CHAPTER-1

INTRODUCTION AND METHODOLOGY OF RESEARCH
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Introduction and Methodology of Research

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CHAPTER 1

INTRODUCTION AND METHODOLOGY OF RESEARCH

1. Introduction:

Iran is an ancient country which was colonised by the Western countries such as Germany, Russia, Britain and USA. The country had become main attraction of the foreigners because of its rich natural resources of petroleum oil and gas. Iran is estimated to have 10.3 percent of the reserves of oil, putting Iran in the 3rd place in the world. According to the US Energy Information Administration, Iran's oil reserves will last over 80 years. Iran is also having the god gift of natural gas with 15.8 percent of global reserves. It is estimated that the natural gas reserves would last over a century at current level of production. Thus it is quite clear that the Islamic Republic of Iran is oil and gas monopoly of the world economy which is subject to cyclical fluctuations leading to vulnerability, highest level of inflation and high inventory cost.

In 60's and 70's Iran's economy was the most advanced country in the Middle East. The economy was crippled by 1979 Islamic Revolution subsequent to Iran-Iraq war and continuous bamabarding of US economic sanctions. Iran's nuclear development activities also create obstacles in the path of economic development of Iran.

1.1 Geographical Position of Iran:

Iran is situated in South Western Asia and its area is 1.684 million square kilometers. Its geographical location has been important to its politics and history. Iran is bound on the north by the Caspian Sea (740 km), the Azerbaijan Republic (611 km), Armenia (35 km) and Torkmenistan (992 km). To the west it shares borders with Turkey (497 km) and Iraq (1,458 km). To the South-West lie the Persian Gulf and the Sea of Oman and to the South-East Afghanistan shares a 936 km border and Pakistan a 909 km border with Iran.

Iran's Population is more than 70 million with an unemployment rate of 12 percent, inflation rate of 17.5 percent and GDP Growth rate is hardly 5.8
percent. It is evidently clear that the export led economy of Iran is still in the middle level of developing economy, even after revolution. Till today, Iran is not a part of sustainable economic development due to the oil price shocks, chronic economic mismanagement. The so called fruits of five year development plans don't reach the common man due to political instability and shocks from external forces.

1.2 Sources of Growth of Iran:

During the period 1960-2002, the Iranian economy grew at an average rate of 4.5 percent, which compares favorably with the rest of the countries in the MENA (MENA: Middle East and North Africa Countries) region (with average growth rate of 4.2 percent). This growth performance, however, shows a high degree of variability. Rapid growth in the 1960s and early 1970s was followed by a period of negative growth during the 1979 revolution and the war with Iraq which lasted into the 1980s. Growth rebounded following the post-war reconstruction and subsequent economic reforms.

Table 1.1 shows the decomposition of the sources of growth in Iran during the period, drawing on a selected issues paper "Economic Growth in the Islamic Republic of Iran." The negative contribution of TFP to economic growth and the relatively high rates of investment in physical capital (30 percent of GDP on average during 1960-2000) suggest that growth in Iran resulted from high savings and investment rather than from an efficient use of resources. Table 1.1 shows that while the investment of GDP ratio has been relatively high compared with high-growth countries, average GDP growth has been 50 percent lower.

In spite of great external shocks and internal political instability the wave of privatization in the 20th Century Iran is improving its economic conditions through industrialization at the cost of heavy subsidies, economic rent and Oil Stabilization Fund (OSF). The following Table 1.2 explain the economic status of Iran. It's real GDP growth rate has increased from 5 percent in 2000 to 6.5 percent in 2002. Iran is a highly inflation oriented economy.
### Table 1.1: Iran: Sources of Economic Growth, 1960-2002 (In percentage points)

<table>
<thead>
<tr>
<th>Period</th>
<th>Average Growth Rate</th>
<th>Contribution of Capital</th>
<th>Contribution of Human Capital</th>
<th>Contribution of TFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-1976</td>
<td>9.8</td>
<td>3.9</td>
<td>2.7</td>
<td>3.2</td>
</tr>
<tr>
<td>1977-1988</td>
<td>-2.4</td>
<td>1.7</td>
<td>5.5</td>
<td>-9.6</td>
</tr>
<tr>
<td>1989-2002</td>
<td>4.7</td>
<td>2.3</td>
<td>4.3</td>
<td>-1.8</td>
</tr>
<tr>
<td>1960-2002</td>
<td>4.6</td>
<td>2.1</td>
<td>3.7</td>
<td>-1.2</td>
</tr>
</tbody>
</table>

Sources: Central Bank of Iran, and IMF staff estimates.

### Table 1.2: Islamic Republic of Iran: Selected Economic Indicators

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP growth (factor cost, percentage change)</td>
<td>5.0</td>
<td>3.3</td>
<td>7.4</td>
<td>6.7</td>
</tr>
<tr>
<td>CPI inflation (period average, percentage change)</td>
<td>12.6</td>
<td>11.4</td>
<td>15.8</td>
<td>15.6</td>
</tr>
<tr>
<td>Unemployment rate (percent)</td>
<td>14.1</td>
<td>14.7</td>
<td>12.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Central government balance (percent of GDP)</td>
<td>8.7</td>
<td>1.8</td>
<td>-2.4</td>
<td>-0.2</td>
</tr>
<tr>
<td>Broad money growth (percentage change)</td>
<td>30.5</td>
<td>25.8</td>
<td>30.1</td>
<td>30.0</td>
</tr>
<tr>
<td>Current account balance (percent of GDP)</td>
<td>13.1</td>
<td>5.3</td>
<td>3.1</td>
<td>1.5</td>
</tr>
<tr>
<td>Overall external balance (percent of GDP)</td>
<td>6.9</td>
<td>3.9</td>
<td>4.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Gross international reserves (billions of U.S. dollars)</td>
<td>12.176</td>
<td>16.616</td>
<td>21,409</td>
<td>24,427</td>
</tr>
<tr>
<td>Public and publicly guaranteed external debt (billions of U.S. dollars)</td>
<td>7.953</td>
<td>7,215</td>
<td>9,250</td>
<td>11,924</td>
</tr>
<tr>
<td>Exchange rate (period average, rials per U.S. dollar)</td>
<td>8,078.1/</td>
<td>7,921/1</td>
<td>7,967</td>
<td>8,282</td>
</tr>
</tbody>
</table>

Sources: Iranian authorities, and IMF staff estimates.

1/ Average market exchange rates before the March 2002 exchange rate unification.
1.3 Iran's Position in Global Scenario:

As Iran is an export-led economy, its economic position in other oil producing MENA countries has to be taken into account by the researchers, policy makers and consultants in the international organizations such as World Bank, IMF and think tanks of developed countries. Today the GDP of Iran is contributed by Hydrocarbon (26.5 percent), industry by (17.1 percent) and services sector by (46 percent).

**Fig. 1.1: Economic Position of Iran**

Sectoral Composition of GDP at Factor Cost (Current Prices)

![Sectoral Composition of GDP](image)

Sources: Iranian authorities; and Fund staff estimates

**Fig. 1.2: Share of Non-hydrocarbon Exports by Major Trading Partners**

![Share of Non-hydrocarbon Exports](image)

Sources: Iranian authorities; and Fund staff estimates
1.4 Statement of the Problem:

High oil revenues and strong government spending have led to higher and less volatile economic growth in recent years. From 1992 to 1999 the Iranian economy grew by an average of 2.5 percent and was very volatile, thus economic growth declined from 4.1 percent in 1992 to -2.1 percent in 1993. The conditions improved slowly and the annual growth rate rose to 6.7 percent, in 1996. By contrast, the average economic growth over the succeeding eight years (2000-2007) was 5.2 percent and annual economic growth never declined below 4.7 percent in this period. The latest economic figures from the Central Bank of Iran put the 2007 economic growth rate at 6.9 percent. It is against this background this research work proposes to study and analyze the trends, direction and impact of exports, income growth and investment in the Islamic Republic of Iran in post revolution period. (1979 to 2004).
1.5 Objectives of the Study:
1. To analyze the performance of Iranian economy in terms of GDP growth rate.
2. To analyze the trends of oil exports and non-oil exports of Iran as an export-led Middle East economy.
3. To compare the Iranian development trends with other developing countries.
4. To evaluate the foreign trade policy of Iran.
5. To evaluate the role of foreign direct investment and its effectiveness on the internal economy of Iran.
6. To suggest some recommendations for policy formulation for increasing the level of income and investment in Iran.

1.6 Scope and Limitation of Study:
The present research work is particularly based on the secondary sources of data generated by various references and literature. The international organizations such as World Bank and Western Universities have expressed their views that they also face the problem of reliability of data. However, the researcher has tried to present an overall scenario of Iranian economy in terms of GDP growth, investment and exports during the post-revolution period.

1.7 Hypothesis:
1. Per capita income is expected to be positively correlated with tax structure because most of the revenues of Iran come from exports of oil.
2. The degree of international trade measured by the share of exports, imports has an impact on economic development of Iran.
3. Privatization and low subsidies can play a predominant role in mobilization of resources of Iran. However, there are many basic constraints such as authoritarian and restrictive policies of the Government, volatility of oil prices and risk in investment in both the private and government sector.
4. The macro-economic measures such as government revenue, expenditures, tax revenue and other fiscal measures might contribute to sustainable
growth of Iran. However the level of uncertainty and high unemployment and inflation prove to be the stumbling blocks in development process.

5. Iran has tremendous growth potential as it owns one of the highest natural resources of petroleum oil and gas. Growth performance of Iran is comparatively better than other developing Middle East and North Africa (MENA) countries. However, the economy suffers from structural imbalance such as lower GDP growth rate in comparison to other MENA countries.

6. Despite regional tension and pressure and strict US sanctions, Iranian economy performed relatively well, during 3rd five year development plan (FYDP 2004). However it lacks sustainability.

2. Methodology of Research:

The growth performance of Iranian economy is measured by Total Factor Productivity (TFP) defined as ratio of output to an aggregate measure of inputs which combines the quantities of all the factors of production. These factors consist of capital, labour and enterprises. The significance of unquantifiable factors such as technology and management innovations. Labour relations also become more important.

TFP growth should be considered an important economic indicator to be measured on a national and sector basis yearly and included in official government statistics. This would mark a crucial decision for the Iranian economy and its analysis. The government and responsible authorities like the ISC, Iran Management and Planning Organization, and Central Bank of Iran should concentrate their efforts to overcome limitations on data availability and bottlenecks to facilitate the estimation of TFP growth with minimum errors.

GDP at factor cost at constant prices is used as the measure of output in this analysis. The Asian Productivity Organization (APO) initiated a survey in 1998 to estimate and compare TFP based upon an agreed methodology in selected member countries in Asia and the findings were published. A second survey on the topic was organized by the APO in 2001.
2.1 Estimate of TFP Growth:

Measurement of TFP is based on the economic theory of production. The theory consists of a production function with a constant return to scale together with the necessary conditions for production equilibrium. Quantities of output and input entering the production function are identified with real product and real factor input as measured for social accounting purposes. In this survey, growth accounting, a statistical technique for dividing the growth rate of output into two sources of growth, was used for a variety of inputs and TFP growth. If \( Q \) represents output and \( K \) and \( L \) represent capital and labor inputs in physical units, respectively, then the aggregate production function can be written as:

\[
Q = F(K, L, t) \quad (Eq.1)
\]

The variable for time \((t)\) appears in \( F \) to allow for technical change. Technical change represents any type of shift in the production function. Thus slowdowns, speedups, improvements in the education of the labor force, and other factors will appear as "technical change."

It is convenient to start with the special case of neutral technical change (Solow) in which shifts in; the production function leave rates of substitution untouched, but simply increase or decrease the output form given inputs. In this case, the production function can be written in its special form:

\[
Q_t = A(t) f(K_t, L_t) \quad (Eq.2)
\]

Where,

\( Q_t \) = output during period \( t \), \( K_t \), and \( L_t \) = factor inputs (capital and labour) during period \( t \), and \( A(t) = \) technical progress, giving TFP as a function of time or cumulative effect of shift over time.

By differentiating equation Eq. 2 with respect to time, we have:

\[
Q = \frac{dQ}{dt} = A'f(K_t, L_t) + A \frac{\partial f}{\partial K} K' + A \frac{\partial f}{\partial L} L' \quad (Eq.3)
\]

Dividing the whole equation by \( Q \), we have:

\[
\frac{Q'}{Q} = \frac{A'f(K_t, L_t)}{Q} + A \frac{\partial f}{\partial K} \frac{K'}{Q} + A \frac{\partial f}{\partial L} \frac{L'}{Q} \quad (Eq.4)
\]
\[
\frac{Q'}{Q} = \frac{A'}{A} + A \frac{\partial F}{\partial K} \frac{K'}{Q} + A \frac{\partial F}{\partial L} \frac{L'}{Q}
\]  
(Eq. 5)

Where,
\[
\frac{Q'}{Q}
\]
is the proportionate rate of change in output.

Solow assumed that:
\[
St = \frac{\partial Q}{\partial L} \frac{L}{Q}
\]
\[
St = \frac{\partial Q}{\partial K} \frac{K}{Q}
\]

Where,
\[
S_l = \text{share of labour and } S_k \text{ share of capital, and this assumption means that factors are paid their marginal products under competitive equilibrium conditions. We can now write Eq. & as:}
\[
\frac{Q'}{Q} = \frac{A'}{A} + S_k \cdot \frac{K'}{K} + S_l \frac{L'}{L}
\]  
(Eq. 7)

Or as:
\[
Q_{tg} = \text{TFPG} + S_k K_{tg} + S_l L_{tg}
\]  
(Eq. 8)

Where \( Q_{tg}, \text{TFPG}, K_{tg} \text{ and } L_{tg} \) are the growth rate of output, TFP growth, capital growth, and labor growth over time, respectively, and TFP growth can be obtained from this equation.

Assuming a constant return to scale, where percentage change in input will bring the same percentage change in output, we also have:
\[
S_k + S_l = 1
\]  
(Eq. 9)

Since the rate of change of total factor productivity given in Eq. 2 is an instantaneous rate of change for the discrete time, we take the average of two consecutive periods, and therefore:
\[
\text{TFPG} = (\ln Q_r - \ln Q_{r-1}) \cdot \frac{1}{2} (\ln L_r - \ln L_{r-1}) - (\ln K_r - \ln K_{r-1}) \cdot \frac{1}{2} (\ln S_k S_{k,r-1} + \ln S_l S_{l,r-1})
\]  
(Eq. 10)

This is the equation used in the estimation of TFP growth. It should be noted that other participants in this survey project refer to Eqs. 8 and 10 Eqs. 2 and 5, respectively.
3. Data Sources:

The Iran Statistics Centre (ISC) and the Central Bank of Iran are the main producers of statistics and information in Iran. The ISC is subsidiary of the Iran Management and Planning Organization and was established in 1965. The statistical system in Iran is a centralized system according to its regulations and technical measures, but it is decentralized in relation to operational aspects. The ISC uses a special framework for conducting statistical surveys of different economic, social, and cultural sectors. It uses these frameworks to conduct general population and housing censuses by visiting all sites and registering all their current activities every 10 years.

The Central Bank of Iran as the second main producer of statistics conducts statistical surveys mostly in relation to economic sectors. The Central Bank also releases various publications, the most important of which is the yearly "balance sheet and economic report" which contains statistical tables on productions, costs, and national income; agriculture; fuel and power; mining and industry; buildings and housing; social affairs; government budgets and financial plans; conditions of foreign economies; banking, monetary and credit policies; capital markets; and price trends.

Description of Data:

Measures of Output: GDP at factor cost at constant prices is used as the measure of output in this analysis. The official estimates form the time series tables published by the Iran Management and Planning Organization were the main reference for this purpose. The figures also correspond to the national account figures.

Capital Stock:

Official estimate for capital stock were not published by any official organization, although the estimates were submitted to the author by the Economic Bureau of the Central Bank of Iran. They were estimated by the perpetual inventory method in current and constant prices and differentiated according to "structures" or buildings and "machinery". The capital stock includes inventory as well as fixed assets, and the official depreciation figures were also mentioned in the estimates, current and constant prices.
Employment:
The official employment figures were taken from the time series published by the Iran Management and planning Organization and were compared with those in other publications and the national accounts published by the ISC.

Income Share of Labour and Capital:
Figures for labour compensation were only officially available in the national accounts for 1991-98 and were used to calculate the relevant labour share and then to estimate the labour share figures for 1980-90 and 1999. The labour share figures for 1980-90 were assumed to be fixed and calculated as the average figure for 1991-98. This appeared preferable to the estimation of labour compensation with the present information.

(can be divided into four economic periods)
1. The Revolution Period (1979-80)
2. The Iran-Iraq War Period (1982-88)
3. The reconstruction period (1989-96); and
4. The political development period (1997-99)

5. Chapter Schemes:
Chapter-1 : Introduction and Methodology of Research
Chapter-2 : An Overview of Iranian Economy before 1979 Revolution
Chapter-3 : The GDP Growth Performance of Iranian Economy
Chapter-4 : Development Trends of Iran during FYDP
Chapter-5 : The Oil Sector of Iranian Economy
Chapter-6 : Foreign Trade Scenario of Iran
Chapter-7 : Inflation and Investment: Challenges for Public Authorities
Chapter-8 : The Comparison of Iran with other Countries
Chapter-9 : Findings, Conclusions and Policy Implications
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