

Industrialization and Dependency: the Case of Iran

By

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In the past few years, Iran has rapidly progressed in various scientific and technological fields. Particularly, it has advanced in petrochemical, pharmaceutical, aerospace, defense, and heavy industries. Despite of being under economic sanctions by the United States for about three decades, the country seems to be leaping forward to become an emerging industrialized country. As it appears, no other country in the region has achieved such rapid progress in a short time. In this paper, industrial development in Iran is reviewed in the context of the dependency theory in order to understand Iran's success in pursuing independent development policy. To evaluate Iran's relative progress better, the key features of Iran's economy have been compared with Turkey which is considered to be the only newly industrialized country in the region. Also, Iran and Turkey's experience with neoliberal economic policies is briefly reviewed. Finally, Iran's economic relations with other countries are discussed in the light of the imposed economic sanctions and the recent global economic crisis.

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Iran's Technological Progress

Despite of the government's emphasis on Islamic subjects in the education curricula, Iran has advanced tremendously in secular sciences. Studies reveal that Iran has been the fastest growing country in scientific capabilities in the world during the past two decades.¹ Using the number of scientific publications available in the Web of Science database,² Eric Archambault has found that the overall growth of scientific publication in the Middle East has been four times the world average growth -- Iran has had the fastest growth rate followed by Turkey, while contribution share of the countries in North America to the world science has dramatically declined since 1980. The growth of Europe and Africa has been rather unchanged in the past three decades. In his paper, Archambault has tabulated data that shows Iran's publications in organic and nuclear chemistry, nuclear and particle physics, and other subfields of physics have increased substantially faster than the world average.³ Archambault says Iran's scientific achievements in the past few years may be in part due to its nuclear technology development program. Based on his Growth Index measure, Iran has progressed 11 times faster than the world average, 2 times faster than Turkey and about 12 times faster than Israel in the past three decades.⁴ According to his paper, Iran's scientific advancement has been faster than any country, including Brazil, Russia, India, and China. Even though this study is based on quantitative measurement of growth by the number of publications and not qualitative achievement, it still shows tremendous progress for Iran.

Furthermore, Iranian students' success in international arena is an evidence of Iran's progress in science. Students from top Iranian universities have achieved high ranks in the international Science Olympics, winning prizes in the areas of physics, mathematics, chemistry and robotics. Bruce A. Wooley, a former chairman of the Electrical Engineering Department at Stanford University has said Sharif University of Technology in Tehran has one of the best undergraduate electrical-engineering programs in the world.⁵ The Genius of Iranian scientists and engineers is the key to Iran's technological progress. Iran's scientists and engineers are native, as opposed to the United States and the Gulf Co-operation Council (GCC) countries that employ a large number of foreign born scientists and engineers.

Technological progress is commonly referred to as new and better ways of performing customary tasks in production of goods and services. It is the most important contributor to economic growth. Despite the West unwillingness to provide Iran with advanced technology, the country has rapidly progressed on its own in science and technology. The tangible evidence of Iran's technological progress is the breakthroughs it has achieved in heavy industries, aerospace, advanced weapons, and in many engineering and scientific fields. While before the revolution Iran's manufacturing was mostly limited to assembly of foreign items; at present, Iran manufactures a variety of advanced civilian and military products. Iran has its own indigenous defense industry, which builds fighter jets, helicopters, drones, rockets, satellites, destroyers, tanks, armored personnel carriers, torpedoes, and various kinds of missiles. Iran's progress particularly in nuclear technology has concerned the West because of its dual application in development of nuclear weapons.

¹Archambault, Eric, 30 Years in Science , Secular Movements in Knowledge Creation , 2010, a paper published by Science-Matrix , <http://www.science-matrix.com/30years-Paper.pdf>

² Web of Science http://thomsonreuters.com/products_services/science/science_products/a-z/web_of_science

³ Archambault, Eric, Table 1, page 6

⁴ Ibid P.1-2

⁵ Asefati, Dean of Stanford: Sharif University Best in World, 26-, April, 2008
<http://www.iranian.com/main/blog/asefati/dean-stanford-sharif-university-best-world>

On February 3, 2009, Iran announced it had launched its first domestically made satellite called Omid into the earth orbit. Launching of the satellite stunned the West as it did the Soviet's launching of Spatnic into space in 1962. The Guardian reported "in another achievement for Iranian scientists under sanctions, Iran launched its first homemade Omid satellite into orbit"⁶ Also, the New Scientist reported "The evidence is mounting that the Iranian rocket recently used to launch a satellite was more powerful and advanced than initially thought."⁷ Referring to Iran's recent successes in buildup of its advanced defense capabilities and launching its first homegrown satellite, on the thirtieth anniversary of Iran's 1979 revolution, President Ahmadinejad said "Iran today is a real and true superpower", and the country no longer faces threats from abroad.

In the modern world, competition among nations for power has become competition for developing advanced technologies. Following progress in technological innovations, the leading European countries beginning with Britain in the eighteenth century became industrialized and emerged as great powers. Subsequently, prominence of Germany in military technology during the first half of the twentieth century made it a great power.⁸ Later, Russia became a superpower after achieving some technological breakthrough in 1950s and its success to put the first man in the earth orbit. It remains to be seen how much Iran's national power has increased as a result of its recent progress in science and Technology.

For a country that underwent eight years of imposed war with Iraq, suffered a severe brain drain of some of its best professionals and entrepreneurs after the revolution, and has been under sanctions for almost three decades, it is impressive to see the level of technological progress that has been achieved. But what is the reason behind this startling progress, even though it can be rudimentary as compared to technological breakthroughs in the advanced industrialized countries? The answer must be Iran's policy of self-reliance. That proves dependency is a barrier to industrial development. Some may argue that oil revenues are the underlying reason for Iran's recent progress. That could be a significant factor but it is not the primary reason as the other oil exporting countries in the region have not progressed to that level. Industrial development in most oil exporting countries has been negligible and commonly less than some resource-poor countries. Despite large increases in their oil revenues, they have not been able to establish their basic industrial infrastructure. They are still largely dependent on the industrialized countries for basic manufactured products. That is largely the case for the oil-rich GCC countries. Iran's success in industrial development is an exception in the region.

The Dependency Theory and Development

In recent years the dependency theory has re-emerged as an analytical framework to explain the economic relations between the developed and the developing countries. In 1950s, Raul Prebisch argued "real world economic relations between the mainly industrial **center** and the mainly agricultural-and extractive **periphery** (terms made famous by Prebisch) did not conform to principles of classical or neo-

⁶ Tait, Robert, Iran launches first domestically produced satellite Omid launch likely to stoke western fears of missile capabilities, 3 February 2009 , <http://www.guardian.co.uk/world/2009/feb/03/iran-satellite-launch-omid>, viewed September 17, 2010..

⁷ New Scientist, Evidence is mounting that Iran used beefed-up rocket, <http://www.newscientist.com/article/dn16619-evidence-is-mounting-that-iran-used-beefed-up-rocket.html?full=true&print=true> , viewed September 17, 2010.

⁸ Morgenthau, Hans, *Politic among Nations* , Fourth Edition, Alfred A Knopf, (1968), p.113-5.

classical theory.” In his view, a better metaphor or theory to explain such relations was **unequal exchange**.⁹

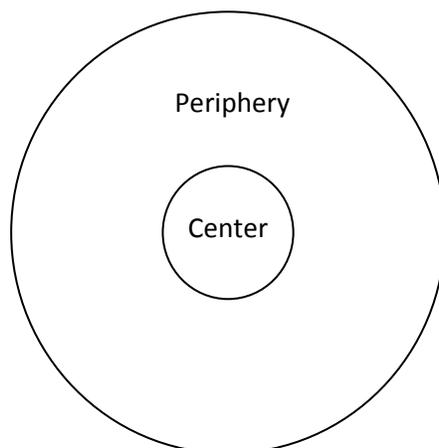


Figure 1. Schematic Diagram of the Center Periphery Model

Classical free trade theories such as the absolute and comparative advantage theories do not adequately describe gains from trades between the developed and developing countries. One criticism is that these theories are examined under too many unrealistic assumptions and in particular ignore the dynamic of international trade. The developed countries commonly export manufactured products and “soft” goods to developing countries in exchange for primary goods such as raw materials. For example a computer software package that has negligible marginal cost can be exchanged for some amount of crude oil, a scarce nonrenewable resource. Hence, the developed countries obviously gain much more from this kind of trade than the developing countries, for that reason, such trade is referred to as unequal exchange.

Dependency theorists argue that international related factors in general and in particular the dependence of the underdeveloped countries on the imperial powers has caused their underdevelopment. The underdeveloped countries that constitute the periphery have been forced to be in the existing situation by the countries in the center. Any country in the periphery that wants to get out of that relationship will be faced with sanctions and military interventions by the countries in the center. That explains why Iran has been under pressure of economic sanctions and threat of military interventions because it has tried to leave out of the center periphery relationships. It is in the benefit of the industrialized countries to keep the resource-rich countries in the periphery status and do not help them to be industrialized. They want to continue to export manufactured products in exchange for the primary goods and raw materials that they badly need to import. This trade arrangement will help them to balance their trade deficits.

Dependency theorists say industrialized countries possess monopolies on some key technologies and manufactured products that are exported to the Third World countries by the multinational corporations (MNCs) and that leads to unequal exchange. Transfer of technology through MNCs is very limited due to the fact that they tightly control the key information on their design and manufacturing process that is referred to as internalization. This leads to centralization of research and development in

⁹ Love, Joseph L., “Raul Prebisch and Origins of the Doctrine of Unequal Exchange”, *Latin American Research Review*, 15:3, pp. 45-72. Quoted in Robert A. Packenham, *The Dependency Movement*, Harvard University Press,(1992), p.16.

their home base that is in conflict with the developing countries' desire for domestic technological independence. This makes the underdeveloped countries dependent on the advanced technologies invented and produced in the developed countries. Technology dependence refers to lack of means in the underdeveloped countries to master know-how to produce advanced technology products. If a country cannot possess the means to produce such products, it has to be dependent to import them from advanced countries at unequal exchange. This arrangement normally benefits the advanced countries that exchange manufactured goods for primary goods in terms of trade in their favor. This trade arrangement perpetuates underdevelopment and technology dependency that results from the influence of advanced countries over the economic and political sovereignty of the Third World countries. A number of elites in the developing countries act as compradors sacrificing their countries interests for personal gains to bring about that trade relationships.

Furthermore, some developing countries are dependent on financial capital from the developed countries. They need to borrow from the financial institutions in the developed countries for financing their development projects. The oil-rich countries such as Iran normally do not need much to borrow from abroad if they receive sufficient exported oil revenues. The international financial institutions commonly make restrictions on the budgetary and economic policies of the developing countries that borrow in exchange for giving loans that causes them more dependency. In short, technological and financial dependency undermines political sovereignty of the developing countries.

There are two widely known strategies for promoting industrialization in the developing countries. One strategy advocates import substitution industrialization (ISI) and the other support export led industrialization (ELI). The decision to adopt one versus the other is contentious and largely depends on economic and natural resources of a country as well as the geopolitical factors that affect the country. ISI originated from the works of dependency theorists.¹⁰ It is theoretically based on the Prebisch-Singer thesis and is intended to support the infant industries. It is argued a country should attempt to reduce its foreign dependency through domestic production of manufactured products that can be substituted for imported products. ISI discourages external competition from imports into the markets of the targeted industries by tariffs, devalued currencies and other factors. This strategy was adopted by advanced countries in early stage of their industrialization in order to promote their infant industries. ELI is another strategy that speeds-up the industrialization process in a country through exporting goods for which the nation has a comparative advantage. Export-led growth implies opening domestic markets to foreign competition in exchange for market access in other countries. It encourages reducing tariff barriers, floating exchange rate, and often devaluation of national currency to facilitate exports. ELI policy was employed by the national economies of the Asian Tigers: Hong Kong, South Korea, Taiwan and Singapore, even though, these economies had strong barriers on imports in the beginning of their industrialization during the 1960s-1980s. The Asian Tigers began their industrialization by assembling manufactured products for US and Japan markets. They now have reached to the stage that they exports advanced technical products in competition with advanced countries. S. Korea became industrialized with the help of government investments and export led policies, but this has rarely happened in the resource-rich countries especially in the Persian Gulf region and Latin America. An explanation for lack of progress in these countries' industrializations is the constraint within the center periphery relationship that has lingered from the colonial era. This constraint however was changed in Iran after the 1979 revolution. Even though the country has been subject to external pressures under economic sanctions, but it has strived to become rather autonomous of political influence of the great powers and is marching to become industrialized.

¹⁰ Reynolds, Lloyd G. *Image and Reality in Economic Development*, Yale University Press, New Haven (1977), p.165.

Most developing countries undermine their political sovereignty due to dependency to the developed countries for their industrial development. Iran's technological progress can be a proof of success in independent industrial development. Because of its self-reliant policies, Iran was not affected by the global economic crisis in 2008-10 as some developing countries did in Eastern Europe that are dependent on capital flow and technological know-how from the West, or the countries in East Asia that are dependent on exporting their manufactured products to the West. The Asian Tigers' export dependency to the West caused them economic downturn due to lack of demand for their products in the West. Iran self-reliance policy has worked better than the Asian Tigers' export led development strategy. The economic sanctions imposed on Iran have been a blessing in disguise because they have curtailed the country's external economic dependency. Yet Iran's economy is still heavily dependent on crude oil export, but this dependency is rather asymmetric; which means oil importing countries are more dependent on Iran's oil than Iran is dependent on their products. Whether Iran can continue to show rapid technological progress depends on how successful the West will be to suppress Iran's progress with tightening sanctions. President Mahmoud Ahmadinejad has said repeatedly that the West sanctions would only strengthen Iran's technological progress by encouraging it to become more self-sufficient.¹¹

Industrialization in Iran

Increase in industrial capacity is referred to as industrialization. Industrial capacity is the size of variety of manufacturing processes and plants in a country, especially in heavy industries that can transform raw materials to usable products. In other words, industrialization is expansion of a country's factories, mills, mines, power plants, railways and the like, especially activities involved in manufacturing and establishment of modern economic infrastructure. Industrialization is a continuous process; it involves change in economic structure from merely handicraft activities to modern production process using skilled labor and advanced technology. Industrialization is a crucial factor to enhance economic growth and is a major contributor to modernization and national power. A newly industrialized country (NIE) is generally more advanced than a typical developing country but not yet fully developed. Such a country of course must show rapid technological progress and economic expansion. The following is a brief review of industrialization process in Iran and an examination of Iran's progress to become a newly industrialized country.

Historical review of industrial development in Iran has been done by a number of authors. For instance, Julian Bharier has studied the development of large-scale industries in Iran from the beginning of twentieth century to 1970. He says industrialization in Iran progressed after 1929, and more intensely between 1939-38.¹² It then interrupted for several years due to occupation of Iran by the Allied forces during the World War Two and the damages that it resulted. It then continued to progress starting in late 1950s, when the number of industrial enterprises significantly grew, and the value of manufacturing output rose about four times from 1959 to 1966.¹³ Overall, he concludes Iran's manufacturing industries progressed during the seventy year period but were heavily protected and subsidized due to their

¹¹ Dareini, Ali Akbar, Ahmadinejad: Sanctions aid, rather than hurt, Iran, April 4, 2010 <http://www.guardian.co.uk/world/feedarticle/9016818> , viewed September 17, 2010.

¹² Bharier, Julian, *Economic Development in Iran: 1900-1970*, Oxford University Press, New York (1971) p. 172.

¹³ Ibid pp. 186-190.

infancy and most of them did not reach the maturity stage.¹⁴ More recently, Hadi Salehi Esfahani and M. Hashem Pesaran have studied the Iranian economy during the past century. They say “in the course of 20th century, Iran's economy transformed from a relatively simple agrarian system into a complex and industrialized one with a much higher level of income.” They believe “a great part of this transformation came about as a result of Iran's ability to engage in global markets, particularly through imports of knowledge, technology, and capital and intermediate goods.”¹⁵ The Pahlavi regime adopted the import substitution strategy to promote industrialization in Iran. Heavy import barriers were imposed on some manufactured products in order to protect domestic infant industries and shift Iran's largely agrarian economy toward the manufacturing sector. In the late 1960s, Iran's modern manufacturing sector was primarily consisted of the automobile and household appliance industries. Since most parts had to be imported and assembled in Iran, the industrial sector was heavily dependent on supply of foreign made parts and intermediate inputs.

Also, Hassan Hakimian and Massoud Karshenas have done a comparative study of Iran's economic performance over the period 1960 -1996. They find Iran's economy grew strongly until 1977, at which time began lagging behind as compare to its peers. They specifically compare the growth performance of Iran's economy with Turkey and S. Korea by using a number of economic indicators, including growth of output, employment, productivity and real wages.¹⁶ Their study show in 1960 per capita income in Iran was nearly two times of Turkey and more than three times of South Korea; and in 1975, it was more than double of Turkey and 2.5 times of S. Korea. However, by late 1970s, per capita income in Iran rapidly declined while per capita income in Turkey and S. Korea continued to grow and superseded Iran by 1990.¹⁷ Hakimian and Karshenas further show growth rate of manufacturing output in Iran was about 1.5 times of Turkey in 1963-1977 period, but it fell to about one third of Turkey in 1977-96 period.¹⁸ During which time Korea consistently had higher manufacturing output relative to both countries.

Hakimian and Karshenas say the strategy of promoting manufacturing exports was the main stimulus of Korea's economic growth and Turkey also had adopted similar export promotion strategy. In contrast, Iran had pursued policy of import substitution before revolution and that had been continued after the revolution. However this does not imply that Iran strategy of import substitution was the cause of Iran's lagging behind its peers. Because the multiple exchange rates regime that was enforced for a period of time after the revolution and the lack of adjustment for purchasing power parity exchange rate make the comparison rather incompatible. Furthermore, Iran opened its economy to neoliberal reforms in early 1990s but it ran to difficulties and had to be partly abandoned. Similarly, a few decades of neoliberal reforms in Turkey that had begun in early 1980s led to high inflation and a severe financial crisis by early 2000s. Moreover, Iran encountered an 8-year war with Iraq, while Turkey and S. Korea continued to grow without experiencing any noticeable international conflicts. Korea has had special geopolitical factors in its favor. After the Korea's war (1950-53), the South portion benefited extensively from the US financial and political support that was intended to prevent spread of communism from China and North Korea. It also benefited from capital and licensing of Japanese companies. Capital

¹⁴ Ibid. 193.

¹⁵ Hadi Salehi Esfahani and M. Hashem Pesaran, *The Iranian Economy in the Twentieth Century: A Global Perspective*, *Iranian Studies*, Volume 42, Issue 2, April 2009, pages 177-211.

¹⁶ Parvin Alizadeh, Hassan Hakimian, and Massoud Karshenas, *The economy of Iran: dilemmas of an Islamic state*, see Chapter 1 “Dilemmas and Perspectives for Economic reform and reconstruction in Iran” pp. 29-63, I. B. Tauris (2001)

¹⁷ Ibid p. 32.

¹⁸ Ibid p.38.

flowed in to the country to take advantage of very cheap and productive labor force. In contrast, Iran was under US sanctions from time to time which impeded its development. Hakimian and Karshenas indicate Iran's high dependency on oil export was one of the problems of its economy which is true. Nevertheless, considering Iran's vast oil and gas resources, the petroleum industry should naturally be its primary economic lifeline. But the point is Iran should export much less crude oil and instead promote its refined and petrochemical products exports. That would establish linkages with other sectors of its economy and accelerate economic growth.

The degree that a country has progressed to be industrialized is rather judgmental. However, looking at the key industries of a country, the number of industrial employees, the size of industrial output, and the volume of manufactured goods that it exports are helpful to get a quantitative measure of the degree of industrialization in a country. This study is a brief evaluation of industrialization process in Iran. An extensive evaluation would need much more information and data than is provided here.

Iran's program to promote industrialization actively started in mid 1960s. The foundation for heavy industries began by establishment of a number manufacturing facilities throughout the country, including a machine tool factory in Tabriz and machine manufacturing plant in Arak in late 1960s. Also the first Steel Plant in Esfahan began to be constructed at the same time and became operational in 1973-74.¹⁹ However, the revolution and the eight-year war with Iraq postponed the country's self-sufficiency goal in industrial production. Iran's industries further expanded after the Iraq war. Oil, petrochemical, and heavy industries have especially grown to substantial size. These industries have increased the size of industrial labor force in the country. In 1999, the size of manufacturing labor force was 2,551,962 or 17.5% of the 14,571,572 total labor force, and the share of the entire industrial workers, which includes mining, manufacturing, utility, and construction was 30.6%.²⁰ In 2009 the industrial workers increased to 6,675,048 or 31.8% of 23,840,676 total labor forces.²¹ Thus within 10 years, the share of industrial workers in the total labor force has increased by merely 1.2% because most of increase in the labor force has gone to the service sector.

Heavy industries provide the basis for manufacturing arms and relevant materials for defense. Without industrial plants a country cannot domestically build and maintain an indigenous military establishment. Iran has succeeded to expand its heavy industries. Iran's iron and steel industry have rapidly advanced and according to International Iron and Steel Institute Iran has become the largest producer of crude steel in the Middle East. In 2008, Iran produced 9,964 thousand metric tons of crude steel as compared to 26,806 by Turkey that is classified under Europe.²² Iranian steel mills and other facilities transform Iran's vast raw materials to industrial products and mechanized weapons to boast defense.

Iran's largest industrial sector is oil and petrochemical. Iran possesses expertise and capabilities in oil refinery, exploration, and drilling. The petrochemicals industry expansion has partly helped to diversify Iran's sizeable crude oil export. The National Petrochemicals Company has now positioned itself in the markets as a viable exporter to various countries in Asia and Europe. Iran's petrochemical export has grown substantially in recent years. Large petrochemical complexes and oil refineries have been

¹⁹ Amuzegar, Jahangir, *Iran: an Economic Profile*, the Middle East Institute, (1977), p. 90

²⁰ *Iran Statistical Yearbook*, 1378 (2001), Statistical Center of Iran, pp 106-109.

²¹ Markaz Amar Iran <http://www.amar.org.ir/>

²² World Steel Association, *Steel Statistical Yearbook 2009*

<http://www.worldsteel.org/pictures/publicationfiles/Steel%20Statistical%20Yearbook%202009.pdf>, p. 4

established in major cities including Arak, Shiraz, Tabriz, Bandar Abbas, and Isfahan.²³ Iran shares with Qatar the South Pars / North Dome Gas-Condensate field that is the largest natural gas field in the world. Iran's portion called the South Pars Gas field contains 450 trillion C.F. of gas equal to about 6.8% of the world gas reserves.²⁴ A variety of downstream petrochemical industries have been established in Asalluyeh that is the closest port to this huge field and is a part of the Pars Special Economic Energy Zone in the Persian Gulf.²⁵

Iran's automobile industry has had a huge progress. Iran now manufactures different kinds of buses, cars, tractors and trucks. It is the second most active industry in the country, after oil and gas industry. According to OICA survey, in 2008 Iran produced 1,051,430 automobiles, close to 1,147,110 units produced by turkey in that year.²⁶ Iran's automobile manufacturing has progressed benefiting from high tariffs imposed on imported cars. Iran is now the largest car manufacturer in the Middle East. The country's two leading carmakers, Saipa and Iran Khodro produced more than 1.4 million vehicles in 2009.²⁷ Iran Khodro and Saipa, have respectively about 60% and 35% shares of the domestic market.²⁸ Major auto makers in Western Europe, Japan, South Korea, and China have also established assembly plants jointly with the Iranian companies. At the time that the major auto makers in the West have suffered contractions and bankruptcies, Iran's auto industry is thriving. Iran's auto makers have lately designed and built complete homegrown automobiles. That is a technological breakthrough for Iran, although the automobiles may not be as advanced as the competing foreign cars. In December, 2008, Saipa announced its first completely designed and domestically manufactured car called Tiba/Miniatur. In April 2009, the other auto manufacturer Iran Khodro announced the second entirely built automobile at home called Rana or Navand. The cars are manufactured in commercial scale this year. Iran also exports and assembles cars abroad. For example, Iran Khodro assembly plant has produced few hundred cars in Thies 60 km east of Dakar that are used as taxis in Senegal.²⁹ In May 2010, Saipa opened a large automotive assembly plant in Kashan. This plant is the largest auto assembly factory in the Middle East with a capacity of producing 150,000 cars annually. That would add about 15 percent to Iran's auto production capacity.³⁰ The plant is entirely Iranian-designed, even though 40 percent of its equipment was imported. In this plant a new vehicle called Tiba or Deer that is entirely designed domestically is manufactured.

Iran manufactures various machineries and tractors in Tabriz and Arak. Also the pharmaceutical industry has grown tremendously and has been able to produce about 95 per cent of medicines consumed in the country domestically.³¹ Other industries including mines and minerals, especially copper and aluminum, casting, pipes and profile, and rubber are growing. Overall, it appears Iran is

²³ Business Recorder, Pakistan Financial daily, Feb. 11, 2010, viewed September 17, 2010.

<http://www.brecorder.com/index.php?id=1019611&currPageNo=1&query=&search=&term=&supDate=m>

²⁴ Asalluyeh, <http://www.assaluyeh.com/main-en.php>

²⁵ Pars Special Economic Energy Zone (PSEEZ), <http://www.pseez.ir/home-en.html>

²⁶ OICA survey, world motor vehicle production by country 2007-2008, <http://oica.net/wp-content/uploads/all-vehicles.pdf>

²⁷ Iran Press TV, <http://www.presstv.ir/detail.aspx?id=125922§ionid=351020102>

²⁸ Atieh Bahar Consulting, <http://www.atiehbahar.com/Resource.aspx?n=1000042>, viewed September 17, 2010.

²⁹ *The Economist*, Feb 4th 2010, Dakar and Nairobi, http://www.economist.com/world/middle-east/displaystory.cfm?story_id=15453225, Iran and Israel in Africa, search for allies in a hostile world.

³⁰ *Iran Times*, May 14, 2010 p.3, Giant auto plant opens to make first all-Iran car,

³¹ Nasoochi, Sasan, Iran Pharmaceutical Industry, August 24, 2008, <http://iran-pharma.blogspot.com/2008/08/iran-pharmaceutical-industry.html>

becoming industrialized faster than other countries in the region. In the following section, the key features of Iran's economy and the size of its industrial sector are compared with Turkey in order to evaluate Iran's comparable development.

Iran's Economy versus Turkey

To understand Iran's industrial progress, it is necessary to compare Iran to at least one of the countries in the region. The only country in the region that has had similar progress and is believed to be a newly industrialized country is Turkey. Hence, Iran's key economic features are compared with Turkey to get a sense of the two countries comparable developments.

A basic measure of economic development is per capita national income that is limited to only monetary income and ignores other development parameters. In 2007, Iran's Gross national income per capita was \$3470 or \$10,800 in terms of purchasing power parity (PPP). It is unrealistic to get a time series data for per capita GDP in US dollar, because until 2002, Iran had multiple exchange rates. However, looking at real GDP growth rates shows income has improved in the country. An estimate of per capita PPP GDP for 2009 in the following table shows Iran's per capita income has surpassed Turkey.

Key Economic Data: Iran and Turkey – 2009 Estimate

| Country | Population | GDP Billion | GDP PPP billion | Per Capita GDP PPP | Unemployment rate | Inflation Rate | Current Account Balance Billion | External Debt billion | Public Debt % of GDP |
|---------|------------|-------------|-----------------|--------------------|-------------------|----------------|---------------------------------|-----------------------|----------------------|
| Iran | 67?? | \$335 | \$876 | \$12,990 | 11.8 % | 13.5% | \$26.53 | \$18 | 16.7% |
| Turkey | 78 | \$608 | \$863 | \$11,200 | 14.1% | 6.3% | -\$13.96 | \$274 | 46% |

Source: The World Factbook³²

The following table shows historical annual growth rate of real GDP for both countries. As is shown, Iran has had respectable growth rate and its economy is expected to grow at about 3% on the average till 2015.

Real GDP Annual Growth Rate – Iran and Turkey

| Country | Average | Projection | | | | | | | | | | |
|---------|-----------|------------|------|------|------|------|------|------|------|------|------|------|
| | 1992-2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2015 |
| Iran | 2.9 | 7.5 | 7.2 | 5.1 | 4.7 | 5.8 | 7.8 | 2.3 | 1.8 | 3.0 | 3.2 | 3.2 |
| Turkey | 3.0 | 6.2 | 5.3 | 9.4 | 8.4 | 6.9 | 4.7 | 0.7 | -4.7 | 5.2 | 3.4 | 4.0 |

Source: World Development Outlook, Table A4 Real GDP Growth pp. 150-160³³

Despite economic sanctions imposed on Iran and the global economic crisis, Iran's economy has grown in moderate pace in the past few years. In 2008/09, growth on the GDP was about 8% and inflation declined from 22.5% to current rate of about 10%. Tehran Stock Exchange Price Index (TEPIX) increased

³² The Central Intelligence Agency, <https://www.cia.gov/library/publications/the-world-factbook/geos/ir.html> , visited July, 3, 2010.

³³ *World Economic Outlook* , International Monetary Fund, April 2010
<http://www.imf.org/external/pubs/ft/weo/2010/01/pdf/text.pdf>

about 60% in 2009/10 after declining 21% in 2008/09 due to the global economic crisis.³⁴ Similarly the Istanbul Stock Exchange National 100 index had huge gain of about 100 % in 2009 after crashing in 2008.³⁵

A better measure of progress is Human Development Index (HDI), which in addition to the per capita national income has two more components that are longevity (life expectancy) and knowledge (adult literacy rate plus average years of schooling). As the following table shows, Iran's development indicators have markedly improved in recent years. In 2007 Iran's HDI index was 0.782 versus Turkey 0.802, and since 1980 both countries' indices have improved. In 1980 Turkey's HDI index was 12% higher than Iran, while in 2007 was only 3% higher. This means Iran's HDI is improving rapidly to reach Turkey soon. In the latest Human Development Report, Iran is ranked 88 as compared to Turkey that is ranked 79 out of 182 countries.³⁶

Human Development Index 1980 - 2007

| Country | HDI Rank | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2006 | 2007 |
|---------|----------|-------|-------|-------|-------|-------|-------|-------|-------|
| Turkey | 79 | 0.628 | 0.674 | 0.705 | 0.730 | 0.758 | 0.796 | 0.802 | 0.806 |
| Iran | 88 | 0.561 | 0.620 | 0.672 | 0.712 | 0.738 | 0.773 | 0.777 | 0.782 |

Source: Human Development Report 2009, United Nation

HDI components show Iran is a bit lagging behind Turkey. In 2007, Iran's life expectancy was 71.2 years, adult literacy rate was 82.3%, and PPP GDP was \$10,955. In that same year, Turkey's life expectancy was 71.7 years, adult literacy rate 0.91% and PPP GDP \$12,955. This shows substantial improvement as compared to Iran's life expectancy of 63 years, literacy rate of 54%, and \$2,489 per capita income in 1990.³⁷ In Turkey life expectancy was 67 year, literacy rate 81% and per capita income \$1,630 in the corresponding year. In 2008/09, Iran's literacy rates further improved to 86.9% among those over six years of age and 95.6% in 6 to 29 age group.³⁸

Since early 1960s, Urbanization has significantly increased in Iran and rural-urban income disparity has also narrowed. According to the World Development Report, the share of urban population reached to about 70% in 2007 from 49% in 1979. Urban population has increased about 5.4% per year on the average since the revolution. Urban-rural income gap has shrunk and the overall poverty rate has declined in the last three decade. In the rural areas, female literacy rate has increased and infant mortality has declined.³⁹ Also, the Gini index that measures income equality shows national income is more equally distributed in Iran than Turkey. Iran's Gini was 38.3 as compared to Turkey that was 43.2.⁴⁰

³⁴ Central Bank of the Islamic Republic of Iran, also <http://market.tse.ir/Indices.aspx>

³⁵ Istanbul Stock Exchange, <http://www.ise.org/Home.aspx>

³⁶ Human Development Report 2009 http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf

³⁷ The World Bank, *World Development Report 1992*, 218-219.

³⁸ Central Bank of Iran, *Economic Trends*, 1388, Q1

³⁹ *World Development Report 2009*, p. 63

⁴⁰ United Nations, Human Development Report http://hdr.undp.org/en/media/HDR_2009_EN_Indicators.pdf

Iran has a population of about 75 million, with a large educated labor force. About 27% of the population was below the age of 15 in 2007. According to Iran's central Bank, unemployment currently is about 11 percent and some young educated Iranians are migrating to seek employment in other countries. However, the brain drain has slowed down as compared to the earlier years after the revolution.

Turkey and Iran Economic structure

Real gross domestic product by sector (% share of GDP)

| Iran | 2003 | 2004 | 2005 | 2006 | 2007 |
|-----------------|-------------|-------------|-------------|-------------|-------------|
| Agriculture | 12 | 11.2 | 10.2 | 10.4 | 10.2 |
| Industry | 39.2 | 40.6 | 42.4 | 40.8 | 41.3 |
| Services | 48.9 | 48.2 | 47.5 | 48.8 | 48.5 |
| | | | | | |
| Turkey | | | | | |
| Agriculture | 11.4 | 10.9 | 10.8 | 9.5 | 8.7 |
| Industry | 28.6 | 28.5 | 28.5 | 28.7 | 28.3 |
| Services | 60 | 60.6 | 60.7 | 61.8 | 63 |
| ----- | | | | | |

Source: Economist Intelligence Unit.⁴¹

As is shown in the above table, Iran's Industry share of the GDP is growing and is significantly higher than the similar figure for Turkey from 2003 to 2007, while Turkey's industry share of the GDP has stagnated in the same period.

Iran and the Recent Global Economic Crisis

In the first decade of the twenty first century the advanced counties encountered major economic crisis from which they have not yet recovered. At the same time, certain developing countries have continued to be industrialized and are rapidly growing.⁴² They include Brazil, China, and India, some other countries in the Middle East, Latin America, and South East Asia. It has been contended that in the second decade of the twenty first century there is going to be a new world order. The Emerging industrialized countries in the East will be the driving force of the global economy to recovery, while the US, Europe, and Japan struggle to recover from the worst economic recession since the great depression.⁴³ These emerging economies are expected to grow faster than advanced economies in the current decade. China's economy has continued impressive growth and is leading the world recovery. The economies of Turkey and Iran are also growing. In the previous economic crisis the center countries were leading the world recovery and that would stimulate the countries in the periphery. This time is just the reverse; the recovery is from certain countries in the periphery that have followed self-reliant economic policies. While countries in the center are struggling with financial crisis, current account and budget deficits, and heavy national debt, a number of emerging economies are running account

⁴¹ Economist Intelligence Unit, Turkey and Iran Country Profiles 2008.

⁴² Buerkle, Tom, New World Order, *Institutional Investor*, pp. 50-53, June 2010.

⁴³ Ibid

surpluses and are rapidly growing. At the time that the economies in the West are in crisis, imposing economic sanctions on Iran is a counterproductive policy. In fact Iran's economy can have a contributing role in the world economic recovery.

In the past few decades, financial dependency has caused major financial crisis for some developing countries, including Iran and Mexico in mid 1990s, several countries in South and East Asia in late 1990, Brazil and Turkey in early 2000, and Greece in 2010. Neoliberal economic policies commonly open the developing countries to financial dependency. In early 1990s, Iran began pursuing neoliberal economic policies prescribed by the World Bank and IMF. That generated a serious financial crisis in Iran as inflation rose to nearly 50% and the country accumulated a whopping 30 billion dollar foreign debt by 1994. Similarly, in early 1980s, Turkey began liberalizing its economy under the IMF and World Bank reforms' guidelines. The outcome of the reforms was not positive for Turkey either. Inflation rose to 65% in 1989 -93 and 85% in 1994- 99, reduced to 50% in 2000 and again rose to above 70% in early 2002. Turkey suffered a major financial crisis in 1999-2002, Recep Tayyip Erdogan inherited an economy deep in recession because of financial crisis and skyrocketed inflation. In 2008, Turkey fell to recession as a result of global economic crisis while Iran did not. However, the two neighboring countries' economies are now growing and expected to contribute to the world economic recovery. Iran's economy did not go to recession as a result of the global economic crisis and has grown on the moderate pace in the past few years despite of the sanctions and inflation has been controlled to about 13.5%. Turkey's economy suffered a recession because of global crisis, but recovered in 2010 and is expected to grow about 5.2 % this year. Also Premier Erdogan has been able to reduce public debt from 74% of the GDP in 2002 to 39% in 2009, and decreasing inflation to a single digit. Turkey has shunned away from getting loans from IMF lately. In the past, Turkey's financial dependency to IMF had put it under external restrictions, but this time Turkey wanted to be self-reliance and get out of financial crisis on its own.⁴⁴

To deal with the West economic sanctions, Iran has increased its economic ties with other developing countries including Syria, India, China, South Africa, Cuba and Venezuela by pursuing the policy of "South-South" trade and economic integration. Iran's trade with India amounted to \$13 billion in 2007, an 80% increase in trade volume within a year. According to the Indian Embassy in Tehran, "India exports goods worth US\$ 1.937 billion to Iran and imports goods worth US\$ 11.049 billion from Iran." "India's imports from Iran include crude oil and petroleum products worth US\$ 10.06 billion and India's exports include petroleum products worth US\$ 850 million".⁴⁵ Also, Iran's trade with Iraq and other neighbors has substantially increased. Furthermore, Iran has expanded its trade ties with the counties located in west and central Asia through a regional economic market called Economic Cooperation Organization (ECO). ECO has ten member countries that include Afghanistan, Azerbaijan (Republic of), Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey, Turkmenistan, and Uzbekistan.⁴⁶ The ECO objective is to be a single market for goods and services similar to the European Union. ECO's secretariat and cultural departments are located in Tehran, its economic bureau is in Turkey and its scientific bureau is in Pakistan. ECO Members have launched several routes that connect them through a network of railways. In 2009, a route that runs from Islamabad through Tehran and onto Istanbul was completed. ECO plan to launch a container train from Almaty in Kazakhstan to Bandar Abbas that will connect the landlocked countries of Central Asia to international waters. Similarly it plans to establish

⁴⁴ Mellow, Craig, Anatolia: Turkey Shuns Loans as it Cuts Public Spending and Shock-proofs Bank, *Institutional Investor*, April 2010.

⁴⁵ State Television, <http://www.presstv.ir/Detail.aspx?id=73952§ionid=351020102>

⁴⁶ ECO, <http://www.ecosecretariat.org/>

the ECO Silk Road Truck Caravan this year that passes through the ten ECO countries and ends its route in Istanbul.⁴⁷

As the first decade of the twentieth first century ended, the new liberal economic policy that was preached for the developing world failed in its center. The countries in the periphery that pursued statist policy such as China and Iran were immune from the global financial crisis. China has accumulated a substantial trade surplus, which has increased its financial power. Major developed economies facing sluggish outlook as a result of the recent global economic crisis. They suffer out of range budget deficits and national debts that have clouded their recovery. For example, the United States imports more than half of its oil consumption, which has caused it continuous trade deficits. Some developed countries are now borrowing from the oil producing counties of the Persian Gulf region and the emerging economies in East Asia that have large current account surpluses. The Keynesian economic policies have reached to their limit. Further government spending will lead to explosion of government debt and inability to borrow in the international financial market, followed by currency devaluation. Also, monetary policy has reached to the limit of what is referred to as “liquidity trap”. There is now hope that the newly industrialized countries in the “Global South” could help the world economy to recover.

In brief, it seems there is a shift of economic power from the West to emerging market countries in the Global East and South. As is observed, the industrialized countries in the West are losing power to the emerging economies in the East. The countries in the East are expanding their industrial capacity and have become viable exporters to the West. The Western countries are turning to consuming market for the products of the countries in the East. Iran as an emerging regional power in the East is benefiting from this trend and has rapidly increased its industrial capacity.

Concluding Remarks

This was an attempt to review Iran’s key strengths in science and technology and understand its success in independent industrial development. As it was shown, Iran’s economy has developed in a moderate pace as compared to its regional counterpart Turkey. Despite Turkey’s reliance on its Western allies for economic benefits, it seems its economy has not done much better than Iran that has been under economic sanctions for decades. In fact, Iran has had better success in pursuing self-reliance policy. Iran progress in advance technology, aerospace, and establishing its indigenous defense and heavy industries is admirable. In automobile industry, Iran is equally competing with Turkey, yet Iran’s steel production is about half as much as Turkey’s. Despite Iran’s progress in expanding its industrial goods exports, still its major export is crude oil export, while Turkey’s exports are mostly consist of industrial goods. Whether Iran has reached to the stage that can be called a newly industrialized country is subject to obtaining more information and data. It is hoped this paper can open discussions among the colleagues to better understand the answer to this important question. Based on the limited information that was gathered for this paper, it seems Iran is marching to become a newly industrialized country.

⁴⁷ ECO, <http://www.ecosecretariat.org/index.htm>