five-Year Development Plan, the improvement concentrated on placing an interest rate on bank deposits at a position that guaranteed positive real returns, giving out investment certificates, and motivating the existence of individual credit institutions. Moreover, in the Third Five-Year Development Plan during the

years 2000-2005, the reconstruction concentrated on reducing the use of executive controls on interest rates and credit apportionment, reinvestment of the state banks by issuing securities, and the establishment of private banks and non-bank credit organizations. Despite these improvements, the policies were not sufficient to loose up financial repression in Iran (Taghipour, 2009).

Table 1 presents the average data for every 10 years between the years 1960 and 2007 on leading financial and economical variables.

Table 1: Banking Sector and Macroeconomic Indicators in Iran

	Years				
	1960-1970	1970-1980	1980-1990	1990-2000	2000-2007
CPI (%)	2.55	0.00	19.82	23.71	11.39
GDP growth (annual %)	11.62	11.00	-0.31	4.64	4.69
GDP per capita growth (annual %)	8.51	2.88	-3.66	2.91	4.87
M2 as % of GDP	25.19	31.06	49.87	39.62	38.99
Deposit Money Banks: Assets (Millions US Dollars)	45.31	529.74	2003.08	3285.38	18946.31
Deposit Money Banks: Liabilities (Millions US Dollars)	22.28	776.52	885.44	3215.28	18714.94
Reserves (Billions Rials)	17.46	181.29	2966.02	22396.44	97467.76
Foreign Assets (Net)(Billions Rials)	16.53	422.51	780.10	5933.61	180179.38
Domestic Credit (Billions Rials)	119.99	975.89	10436.32	81803.45	505973.38
Cash (Billions Rials)	1.84	13.39	42.39	616.64	12199.65
Demand Deposits (Billions Rials)	4.23	30.42	127.63	1754.57	16488.95
Private Sector Deposits (Billions Rials)	2.70	11.31	125.50	1754.57	16487.95
Time And Savings Deposits (Billions Rials)	2.00	33.22	320.57	3730.76	75938.84
Deposit Rate	-	8.07	7.38	11.11	11.66
Lending Rate	-	12.07	10.43	17.40	14.66

Source: International Monetary Policy and World Bank Country Data

2.3 Banking Sector in Iran

According to RSM International (2008), there are approximately 17 commercial banks in Iran today. Among these banks, eleven of them are state-owned and six of them are privately owned. All of these banks have to follow the principles of Islamic banking whereby usury is not allowed and, beside to interest rates, profit rates are set on deposits and expected rates of profit on facilities are set on loans. The banking sector is dominated by Bank Melli Iran (National Bank of Iran) in terms of both capital and asset size.

Currently, six banks which are privately owned, Bank Persian, Bank Kafarin, Bank Saman, Bank Pasargad, Bank Eqtesad-e-Novin, Bank Sina and Bank Sarmaye were the first banks to start operations in Iran after the nationalization of the banking sector in 1952. Some policies have been introduced to reform the structure of financial sector by privatizing the majority of Iran's state-owned banks. Nevertheless, the privatization process is restricted to domestic investors, and the state proposes to keep a 30% stake of the overall banking sector (RSM International, 2008).

In Iran, following to the completion of landmark reforms in the financial sector, banking sector has witnessed large changes with the elimination of bureaucratic controls, encouragement to foreign private and private investment and integrating the Iran's banking systems with the international economy. The entry of new private banks constitute a challenge to the public sector bank leadership in Iran (Ahangar, 2009).

The Iranian Government obliges the Central Bank to use specific monetary policies in support of catering for their current affairs and fiscal policy. Thus, usually the money supply stays out of control of the Central Bank. In determining the quantity of money, the most significant factors are how the monetary base is controlled and the ways the money is supplied (Naghshineh-pour, 2009).[3]

Even though the mix of private and state banking in Iran may be considered as a structural problem, it is ideo-politically driven (Naghshineh-pour, 2009). There is still a big deal which supports the establishment of state banking that prevents healthy competition, although privatization of the majority of the state owned banks is on the agenda. All private banks were nationalized after the revolution. Private banking restarted its activity again only eight years ago and its growth has been considerably fast (Naghshineh-pour, 2009).

At the moment the market share of private banks is 22% (in terms of asset) of the whole market. Their performance and productivity are significantly higher than those of the state banks. Nevertheless, they are subject to anti-competitive interference in their affairs constantly by the government and the Central Bank to prevent their fast market share growth. Additionally, state owned banks can slash the private-owned banks' profitability, since they tend to care less about profits. Besides, they receive a large number of unfair benefits from the Central Bank (Naghshineh-pour, 2009). Based on international standards, Iran does not have an adequate number of private banks compared to the number of state-run banks. There are fewer private banks in Iran than that of developed countries because of the loss of a competitive state of

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[3] The monetary base consists of the government's debts to the Central Bank, the net amount of Central Bank's foreign assets, financial institutions' and commercial banks' debts to the Central Bank, and other assets of the Central Bank (Naghshineh-pour, 2009).

affairs in the country (Naghshineh-pour, 2009). Recently, the average real interest rate has been either close to zero or negative. Therefore, depositors have fewer intensive to save and have more tendencies to spend. They allocate their capital in gold, real estate, and durable goods to avoid depreciation of their money. In contrast, negative real interest rates increase the demand for borrowing in the banking system (Naghshineh-pour, 2009).

Currently, under the command of the government, the banks are converted into a tool for distributing credit with no consider to economic wisdom and to the profitability of the investments. Consequently, the banks are at the risk of credit defaults. This policy has significantly decreased the level of efficiency of the banking system and has imposed on the economy high costs (Naghshineh-pour, 2009).

The Central Bank of Islamic Republic of Iran (CBI) was set up in 1960, and is in charge of formulating and implementation of the fiscal and credit policies. In line with the common economic policy of the country, four main goals of central bank of Iran are; (1) Preserving the value of national currency; (2) Preserving the stability of the balance of payments; (3) Smoothing the path of trade-related transactions; and (4) Developing the potential expansion of the country (CBI, 2009).

According to CBI (2009), the financial institutions in Iran include the following: (1) The banks which are authorized by government and the banks which are nongovernmental; (2) The credit organizations which get the permission from Central Bank of Iran; (3) Money dealers which are accredited, as well as charitable lending funds; and (4) Cooperative funds and cooperative credit firms (CBI, 2009).

In the guideline of Central Bank of Iran for banking sector, it is stated that Central Bank of Iran has the option to meddle in and control fiscal and banking affairs to ensure the performance of the fiscal system. Some of these actions have been listed as follows:

First, clearing the formal loan interest rates and rediscount rate, which may differ on the basis of the type of bill and loan or document.

Second, for different aspects of banks according to their performances or on the basis of other standards at its own, setting the ratio of the bank's liquid assets to their total assets or to their different types of liabilities.

Third, the ratios and the rates of interest should be payable on the lawful deposits of banks at the central Bank of Iran. The mentioned ratios may be different according to the formats and performances of the banks, but it will never decrease below 10 percent and increase over 30 percent.

Fourth, identifying the upper and lower rates of interest. Fifth, setting the proportion of the total amount of paid up reserves and capital of banks to their various categories of assets.

Sixth, determining the highest amount of obligation on the part of banks issuing letters of credit, and, the kind and amount of commitment for such obligations.

Seventh, setting the periods and conditions relating to hire-purchase negotiations financed by banks.

Eighth, determining the kinds and amounts of awards and other encouragements recommended by banks to absorb savings or current deposits also regulations relating to public interests in this regard.

Ninth, restraining the operations of banks to one or more specific sectors of performance either temporarily or permanently.

Tenth, determining methods in which banks savings and deposits are utilized.

Eleventh, setting the maximum amount of credits and loans granted by banks or the maximum amount of their credits and loans in particular fields. Lastly, applying these rules, which are mentioned above, to credit institutions and systematizing regulations for them.[4]

In light of this information, the present thesis focuses on the impact of financial repression policies on the financial development process in Iran. The next chapter reviews the related literature.

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[4] For full list see: www.cbi.ir/page/BankingStudiesRegulations_en.aspx

Chapter 3

LITERATURE REVIEW

There are many prior studies which investigate the determinants of financial development. The main differences among these studies arise from the way that these studies are conducted. Some studies reflect the impact of a set of variables whereas others investigate the impact of a particular variable on financial development. Another issue that causes the difference among these studies is the methodology, through which these studies are carried out. In this chapter, the major studies which have been done in the area of financial development will be reviewed.

Table 2 and 3 present the summary of the major studies which have been done in the financial development literature.

First of all, macroeconomic stability is found to affect financial development. Macroeconomic stability has generally been described as a composition of a low budget deficit, low inflation rate, and stable foreign exchange markets. It makes the business circumstances better and decreases the hedging on the return of investment projects, and consequently, has a positive association with economic growth and financial development. Bleaney (1996) and Fischer (1993) discover that macroeconomic instability, measured by a mix of high inflation; fiscal imbalances and frequent fluctuations of the real exchange rate had a significant negative effect on investments and, ultimately, on financial development.

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Table 2: Summary of the Major Studies in the Financial Development Literature

Authors	Country/Countries	Findings
Roubini and Sala-i-Martin (1995)	General	There exists a negative relationship between financial repression indexes and financial development.
Hussein and Demetriades (1996)	General	Investigate the incidence of 16 countries; 7 show a feedback relationship between growth and financial development.
Morgan, et al (1998)	General	Effects of trade openness on financial development become more considerable over the long period.
Demirgüç-Kunt and Detragiache, (1998)	General	There exists a positive relationship between financial development and domestic financial liberalization.
Claessens et al (1998)	General	Opening banking markets promote the quality of financial services and the functioning of national banking systems with lower profitability of domestic banks and positive implications for banking customers.
Bailliu (2000)	General	Potential destabilizing effects may exist between external financial liberalization, financial development and especially capital account openness.
Jaffee and Levonian (2001)	General	Savings rate and the level of GDP per capita as measured by bank assets, have positive effects on the banking system structure, branches and employees number for 23 transition economies.
Jakob et al (2003)	General	Credit to the private sector remained relatively low, although bank assets increased during 1990s. Foreign-owned banks have become major players in the financial system.
Toan do and Levchenko (2004)	General	Trade openness is associated with faster financial development in wealthier countries, and with slower financial development in poorer ones.
Jbili et al (2004)	Iran	Reduction in controls on credit allocation and rates of return will result in better financial intermediation.

Table 3: Summary of the Major Studies in the Financial Development Literature (Continued)

Girma and Shortland (2004)	General	Political stability and the degree of democracy are significant explanatory factors in determining the speed of financial development.
Huang and Jonathan (2005)	General	Increases in goods market openness are typically followed by sustained increases in financial depth.
Chinn and Ito (2005)	General	Growth in the banking sector is a prerequisite for equity market growth.
Huang and Temple (2005)	General	Goods market openness has a positive impact on financial development.
Huang (2005a)	General	The level of financial development in a country is determined by its institutional quality, macroeconomic policies, and geographic characteristics, as well as the level of income and cultural characteristics.
Huang (2005b)	General	Positive causal effects going in both directions, between financial development and private investment.
Huang (2006)	General	Any efforts by government to decrease macroeconomic policy uncertainty improve the regulatory framework and strengthen creditor and investor rights will be conducive to the development of financial markets.
Ang (2007)	General	Development of the financial system is shaped by financial sector policies.
Yildirim et al (2007)	Turkey	Credits help economic growth whereas deposits hinder it.
Koubi (2008)	General	Both the depth of financial markets and the stability of the rates of return on financial assets (stocks) are inversely related to the quality of government.
Dorrucci et al (2009)	General	Different levels of domestic financial development tend to be associated with the building up of external imbalances across countries.
Taghipour (2009)	Iran	Financial restraints have a negative impact on financial development.

As can be seen in Table 2 and 3, in the existing literature, financial development is found to decrease the cost of capital and is usually found to be in a positive

relationship with economic growth. Nevertheless the direction of the causality is difficult to prove. Hussein and Demetriades (1996) investigate this incidence for sixteen countries. They report evidence that in four of them the causality runs from financial depth to growth, in four cases causality runs from growth to financial depth, and in seven cases there is a feedback relationship between growth and finance. With reference to financial repression and growth, Roubini and Sala-i-Martin (1995) discover a negative relationship between financial repression indexes and growth. Korea is the only exception where financial repression helped to achieve significant growth in the export sector. Furthermore, the individual country case studies of Luintel and Demetriades (2001, 1997) and McKibbin and Ang (2007), demonstrate that economic growth has a positive impact on financial development.

In a recent study, Dorrucci et al (2009) measure domestic financial development in 26 emerging economics, based on the original database, methodology and complex indices, using mature economies as a benchmark. The authors use and group twenty-two variables according to three board dimensions: (i) Size of and access to financial markets; (ii) Institutions and regulations and (iii) Market performance. They find evidence that a process of financial convergence towards mature economies has already started in certain emerging economies. Finally, they conduct an econometric analysis showing that different levels of domestic financial development tend to be associated with the building up of external imbalances across countries.

On the other hand, Toan do and Levchenko (2004) investigate the effects of trade on the financial development. They build a model in which a country's financial development is an equilibrium outcome of the economy's productive structure. They test their model using data on financial development for a sample of 77 countries.

They find that trade openness is associated with faster financial development in wealthier countries, and with slower financial development in poorer ones. Like wises Jbili et al (2004) found evidence using Granger causality test that there is a feedback relationship between trade openness and economic growth. Regarding macroeconomic stability and development, the authors find that there is a positive and significant relationship connection between lower inflation and development in Iran. The authors argue that given the cross-country empirical evidence of a positive relationship between economic growth and financial development, it is possible that improvements in the financial structure would lead to better performance and gain, hence, higher economic growth.

In a comprehensive study, Huang (2006) provides an exhaustive analysis of causality between aggregate private investment and financial development for 43 countries. The author's analysis is conducted in two steps. One is a general factor approach on annual data allowing for global interdependence and heterogeneity across countries. The other is system Generalized Method of Moments (GMM) estimation on data for 5-year averages, indicating positive causal effects going in both directions and a high degree of persistence in the averaged data of private investment and financial development. The author reports evidence that the positive effect of private investment on financial development has important implications for the development of financial markets. He argues that since sound macroeconomic policies and a legal environment and favorable economic definitely facilitate private investment, any efforts by government to decrease macroeconomic policy uncertainty, improve the regulatory framework and strengthen creditor and investor rights will be conducive to the development of financial markets.

The theories of political economy of financial development discuss that financial development may be hindered if access to finance by potential competitors is denied in countries where a narrow elite controls political decisions. Girma and Shortland (2004) examine this hypothesis, with looking at the effect of regime stability on financial development. Their results show that political stability and the degree of democracy are significant explanatory factors in determining the speed of financial development. Their results also suggest that the banking sector benefits from increasing democracy and regime stability, and in fully democratic regimes, stock market capitalization grows the fastest.

Focusing on the banking sector, Jakob et al (2003) analyze the development of the banking sector in European transition countries. They find that foreign bank presence and financial development vary significantly among the transition economies. In general, foreign-owned banks have higher profitability levels than domestic banks. However, they document evidence that domestic and foreign bank performance tend to converge. Regarding to the banking sector development in transition economies, Jaffee and Levonian (2001) display that the saving rate and the level of GDP per capita as measured by bank assets, have positive effects on the structure of banking system.

Analyzing the financial development issue from a different perspective, Chinn et al (2005) analyzed the relationships among legal and institutional development, financial development and capital account liberalization. In a panel data analysis including 108 countries in a twenty year period ranging from 1980 to 2000, they investigate financial sector with various dimensions. Primarily, they examine whether financial openness can lead to equity market growth when they control the

state of legal and institutional development. Then, they test whether the opening of the goods sector is a prerequisite for financial opening. Ultimately, they explore whether a well-developed banking sector is a prerequisite for financial liberalization to lead to equity market growth. In addition, they investigate, whether bank and equity market growth are substitutes or complements. The authors report evidence that a higher level of financial openness contributes to the growth of equity markets only if a beginning level of common legal systems and institutions are achieved, which is more common among emerging market countries. The authors find evidence that across emerging market countries, a superior level of bureaucratic merit and order and law, beside lower levels of immorality, increases the effect of financial opening in promoting the growth of equity markets. They also find that the finance-related legal/institutional variables do not increase the effect of capital account opening as strong as the common legal/institutional variables. Their findings also show that the growth in the banking sector is a prerequisite for equity market growth, and that the improvements in these two types of financial markets have synergistic effects.

Yildirim et al (2007) analyze the subject of financial development and economic growth among provinces of Turkey using spatial econometric methods for the period 1991-2001. Furthermore, two alternative sub-periods, which are from 1991 to 1995 and from 1996 to 2001 are additionally considered to examine whether the financial crisis in 1994 has any fundamental altering effects on relationship between financial growth and economic development. Empirical results show that credits help economic development while deposits hamper it.

Demetriades and Luintel (2001) and Taghipour (2009) examine the role of financial restraints on financial development by specifying an equation for financial development including the measures of financial restraints in addition to other controlling variables such as, the real income and the real interest rate of deposits. They find a positive relationship between financial deepening and the degree of state control over the banking system joint with mild repression of lending rates, confirming the view that government involvement in the financial sector can improve economic growth by positively affecting financial development.

On the other hand, Koubi (2008) used a large cross section of countries to investigate whether political institutions related to government quality are important for financial markets. He finds that both the stability of the rates of return on financial assets and depth of financial markets are inversely connected to the quality of government as determined by the quality of bureaucracy and government's regards for the rule of the law and its fundamentals.

In an inspirational study, Huang (2005) studies the basic determinants of cross-country differences in financial development. He addresses two important tools for modeling uncertainty, he applied jointly Bayesian Model Averaging and General-to-Specific approaches to examine the financial growth effects of an extensive range of variables taken from different sources. The analysis suggests that the level of financial growth in a country is measured by its institutional quality, geographic characteristics and macroeconomic policies, as well as the level of cultural and earning characteristics.

The positive relation between financial development and domestic financial liberalization is supported by evidence (World Bank, 1989) although domestic financial liberalization is not without risks (Demirgüç-Kunt and Detragiache, 1998). Research on the positive correlation between external financial liberalization, financial development and especially capital account openness is argued in the panel data study of Bailliu (2000). However the author argues that potential destabilizing effects may as well exist.

Claessens et al (1998) show that opening banking markets promote the quality of financial services and the functioning of national banking systems, with lower profitability of domestic banks and positive implications for banking customers.

It can be concluded based on the review of the literature that there are many studies in the case of financial development which have been implemented by different methods for different countries. As Ang (2007) summarizes, development of the financial system is formed by financial sector policies, even though the positive correlation between economic growth and financial development is now a stylized fact as demonstrated by many empirical studies.

The present thesis aims to making a contribution to the literature by examining the impact of financial repression on financial development in Iran.

Chapter 4

THEORETICAL FRAMEWORK

From a theoretical perspective, the potential determinants of financial development can be listed as trade openness, economic growth, financial liberalization, savings, and inflation. Some of these variables are expected to have a positive impact and some of them are expected to have a negative impact on financial development. For instance, trade openness, economic growth, financial liberalization and savings are theoretically expected to have a positive impact on financial development whereas inflation is expected to have a negative or, in same cases, a positive impact on financial development (see Khan, 2002).

The rest of this chapter reviews the theories that explain the possible effects of these factors on financial development.

4.1 Economic Growth

Greenwood and Jovanovic (1990) and Saint-Paul (1992) explain that as the economy grows the costs of financial intermediation falls because of increased competition, which results in an increase in funds available for productive investments. However, these are not the only studies explaining the theoretical link between financial development and economic growth. For instance, the importance of income level in financial development has also been addressed by Levine (1997, 2003, and 2005). The author emphasizes that development of financial sector ought to be in place to drive economic growth. This is because; growth leads to promote development of the

financial system and provides motivation to deepen and to widen the system for financial intermediation.

Particularly, during periods of economic expansion, the financial sector is more developed; showing financing needs for further development as reaction to real activity (Shaw and Gurley, 1967; Goldsmith, 1969). That is, because of increased demand for financial services with increased per capita income, expansion of the financial system will be encouraged. Robinson's (1952) hypothesis states that when an economy expands, more financial products, financial institutions and services will emerge in response to larger demand for financial services. The cost of financial services involves a significant fixed component therefore with increasing the volume of transactions, average costs will fall. As such, wealthier economies have more demand for financial services and are more able to afford a costly financial system. This implies that financial development is crucially affected by the level of real economy activity (Ang, 2007). The most important theory which explains the impact of economic growth on financial development is the demand-driven hypothesis, according to which the growth of an economy will generate new demand for financial services. Such increase in demand in return, will result in further sophisticated financial intermediaries capable to meet the new demand for their services (Yartey, 2008).

4.2 Trade Openness

In recent years, many studies have discussed that financial development and trade may be correlated. For instance, Huang and Jonathan (2005) employed the cross-country and time–series techniques to investigate the relationship between finance

and trade. Their findings suggest that growth in goods market openness is followed by a continuous growth in financial development.

A number of other studies have supported the approach that policies which promote openness to external trade tend to improve financial development.

For instance, Huang and Temple (2005) employed time-series variation and the cross-country in openness and financial development, and they discovered a positive effect of goods market openness on financial development.

Theoretically, trade openness is expected to have an impact on financial development because a raise in the volume of trade increases opportunities for financial deepening and economic growth. Both these elements are bound to mobilize domestic savings and raise inflows, increasing liquid liabilities in favor of development of financial system. Therefore, capital inflows are also expected to have an impact on financial development because more capital inflows are expected to increase liquid liabilities and support further financial development (Taghipour, 2009).

From another theoretical standpoint, trade openness encourages economic activity and capital inflows. In support of credit growth, the former channel raises the pool of resources in the financial system. Also, significant increase in credit to the private sector emerges as a result of the latter channel. Equally, credit expansion is a result of capital inflow, which increases available resources in the financial system (Taghipour, 2009).

4.3 Financial Liberalization

According to financial liberalization theory, deregulating the domestic financial market and allowing the market to define the interest rate and controlling the capital i.e., credit, will help in macroeconomic stability and economic growth of countries. This theory is well explained by McKinnon (1973) and Shaw (1973), who explain that financial liberalization can promote economic growth by increasing investments and productivity.

Financial liberalization could be beneficial if it results in greater savings, reduction in cost of capital and adoption of improved governance practices (Mandel, 2009). The early hypotheses of McKinnon (1973) and Shaw (1973) postulated that liberalization would be associated with higher real interest rates and, so, it would stimulate savings and the higher saving rate would finance a higher level of investments, therefore, leading to higher economic growth. Overall, financial liberalization is expected to contribute to the efficiency with which markets can transform savings into investments and growth. Hence, according to this view, we should expect higher economic growth, investment and saving rates, as well as financial development following financial liberalization.

On the other hand, McKinnon (1973) and Shaw (1973) show that financial repression policies will have a negative impact on a country's economy. For example, interest rate ceilings cause an increase in the spread between deposit and lending rates. In this case, the government controls interest rates on bank operations, and, hence, commercial banks cannot compete neither on the market for deposits nor for loans. Furthermore, the regulation of financial markets, which implies interest ceilings, high

reserve ratios and credit programs, will lead to lower saving, lower investment and will have a negative impact on economic growth and financial development.

After the introduction of the financial liberalization theories by McKinnon (1973) and Shaw (1973), there has been a very widespread move to liberalize financial systems. This move toward financial liberalization has taken place since the mid-1980s, where many developing countries have got involved with extensive reforms of their financial system by liberalizing and making them more market oriented.

In contrast to financial repression, financial liberalization can be achieved when there is no government intervention in the presence of a free market economy with sufficient funds for investments. In this case, banks become involved in credit allotting among borrowers, and the quality and quantity of investments will increase as more funds become available and cost of funds falls.

Therefore, the McKinnon-Shaw school of thought proposes that government limitations on the operation of the financial system, such as reserve, liquidity requirements and directed credit programs, can inversely affect the quantity and quality of investment and therefore hinder financial development (Ang, 2007).

Furthermore, according to McKinnon-Shaw framework, interest rate controls and particularly interest rate ceilings, may distort the economy in many ways. For instance, it can discourage investors from investing in high-risk, but potentially high-yielding investment projects. Second, financial intermediaries might become more risk averse and offer preferential lending to existing borrowers. Third, borrowers prefer to invest only in capital intensive projects, while obtaining their funds at

relatively low cost (Ang, 2007). Overall, it can be concluded that financial liberalization is theoretically expected to lead to financial development.

However, it should also be mentioned that not all theories support this argument. For instance, Ang (2007) states that, liberalizing interest rates can not automatically lead to higher development of financial sector. For example, with deposit insurance, the absence of interest rate controls may result in overly risky lending behavior among banks due to moral hazard problems (Villanueva and Mirakhor, 1990; McKinnon and Pill, 1997).

4.4 Savings

Financial intermediaries, mobilize savings to investment projects. Consequently, we expect investments and savings to be significant determinants of development of financial sector (Yartey, 2008). This is because, in the presence of investment opportunities, the size of the financial system expands.

Increased number of investments mobilizes resources in the banking system, leading to an expansion in private credit growth. In other words, more investment increases demand for credit, increasing financial intermediation. Therefore, savings and investments are expected to result in financial development. On the other hand, savings and investments can be fostered by financial development. For instance, Huang (2005b) empirically explores the direction and existence of causality between financial development and private investments over the period 1970-1998 on a panel dataset of 43 developing countries. He displays positive causal effects going in both directions.

4.5 Inflation

Maintaining lower inflation is one of the most important national macroeconomic policies which have been documented to be beneficial to financial development. Ben Naceur et al (2007) and Boyd et al (2001) empirically, and Huybens and Smith (1999), theoretically, examine the effects of inflation on financial development. They found that economies with higher inflation rates are expected to have smaller, less active, and less efficient equity markets and banks.

Furthermore, inflation raises inflationary expectations and promotes capital outflow and discourages decisions for private activity. Therefore, demand for credit falls. Also, the supply of credit may be negatively affected as a result of a shrinking pool of financial savings since agents diversify away from liquid assets to keep away from the risk of the inflationary tax. Therefore, it is theoretically expected that inflation hinders financial development (Naceur et al, 2007).

Nonetheless, an alternative theory (see Khan, 2002) argues that low levels of inflation on the contrary of the expectation, may foster financial development rather than hindering it. Therefore, in the case of Iran, for instance, where inflation rate has traditionally been kept low, inflation may as well have a positive impact on financial development.

Therefore, in light of the theories pointed out in this chapter, it is expected that Economic growth, Trade openness and capital inflows, financial liberalization, savings have a positive impact on financial development and Inflation has a negative impact on financial development. The rest of this thesis is based on this theoretical

foundation. Theoretically, it is also expected that financial repression has a negative

impact on financial development.

Table 4 summaries the theoretical determinants of financial development.

Table 4: Theoretical Determinants of Financial Development

Determinants	References	Expected impact
Economic growth	Levine (1997, 2003, 2005)	+
Trade openness	Taghipour (2009)	+
Financial liberalization	McKinnon (1973) and Shaw (1973)	+
Savings	Yartey (2008)	+
Inflation	Huybens and Smith (1999)	-/+

As a result, this thesis will employ these variables to investigate the determinants of

financial development in the case of Iran.

Chapter 5

DATA AND METHODOLOGY

5.1 Data

This chapter introduces the data and the methodology used in the thesis. The data series include 41 annual observations from 1965 to 2006. All data have been obtained from the World Bank's World Development indicators (WDI) database. Data on financial repression has been obtained from Taghipour (2009).

One indicator is hardly enough to capture financial deepening to represent financial development. In this thesis, first, the share of money supply in GDP is considered. This is the most classic and practical indicator related to financial deepening. However, it can be argued that the ratio of broad money (M2) to nominal GDP shows the level of monetization rather than financial development. This is especially relevant in an economy such as Iran, where a part of M2 has increased during the sample period because of converting Petro dollars to Rial. As a result, because of monetization process rather than increasing financial intermediation, M2 may have increased relative to GDP during the period under study (Taghipour, 2009). Therefore, in this thesis, in addition to M2 as a share of GDP (M2GDP), we will also use two other proxies for financial development which are Domestic Credit to Private Sector (DCPS) and Domestic Credit Provided by Banking Sector (DCPB). Both series are also considered as a share of GDP. These two series capture the

effectiveness of financial intermediation process as represented by the volume of credits.

Consequently, in line with Demetriades and Luintel (2001) and Taghipour (2009), the following explanatory variables are used in this thesis:

lM2GDP (the logarithm of ratio of money and quasi money to Gross Domestic Product), lDCPB (the logarithm of domestic credit provided by banking sector as a percentage of GDP) and lDCPS (the logarithm of domestic credit to private sector as a percentage of GDP) were used as the dependent variable to represent financial development. On the other hand, lGDP (the logarithm of Gross Domestic Product (in current US dollars), INF (Consumer Price Index in annual percentages), FR (financial restraints index), lTR (the logarithm of trade as a percentage of GDP), lSAV (the logarithm of gross domestic savings as a percentage of GDP), and lRR (the logarithm of reserve requirement ratio) were used as the independent variables.

In this thesis, financial repression policies in Iran are proxied by an index (FR) which is introduced by Taghipour (2009) because, empirically it is not straightforward to capture the magnitude of financial repression and to measure its size. Taghipour (2009) constructed this index by combining reserve and liquidity requirements, interest rate controls, and directed credit programs using a procedure called Principal Components Analysis (PCA).[5]

In Iran the government used two kinds of interest rate controls. One of them is fixed deposit rate and the other one is fixed lending rate. To measure the strength of these

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[5] See Feridun and Sezgin (2008) for information on PCA.

controls, Taghipour (2009) used a dummy variable. If the interest rates control is severe, the dummy (DLR) takes the value of 1 and it takes the value of 0.5 if the interest rates are partially relaxed, and it takes 0 if it is freely determined by banking institutions. Taghipour (2009) also used a dummy variable (DCP) in order to measure the strength of directed credit program. When there is no evidence of a directed credit program, it is set to 0 and when the directed credit program respectively covers up to 5%, 5%-15% and more than 15% of total banks' lending, it is set to 0.5, 1 and 2. Taghipour (2009) also used data on reserve requirement ratio (RR) on bank deposits to capture the impact of the reserve and liquidity requirements. Taghipour's (2009) index contains all financial controls including reserve requirement, directed credits, and interest rate. He achieved the following overall index of financial restrains (FR) by using PCA:

$$FR = 0.358 * DCP + 0.658*DLR + 0.661*RR$$

where the weights for each component of the index is determined by PCA. The lower values represent less severe restrictions and controls on the policy variables, consequently indicating less financial repression, and vice versa.
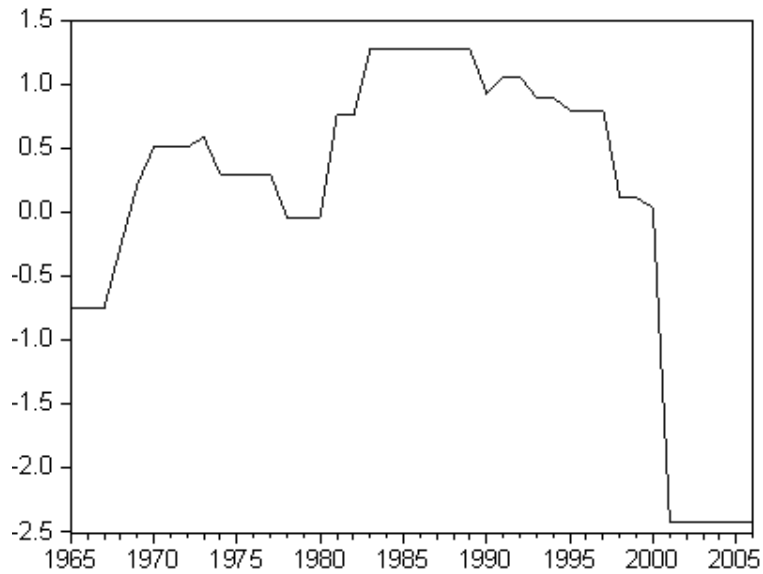
Figure 6: Financial Repression Index
Source: (Taghipour, 2009, p.5)

As can be seen in Figure 6, the index of financial restraints reflects many of the policy shifts that occurred in Iran over the period 1960-2005. The index indicates a slow increase in the level of financial repression during 1960s and early 1970s. As Taghipour (2009) explains, this behavior coincides with raises of reserve requirement ratio on deposits. In the early 1980s, with the nationalization of banks, the level of financial restraints increased which allowed the government to enforce its directed credits programs, to impose controls on the interest rates, and to impose high reserve and liquidity requirements. Except in the early 1990s, when the government increased the level of directed credits, this policy remained stable over the period 1983-97. In the following years, nevertheless, the index has fallen significantly which coincides with the partial deregulation of interest rates, relaxation of reserve and liquidity requirements, the elimination of the ceilings on total credit rates and the fall in directed credits (see Taghipour, 2009).

Based on the review of the theories on financial development and the review of the related literature, the following variables have been used in the thesis as summarized in Table 5.

Table 5: Dependent and Independent Variables and Data Sources

Variable	Data	Data Source	Symbol
M2/GDP	The ratio of money and quasi money to Gross Domestic Product	The World Bank's World Development Indicators (WDI)	M2GDP
Domestic credit to private sector	Domestic credit to private sector (% of GDP)	The World Bank's World Development Indicators (WDI)	DCPS
Domestic credit provided by banking sector	Domestic credit provided by banking sector (% of GDP)	The World Bank's World Development Indicators (WDI)	DCPB
Trade	Exports + Imports (% of GDP)	The World Bank's World Development Indicators (WDI)	TR
Gross Domestic Product per capita	GDP per capita (current US$)	The World Bank's World Development Indicators (WDI)	GDP
Gross domestic savings	Gross domestic savings (% of GDP)	The World Bank's World Development Indicators (WDI)	SAV
Inflation	Consumer Price Index (annual %)	The World Bank's World Development Indicators (WDI)	INF
Financial restraints index	Taghipour's (2009) index	Taghipour (2009)	FR
Reserve requirement ratio	Reserve requirement ratio	Taghipour (2009)	RR

The justification and explanation of the variables are presented as follows:

The first proxy for financial development is the ratio of broad money (M2) to GDP (lM2GDP). Higher lM2GDP shows a more developed financial sector and, consequently, greater financial intermediary development (Calderon and Liu, 2002).

The second proxy is the domestic credit provided by banking sector as a percentage of GDP (lDCPB). Higher lDCPB shows higher degree of dependence for financing upon banking sector (Kabir and Yu, 2007). Hence, higher values represent a more developed financial sector.

The third proxy is the ratio of Domestic Credit to the Private Sector to GDP (lDCPS), which isolates credit provided by banks to private sector (Levine and Zervos, 1996). Again, higher values represent a deeper financial sector.

The first independent variable is the ratio of Gross Domestic Savings to GDP (lGDS). Higher level of savings would mean that there are more funds in the economy to be channeled to borrowers (investors) through the financial intermediation process. Hence, savings are expected to lead to increased financial development.

The second independent variable used in this study is the ratio of trade (export + import) to GDP (lTR). Svaleryd and Vlachos (2000) find that there is a strong and positive relationship between domestic financial development and openness to trade.

Third independent variable is Consumer Price Index (lCPI). Khan (2002) argues that there is a critical inflation rate, below which, a modest rise in inflation can encourage real activity and promote financial development. Higher than this threshold hinders the efficient allocation of investment capital, and therefore have negative growth consequences. The threshold levels of inflation beyond which inflation significantly obstruct financial development is predicted to be in the range of 3-6 percent annual (Khan, 2002).

The fourth independent variable is Gross Domestic Product per capita (GDP). According to many empirical studies, there is a positive relationship between financial development and GDP per capita. For instance Goldsmith (1969) and King and Levine (1993) report a significant and positive relationship between GDP per capita and several financial development indicators. In addition, financial restraints index and reserve requirement ratios are used to proxy financial repression.

5.2 Methodology: Johansen Cointegration

Macroeconomic variables usually consist of non-stationary series in empirical economics. In empirical analysis, the treatment of non-stationary variables is important so that spurious regression can be avoided. If two or more non-stationary time series share a common trend, according to the cointegration concept they are said to be cointegrated. In this case the vector component of *Yt = (y1t, y2t,..., ynt)* are considered to be cointegrated of order *b, d,* indicated *Yt ~ CI (b,d)* if:

(i) All the components are stationary at *Yt* after n difference, or at order *d* integrated and noted as *Yt ~ I(d).*

(ii) In the existence of a vector   = (1, 2,...,) in such that linear combination

= 1 1 + 2 2 + ··· +   so that the vector   is named the cointegrating vector (Radam, 2009).

The main characteristics of this model are that the obtained cointegration relationship shows non-stationary variables with a linear combination, where all variables of the same order have to be integrated and finally if n series of variables are available, as many as n-1 linearly independent cointegrating vectors may exist (Radam, 2009).

Johansen's (1991) cointegration test is used to determine whether the linear combination of the series hold a long-run equilibrium relationship. By using the maximum likelihood based Maximum Eigenvalue and Trace test statistics introduced by Johansen and Juselius (1990), the number of significant cointegrating vectors in non-stationary time series can be tested.

The advantage of these tests is that they utilize test statistic that can be used to assess cointegration relationship between groups of two or more variables. Consequently, it is an advanced test because it can deal with two or more variables that possibly have more than one cointegrating vector in the system. Before testing for the number of cointegrating vectors which are significant, the several criteria such as Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HQ) are used to determine the vector autoregressive system lag length (Radam, 2009).

The procedure of Johansen, following a vector autoregressive model (VAR), involves the classification of rank of the $n \ x \ n$ matrix   in the condition given by:

$$\Delta \quad = \quad + \sum \quad \Gamma \ \Delta Y \quad + \Pi \quad + \qquad (1)$$

where Yt is the n variables column vector, Δ is the difference operator, coefficient matrices are Γ and Π, lag length is denoted by k and, δ is a constant. Π is a singular matrix, in which the absence of cointegrating vector implies that the cointegrating vector rank is equal to zero. In contrast, in a cointegrated scenario, the Π rank might be anywhere between zero and one. On the other hand, the Johansen cointegration

test is able to determine the number of cointegrating equations and this number is named as the cointegrating rank (Radam, 2009).

For the rank of Π the Johansen Maximum likelihood test involves the use of trace test (λtrace) and the Maximum Eigenvalue test (λmax). These test statistics are specified as follows:

$$(r) = -T \sum (1 -) \qquad (2)$$

$$(r, r+1) = -T \sum (1 -) \qquad (3)$$

where the number of series to be analyzed is denoted by p, the number of observations is denoted by T and the estimated eigenvalues is denoted by (Radam, 2009).

Chapter 6

EMPIRICAL RESULTS

6.1 Results of the Unit Root Tests

Prior to the application of the Johansen cointegration method, it is important to first verify the order of integration of each variable by carrying out unit root tests. Augmented Dickey Fuller (ADF) and Phillip-Perron (PP) tests are the most commonly used techniques for unit root testing. In both cases, the null hypothesis of a unit root is tested against the alternative hypothesis of no unit root (Banerjee et al, 1993). The ADF test is carried out by examining $= 0$ against the one sided alternative < 0 in the regression:

$$\Delta \quad = \quad + \quad t + \quad + \Sigma \quad \Delta \quad + \quad , \qquad t = 1, 2, \ldots, T \qquad (4)$$

where Δ denotes the first-difference operator, i.e. $(\Delta \quad = \quad - \quad)$ and $,$ is the error term. To produce a test that is similar in the presence of an unknown drift, the term t is usually included. In the present thesis, for the ADF test, the optimal lag length is determined using the Schwarz Information Criterion (SIC).

Banerjee et al (1993) observed that the results obtained by the ADF test are stronger than those obtained by any other unit root tests in the existence of autoregressive errors.

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The Phillip-Perron test, which has been revealed to be robust to a wide range of econometric problems such as serial correlation and time-dependent heteroscedasticity in the error term, is also carried out against the alternative that the series is stationary in the following regression by testing $= 0$:

$$\Delta \quad = \quad + \quad (t - T/2) + \qquad + \quad , \qquad t = 1, 2,\ldots, T \qquad (5)$$

where *(t-T/2)* denotes the time trend. The term *(t-T/2)* is eliminated from the equation if the series has a constant term of , but no time trend. If the PP and ADF tests accept the null hypothesis for the series in levels but rejects the null hypothesis for the series in first differences, then the series is supposed to have a unit root. The difference between the PP and ADF unit root test is that the former has better power and the latter has, in general, better size properties. In addition, the PP test corrects non-parametrically for possible autocorrelation and heteroscedasticity of the long-run co-variances. If two or more variables are I (1), then the possible cointegration relationship among these variables can be tested (Banerjee et al, 1993). Results of the unit root tests are presented in table 6.

Table 6: Results of the ADF and PP Unit Root Tests

Name of variables		ADF		Conclusion at the 5% level	Philips-Perron		Conclusion at the 5% level
		levels	difference		levels	difference	
lM2GDP	Intercept	-3.03	-5.59	I(1)	-3.13	-6.77	I(1)
	Trend and intercept	-2.97	-5.53	I(1)	-3.07	-7.42	I(1)
	None	-1.05	-5.67	I(1)	-0.92	-6.89	I(1)
lDCPS	Intercept	-1.62	-5.83	I(1)	-1.84	-5.83	I(1)
	Trend and intercept	-1.78	-5.75	I(1)	-2.04	-5.75	I(1)
	None	1.08	-5.75	I(1)	1.04	-5.75	I(1)
lDCPB	Intercept	-1.93	-5.99	I(1)	-1.98	-5.99	I(1)
	Trend and intercept	-1.63	-6.07	I(1)	-1.69	-6.07	I(1)
	None	0.34	-6.04	I(1)	0.32	-6.04	I(1)
FR	Intercept	-0.38	-5.85	I(1)	-0.66	-5.89	I(1)
	Trend and intercept	-1.02	-6.50	I(1)	-0.98	-6.50	I(1)
	None	-0.46	-5.88	I(1)	-0.75	-5.92	I(1)
lTR	Intercept	-2.22	-4.43	I(1)	-2.00	-4.46	I(1)
	Trend and intercept	-2.18	-4.37	I(1)	-1.98	-4.41	I(1)
	None	0.40	-4.46	I(1)	0.23	-4.49	I(1)
lGDP	Intercept	-1.26	-4.82	I(1)	-1.49	-4.81	I(1)
	Trend and intercept	-1.34	-4.76	I(1)	-1.62	-4.75	I(1)
	None	0.53	-4.71	I(1)	0.19	-4.70	I(1)
lSAV	Intercept	-2.12	-8.07	I(1)	-2.15	-8.10	I(1)
	Trend and intercept	-2.25	-8.00	I(1)	-2.27	-8.04	I(1)
	None	0.0008	-8.16	I(1)	0.10	-8.18	I(1)
INF	Intercept	-2.93	-7.07	I(1)	-2.78	-8.74	I(1)
	Trend and intercept	-3.06	-7.15	I(1)	-2.99	-16.57	I(1)
	None	-1.32	-1.32	I(1)	-0.98	-8.64	I(1)
lRR	Intercept	-2.34	-3.80	I(1)	-2.39	-6.37	I(1)
	Trend and intercept	-1.88	-4.23	I(1)	-1.93	-6.66	I(1)
	None	-0.64	-3.83	I(1)	-0.64	-6.43	I(1)

As can be seen in Table 6, all variables are integrated of order one, i.e. they are I (1). Therefore, they can be used in cointegration tests.

6.2 Tests for Multicollinearity

Prior to building each model, in the first step, the presence of multicollinearity has been investigated. Multicollinearity is an econometric issue which deserves attention because one of the elements that affect the standard error of a regression coefficient is the degree of correlation between one independent variable with the other independent variables in the regression equation. In the situation, where other things being equal, an independent variable, which is very highly correlated with one or more other independent variables, will have a relatively higher standard error. This means that the regression coefficient is unsteady and will vary greatly from one model to the next. This condition is known as multicollinearity. In other words, in a multiple regression equation, multicollinearity exists when an independent variable is highly correlated with one or more of the other independent variables. Multicollinearity is a problem since it weakens the statistical significance of an independent variable. Other things remaining the same, the larger the standard error of a regression coefficient, less likely it is that this coefficient will be statistically significant (Allen, 1997).

However, there is no rule of thumb for eliminating variables in a model based on their pairwise correlations. In the present analysis, variables which are correlated with a correlation coefficient of 0.55 or above are not used in the same model. In fact, initially variables up to 0.70 correlation coefficient were considered in the same model but it was observed that this resulted in unexpected changes in the signs and

significance of the variables when they are used in different combinations. Therefore, 0.55 seems to be a sensible threshold for eliminating correlated variables.

Table 7 shows the correlation matrix of variables. Correlation between the dependent variable and the independent variables is of no importance in terms of multicollinearity problem. In fact, it is preferable to have high correlation between independent and dependent variables.

However, correlations among independent variables are important as this may result in multicollinearity problem. As evident from the table 6 the pairwise coefficient of the independent variables of INF and lGDP, INF, as well as lRR, lTR and lSAV are correlated with a correlation coefficient of 0.55 or higher. Therefore, they are not used in the same models. Also FR and lRR are not used in the same models as lRR is already a component of FR index.

Table 7: Correlation Matrix of Variables

	lM2GDP	lDCPB	lDCPS	lGDP	lRR	lSAV	lTR	FR	INF
lM2GDP	1								
lDCPB	0.2579	1							
lDCPS	0.2098	0.77	1						
lGDP	0.5746	0.7058	0.65	1					
lRR	0.1494	0.3005	0.355	0.5466	1				
lSAV	-0.2127	-0.7275	-0.5877	-0.3821	0.1152	1			
lTR	0.0515	-0.5933	-0.1611	-0.2068	0.1562	0.6501	1		
FR	0.372	0.554	0.2183	0.4732	0.3829	-0.3307	-0.2777	1	
INF	0.2618	0.3959	0.1876	0.5546	0.6362	-0.042	-0.1174	0.4385	1

For each model, three separate financial development variables have been used to test if the results would be sensitive to the choice of the financial development indicator used.

Based on this consideration, the models which have been established with various combinations of the variables which yielded cointegrating relationships are summarized in Table 8. Only the combinations of the variables which yielded cointegrating relationships are reported to preserve space.

Table 8: Estimated Models with Cointegrating Relationships

Model	Variables
Model 1	M2GDP, GDP, SAV, FR
Model 2	M2GDP, TR, GDP, RR
Model 3	DCPB, INF, TR, FR
Model 4	DCPB, TR, GDP, FR
Model 5	DCPB, TR, GDP, RR
Model 6	DCPS, GDP, TR, RR

6.3 Results of the Johansen Cointegration Tests

In this section results of the tests which have indicated the presence of cointegration have been provided. In Johansen Cointegration analysis the first step is to determine lag lengths. There are several criteria available for this purpose. These are Sequential modified LR test statistic (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HQ). The results of the lag length selection process are not

reported in this section due to space limitations but the selected lag lengths and the selection criteria are reported in the Appendix.

In each case, up to 4 lags are considered until significant results are obtained. The results where the dependent variable and the independent variables are considered contemporaneous were not significant so they are not reported.[6]

In Johansen Cointegration tests, the Vector Autoregression (VAR) specification is chosen to be with intercept and no trend.

The results of the Johansen Cointegration tests which yielded a Cointegrating relationship are reported in Tables 9 - 14.

Table 9: Model 1 Maximum Eigenvalue and Trace Test Results

Ho	Maximum Eigenvalue Statistic	5% Critical Value	Trace Statistic	5% Critical Value
r = 0	31.61468*	27.58434	61.12912*	47.85613
r <= 1	15.61153	21.13162	29.51444	29.79707
r <= 2	9.402458	14.2646	13.90291	15.49471
r <= 3	4.500452*	3.841466	4.500452*	3.841466

Note: * denotes rejection of the hypothesis at the 5% level of statistical significance. Lag length is determined as 1 based on LR, FPE, AIC, SC, HQ (see Appendix).

In Table 9 the Trace test indicates one cointegrating equation at the 0.05 level. Also,

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[6] Alternatively, the independent variables are used after lagging one year because these variables theoretically expected to have impact on financial development with some delay. Since annual data is used in this study, lagging independent variables one period seem to be an appropriate approach to see the impact of these variables on the dependent variable after one period rather than measuring their contemporaneous effects.

Maximum Eigenvalue Test indicates one cointegrating equation at the 5% level.

Table 10: Model 2 Maximum Eigenvalue and Trace Test Results

Ho	Maximum Eigenvalue Statistic	5% Critical Value	Trace Statistic	5% Critical Value
r = 0	27.72849*	27.58434	60.29056*	47.85613
r < = 1	21.40919*	21.13162	32.56206*	29.79707
r < = 2	7.243135	14.2646	11.15288	15.49471
r < = 3	3.909741*	3.841466	3.909741*	3.841466

Note: * denotes rejection of the hypothesis at the 5% level of statistical significance. Lag length is determined as 1 based on LR, FPE, AIC, SC, HQ (see Appendix).

In Table 10, Trace test indicates two cointegrating equations at the 5% level. Also,

Maximum Eigenvalue Test indicates two cointegrating equations at the 5% level.

Table 11: Model 3 Maximum Eigenvalue and Trace Test Results

Ho	Maximum Eigenvalue Statistic	5% Critical Value	Trace Statistic	5% Critical Value
r = 0	34.07143*	27.58434	72.20667*	47.85613
r < = 1	26.27571*	21.13162	38.13525*	29.79707
r < = 2	10.09532	14.2646	11.85953	15.49471
r < = 3	1.76421	3.841466	1.76421	3.841466

Note: * denotes rejection of the hypothesis at the 5% level of statistical significance. Lag length is determined as 4 based on LR, FPE, AIC, SC, HQ (see Appendix).

In Table 11, the results of Trace test indicates two cointegrating equations at the 5%

level. Also, Maximum Eigenvalue Test indicates two cointegrating equations at the

5% level.

Table 12: Model 4 Maximum Eigenvalue and Trace Test Results

Ho	Maximum Eigenvalue Statistic	5% Critical Value	Trace Statistic	5% Critical Value
r = 0	48.65121*	27.58434	101.1346*	47.85613
r < = 1	28.62824*	21.13162	52.48341*	29.79707
r < = 2	23.72786*	14.2646	23.85518*	15.49471
r < = 3	0.127316	3.841466	0.127316	3.841466

Note: * denotes rejection of the hypothesis at the 5% level of statistical significance. Lag length is determined as 4 based on LR, FPE, AIC, SC, HQ (see Appendix).

In Table 12, Trace test indicates three cointegrating equations at the 5% level. In addition, Maximum Eigenvalue Test indicates three cointegrating equations at the 5% level.

Table 13: Model 5 Maximum Eigenvalue and Trace Test Results

Ho	Maximum Eigenvalue Statistic	5% Critical Value	Trace Statistic	5% Critical Value
r = 0	25.27313*	27.58434	51.76444*	47.85613
r < = 1	15.94692	21.13162	26.49132	29.79707
r < = 2	8.121073	14.2646	10.5444	15.49471
r < = 3	2.423326	3.841466	2.423326	3.841466

Note: * denotes rejection of the hypothesis at the 5% level of statistical significance. Lag length is determined as 1 based on LR, FPE, AIC, SC, HQ (see Appendix).

In Table 13, the result of trace test indicates one cointegrating equation at the 5% level. Additionally, Maximum Eigenvalue Test indicates no cointegration at the 5% level.

Table 14: Model 6 Maximum Eigenvalue and Trace Test Results

Ho	Maximum Eigenvalue Statistic	5% Critical Value	Trace Statistic	5% Critical Value
r = 0	30.71264*	27.58434	48.02838*	47.85613
r < = 1	9.265407	21.13162	17.31575	29.79707
r < = 2	7.286935	14.2646	8.050338	15.49471
r < = 3	0.763404	3.841466	0.763404	3.841466

Note: * denotes rejection of the hypothesis at the 5% level of statistical significance. Lag length is determined as 1 based on LR, FPE, AIC, SC, HQ (see Appendix).

In model 6, the result of Trace test indicates one cointegrating equation at the 5% level. Besides Maximum Eigenvalue test indicates one cointegrating equation at the 5% level.

As evident from the results presented above, both Trace and Maximum Eigenvalue statistics indicate that there is at least one cointegrating vector in each of the reported models.

The related cointegrating vectors for (CI) each model is presented respectively as follows. Standard errors are given in the parenthesis. It should be emphasized that due to the nature of the representation of the models, the signs of the coefficient are interpreted as the opposite of the reported signs in each case.

CI (1) = lM2GDP – 0.33677(lGDP) – 0.06957(lSAV) + 0.062966(lFR)
                  (0.06054)   (0.11413)   (0.07986)

CI (2) = lM2GDP – 0.26784(lTR) – 0.41783(lGDP) + 0.591555(lRR)
                  (0.12357)   (0.06084)   (0.19595)

CI (3) = lDCPB – 0.03247(lINF) + 1.108658(lFR) + 0.1426(lTR)
                  (0.01046)   (0.21531)   (0.1321)

CI (4) = lDCPB – 0.23377(lTR) – 0.33579(lGDP) + 0.164347(lFR)
                    (0.08876)   (0.03649)   (0.03937)

CI (5) = lDCPB – 12.2387(lTR) – 1.00088(lGDP) + 6.370229(lRR)
                    (2.79023)   (1.02905)   (3.61074)

CI (6) = lDCPS – 0.35551(lGDP) – 0.68726(lTR) + 0.877409(lRR)
                    (0.05393)   (0.11064)   (0.17742)

As can be seen from the results, in the models where M2GDP, DCPB and DCPS are the dependent variable, TR and GDP are significant with a positive coefficient which means that economic growth and trade openness have a positive impact on financial development. These finding are in line with the theoretical expectations.

On the other hand, in these models, FR and RR are negative which suggest that financial repression has indeed a negative impact on financial development as the theory suggest.

In the case where DCPB is the dependent variable, inflation has a positive sign. This is an interesting result as theoretically inflation is expected to inhibit financial development process.

However, as Khan (2002) argues, "there is a critical rate of inflation which below this rate modest increase in inflation can stimulate real activity and promote financial depth". This proposition seems to be verified by the results of the present study in the case of Iran.

Chapter 7

CONCLUSION

This thesis investigated the determinants of financial development in Iran in its post-revolution era and assessed whether financial repression has a significant impact on financial development using annual data spanning the period between 1965 and 2006. For this purpose, the time-series econometric technique of Johansen Cointegration analysis was used. It has been widely discussed in the financial development literature that repressive financial policies have an adverse impact on financial development process in developing countries, This thesis has verified this conclusion for the case of Iran through empirical research. In this respect, the present thesis lends support to the findings of Taghipour (2009) who concludes that financial restraints hinder financial development in Iran.

The results of the cointegration tests suggest that trade openness, savings and economic growth are statistically significant with a positive coefficient, which means that these variables have a positive impact on financial development in the case of Iran.

These findings lend support to authors such as Greenwood and Jovanovic (1990), Saint-Paul (1992) and Levine (1997, 2003, and 2005) who emphasize that development of financial sector is crucial to drive growth. This is because growth leads to promote development of the financial system and provides motivation to

deepen and to widen the system for financial intermediation. As Gurley and Shaw (1967) and Goldsmith (1969) point out, during periods of economic expansion, the financial sector is more developed, showing that financing needs force further development as reaction to real activity. The finding of this thesis regarding the impact of economic growth on financial development is therefore in line with this theory. The results suggest that, due to increased demand for financial services with increased per capita income, expansion of the financial system has been fostered in the case of Iran. This is indeed in line with Robinson's (1952) hypothesis, which states that when an economy expands, more financial institutions, financial products and services will emerge in response to greater demand for financial services.

Furthermore, as expected in light of the theory, trade openness has a positive impact on financial development. This suggests that an increase in the volume of trade in the case of Iran increases opportunities for financial deepening and economic growth. From another theoretical standpoint, trade openness encourages economic activity and capital inflows, which expands the pool of resources in the financial system.

In addition, the results suggest that savings have a positive impact on financial development in the case of Iran, which suggests that financial intermediaries in Iran efficiently mobilize savings to investment projects, in which case the size of the financial system expands. This is because increased amount of savings through deposits mobilizes resources in the banking system, leading to an expansion in private credit growth, increasing financial intermediation. Therefore, the finding that savings have a positive impact on financial development is in line with the theoretical postulations.

On the other hand, financial repression index and reserve requirement ratio have a negative coefficient, which suggest that repressive financial policies have indeed a negative impact on financial development process in the case of Iran. This is in line with the financial liberalization theory which was put forward by McKinnon (1973) and Shaw (1973). Theoretically, financial liberalization is expected to contribute to the efficiency with which markets can transform savings into investment and growth. Hence, according to this view, we should expect lower economic growth, investment and saving rates, as well as underdeveloped financial markets to the extend that the financial system is repressed.

As McKinnon (1973) and Shaw (1973) argue, the results obtained in this thesis suggest that in the case of Iran, financial repression policies have a negative impact on the country's economy. For example, interest rate ceilings cause an increase in the spread between deposit and lending rates. In this case, the government controls interest rates on bank operations, and, hence, commercial banks cannot compete neither on the market for deposits nor for loans. Furthermore, the regulation of financial markets, which implies interest rate ceilings, high reserve ratios and credit programs, lead to lower savings, lower investments and ultimately have a negative impact on financial development. This is an important issue for the Iranian economy because financial repression distorts the economy and hinders the financial development process.

First of all, financial repression limits the level of bank deposits and mobilizes banks resources and reduces the banks' income. Due to limited financial resources of banks in Iran, the major resources in the banking system consists of public deposits. Deposit interest rates are considered as the benchmark and interest rates are

determined with regard to the deposits interest rates. Consequently, reducing the interest rates of credit facilities depends on reduction in deposits interest rates. Secondly, it reduces government revenues by decreasing the number of available credit facilities. Furthermore, financial repression creates unaligned money market, reducing deposits interest rates, causing changes in the combination of deposits and increases activities in parallel markets, such as currency, real estate, and gold. In addition to this, financial repression causes investment repression due to negative real interest rates. Ultimately, financial repression creates economic rant due to low-cost banking facilities. While interest rates of credit facilities are lower than inflation rates, the willingness of people who use bank resources in Iran has increased. In this case, from one hand, banks face the lack of financing resources and on the other hand, due to the number of applicants demanding facilities, they face a low speed and spend long time and face unnecessary bureaucracy to promote the facilities. These circumstances provide primary creation of economic rant due to low-cost banking facilities (Bagheri, 2008).

An interesting finding of the thesis is that inflation has a positive impact on financial development in the case of Iran. This is an interesting result as theoretically inflation is expected to inhibit financial development process. It is normally expected that inflation increases inflationary expectations and encourages capital outflow and discourages decisions for private activity. Therefore, it reduces the demand for credits. Nonetheless, The finding that inflation has a positive impact on financial development is still in line with the theory discussed by Khan (2002) that there is a critical inflation rate (lower than 5% for industrial countries and 18% for developing countries), below which, a modest rise in inflation can encourage real activity and promote financial development rather than obstructing financial development in the

case of Iran. Since Iran did not have excessive levels of inflation in the period under study (the average of inflation rate in Iran during the period under study is 14.35), it seems to have supported financial development rather than hindering it by encouraging real activity.

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APPENDIX

Lag Length Selection Process

The results of lag length selection process are presented in the following tables:

Model 1: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-73.77990	NA	0.001001	4.444566	4.622320	4.505926
1	24.99518	169.3287*	8.90e-06*	-0.285439*	0.603332*	0.021365*

Note: * indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Model 2: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-44.25205	NA	0.000185	2.757260	2.935014	2.818621
1	65.42596	188.0194*	8.83e-07*	-2.595769*	-1.706999*	-2.288966*

Note: * indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Model 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-199.5375	NA	0.705092	11.00203	11.17618	11.06343
1	-112.0335	151.3584*	0.014877*	7.136944*	8.007710*	7.443929*
2	-100.6581	17.21674	0.019746	7.386925	8.954304	7.939500
3	-91.22490	12.23768	0.030667	7.741886	10.00588	8.540050
4	-82.44175	9.495297	0.053816	8.131986	11.09259	9.175739

Note: * indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Model 4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-86.12431	NA	0.001534	4.871584	5.045738	4.932982
1	38.58883	215.7200*	4.33e-06*	-1.004802*	-0.134035*	-0.697816*
2	52.64622	21.27605	4.97e-06	-0.899796	0.667584	-0.347221
3	62.19290	12.38489	7.68e-06	-0.550968	1.713025	0.247196
4	70.33717	8.804618	1.39e-05	-0.126334	2.834272	0.917419

Note: * indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Model 5: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-29.77946	NA	6.95e-05	1.777866	1.950244	1.839197
1	93.70970	214.4812*	2.44e-07*	-3.879458*	-3.017570*	-3.572805*
2	105.5753	18.11062	3.13e-07	-3.661857	-2.110459	-3.109881
3	118.7959	17.39560	3.92e-07	-3.515575	-1.274668	-2.718277

Note: * indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.

Model 6: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-26.61831	NA	5.43e-05	1.530915	1.699803	1.591980
1	112.6411	243.7039*	1.15e-07*	-4.632054*	-3.787614*	-4.326731*

Note: * indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level, FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion.