Conference of Korea and the World Economy

An Overview of Industrial Policies
In Iran and Korea in 1960-2012

Behrooz Hady Zonooz,
June, 2013
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An Overview of Industrial Policies in Iran and Korea in 1960-2012
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Abstract
Primary objective of this paper is to explain why Korea has been successful in economic growth and industrial transformation while Iran has failed in this area. To explain the different performances of the two countries, we have looked at their initial level of industrialization, nature of political regimes and economic institutions, trade and industrial policies in the two countries. Our conclusions are as follows:

First, before 1960s, the level of per-capita GDP and industrial development in Korea was well above Iran, and Korea was better placed for long term growth and industrial development, than Iran.

Second, in the period 1960-1977, political regimes, planning organization and baking system were similar in both countries, and despite the fact that Korea adopted export oriented policy and Iran adopted import substitution policy, the economic growth and industrial development in Korea and Iran were quite high, compared to the other developing countries.

Third, in the period 1980-2012 Korean government liberalized its trade and FDI regimes, gave more role to markets and modified its industrial policies to facilitate entry of Korean economy to the knowledge based economy. Iranian economy, however, during a long period from 1979 to 2013, faced a revolution, a prolonged war, international sanctions, institutional disruptions, and contradictory shifts in economic policies. Better performance of Korean economy in this period can be attributed to its superior institutions and policies.

Fourth, even if Iran did not face with all of these adversaries, import substitution policy, coupled with no specific industrial policy, could not bring about the industrial transformation and competitive edge for the country:

- Export orientation of Korean economy, was beneficial for Korean entrepreneurs. They had better access to large and expanding export markets and technical know-how. Import substitution policies In Iran, before and after the Islamic Revolution, with its un-discriminated, unconditional and open-end protection, brought about adverse effects such as unproductive rent seeking and technological lethargy. Monopolistic structure of market for many manufacturing product and non-optimal scale of domestic oriented industries, gave rise to further inefficiencies.
- In Korea government policy toward FDI was restrictive almost until 1997. Although after this period, Korean government liberalized inward FDI, its policy was steel selective. In Iran in the period 1960-1977, government policy toward FDI was unrestricted and unselective. In the period 1979-1988, government expropriated foreign equity capital in the country. After that period, government revised its policies toward FDI and took certain measures to attract more FDI to the country. But unrestrictive and un-selective protection of inward FDI, gained almost no technology transfer or increase in exports of manufactured goods.
- In both countries transition from light and labor intensive industries to heavy and chemical industries, have taken place under government policies. In Iran this is realized mostly due to the government investments in metals, machinery and petrochemical industries. Diversity, technological sophistication and scale of heavy and petrochemical industries in Korea are much higher than that of Iran.
- Transition to high-tech and knowledge based industries in Korea, initiated earlier than Iran and was more successful.
- The Iranian government unlike Korean government, has never exerted a serious restriction on the entry and exit to any industry, and has never paid due attention to the economies of scale.
- In Korea most of government loans and subsidies have been given to chaebols. Chaebols have been reliable partners for government in providing information about markets, technologies, competitors, and in formulating and implementing industrial policies. In Iran government has never established official connections with the big businesses.
- , Koran government industrial rationalization program which was implemented in the beginning of 1980s was meant to improve the competitiveness of the industries. But its success was limited.

Key Worlds: industrial policy, trade policy, FDI policy, heavy and chemical industries, high-tech industries.
Introduction

As compared to Iran and with respect to the economic growth and industrial transformation, better performance of South Korean Economy in the period 1960-2012 is evident. The main objective of this article is to explain the role of industrial policy in different economic performances of the two countries.

To answer the main question of this research, this paper is organized in 6 sections. In the first section, theoretical and conceptual framework of research is discussed. In the second section a brief picture of the economic and industrial performance of the two countries is provided. In the third section, we have argued that different economic performances of these countries if not wholly but partly depends on the level of industrialization they had attained before 1960s.

In the fourth section, we have examined similarities and differences of political and institutional settings in both countries. Here we have given a glance at the political regime and the role of planning and banking institutions in industrial transformation of these countries.

Many scholars have argued the importance of trade regime for economic and industrial growth. In the fifth section, we show that South Korea (hence force Korea) has pursued import substitution and export promotion policies simultaneously, but Iran has followed the import substitution policy in the long run. Still, the two countries approach toward FDI also was fundamentally different at different stages of their development.

In the final section we have elaborated on the industrial policy at manufacturing sector and firm level in both countries. Here again, we observe a sharp contrast between the economic policies adopted in the two countries at different stages of their development.

1- The Theoretical Framework

Industrial policy is defined as the state intervention in the allocation of resources between different sectors of manufacturing and industrial organization of a specific sector within it, with the aim of accelerating economic growth and structural transformation of a country (Zonooz, 2003, p.162). Hence, industrial policy can be defined as any policy regime where incentives are intentionally non-neutral across industrial sectors.

There are essentially two approaches to the issue of policy: neoliberal and structural. The neoliberal approach is that the best strategy for all countries and in all situations is to liberalize, and not do much else. Integration into the international economy, with resource allocation driven by free markets, will let them realize their "natural" comparative advantage. This will in turn optimize dynamic advantage and so yield the highest rate of sustainable growth attainable. No government intervention can improve upon this but will only serve to reduce welfare. In this approach, the only legitimate role for the state is to provide a stable macro economy with clear rules of the game, open the economy fully to international product and factor flows, give a lead role to private enterprise, and furnish essential public goods like basic human capital and infrastructure. This approach has the backing of the industrialized countries and the Breton Woods institutions (which is why it is also referred to as the Washington consensus.). It has become enshrined in the new rules of the game being formulated and implemented by the WTO (Lall, 2004, p.1 and 2).

The structuralist view puts less faith in free markets as the driver of dynamic competitiveness and more in the ability of governments to mount interventions effectively. It questions the theoretical and empirical basis for the argument that untrammled market forces account for the industrial success of the East Asian Tigers (or, indeed, of the earlier industrialization of the presently rich countries). Accepting the mistakes of past
industrialization strategies and the need for greater openness, it argues that greater reliance on markets does not pre-empt a proactive role for the government. Markets are powerful forces but they are not perfect; the institutions needed to make them work efficiently are often weak or absent. Government interventions are needed to improve on market outcomes. Structuralists also accept that some industrialization policies have not worked well in the past. To the neoliberals this is a reason for denying any role for proactive policy both in past success and in future strategy: if there are market failures, the costs are always less than those of government failures. The structuralists, on the other hand, see a vital role for policy in industrial success. For them, therefore, past policy failure is not a reason for passive reliance on deficient markets but for improving government capabilities. They note that many poor regions that have implemented neoliberal policies recently have not experienced the industrial growth or export success that characterized more interventionist economies (Amsden, 2001). To them, a projection of current trends suggests that persisting with passive liberalization in the context of globalization will exacerbate rather than reverse divergence (Lall, 2004, p. 2).

The important point is that only developmental governments have the capacity needed for beneficial interventions in the market economies (Evans, 1995). In fact the nature of the political regime, determines the quality of bureaucracy, and this one in turn affects the quality of market institutions and government policies.

2- Economic and industrial Performance in the Period 1960-2011

In this section a brief picture of economic performance of the two countries is provided. For this purpose we have examined three sets of indicators, namely: growth rates, structural changes and foreign trade.

2-1 Economic and Manufacturing Sector Growth

In the period 1960-2011 GDP growth rate of Korea and Iran were 6.9 and 4.8 percent respectively (table 1). Due to the better performance of Korean economy and higher population growth of Iran, the gap between per capita GDP of the two countries widened tremendously. While per capita GDP of Iran was about 66.6 percent of Korea in 1960, this figure plunged to 13.7 percent in 2011.

Iranian economy in the pre-revolution period (1960-1977) performed better than Korea. However, following the Iranian revolution and during Iran-Iraq war period (1978-1988), Iranian economy experienced a major setback. Although in the period 1989-2011 the average growth rate of Korean economy decreased due to the financial crises in 1997 and 2008 and narrowing down the technological gap between Korea and major industrial powers; however in this period the growth rate of Iranian economy was less than Korea (table 1).

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>9.2</td>
<td>-2.2</td>
<td>4.9</td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>8.3</td>
<td>7.8</td>
<td>5.4</td>
<td>6.9</td>
<td></td>
</tr>
</tbody>
</table>

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran</td>
<td>13.3</td>
<td>2</td>
<td>8.4</td>
<td>8.7</td>
<td></td>
</tr>
<tr>
<td>Korea</td>
<td>18</td>
<td>12.5</td>
<td>7.3</td>
<td>12.1</td>
<td></td>
</tr>
</tbody>
</table>

1. Central Bank of Islamic Republic of Iran, National Accounts (1960-2011)
2. www.worldbank.org/data
As far as the performance of manufacturing sector is concerned, Korean economy has done better than Iranian economy, both before and after the Iranian Revolution (table 1).

2-2 Structural Changes in the Economy and Manufacturing

While the Korean economy has rapidly expanded, the entire structure and other dimensions of the economy have undergone drastic changes. The miraculous economic growth has transformed the economy from mostly agricultural to a major new industrial power. The exceptionally fast growth of the manufacturing and social overhead capital sectors (networks of transportation, communications, electricity, water and sanitary services) chiefly led the structural changes, as well as economic growth. The expansion of industrial sector was impressive and came to dominate the economy (table 2). In comparison to the modern industrial sector, agriculture, the backbone of the economy before World War II, has lost its dominance. It now accounts for about 3 percent of GDP in the country.

Table 2: Composition of GDP in Iran and Korea (1960-2011) (percent)

<table>
<thead>
<tr>
<th></th>
<th>Iran</th>
<th>Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Forestry and Fishing</td>
<td>17.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Oil, Gas extraction and Mining</td>
<td>34.2</td>
<td>30.7</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>4.2</td>
<td>6.8</td>
</tr>
<tr>
<td>Power, Water and Gas</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>Construction</td>
<td>2.7</td>
<td>5.7</td>
</tr>
<tr>
<td>Services</td>
<td>41.7</td>
<td>49.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

1. Central Bank of Islamic Republic of Iran, National Accounts (1960-2011)

Although the Iranian economy has experienced similar structural transformation, but there are major differences between Iran and Korea in this respect:

First, in 2009 primary sector's (agriculture and mining) share in Iran's GDP was about 22.5 percent. While in Korea primary sector has much less importance (table 2).

Second, in 2009, the share of manufacturing value added in Iranian economy was much less than that of Korea (table 2).

In Korea, within the manufacturing, the sectors that expanded most rapidly were the chemical, metal, electrical, machinery, equipment and textile industries. Over time, the industrial sector has also become more capital and technology intensive. The dynamic industrialization in South Korea that began with light consumer goods after the Korean War quickly advanced into heavy and chemical industries (HCIs) and then into high-tech industries. The industrial scene is now marked by plants requiring relatively high skills and technology, such as the manufacture of electrical machinery, electronic appliances, electronics, chemicals, transport equipment, ships and high-tech products.

Table 3: Composition of Manufacturing Value added In Iran and Korea (1960, 1977 and 2009)

<table>
<thead>
<tr>
<th></th>
<th>Iran</th>
<th>Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods and Beverages</td>
<td>20.7</td>
<td>12.2</td>
</tr>
<tr>
<td>Textiles and clothing</td>
<td>33.5</td>
<td>20</td>
</tr>
<tr>
<td>Chemicals</td>
<td>11.3</td>
<td>8</td>
</tr>
<tr>
<td>Machinery and transport equipment</td>
<td>19.3</td>
<td>15.4</td>
</tr>
<tr>
<td>Other</td>
<td>15.2</td>
<td>44.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

1. The Central Bank of Islamic Republic of Iran, National Accounts
2. The World Bank, Data.worldbank.org
Manufacturing sector in Iran also experienced structural changes in the period 1975-2008:
First, the relative importance of food and textile industries in manufacturing sector of Iran declined as it did in Korea (table 3).
Second, the relative importance of chemicals and machinery and transport equipment in Iran increased as it did in Korea but rather to a lesser degree (table 3).
Third, the development of high-tech industries in Iran unlike Korea started late and at present is at its infancy.

2-3 Foreign Trade Performance

In the period 1960-2011 Iran relied mainly on oil export to earn hard currencies. Adoption of import substitution strategy also discriminated against non-oil exports. In 1977 and 2011 the share of oil and gas export in merchandise export was 93.2 and 81.6 percent respectively. In the early years of development the foreign trade deficit was covered by foreign aid and loans. But after the Revolution government access to international financial markets was reduced dramatically and negative oil price shocks had serious consequences for domestic economy.

Unlike Iran, in Korea government primarily relied on US aid for reconstruction of the country after the Korean War (1954-1960). But in the years of rapid industrialization in 1960-1990 Korean government knew that it should rely on the export of manufacturing goods to earn hard currencies, it therefore, followed export promotion strategy. That is why rapid industrial growth in Korea went hand in hand with rapid growth of manufacturing products export. In Korea for about 30 years the foreign trade deficit was mainly covered by foreign loans.

The evolution in the size and composition of manufacturing products export in the two both countries, shows the high degree of competitiveness of this sector in Korea and failure of Iranian economy in penetrating into the international markets and changing its position in international division of labor (tables 4 and 5).

| Table 4: Foreign Trade Performance of Iran and Korea (1960, 1987 and 2009) (in million US $) |
|----------|----------|----------|----------|----------|----------|----------|
|          | Iran     |          | Korea    |          |          |          |
| Imports  | 650      | 14070    | 77805    | 344      | 10811    | 524413   |
| Exports  | 636      | 9216     | 144874   | 32       | 10048    | 555214   |
| Foreign  |          |          |          |          |          |          |
| trade    | -14      | -4854    | 67069    | -312     | -763     | 30801    |
| balance  |          |          |          |          |          |          |
| Source:  | http://unctadstat.unctad.org,  |
| Central Bank of IRI, Economic Indicators, 2011 |

| Table 5: Value of Non-oil Export in Iranian Economy, 1962, 1977, and 2009 (in million US $) |
|----------|----------|----------|----------|----------|----------|
|          | 1962     | Percentage share | 1977     | Percentage share | 2009     | Percentage share |
| Agricultural and traditional products | 193.2 | 89.1 | 443 | 70.9 | 4133 | 23.1 |
| Mining products | 7.4 | 3.4 | 46.6 | 7.5 | 702 | 3.9 |
| Manufacturing products | 16.3 | 7.5 | 135.6 | 21.7 | 13094 | 73.0 |
| Iron and steel | 0 | 0 | 0 | 0.0 | 1041 | 5.8 |
| Organic chemical product | 0 | 0 | 17.7 | 2.8 | 2436 | 13.6 |
| Aluminum, copper and zinc | 0 | 0 | 0 | 0.0 | 915 | 5.1 |
| Plastic materials and products | 0 | 0 | 0 | 0.0 | 2301 | 12.8 |
| Non-metallic mineral products | 2.3 | 1.1 | 2.2 | 0.4 | 1286 | 7.2 |
| Textiles and clothing | 4.3 | 2.0 | 24.3 | 3.9 | 260 | 1.5 |
year  | 1962 | Percentage share | 1977 | Percentage share | 2009 | Percentage share
---|---|---|---|---|---|---
Automobiles and its spare parts | ... | ... | 13.1 | 2.1 | 473 | 2.6
Non-organic chemical products | 0 | 0 | 0 | 0.0 | 349 | 1.9
Carpets and floorings | 0 | 0 | 0 | 0.0 | 277 | 1.5
Jewelry | 0 | 0 | 0 | 0.0 | 146 | 0.8
Washing powder and soap | 4.2 | 1.9 | 16.1 | 2.6 | 169 | 0.9
shoes | 2.9 | 1.3 | 8.1 | 1.3 | 125 | 0.7
Sweets | 0 | 0 | 11.3 | 1.8 | 0 | 0
Other products | 0 | 0 | 0 | 0 | 3316 | 18.5
Non-classified goods | 2.6 | 1.2 | 42.8 | 6.8 | 39 | 0.2
Non-oil export | 216.9 | 100 | 625.2 | 100 | 17929 | 100

Table 6: Share of the top 10 export items in total exports of Korea (percent)

<table>
<thead>
<tr>
<th>Rank</th>
<th>1961</th>
<th>1980</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Iron ore</td>
<td>13.0</td>
<td>Garments</td>
</tr>
<tr>
<td>2</td>
<td>Tungsten</td>
<td>2.6</td>
<td>Steel plate-rolled products</td>
</tr>
<tr>
<td>3</td>
<td>Raw yarn</td>
<td>6.7</td>
<td>Footwear</td>
</tr>
<tr>
<td>4</td>
<td>Coal</td>
<td>5.8</td>
<td>Ships</td>
</tr>
<tr>
<td>5</td>
<td>Cuttlefish</td>
<td>5.6</td>
<td>Audio equipment</td>
</tr>
<tr>
<td>6</td>
<td>Live fish</td>
<td>4.5</td>
<td>Man-made filament fabrics</td>
</tr>
<tr>
<td>7</td>
<td>Graphite</td>
<td>4.2</td>
<td>Rubber products</td>
</tr>
<tr>
<td>8</td>
<td>Plywood</td>
<td>3.3</td>
<td>Woods and wood items</td>
</tr>
<tr>
<td>9</td>
<td>Rice</td>
<td>3.3</td>
<td>Video equipment</td>
</tr>
<tr>
<td>10</td>
<td>Swine bristle</td>
<td>3.0</td>
<td>Semiconductors</td>
</tr>
<tr>
<td>Sum</td>
<td>62.0</td>
<td>47.6</td>
<td>61.3</td>
</tr>
</tbody>
</table>

3- Economic Development and Manufacturing Experience Before 1960

The fundamental transformation of Korean economy began when the peninsula's economy was an integral part of Japanese empire as a colony before 1945 (1910-1945). Its real GDP and population under colonial rule approximately tripled and multiplied twofold, respectively, resulting in a rise in per capita GDP of about 52 percent, from $745 to $1094 in year 2000 prices, which was about one third of that of Japan at the time (Ohakawa and Rosovsky 1973:89, cited in Young-Iob Chung, 2007, p. 7). The average annual increases in aggregate and per capita GDP during the 40 year period were about 3 and 1.2 percent respectively. The rates of increase were not spectacular, but they certainly showed solid gains in comparison to earlier traditional (before 1876) and transitional (1876-1904) periods, as well as to many underdeveloped economies at the time (Ibid).

Accompanying the economic growth were substantial changes in the nation's economic structure during the shift from an agrarian to a semi-industrial economy during the period. It is estimated that from 1910-12 to 1939-1941, the real value added in manufacturing grew by more than 10 percent per year on average. Country’s foreign trade also expanded and changed over time. By 1936-1940, manufacturing goods accounted for more than 40 percent of exports, which in turn comprised well over a quarter of commodity production(Ibid, p. 8).

Japanese colonialism left a rich legacy of capital, including human capital and institutions more substantial than those typically found under Western colonialism. After World War II Korean economy faced with two major blow. The first was the collapse of Japanese economy, in which Korean economy was highly integrated. The collapse meant not only a loss of vital spare parts, capital, human resources and other necessities but also of markets. In
manufacturing and construction, the number of operating establishments in South Korea fell from 10000 in 1943 to 4500 in 1947-48.

Second, a further blow to the Korean economy was the partitioning of the nation into two separate and independent countries. There was a vast difference between their industrial structures, with mainly light industries in the south and heavy and chemical industries (HCIs) in the north. In 1940 the area that became North Korea produced about 54 percent of Korea's industrial output and 86 percent of the heavy industries.

In addition the country went through the catastrophic Korean War. The physical destruction to property in South Korea during the war has been estimated at a quarter of its infrastructure and $3 billion (in 1953 prices); which was more than 2.3 times its GDP in 1953. In the manufacturing sector the production level fell by about 75 percent between 1949 and 1951 (Ibid: 11). It is clear that without foreign aid, the South Korean economy would not have remained viable, especially in the early years of independence following the Korean War (Ibid, p. 9).

After the armistice in 1953, South Korea continued to experience many economic problems. Severe shortages hampered daily life. Per capita GDP in 1953 was only $67 (equivalent to about $778 in year 2000 prices), and its net commodity production level was estimated to have been 27 percent lower than it was in 1940. Moreover, heavy defense expenditures shifted resources away from investment and development (Ibid, p. 13).

In spite of these obstacles, the South Korean economy gradually shifted onto the road to recovery and eventual economic success. In the nine year period between 1953 and 1961, the economic growth was moderate at 3.3 percent per annum and per capita GDP growth rate of 1 percent. Few advances were made beyond prewar levels. Most economists agree that the war-torn economy had more or less recovered around 1958, and industrial production reached the pre war level in about 1960 (Ibid).

Iranian experience was rather different. New manufacturing industries in Iran were established in 1880s by foreign and domestic investments. But most of the newly established industries went bankrupt due to foreign competition and backward infrastructure of the country (Ashraf, Ahmad, 1980).

In the period 1900-1925 three textile factories, one lumber mill, one match factory, one weaving mill and one soap factory were established in Iran. Number of employees in these 8 factories was not more than 3500 and their products were sold at local markets (Bahrier, Julian, 1971, ch. 9).

Great push for industrialization in Iran came later, during the years 1926-1947. At the end of this period number of large industrial establishments (employing 10 or more workers) was 136 and number of their employees was about 40421. Sugar processing, cotton textiles, match industry and cement factory were among most important enterprises which were established in this period. Most of the industries established in 1930s were state owned enterprises.

In the years 1926-1947, tariffs were increased dramatically, new banks were established, higher education institutes were found, roads and rail-roads were constructed, and internal security in the country was improved. All of these measures insured the success of new industries at this phase of development in the country.

The years between 1947 and 1955 were the period of political instability and economic uncertainty. In this period Iranian economy witnessed, economic recovery. Preparation of the First Development Plan (1948-1955) and nationalization of oil industry were the products of this recovery period. In this period some measures were undertaken for reorganization and completion of state owned enterprises and projects. Annual reports of Bank Melli show that the years 1947-1952 were the period of industrial recession. The main reason for this was competition from imported goods which was abundant after the World War II. The
nationalization of Iranian oil industry also had adverse effects on the industrial development. Due to lack of government revenue, Rials 5.3 million which was earmarked for industrial projects in the First Plan, decreased to 1.4 million (Bahrier, Ibid).

In the period 1953-1960 industrial sector of Iran experienced a rapid growth. Production of sugar, tea, cigarettes, cotton and woolen textiles, match and cement increased rapidly during this period (Bahrier, Ibid).

The brief picture which was given here shows that in the beginning of 1960s, Korean economy was better placed for rapid economic growth and industrial development. As Amsden argues, countries in that industrialized rapidly after World War II, had accumulated manufacturing experience in the prewar period (Amsden, 2001, p. 99).

4- Political and Institutional Setting: Similarities and Differences

Governments intervene in the market economies by institution building, economic planning, direct investment, and policymaking. The institutional capacity of states for beneficial interventions in economy differs dramatically across countries and different periods. Industrial policy design and implementation requires a developmental state which is independent from private sectors influences, meritocratic and in the mean time cooperative with private sector (Evans, Peter, 1995). Here, first we will briefly look at the political regimes in Iran and Korea and compare their capabilities, and then will examine the crucial role of planning and banking institutions in economic and industrial development of the two countries.

4-1 Nature of Political Regimes in Korea and Iran

In South Korea, the authoritarian and highly centralized government of the military regime set the acceleration of economic growth as its primary goal and played the central and most crucial role in it. Cole and Lyman, along with Jones and Sakong, noted that the key to effective planning in the new military-led administration was that of government that embraced economic growth as a primary objective and as principal legitimizing factor of its holding the power (Cole and Lyman, 1971, P. 80). Also the World Development Report for 1983 observed that "single minded attention to economic growth" was a significant factor in promoting the country's economic development. All the regimes installed in South Korea after the 1961 military coup set rapid economic development, as accompanied by the maintenance of a strong military defense capacity against North Korea as the country's most important goal.

Transformation of authoritarian regime to a democratic one in Korea was realized peacefully in 1987. Under the new political system also economic development was the most important priority for Korean government.

In Iran like Korea, an authoritarian and centralized government was set up after the 1953 coup de tat, whose main objective was modernization of Iran through rapid industrialization. Military strength was also justified by the government to face treats from communism and regional rivalry.

Both Korean military generals and Shah's regime had close political, economic and military ties with United States and western world. Both of these regimes established a mixed economy in which private sector was protected by state subsidies.

After the Iranian Revolution the course of events and policies changed dramatically. Modernization was interpreted as westernization of an Islamic country and came under fire. Private entrepreneurship was identified as dependent bourgeoisie and exploitative nature of
big businesses were morally condemned. The close political and economic ties with west collapsed and replaced by hatred and pessimism.

Due to this paradigm shift private enterprises were mostly replaced by state owned enterprises. Foreign direct investments as well as domestic big businesses were expropriated and export of oil reduced to minimum to curtail the economy's dependence on oil.

These policies were predominant during the first ten years after the Islamic Revolution. But after the Iran –Iraq War in 1988, when the First Five Year Development Plan was approved, Iranian economy witnessed a dramatic policy change and since then heavy interventions of government in the markets was avoided. However the foreign policy of Islamic Republic of Iran (IRI) still had an unfriendly connotation toward western powers.

With respect to the meritocracy in public sector, we must say that Korea in the period 1960-2012 had highly qualified technocrats whose employment and promotions were under close watch of high ranking administrators. In Iran this was partly exercised before 1978, but was totally neglected following the Islamic Revolution. During the Iran-Iraq War, ministries were full of low rank, unqualified and low paid staff. However new generation of managers and technocrats were trained in the first 10 years after the revolution who undertook the reconstruction of Iranian economy after Iran Iraq War. Iranian bureaucracy experienced another blow in the period 2004-2013 when a populist government took office in Iran. Again this had a negative effect on the quality of bureaucracy, economic policy and resource allocation in the country.

4-2 Plan and Budget Organization

In Korea and Iran economic planning had important role in economic and industrial development. State planning apparatus in both countries had crucial role in laying down the foundations of infrastructures, health and education systems, direly required for economic development.

In Korea government established the Office of Planning under the Prime Minister in 1952, which was responsible for submitting the annual budget. It later organized a separate Ministry of Reconstruction, which was responsible for planning reconstruction and development, followed by the new Economic Development Council in 1958. Finally, in the executive branch of the government, a pioneering principal office in charge of nation's economic development and investment programs, the Economic Planning Board (EPB) was created in 1961. The EPB combined the functions of planning, economic management, and budgeting. It was supplied with omnipotent power for promoting the expansion of industrial capacity and enhancing the level of operation and profitability of existing capacity. While the office had the dominant voice in development strategies, including the nation's investment and its financing, the Ministry of Finance had the control over supervision of organized financial institutions.

Within the EPB, a capital import bureau was established, and its power extended to the area of foreign borrowing. It was also given the power to guarantee loans and audit and oversee the activities of the borrowing firms. The EPB was given the power to select the capital-goods imports and importers that qualified for government-aided deferred payment privileges. Finally when the power to approve and extend incentives to foreign direct investment (FDI) was transferred from the Ministry of Finance to the EPB, it effectively gained complete control over Korea's importation of foreign capital. These responsibilities naturally gave the EPB a strong say over the money supply and industrial policy as well.

EPB had close ties with the private sector and directed it to achieve the planed goals for industrial development.
The new military government in Korea undertook a series of ambitious five-year economic plans aimed at converting the still overwhelmingly agricultural economy into an industrialized one. The economic development plans had better than expected results. Annual economic growth typically outpaced plans.

In the Fifth Five Year Plan (1982-1986) the government of Korea had accepted that Korean economy and world market have become so much complicated that its direct management is impossible. That is why indicative planning was adopted and markets were given bigger role to play. In the Fifth Plan period financial and import liberalization were adopted. It should be noted that at international level also these years were coined by privatization and market orientation.

In December 1994 Economic Planning Board was merged into the Ministry of Economy and Finance (Tofigh, 2004, ch, 6).

In Iran the Plan Organization was created in 1948 and the First Development plan (1949-1955) was approved by the parliament in the same year. In 1962 the Plan Organization took the responsibility for preparing government budget and subsequently its name changed to Plan and Budget Organization (PBO). After the Revolution in 2000, State Administration and Employment Organization merged with the PBO and the latter's name changed to Organization of Management and Planning (OMP). But this merger did not brought about a valuable reform in government administration. Eventually in 2007 OMP was dissolved and became the Office of Vice Presidency for Strategic Planning, and Supervision (Zonooz, 2010).

In Iran like Korea PBO formulated and supervised the implementation of social overhead investment projects. In both countries government undertook some major projects in oil refining, fertilizer, petrochemicals and iron and steel.

Unlike Korea PBO in Iran did not have close tie with the private sector and the responsibility of FDI and Foreign loans was held by the Ministry of Economic Affairs and Finance.

Despite the fact that the Economic Council was given the responsibility of overseeing PBO in 1972, and its secretariat was placed in PBO, its main preoccupation was to decide on the allocation of financial resources to big projects by ministries or state owned enterprises. It never succeeded in coordinating the government monetary, fiscal and trade policies.

The First Development Plan of Iran (1948-1955), failed because of oil embargo and the World Bank refusal to give a long term loan to Iran. Before the Revolution the Second, Third, and Fourth Development Plans were implemented successfully. But the Fifth Five Year Plan (1973-1977), failed because of abundant financial resources and limited absorptive capacity of the economy (Zonooz, 2010).

After the revolution, economic planning in Iran was abandoned for ten years (1978-1988), partly because of ideological prejudices against it and partly because of Iran- Iraq War. After the War, in the period 1989-2004, three plans were approved and implemented. The most successful of which was the third Development Plan (2000-2004). But the Fourth Development Plan which had been approved by the parliament was abandoned by the new government, because of anti-liberalist attitudes of it.

4-3 the Role of Banking Sector in Financing Industries

Banking sector played a very important role in financing manufacturing sector in the early stages of economic take off in both countries. In 1960s and 1970s, development banks were owned by state and in both countries state authorities had a considerable control over the credit allocation.
In Korea, Development Bank, Medium Industry Bank, and Export-Import Bank, owned by the state and had a prominent role in financing manufacturing sector of the country.

In Korea the major portion of the nation's investment was financed with domestic resources, in both the public and private sector. Most loans were extended to promote the designated industries and sometimes particular enterprises that were considered by the government to be critical to the nation's economic development. "Entrepreneurial" projects, capital and technology-intensive industries, and large corporations were favored. A relatively small number of large businesses, especially the Chaebols, received the lion's share of loans after 1953.

Loans to the targeted industries and firms were made on favorable terms, including low interest rates and often with a long maturity period, to both public and private enterprises, which varied depending on the type of industry to which the loans were extended and the personal connections and contacts the borrowers had with the government.

The government directly allocated about 70 percent of domestic credit until about 1978 and the allocation of loan-able funds did not become subject to market forces until about 1980s. Commercial banks were instrumental in implementing a comprehensive system of selective credit allocation to ensure the flow of funds to chosen industries and firms. Korean government has been flexible with its financial policies over time, however (Young-Iob Chung, pp172 and 173).

Along with its credit policy, the government controlled the organized financial intermediaries and regulated interest rates for most of the period after World War II. For most of the period it followed a repression policy, starting with a very harsh policy in the early years and gradually relaxed more recently to the point where the capital market has more or less returned to normal free market.

Not only the business that received bank loans had to meet the official and objective benchmarks based on both economic rationale, but they were also subjected to unofficial, subjective, and administrative discretion.

In Iran the Industrial Credit Bank (ICB) was established in 1955 by the Plan Organization. The main objective of ICB was to provide long-term loans to private industries. The state provided 90 percent of ICB and remaining funds were financed through foreign loans which were guaranteed by the state. In 1960s and 1970s about 30 percent of loans provided to industrial sector in Iran were given through ICB.

The Industrial and Mining Development Bank (IMDB) was a private joint venture bank which was established by the joint initiative of Iranian government and the World Bank in 1959. Foreign partners provided 40 percent of the initial capital and 60 percent of it was paid by domestic partners. Initial capital of the bank only accounted for 12 percent of its resources, and the rest of it came from long term government and foreign loans (Karshenas, 1995, pp 146,147). In the period 1960-1977 between 30 to 40 percent of private sector's investments in manufacturing and mining were financed by long term loans from IMDB.

After the Revolution, ICB and IMDB merged and a new bank by the name of Industry and Mining Bank (IMB) was formed. In the post Revolution period, the role of this bank in providing long term and medium term loans to private sector was decreased, due to two factors. First, government did not provide enough transfer payments or loans to the bank. Second, commercial banks started providing long term and medium term loans to different sectors as well as manufacturing and mining sectors under the new Islamic Banking Law (1982).

After the Revolution, financial repression policies were adopted by the Central Bank of Iran and credit rationing became prevalent. But manufacturing sector because of long digestion period of investments and higher risks inherent in this sector, was not favored by banks for credit distribution.
There are two other problems facing private sectors financing in Iran. One is the free entry to the manufacturing sector. Due to this policy there are always too many new projects with below optimal scale and technology, which usually end up with the wastage of resources. The second is the unsupervised credits, which is usually used for speculative purposes.

5- Trade and FDI Policies in Korea and Iran

Trade and FDI policies are interlinked with industrial policy. Actually late industrialization involves protection of domestic industries to overcome technological backwardness through learning process. In the meantime trade orientation and FDI policies have strong implications for access to larger markets hence economies of scale and filling the technological gap and enhancing competitiveness of manufacturing sector.

5-1 Import Substitution and Export Promotion Policies in Korea and Iran

As we know Korea and Iran followed different policies in foreign trade. Adoption of two different approaches toward foreign trade, in these countries is not accidental, and its roots lie in their differences in the natural resource endowments.

Lack of natural resources in Korea (Annex table 1), has urged the Korean government to pursue export promotion policies in early 1960s. To fill the gap between domestic savings and investment and the gap of foreign exchange (which was urgently needed for the rapid industrialization of the Korean economy), Korean government heavily depended on foreign loans in 1960s and 1970s. In the meantime government of Korea was well aware that in the long run it should earn foreign currencies through export promotion to be able to pay back the loans.

In Korea the currency was devalued in May 1964 from 130 to 255 won per United States dollar and in March 1965 a unitary floating exchange rate was adopted. Selected import markets were liberalized to supplement the outward-looking strategy, since high-cost or low-quality inputs could harm the competitiveness of exports. However, most domestic markets were protected until the end of the 1970s (Somi, 2001, p124). Along with these policy measures, the government intensified incentives to exporters. The export incentive system allowed exporters to deduct various taxes (domestic commodity taxes, and income taxes), giving them accelerated depreciation. A formal system of wastage allowances permitted exporters to import, on preferential terms, a greater amount of intermediate inputs than required in production. Among these incentives, the export credit subsidy was the most significant incentive scheme (Ibid). This played a critical role in supporting export industries until the mid-1980s, when the Republic of Korea's current account recorded a surplus.

The export oriented growth strategy was a wise choice but it was not the only reason why Korea's economy performed so well during the period 1963-1972. Korea had a well trained labor force and dynamic entrepreneurs. The world trade environment was also favorable to developing countries in the 1960s.

Contrary to Korea, Iran had an easy access to hard currencies by exporting crude oil (Annex table 1), so import substitution policy was adopted in the country for a long time without paying due attention to the export promotion.

In Iran to facilitate cheap importation of machinery and intermediate goods, foreign exchange rate deliberately kept low for a long period despite the fact that inflation rate in the country was higher than its trading partners. For example in the period 1968-1972, the exchange rate of Iranian currency against US dollar was almost kept fixed, despite the fact that wholesale price index changed in the same period by about 21.6 percent. In the period 1973-1977, the value of the US dollar was cheaper than previous period and was fixed
between 67.6 and 70.6 Iranian Rials. In this period whole sale price index increased as much as 54.7 percent (Zonooz, 2000, pp. 100 and 103).

After the revolution, a multiple exchange rate system with rationing of foreign exchanges was adopted, followed by managed floating exchange rate system for ten years (2002-2012). In 2013 heavy oil sanctions caused disruption of this system and a multiple exchange rate was established again.

Other factor which hindered the export promotion policy in Iran can be attributed to the fluctuation of real exchange rate in the country due to unanticipated changes in terms of trade, caused by changes in crude oil prices in the international market.

Different natural resource endowments in the two countries also had far reaching implications for institutional capacity building and economic management. Actually in Korean government had felt the necessity of better business environment to enhance economic development much better than the government of Iran. In fact raising tax revenues to finance social over head investment and earning of hard currencies to import machinery, intermediate goods and technology, wholly depended on the competitiveness of Korean economy. While in Iran the primary source of government budget and foreign exchange revenue was export of crude oil. So we can suggest that the Korean government was forced to design its foreign trade and industrial policies in such a way to overcome the main obstacles of its development. But in Iran, government having access to an easy source of revenue did not fill such an urgent need.

In Korea the import substitution policy was simultaneously followed with export promotion policy. Government of Korea made access to the banking system credits and allocation of foreign exchange to the Industries, conditional to their export performance. Another feature of Korean incentive system was its selectivity. By this we mean that in each period certain industries which had priority for development were selected for protection (Amsden, 1989).

In the 1960s with its export promotion program, government of Korea, eliminated rent-seeking opportunities and encouraged positive-sum activities by entrepreneurs with the exchange rate reform (Jones and SaKong, 1980). It provided export subsidies, which can be considered as a compensation for the knowledge spillover (positive externalities) exporters generated for other domestic producers by finding new markets or products. The subsidies were given in proportion to the export performance, which acted as a clear and objective criterion for success. They were also given to all export activities regardless of the sectors or industries. The government held a monthly cabinet-level meeting with representatives from the private sector to discuss and solve export-related problems. The government also has focused on education and training to support export industries (SaKong and Koh, 2010).

Foreign trade played a pivotal role by encouraging innovation and accelerating resource reallocation. It also enabled Korea to learn from advanced countries and take advantage of the vastly expanded global market. Entrepreneurs responded to changing circumstances by committing themselves to pioneering new markets and new products. The government provided institutional and physical infrastructure essential for their activities (Ibid).

In Iran, however, inward looking policies, coupled with unconditional, in-discriminatory and open-end subsidies to domestic industry, brought about unproductive rent seeking and technological lethargy under monopolistic market structure.
5-2 FDI Policies in Korea and Iran

Another important theme of Korean state intervention is the policymakers’ attitude towards foreign firms. Korean policymakers have regarded assimilation of advanced technology by domestic firms as a vital condition for effective industrial upgrading. To them, this meant tight state control over foreign direct investment. Of course the persistent saving gap had to be filled, but Korean policymakers tried to avoid foreign direct investment and contracted (all state-guaranteed) foreign loans to do the job, if they could afford it. As a result the share of foreign direct investment in total foreign capital inflow (except foreign aid) from 1962-83 was a mere 5 percent (Amsden, 1989, p.92, table 5).

Although restrictions on foreign direct investment have been weakening in later years, even Law for Importation of Foreign Capital (amended in 1988) – which was regarded as a liberal one by Korean policymakers- specifies that foreign direct investment should be restricted in priority industries, infant industries, industries using large quantities of imported raw material, consumer (especially luxury) goods industries, polluting industries and agriculture and fishery – which can mean practically all industries, if the state so wishes. Even when foreign direct investment was allowed, foreign majority ownership was practically banned, with some rare exceptions, outside the free trade zones (FTZs). The fact that only 6 percent of multinationals in Korea (including the ones in the FTZs) are wholly-owned subsidiaries compared with 50 percent in Mexico and 60 percent in Brazil, suggests a substantial degree of state control over foreign direct investment in relation to ownership (Evans, 1987, p. 208). Even technological licensing, which was preferred to foreign direct investment whenever feasible, was subject to heavy restrictions. For example the 1988 version of the Law for Importation of foreign capital clearly states that technological licensing is banned in industries where local technological capability is deemed to be promising – which, again, can effectively mean any industry.

For the 42 year period between 1953 and 1994, the share of FDI, which accounted for 0.2 percent of GDP, was less than 1 percent of total investment in the country. While the bulk of FDI projects was jointly owned with Korean businesses until about 1984, notable changes resulted in a rise in the number wholly owned or majority–owned foreign subsidiaries in later years ( Young-Iob Chung, 2007, pp303and304). Korea adopted more friendly policy in respect of inward FDI after the financial crises of 1997. The stock of inward FDI after this year surged in Korea (Figure 1).

Iran unlike Korea adopted more liberal policy toward FDI in pre- revolutionary era. In 1955 the law of attraction of FDI passed by Iranian parliament. In the period (1962-1977), about $ 3.3 billion FDI was absorbed, 29.6 percent of which was invested in oil industry and rest of it was mainly invested in manufacturing sector of Iran (Zonooz, 2000, p. 137). Multinationals policy at that time was to erect assembly lines in the country and sell their products in the domestic market, which was growing fast.

After the Islamic Revolution, government's attitude toward FDI was hostile and expropriated all foreign investments in the country. After the Iran –Iraq War, Iranian government revised its policies and made several attempts to attract FDI to the country, buts its efforts were not fruitful, because of prolonged tensions with western world, political instability in the country and unfavorable business environment (Zonooz, 2000, ch, 4). In the year 2002 a new law for FDI was passed by legislature to ease inward FDI. According to the law there is no restriction for investment in different sectors of Iranian economy. The only exception is prohibition of joint venture in oil and gas industries which is based on the constitution of IRI.

In the period 2003-2011 inward FDI increased (Figure 1), but new sanctions in 2012 and 2013 by UN and industrial countries halted this trend.
Both before and after the Iranian Islamic Revolution, unrestricted and unselective attraction of FDI has not helped Iranian manufacturing sector very much in technology transfers or in opening up foreign markets.

**Figure 1: Inward FDI stock, (1980-2011) (US $ at current prices and current exchange rates in millions)**

Source: UNCTAD, STAT.

## 6- Industrial Policies in Korea and Iran

In this section we will briefly overview the industrial policies in its limited meaning in the two countries. By this we mean: picking up the winners (or priority sectors), the role of Cheobols in Korea's industrialization, and industrial rationalization program.

### 6-1 Priority Sectors in Korea and Iran

Most of Korea's major industries have been designated as priority sectors at some stage and were developed through a combination of massive support from and heavy control by the state. The designated industries had priority in acquiring rationed (and often subsidized) credits and foreign exchange, state investment funds, preferential tax treatment (for example tax holidays, accelerated depreciation allowances) and other supportive measures, including import protection and entry restrictions. In return for this support, they became subject to state controls on technology (for example production methods, products), entry, capacity expansion and prices (Ha-Joon Chang, 1994, p, 113).

The practice of giving priority to certain industries identified as important is a common practice in industrial-policy states such as France and Japan. In Korea the practice originated in the very early years of economic development, with the designation of cement, fertilizer, and oil refining in First Five Year Plan(FYP)(1962-1966) as basic industries. In the second FYP (1967-71), chemicals, steel and machinery were designated as priority sectors. And during the Third and Fourth FYP (1972-81), especially through the HCI program (announced in 1973), non-ferrous metals, shipbuilding and electronics were added to the Second FYP's list of priority sectors. The practice continued in the Fifth and Six FYP periods (1982-91), during which machinery, electronics, automobiles, chemical, shipbuilding and various high-tech industries (semiconductor, new materials, biotechnology) were designated priority sectors. In the Seventh Economic and Social Development Plan (1992-1996), government aimed at the development of high-Tech industries including micro-electronics, new materials, fine chemicals, bio-engineering, optics and aviation (Tofigh, 2004, ch.6). Changes in the priority sectors in Korea are shown in table (7).
Korean government had tight performance monitoring system. The monthly export-performance monitoring by the Korean state is already famous, but all firms in promoted industries were required to report not just on their export performance but also on their performance in other areas. Failure to report regularly and/or false reporting could result in the imposition of fines and prison sentences (Ha-Joon Chang, 1994, p. 113, p114).

The biggest challenge for Korean industry in the 2000s was how to deal with restructuring between industries that are able to handle the changes resulting from market opening and technological advancement and those industries that have trouble dealing with these challenges. In addition, there was the need to effectively select and develop future growth engines.

In the light of the country’s resources and industrial structure, it is generally agreed that the Korean government and business should focus on advanced technology industries, parts and materials sector, and knowledge-based service industries as the sources of future growth. These new growth industries are not only expected to play the leading role in forging the future of the Korean economy, but also influence the development of existing industries. In addition, the “green growth” economic strategy for the next 60 years as outlined by the Lee Myung-bak administration is expected to influence the future growth of some industries.

From the early 2000s, Korea started to foster the development of new advanced industries under such programs as “next-generation growth engine businesses,” “basic development plan for bio-technology,” “comprehensive development project for nano-related technology,” and “development plan for convergence technology.” These efforts will require large financial investments and long lead times since Korea now lacks the core technologies in these areas.

As for science and technology, Korea has reached the level where it can be at the forefront of global efforts in making scientific and technological breakthroughs. (SaKong and Koh, 2010, ch, 3).
### Table 7: Korea’s Transition toward a Knowledge Economy

<table>
<thead>
<tr>
<th>Development Stage</th>
<th>1960s</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Policy</td>
<td>Fact-Driven</td>
<td>Investment-Driven</td>
<td>Innovation-Driven</td>
<td></td>
<td></td>
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<tr>
<td>Support Export Development</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote Heavy and Chemical Industries</td>
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<td></td>
<td></td>
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<tr>
<td>Shift from Industry Targeting to R&amp;D</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide Information Infrastructure and R&amp;D Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote New Engines of Growth and Upgrade R&amp;D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S&amp;T Policy</td>
<td>MOST/KIST</td>
<td>Government Research Institution</td>
<td>National R&amp;D Plan</td>
<td>Information</td>
<td>Universities Leading Role</td>
</tr>
<tr>
<td>- S&amp;T Promotion Act</td>
<td>- Technical and Vocation Schools</td>
<td>- Private Sector Initiatives in R&amp;D</td>
<td>- E-Government</td>
<td>- Efficient NIS</td>
<td></td>
</tr>
<tr>
<td>- Five-Year Economic Plan Including S&amp;T</td>
<td>- R&amp;D Promotion Act</td>
<td>- Daedeok Science Town</td>
<td>- GRI Restructuring</td>
<td>- RIS and Innovation Clusters</td>
<td></td>
</tr>
</tbody>
</table>

In Iran apparently a similar pass from light industries to heavy and chemical industries and then to high-tech industries have been followed by policymakers (table 9), but close examination of Iranian experience shows that we have not reached the same level of industrial development as Korea did.

Actually having in view the rich natural resources of gas and mining in Iran, it may be argued that, development of petrochemical and metal industries in Iran is an obvious opportunity. Government of Iran decided to develop these industries by state owned companies, through turnkey contracts, before the Revolution (1968-1977) and after the Revolution (1988-2004). In practice in some projects such as Isfahan Iron and Steel and Arak aluminum project, selection of inappropriate technologies, and small scales, has increased the cost of production.

The execution of many large projects, were delayed, due to managerial shortcomings and Iran-Iraq War (1980-1988). Iranian engineers and technicians did not acquire necessary capabilities to implement similar projects after the completion of projects in their hand. Due to long delays in the completion of petrochemical projects, Iran's entry to the international markets has become difficult.

In Auto industry, machine making and electrical appliances Iran has not made any considerable progress in the long run, and failed to establish and expand competitive enterprises in these fields.

Development of high-tech industries in Iran started very late in 2000s. Iranian government started its efforts in high-tech industries by setting up government companies in nanotechnology, micro-electronics, bio-technology, aerospace, and atomic energy (for peaceful purposes). But commercialization of R&D in these areas has been delayed for various reasons.

Establishment of necessary infrastructures for a knowledge based economy and E-government also has not gone properly. The World Bank indicators show the large gap between Iran and Korea in this respect (table 8). In the table, two indicators of knowledge economy are shown: Knowledge Index (KI) measures a country's ability to generate, adopt and diffuse knowledge. This is an indication of overall potential of knowledge development in a given country. The Knowledge Economy Index (KEI) takes into account whether the environment is conducive for knowledge to be used effectively for economic development. It is an aggregate index that represents the overall level of development of a country towards the Knowledge Economy.

<table>
<thead>
<tr>
<th>Country</th>
<th>Iran</th>
<th>Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank (2012)</td>
<td>94</td>
<td>29</td>
</tr>
<tr>
<td>Change in rank</td>
<td>1</td>
<td>-5</td>
</tr>
<tr>
<td>KI</td>
<td>4.97</td>
<td>8.65</td>
</tr>
<tr>
<td>Innovation</td>
<td>5.02</td>
<td>8.8</td>
</tr>
<tr>
<td>Education</td>
<td>4.61</td>
<td>9.09</td>
</tr>
<tr>
<td>ICT</td>
<td>5.28</td>
<td>8.05</td>
</tr>
<tr>
<td>Economic Incentive Regime</td>
<td>0.73</td>
<td>5.93</td>
</tr>
<tr>
<td>KEI</td>
<td>3.91</td>
<td>7.97</td>
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Source: www.worldbank.org/kam,
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<tbody>
<tr>
<td>Industry Policy</td>
<td>Factor-Driven</td>
<td>Investment-Driven</td>
<td>Investment-Driven</td>
<td>Investment-Driven</td>
<td>Innovation-Driven</td>
</tr>
<tr>
<td>Support, Import Substitution</td>
<td>Support, Import Substitution</td>
<td>Promote Heavy and Chemical Industries</td>
<td>Promote Heavy and Chemical Industries</td>
<td>Promote Heavy and Chemical Industries</td>
<td>Provide Information Infrastructure and R&amp;D Support</td>
</tr>
<tr>
<td>S&amp;T Policy</td>
<td>Establishment of Notional Standard and Industrial Research Institute</td>
<td>Turnkey project implementation</td>
<td>Increase domestic content of projects</td>
<td>Establishment of Ministry of Science, Research and Technology</td>
<td>- E-government</td>
</tr>
<tr>
<td></td>
<td>Establishment of Industrial Development and Renovation Organization</td>
<td>Joint-venture with foreign Companies</td>
<td>Creation of Technical and Vocational training Organization</td>
<td>- Technology Parks</td>
<td>- National Science and Technology Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Creation of Scientific and Industrial Research Organization</td>
<td></td>
<td>- Development of High-Tech Industries</td>
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<td>- Development of ICT</td>
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<td>- Development of Medium and Small Industries</td>
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<td>- National Innovation System</td>
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<td></td>
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<td></td>
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<td></td>
<td>- Growth Centers</td>
</tr>
</tbody>
</table>
6-2 Scale Economies in Korea and Iran

In moving towards high-productivity sectors, the biggest concern for Korean policymakers was that these industries are often characterized by large scale economies. The strong emphasis on scale economies in Korean economic policymaking is exemplified by EPB (1982), which diagnoses the causes of troubles in the heavy and chemical industries in the early 1980s as the lack of scale economies due to the participation of too many firms in each industry, that is in our terminology, the failure of investment coordination (Ha-Joon Chang, 1994, p113).

The prevalence of scale economies in many priority sectors posed two challenges to Korean policymakers. One was that individual firms in these sectors needed to be large enough in order to obtain the minimum efficient scale of production. Firms were often instructed by the state to build plants of efficient production scale, which given the small size of the domestic markets, had the beneficial side-effect of compelling them to start exporting as soon as possible in order not to incur losses due to low capacity utilization. And whenever firms were thought to be smaller than the minimum scale, state-initiated or state subsidized mergers were implemented. The most dramatic of this policy was 1980 reorganization of six major industries. The merger of two automobile producers in 1965, merger of five PVC producers in 1969 and mergers within the fertilizer, shipping and overseas-construction industries in 1980s (see Leipziger, 1988) and other examples. The second challenge from the presence of large scale economies was the high possibility of "excessive competition", a term used by Korean (and Japanese) policymakers to describe the well-known propensity of industries with large sunk costs to engage in price wars. As a result serious attempts were made to restrict entry and regulate capacity expansion in such industries. Korean policymakers thought that excessive competition could result in social waste (for example, WP, 1968, p.173).

Korean policymakers have regarded competition as a means to achieve efficiency rather than as an end in itself. This view is exemplified by the 6th FYP document, which states that collusive behavior should be allowed, and even encouraged, in ‘promising industries’ that need to ‘increase R&D, improve quality, attain efficient production scale’ and in ‘declining industries’ that need to ‘scale down their capacities’ (p.79). Likewise, the antitrust law (the law for the Regulation of Monopoly and Fair Trade), which come in to being in 1981, after four abortive attempts at legislation (in 1964,1966,1969and 1971), claimed to be concerned mainly with restricting anti competitive behavior, rather than market concentration itself, although the growing criticism of the concentration of economic power in to the hands of conglomerates brought about amendment (in 1986) with stronger restrictions on cross investments between members of the same conglomerates (Ha-Joon Chang, 1994,p, 114).

In Iran scale economies was never a serious concern of the policymakers. Free entry has caused excessive and non-optimal scale projects, in different fields of manufacturing sector. In the last decade government with the aim of reducing regional disparities, decided to construct small scale iron and steel units and petrochemical plants in different provinces of the country. Production for domestic market also has reduced the scale of plants and firms to the size of domestic market.

6-3 The Role of Chaebols in Korea's Industrialization

One significant group within the business community that dominated the Korean economy was business conglomerates, or Chaebols. The term is used in the same context as the Japanese world zabatsu .Chaebol is the highly diversified, family-controlled businesses that have held a central role in the development of Korean economy. In general, a Chaebol is a
very large conglomerate engaged in numerous lines of business, comprising a group of different specialized companies with interrelated management 1988(Yong-Iob Chung, p35).

After the departure of the Japanese in 1945, some Korean businessmen began expanding their businesses, and a number of them became Chaebols in the late 1950s and thereafter.

Chaebols engaged in almost every kind of business, but they were especially conspicuous in manufacturing, and they expanded much faster than non-Chaebol businesses. In 1985 top 30 Chaebols share in manufacturing value added was about 40 percent (Ibid, p. 36). Within manufacturing, Chaebols became more oriented toward HCI. Nearly 60 percent of the top 40 Chaebols's value added in manufacturing was from them.

Businesses of Chaebols' extended far beyond manufacturing. Their value added contributions were higher- greater than 30 percent – also in most other fields, such as construction, finance, insurance, retailing, real estate and foreign trading. While these activities were important in the early 1990s, real growth is now taking place in their electronics and high-technology industries. Many of Korean small and medium sized firms typically manufactured specialized parts or equipments for the Chaebols.

Among all businesses, the group that worked most closely with the government policymakers and bureaucrats in developing and implementing the nation's economic policies and fulfilling its goals was the Chaebols. Chaebols leaders assisted and cooperated with political leaders and government planners who relied on their ideas in the areas of economic planning and implementation. The government policy objectives were not formulated, set, and imposed by politicians or bureaucrats alone. They were the result of close and extensive consultation and coordination with the Chaebols through channels such as "discussion groups", "deliberation councils", and committees established to guide the development of targeted industries and implement government policies. While the discussion groups enabled private sector groups to influence the formulation and implementation of government policies relevant to their interests, the deliberation councils made allocation rules clear to all participants. These groups and councils also facilitated the collection and dissemination of important information about export prospects, technological developments, and markets to assist individual firms in their investment decisions. In this way a highly effective modus operandi emerged in which the Chaebols served as shock troops (Young-Iob Chung. The implementation of economic policies was carried out by the government as if it and Chaebols together formed a quasi-internal organization, paralleling that within a large private enterprise. Since transactions between subunits of the latter were often more efficient than the same transaction across a market between independent firms or agents, direct government intervention in the large private enterprises was smoother and more efficient than functional incentives. In this way, relevant information was shared directly instead of indirectly across markets through prices .the government then was able to use other incentives and control techniques to curb a small number of opportunists, coordinate interdependent enterprises so as to adapt to unforeseen contingencies, and resole by fiat small number bargaining indeterminacy among enterprises for so called public goods. Under this setup, the part of the private sector consisting of small and medium sized firms did not participate directly in the process and was not subject to direct government intervention, but policy of the government that had an impact on large enterprises indirectly influenced their activities, because many of these firms were connected with large enterprises either as suppliers or customers. In this way government influence extended over a wide range of fields and businesses.

In Iran, certain industrial conglomerates were emerging as family businesses, before the Islamic Revolution. They were involved in diverse activities and most of them were among most successful enterprises in the country. But government never intended to establish formal relationship with these holding companies to formulate and implement industrial policies.
After the Islamic Revolution, government expropriated all of the big businesses in the country. But after the Iran-Iraq War (1980-1988), again big businesses emerged in the country again. Some of them have engaged in manufacturing, construction, foreign trade and banking. They have informal connections with politicians and high ranking technocrats, and try to get benefit of rents distributed by government through bribery.

In the last twenty years certain business groups are formed as semi-state owned agglomerations which have monopolistic power in the market of certain products. These groups have benefited from the government privatization policy in this period (Zonooz, 2012). Exertion of monopolistic power by these groups in the absence of any performance based controls amounted to rent seeking activities by these groups and hindered the development of private sector in the country.

6-4 Industrial Rationalization in Korea

Toward the end of the 1970s, attention was increasingly drawn to the over-capacity and low profitability of HCIs, in Korea. In response, the government set out an investment coordination plan as part of the comprehensive economic stabilization program (May 1979) and implemented the plan in two rounds in 1980. The first round (August 20, 1980) was targeted at power generators, automobile and construction machinery, whereas the second round (October 7, 1980) at heavy electric machinery, electronic switchboard, diesel engines and copper smelting. In these industries, the investment coordination plan aimed to merge enterprises if there were too many of them; to reduce excessive capacity and cancel new investments; and to guarantee monopolies if excessive competition was a worry.

In addition to the investment coordination, a series of industrial restructuring programs were carried out in the 1980s to help distressed sectors overcome their difficulties. The shipping industry underwent several rounds of restructuring (December 1983, May 1984, July 1985 and December 1985), in which many shipping companies were merged with the aid of tax benefits and financial support from government. The restructuring of the overseas construction industry began in 1984 and gained speed in 1986.

The industrial restructuring of these industries had its legal basis in the tax reduction and exemption regulation act (TRERA) and the manufacturing development Act (MDA). These laws enabled the government to designate certain industries for rationalization, provide various tax benefits (such as exemption from capital gains taxes) and financial support, and regulate market entry and investment; the rationalization period was specified in advance for each industry. Nine industries were rationalized after 1985 automobile (1986-1989), construction machinery (1986-1988), diesel engine for ships (1986-1989), heavy electric machinery (1986-1989), alloyed metal (1986-1989), textile (1986-1997), dyeing (1987-1988), fertilizer (1987-1990) and footwear (1992-1995).

The industrial rationalization program was meant to improve the competitiveness of the industries. But its success was limited because the government did not adopt reasonable standards in assessing what business categories and companies should be chosen for rationalization. In addition, the government failed to monitor the results of corporate asset disposals.

The industrial rationalization program, however, produced negative side effects as well. It accelerated the concentration of economic power in the hands of the chaebols, which were the only business enterprises with the financial resources to take over troubled companies. In some cases it blocked the entry of new competitors and left key industries under the dominance of a few companies. This led to a monopolistic or oligopolistic market structure in many industries, more importantly; it represented another example of questionable
government intervention in the economy following the HCI drive of the 1970s, which hindered the development of market mechanisms.

Recognizing these problems, the government changed its industrial policy in the late 1980s. Instead of directly intervening in the market, it decided to rely more on indirect and functional methods such as R&D support. It also began to liberalize the financial sector. But the reliance on the private sector in taking the initiative also had its share of drawbacks. The government failed to keep close tabs on excessive investments by the large industrial groups in the early 1990s as they sought to expand their business empires. This eventually led to the 1997 financial crisis. The fundamental problem lay in the inappropriate sequence of liberalizing the economy before strengthening market discipline by abolishing the risk partnership between the state and the private sector.

Conclusion
The main objective of this paper is to explain why Korea has been successful in economic growth and industrial transformation and Iran has failed. To explain the different performances of the two countries, we have briefly looked at their initial level of industrialization, nature of political regimes and economic institutions, trade and industrial policies in the two countries. Our conclusions are as follows:

In the period 1960-2012 performance of Korean economy with respect to economic growth, industrial transformation and export of manufactured commodities, has been better than the Iranian economy (Section 1).

Before 1960s, the level of per-capita GDP and industrial development in Korea was well above Iran, and Korea was better placed for long term growth and industrial development, than Iran (section 2).

In the period 1960-1977, political regimes in these counties were characterized by authoritarian and developmental states, which adhered to market economy, while intervening heavily in the economy to promote industrial development. Both Korean and Iranian government, established a strong planning organization, and controlled the banking sector to direct bank loans to priority sectors. In this period governments of these countries successfully laid down the infrastructures, health care and education systems needed for economic development (section 3). At the time the economic growth rate and industrial development in Korea and Iran were quite high, as compared to other developing countries (section 1).

During the Islamic Revolution and Iran-Iraq War (1978-1988), economic institutions were disrupted in Iran. Private ownership was undermined; foreign investments were nationalized, diplomatic relation with industrial nations froze, economic planning abandoned, and government interventions in the economy with the aim of inflation control and administrative allocation of resources for the War increased. For about ten years while the Iranian economy was experiencing a serious recession and vast destruction, Korean economy was growing fast.

The period 1980-2012 was characterized by economic liberalization and globalization in the world. In this period Korean government liberalized its trade and FDI regimes to some extent, took further measures at home to give more role to markets and modified its industrial policies to facilitate entry of Korean economy to the knowledge based economy. In the same period Korea managed to overcome the difficulties of 1997 and 2008 financial crises in a relatively short span of time.

In the period 1989-2004, Iranian government revised its economic policies, and embarked on privatization, and market oriented reforms in foreign trade and FDI regimes. Government interventions in different markets were decreased considerably. One of the major reforms in this period was adoption of unitary floating exchange rate system in 2002.
In this period the economic growth and performance of industrial sector improved dramatically in the country, compared with the previous period, but as for the competitiveness of manufacturing sector, no considerable breakthrough was made.

In the period 2005-2013, Iran benefited from oil price surges. But owing to the injection of petro-dollars to the economy, Iranian economy after a short period of high growth rates, encountered a long lasting stagflation. The new round of economic sanctions against the country in 2012 and 2013 aggravated the situation further.

Iranian economy, during a long period from 1979 to 2013, faced a revolution, a prolonged war, international sanctions, institutional disruptions, and contradictory shifts in economic policies. The result of which is unsatisfactory economic and industrial performance. Our argument is that even if Iran did not face with all of these adversaries, import substitution policy and absence of proper industrial policy could not bring about the industrial transformation and competitiveness for the country.

Trade policies followed by the two countries in the period 1960-2012, were different. Korea followed import substitution and export promotion policies simultaneously. Export orientation of Korean economy, was beneficial for the Korean entrepreneurs. They had better access to large and expanding export markets and technical know-how. Since subsidies in Korea were conditional to their export performance, protection of domestic industries did not led to unproductive rent seeking activities (section 4).

In Iran, because of easy access to foreign currencies, government followed import substitution policies both before and after the Islamic Revolution, however, undiscriminated, unconditional, and open-end protection, brought about adverse effects such as unproductive rent seeking and technological lethargy. Monopolistic structure of markets for many manufacturing product and non-optimal scale of domestic oriented industries, gave rise to further economic inefficiencies (section 4).

FDI policies in Korea and Iran also differed diagonally. In Korea government policy toward FDI was restrictive almost until 1997. Although, Korean government liberalized inward FDI after this period, its approach still remained selective. It is worth mentioning that, since then, trans-nationals invest in Korea in search of creative assets and high skilled manpower, to produce high-tech products for export (section 4).

In Iran, in the period 1960-1977, government policy toward FDI was unrestricted and unselective. In that period, multinationals invested in Iran in search of raw materials and prospering domestic market. In the period 1979-1988, government expropriated foreign equity capital in the country. Following that period, government revised its policies toward FDI and took certain measures to attract more FDI to the country, but unrestrictive and unselective promotion of inward FDI, resulted in almost no technology transfer or increase in exports of manufactured goods (section 4).

In both countries transition from light and labor intensive industries to heavy and chemical industries, have taken place under government policies, but in Iran, this has been realized mostly due to the state investments in metals, machinery and petrochemical industries. Today, the diversity, technological sophistication and scale of heavy and petrochemical industries in Korea are much higher than that of Iran (section 5).

Transition to high-tech and knowledge based industries in Korea, initiated earlier than in Iran, and government assistance in promoting R&D, training highly skilled manpower and providing subsidies have had crucial role in the development of high-tech industries, but

In Iran, however, high-tech industries are yet to born. Iranian government has created state-owned R&D based companies in high-tech industries, but so far, commercialization of their innovations have not been realized in a large scale (section 5).

The importance of scale economies and its role in attaining competitiveness has been one of the Korean policymaker's major concerns. To this end, government of Korea has
restricted entry to industries, and encouraged private sector to set up industrial units with large sizes. Rationalization program in Korea also has been directed to achieve economies of scale. Iranian government unlike Korean government, has never exerted a serious restriction on the entry and exit to any industry, and has never paid due attention to the economies of scale. Small size of the domestic market and regional policies of government has been other causes of prevalence of small scale production units in the sectors which should have been large enough to attain economic efficiency (section 5).

In Korea most of government loans and subsidies have been given to chaebols. These large agglomerates have benefited from economies of scale and scope. In the meantime chaebols have been reliable partners of Korean government in providing information about markets, technologies, and competitors, and in formulating and implementing industrial policies.

In Iran, large family companies with diversified activities emerged in 1960s and 1970s. But after the revolution all of them were nationalized. After Iran-Iraq war, a few large agglomerates grew up, which have informal connections with government, but they do not have any role in formulating and implementing industrial policies. One of the characteristics of Iranian economy after the Islamic Revolution is the emergence of new economic agglomerates owned by semi-state holding companies, which have close ties with political power centers.

In the beginning of 1980s, Koran government embarked on the industrial rationalization program. This program was meant to improve the competitiveness of the industries. But its success was limited.
### Table Annex1: Natural Resources of Iran and Korea

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>Iran</th>
<th>Korea</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total area:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>land</td>
<td>Sq km²</td>
<td>1648195</td>
<td>99720</td>
</tr>
<tr>
<td>water</td>
<td>Sq km²</td>
<td>1531595</td>
<td>96920</td>
</tr>
<tr>
<td>Arable land</td>
<td>%</td>
<td>10.05</td>
<td>14.93</td>
</tr>
<tr>
<td>Permanent crops</td>
<td>%</td>
<td>1.08</td>
<td>2.06</td>
</tr>
<tr>
<td>Other</td>
<td>%</td>
<td>88.86</td>
<td>83.0</td>
</tr>
<tr>
<td><strong>Total renewable water resources</strong></td>
<td>Cu km /yr</td>
<td>137 (2011)</td>
<td>69.7 (2011)</td>
</tr>
<tr>
<td>Freshwater withdrawal</td>
<td>Cu km /yr</td>
<td>93.3</td>
<td>25.47</td>
</tr>
<tr>
<td>Oil reserves</td>
<td>Million barrels</td>
<td>154580</td>
<td>-</td>
</tr>
<tr>
<td>Gas reserves</td>
<td>Billion cu m</td>
<td>33620</td>
<td>-</td>
</tr>
<tr>
<td>Other minerals</td>
<td></td>
<td>Coal, Chromium, Copper, Iron ore, Lead, Manganese, Zinc, Sulfur</td>
<td>Coal, Tungsten, Graphite, Molybdenum, Lead</td>
</tr>
</tbody>
</table>

Sources: OPEC, Annual Statistical Bulletin, 2011
Official publications of Iran and Korea

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