# POLITICAL ECONOMY OF POST-REVOLUTION IRAN'S ECONOMIC DIVERSIFICATION WITH REFERENCE TO AUTOMOBILE INDUSTRY

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## DECLARATION

I declare that the thesis entitled "**POLITICAL ECONOMY OF POST-REVOLUTION IRAN'S ECONOMIC DIVERSIFICATION WITH REFERENCE TO AUTOMOBILE INDUSTRY**" submitted by me for the award of the degree of **Doctor of Philosophy** of Jawaharlal Nehru University is my own work. The thesis has not been submitted for any other degree of this University or any other University.

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## CERTIFICATE

We recommend that this thesis be placed before the examination for evaluation.

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Dedicated to
The People of Iran

# CONTENTS

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Rachit Kumar Murarka

Date:

Place:

# LIST OF ABBREVIATIONS

| | |
|---|---|
| AoA: | Articles of Association |
| BP: | British Petroleum |
| bpd: | barrels per day |
| CapEx: | Capital Expenditure |
| CEO: | Chief Executive Officer |
| CIA: | Central Intelligence Agency |
| CKD: | Complete Knock Down |
| COMECON: | The Council for Mutual Economic Assistance |
| DEIEs: | Developing and Emerging Industrial Economies |
| DOJ: | Department of Justice |
| ECI: | Export Concentration Index |
| EIA: | Energy Information Administration |
| EOI: | Export Oriented Industrialisation |
| FCPA: | Foreign Corrupt Practices Act |
| FDI: | Foreign Direct Investment |
| GCC: | Gulf Cooperation Council |
| GDP: | Gross Domestic Product |
| GHGs: | Green House Gases |
| GM: | General Motors |
| GPFG: | Government Pension Fund Global |
| HCI: | Human Capital Index |
| ICE: | Internal Combustion Engine |
| ICI: | Index of Core Industries |

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| IEA: | International Energy Agency |
| IIP: | Index of Industrial Production |
| IKCO: | Iran Khodro |
| IKD: | Iran Khodro Diesel |
| ILSA: | Iran Libya Sanctions Act |
| IMF: | International Monetary Fund |
| IOCs: | International Oil Companies |
| IPCC: | Intergovernmental Panel on Climate Change |
| IPO: | Iranian Privatization Organization |
| IRGC: | Iranian Revolutionary Guard Corps |
| ISI: | Import Substitution Industrialisation |
| ISIC: | International Standard Industrial Classification of All Economic Activities |
| JCPOA: | Joint Comprehensive Plan of Action |
| Mbd: | Million barrel per day |
| MEAF: | Ministry of Economic Affairs and Finance |
| MTOE: | Million Tonnes Oil Equivalent |
| MVA: | Manufacturing Value Added |
| NIOC: | National Iranian Oil Company |
| NOCs: | National Oil Companies |
| NPC: | National Petrochemical Company |
| OECD: | Organisation of Economic Cooperation and Development |
| OEMs: | Original Equipment Manufacturers |
| OICA: | Organisation Internationale des Constructeurs d'Automobiles |
| OPEC: | The Organisation of the Petroleum Exporting Countries |
| ORB: | OPEC Reference Basket |

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|---|---|
| OSF: | Oil Stabilisation Fund |
| PCI: | Product Complexity Index |
| PPP: | Purchasing Power Parity |
| PSH: | Prebisch Singer Hypothesis |
| SABIC: | Saudi Basic Industry Corporation |
| SAIPA: | Sociètè Anonyme Iranienne de Production Automobile |
| SAPCO: | Supplying Automotive Parts Company |
| SEC: | Security and Exchange Commission |
| SOEs: | State Owned Enterprises |
| SPSS: | Statistical Package for the Social Sciences |
| SSO: | Social Security Organisation |
| TSE: | Tehran Stock Exchange |
| UNCTAD: | United Nations Conference on Trade and Development |
| UNIDO: | United Nations Industrial Development Organisation |
| WTI: | West Texas Intermediate |
| WTO: | World Trade Organisation |

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# CHAPTER I

# INTRODUCTION

Economic diversification and debates around it are often centred on the developing countries with a concentrated export basket. Economic diversification has become a captivating phrase for the countries which are largely dependent on the export of primary commodities. In recent decades because of a large upswing in oil prices, economic diversification has become the most discussed economic policy of West Asian countries.

Diversification of economy has many benefits, it ensures stable income, lesser risks, encourage technological innovations, and promotes diverse consumption pattern. However, diversification of an economy is not an easy task; for a successful diversification, there is a need for structural and economic reforms. Structural reforms entail the country's population, human capital and quality of political and economic institutions. Economic diversification expands with an increase in the human population. As the population grows demand also grows, and local firms have access to the large local market, as a result benefitting from the economy of scale. An efficient human capital allows vertical movement across the product lines. Vertical movement along the product lines implies making more knowledge-intensive manufactured goods. Manufactured goods have more value added to them compared to primary commodities, and are less susceptible to the price fluctuations.

Similarly, political and economic institutions are also instrumental in economic diversification. Political and economic institutions foster investors' confidence to invest in an economy. Foreign Direct Investment (FDI) in an economy is a function of structural reforms. The state of political and economic institutions, policies of a country, and state of human capital are an important determinant of FDI in a country. FDI is a significant economic indicator for assessing the level of diversification programme. Though FDI is an external factor, the decision to invest is totally dependent on internal conditions.

Economic reforms differ from structural reforms in a way that the former is primarily on account of policies. Economic reforms involve trade liberalisation, access to market and exchange rate mechanism. Trade liberalisation is often measured in terms of the ratio of export and import to the GDP. Trade liberalisation means having fewer barriers to exports

and imports. The idea behind trade liberalisation was that the government's role in resource allocation should be minimised, with an objective of enhancing the role of private players in the trade. It was believed that private economic agents guided by market forces that is profit, would better realise the goal of economic diversification and growth. It was also argued that trade liberalisation would change the output matrix in favour of manufactured goods. Trade liberalisation would often lead to cheap imports, which in turn benefit the consumers and manufacturers, further speeding up the diversification process. Trade liberalisation increases access to the open market, which is believed to have a positive effect on productivity.

Trade liberalisation often works on the principle of reciprocity, implying that the country behaves according to the response of another country. For instance the recent trade war between the US and China, where China is responding by increasing tariffs on the American goods in response to increases in tariffs on Chinese goods by the US. Therefore, successful diversification is not only dependent on resources; it also needs sound institutions, judicious planning and policies.

The structures of institutions are very closely associated with the form of governance; institutions are also shaped by the changing actor identities. The experience with external powers has an impact on the formation of the institutions. Institutions reflect the country's experience with external powers. In the case of Iran, the Shah regime and the post-revolution clerical regime do not differ much in the matter of the economic sphere. The Shah of Iran, who wanted to significantly transform Iran's economy, invested oil wealth within Iran. A similar approach was adopted by the post-revolution government of Iran.

A huge amount of oil wealth was invested in large corporations during Shah's regime, but the Iranian economy was not ready for the enormous investment in the domestic economy. Shah's industrialisation plan overheated the economy. While the Shah's industrialisation plan was ineffective because of impulsive policies, the post-revolution government has squarely blamed external shocks, like Iran-Iraq war, and trade sanctions behind the problems and pace of industrialisation. However, Iran has made some considerable achievements in an attempt to industrialise, though the pace of industrialisation and productivity could be debatable. Iran has made striding developments in the field of steel production, making Iran among the largest producers in the region. A similar development

could be witnessed in the field of cement manufacturing, electricity generation and development of new petrochemical products. Iran has become one of the biggest manufacturers of automobiles in the region.

The automobile industry is highly technology intensive and oligopolistic in nature, with technology confined to few corporations. An automobile industry tends to utilise the inputs of land, labour, and capital from a wide variety of smaller industry in a better way, than the oil industry. The automobile industry has better forward and backward linkages, than that of the oil industry. An integrated automobile sector ensures developed steel, glass, metallurgical, and petrochemical industry. Since the automobile industry has strong backward and forward linkages it is reasonable to believe that a fully integrated automobile industry would signify a certain level of diversification.

Iran has witnessed a phenomenal growth in the automobile industry. It has become the second largest industry after oil and gas. In 2011, Iran produced 1.6 million vehicles and ranked thirteenth in global automobile production. It is a big achievement for Iranian automobile industry compared to 1960s when the automobile industry was merely an assembly plant.

### 1.1 Research Methodology

The proposed study followed the analytical method while studying the diversification programme and the political economy of Iran. The study utilised the available primary and secondary sources of information and data. The secondary sources include books, journals, newspapers, unpublished research documents and other relevant materials. Websites of various organisations are used in this research for the procurement of the materials. The primary source includes statistical bulletins and reports by various organisations like OPEC, Central Bank of Iran, UNCTAD and UNIDO. The study also includes various policy papers and acts enacted by the government and various development plans. Constitution of Iran is also consulted in this study.

## 1.2 Research Questions and Objectives

The study addresses the question around diversification and Iran's dealing with it. The study has made an attempt to evaluate the diversification level of the Iranian economy. The study also seeks an answer to the question of ancillary industries of Iran that are needed for the vibrant automobile industry. Similarly, the study has looked into the policy and institutional sphere of Iran related to diversification programme.

It is imperative for any country to diversify its economy from the narrow export basket, as diversification makes the economy less sensitive towards the external fluctuations. Iran is highly dependent on the oil revenue for its export earnings and government revenues, but oil is highly volatile, and there are great fluctuations in the economy owing to the volatility of oil. Fluctuations in the economy dependent on oil revenues are not a new occurrence, because oil is among the most volatile commodities. However, what makes Iran's case interesting is that sanctions are imposed on Iran's oil and gas industry, which make Iran more vulnerable to revenue fluctuations. This makes diversification more important for Iran. Secondly, the Iranian constitution prohibits foreign ownership of oil and gas sector; moreover, there is no national capitalist class in Iran needed for vibrant privatisation programme. Foreign ownership of resources which ensures a steady flow of FDI and active privatisation is considered as a precondition for successful diversification programme; however, in the case of Iran, both these elements are missing. Therefore, it becomes a stimulating exercise to study the diversification efforts of Iran.

Another reason to study the diversification process of Iran is that discourse around diversification is centred on exports concentration and diversity of trade. Though manufacturing is taken into account, somehow, more weight is assigned to export and trade data. Diversification is often studied as a distinct approach not taking a holistic methodology, focusing more on the export basket and trading data. Larger goals of diversification are often side-lined, whereas, figures and trade data are given more attention. Iran has made considerable achievement in manufacturing a wide variety of products; however, these are not featured in trade data and exports basket as Iran needs to dodge the sanctions. Iran employs various means like trading through shell companies etc.; therefore, these figures do

not feature in trade data. However, Iran has maintained a healthy HCI, and the economy is still growing, make the study of diversification quite interesting in the context of Iran

Moreover, there is no significant forward and backward linkages related to the oil industry, whereas, the manufacturing industry has many forward and backward linkages, which would be examined in this study. The study would make an attempt to study the diversification of the Iranian economy, by examining the automobile industry, as well as the ancillary industries associated with it.

The study is based on the central assumption that Iran's policies and its overwhelming dependence on oil are the reasons for the inadequate level of economic diversification. The study also hypothesises that a well-developed vertically integrated automobile industry is an adequate indicator of economic diversification.

### 1.3 Political Economy of Diversification

The term 'political economy' has been used to refer to a variety of intellectual projects. There are various approaches and several definitions of the term 'Political Economy', which has been developed in the last two centuries.[1] For Adam Smith, political economy was a "branch of the science of a statesman or legislator" and also a guide to the wise management of the national economy.[2] Similarly J.S. Mill, the last major classical economist commented, political economy is the science that teaches a nation how to be rich. Later in the nineteenth century, Alfred Marshall, father of Modern Economics, considerably narrowed the definition of political economy. Marshall substituted the term 'political economy', with present-day 'Economics'.[3] Marshall interpreted, 'Economics as a value-free and empirical science'. This interpretation of Marshall was further substantiated by his student, Lionel Robbins, who defined economics as "science, which studies human behaviour as a relationship between ends and scarce means, which have alternative uses."[4] Therefore economics came to be

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1 Caporaso, James A. and Levine, David P. (1992), *Theories of Political Economy*, New York: Cambridge University Press.

2 Smith, Adam (1776/1976), *An Inquiry into the Nature and Causes of The Wealth of Nations*, Oxford: Oxford University Press.

3 Gilpin, Robert (2001), *Global Political Economy Understanding The International Economic Order*, Oxford and Princeton: Princeton University Press.

4 *Ibid*.

defined as a universal science of decision making under conditions of constraints and scarcity.

After the disappearance from the academic circle, the term political economy again came to prominence in the 1970s. This time, it was brought forth by economists from Chicago School. However, this time there was a considerable difference from its early usage. Economists from Chicago School introduced the term 'political economy' with the view of broadening the subject matter that economists study.[5] Economists like Gary Becker, Anthony Downs, and Richard Posner, were associated with Chicago School, and there study of political economy is based on the assumption that any human behaviour can be explained in terms of efforts of individuals to maximize their self-interest. The essence of this approach is to assume that individuals act alone or together to create social institutions to advance their private interest. The entire economic system, social institutions including government policies, these economists claim, could be explained through a formal model of economics. Chicago School, covers several scholarly areas namely, neo-institutionalism, public-choice theory, and public policies.

However, there is a different concept of political economy, especially used by critics of Chicago School, who believe that the discipline of economics has become too formal, mathematical, and exclusive. Thus, the study of economics has become irrelevant in solving the real social and economic problem. The critics have added the social angle to the study of economics. Economics, they contend, cannot be value-free, and economists should not pretend that it is. According to Heilbroner and Milberg, economics reflects a bias towards the market efficiency and neglects social problem like inequality, for them economics reflect the interest of dominant groups of a capitalist society.[6] Edmund S. Phelps broadly defined political economy as the 'choice' of the political system itself.[7] Similarly, Hirshleifer describes economics as only true social science, as it analyses abstractions such as scarcity

[5] Samuels, Warren J. (1976) (ed.), *The Chicago School of Political Economy*, University Park, Association of Evolutionary Economists.

[6] Heilbroner, Robert L and Milberg, William (1995), *The Crisis of Vision in Modern Economic Thought*, New York: Cambridge University Press.

[7] Phelps, Edmund S. (1985), *Political Economy: An Introductory Text*, New York: W.W. Norton.

and costs that can be effectively used to explain both individual behaviour and social outcomes.[8]

Constructivists drew their ideology from Kant's philosophy, which states that the material world is not free from human understanding. Non-material things influence people's identities; therefore, if the object of social theory is to explain social actions, the material structure is not enough.

However, in the case of diversification, it was often analysed through the prism of the material paradigm. Diversification is not understood in a holistic way, where it encompasses the model of the betterment of human lives and constant innovation. Diversification is analysed in a materialistic way because the discourse on diversification gains popularity due to the problems of the theory of comparative advantage, which is a theory completely based on material gains and loss.

The modern theory of international trade is associated with Ricardo's theory of comparative advantage. The theory emphasises on the specialisation, the rationale behind specialisation is that as long as there is relative cost difference there is an opportunity for trade and it is mutually beneficial. Fundamentally, the theory suggests that the country should produce only those goods, where it has a relative cost advantage. The theory seems reasonable as countries are endowed with limited resources, it cannot be expected that a country produces everything. The resources have to be used in the most efficient way. The theory works best in a free trade environment.

The theory of comparative advantage suggests, for instance, an exporter of primary goods should continue the export of primary goods because the relative cost of producing the commodity is lesser in the country. The theory would suggest, Iran should continue exporting oil, as the relative cost of producing oil in Iran is lesser than other countries. But there are many countries, which cannot produce oil, the cost for producing oil in those countries cannot be defined, and if the absolute cost cannot be defined, then the relative cost cannot be determined. The question of relative cost regarding oil production in Iran vis-à-vis other

[8] Hirshleifer, Jack (1995), "The Expanding Domain of Economics," *American Economic Review*, 75(6): 53-68.

countries, which cannot produce oil is unjustified. Nevertheless, the theory cannot be written off as relative cost cannot be compared between the two countries. The theory becomes really useful when assessing the relative cost of similarly endowed countries.

Diversification, on the other hand, should not be construed as mutually exclusive to the theory of comparative advantage. Often diversification is juxtaposed against the theory of comparative advantage because of the narrow definition of diversification. Comparative advantage and diversification if not complementary are not mutually exclusive. Comparative advantage does not mean that the economy should only produce one thing in which it is best at; similarly, diversification should not be interpreted as autarky where an economy produces everything without taking cost into consideration.

In the case of Iran, a different set of policies adopted during the regime of the Shah and post-Revolutionary government cannot be adequately dealt with materialist theory. Apprehension against foreign influence has shaped the constitution of Iran, which has its bearing on the economic policy of Iran. The concern to protect the country from foreign interference is made clear in the constitution of Iran, referring it as foreign domination. Iranian constitution includes the complete elimination of imperialism and also mentions the prevention of foreign influence completely. This concern of foreign domination defines the economic policy of Iran, which advocates for achieving economic independence by preventing foreign dominations over the country's economy.[9]

Iran is one of the world's most complex societies. In many Western imaginations, the only image of Iran is negative ones: a country oppressed by a harsh theocratic regime.[10] But one needs to study Iran's past in order to understand the current theocratic regime. Almost 25 years after Pahlavi crowned himself Shah in 1925, the Iranian people had another go at establishing democracy, electing Mossadeq as Prime Minister. But this democratic experiment was impeded by CIA's Middle East division, backed by British, to overthrow Mossadeq[11]. This incident conditioned the Iranian attitude towards the West; it may have

[9] Constitution of Islamic Republic of Iran, 1979.

[10] Mahbubani, Kishore (2008), *The New Asian Hemisphere: The Irresistible Shift of Global Powers to the East*, New York: Public Affairs.

[11] Daneshkhu, Scheherazade (2006), "The West Must Stop Meddling in Iran's Affairs", *Financial Times* 30 August 2006.

affected the modern Iranian psyche as much as 9/11 has affected the American psyche. The military coup managed by imperial powers reinstated Muhammad Reza Shah. He was instrumental in bringing the industrial capitalist development in Iran.[12] After the overthrow of Mossadeq, Muhammad Reza Shah had a very important role in integrating Iran into the world economy. His plans for industrial development were augmented by oil revenues. Cushioned by high oil prices, Shah initiated the industrialisation programme, with focus on heavy and petrochemical industries, in order to diversify the economy from oil.

The decade of oil boom boosted the industrialisation process, but at the same time it was uneconomical, as the state intervention was not motivated by the need of private investment, rather it transfers massive amounts of oil resources to the private sector without generating lasting benefits. In fact, the Shah's vision of making Iran a great industrial power turned out to be a misadventure. Another reason Iran failed to achieve a significant level of industrialisation despite being powerful because Iranian capitalist class was in a subordinate role in the development strategy of the Shah's regime.[13] There are various complex factors such as class conflict, economic inequality, and arbitrary use of power by Shah, neglect of agriculture, and high rate of migration to cities, which became the cause of the revolution. Thus it culminated into the Iranian revolution, which witnessed the popular resentment against the monarchist rule and imperialist influence over the country.

Iran's quest for democratisation did not arise in the classic conditions of economic and political crises. On the contrary, it followed prosperity associated with oil boom period of the 1970s, implying that desire for revolutionary change may have had more to do with growing inequality and relative poverty in these years than with actual impoverishment and hunger. At the core of the revolution was democratic and anti-dictatorial aspirations, but it was overshadowed by religious leadership. The desire for revolution was to the extent fuelled by relative inequality, it gave religious leadership impetus to pursue the populist policies in the economic domain.[14] The Iranian revolution, like Latin American populism, was built

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[12] Ramakrishnan, A. K. (2008), *US Perceptions of Iran: Approaches and Policies*, New Delhi: New Century Publications.

[13] Behdad, S. and Rahnema S. (eds.) (1996), *Iran After the Revolution: Crisis of an Islamic State*, London: I.B. Tauris.

[14] Abrahamian, E. (1993), *Khomeinism: Essays on the Islamic Republic*, Berkely: University of California Press.

around the broad coalition of the middle classes led by strong and charismatic leadership.[15] While respecting private property, it had strong connotations of class conflict between the downtrodden and the oppressors, and revolution promised to emancipate the downtrodden from all injustices of monarchist era. This involves the pledge to build a society free from hunger, inequality, and corruption.

Since the revolution, Iran has witnessed several institutional and socio-economic changes and has been affected by many economic and political upheavals. The economy of the country has experienced a number of major shocks, including oil booms and busts, war, trade sanctions, and internal political strife, affecting prospects of growth. Revolutionaries blamed mismanagement of excessive oil wealth, which heated the economy for the Shah's plan of industrialisation. Therefore, the revolutionary government intended to diversify its economy from oil and setting up the institutions, which would help in achieving this goal. Ironically, oil dependency appears to have risen during the post-revolutionary periods. In fact, the correlation coefficient for the period after 1979 is twice that of the period before. It is perhaps ironic that oil dependency has increased overall during periods after 1979, despite more emphasis being placed on achieving self-sufficiency and economic independence. It is only during the Third Plan (2000-2004), there is a negative correlation between oil revenues and GDP growth. However, this does not mean, Iran has not achieved anything in terms of diversification. Iran has become the biggest producer of cement and steel in the region, similarly, Iran has also become the biggest manufacturer of the automobile in the region.

### 1.4 Iran's Energy Industry

Though the study is focused around the diversification of the economy, discussing energy industry is important here, because oil is the main source of export revenue to the government, and Iran wants to diversify its economy from oil to manufacturing. Iran's energy industry is the biggest source of revenue to its government. It generates around 20 per cent of Iran's Gross Domestic Product, 80 per cent of its foreign exchange and 50 per cent of its government revenue in 2012.[16] Iran's energy industry is the oldest in the West Asian

[15] Dornbusch, R. and Edwards, S. (1991), *The Macroeconomics of Populism in Latin America*, London: The University of Chicago Press.

[16] Katzman, Kenneth (2013), "Iran Sanction", *Congressional Research Service*, Library of Congress.

region, as oil was first discovered in Iran.[17] Although oil has been produced in Iran over a very long period, its importance in the Iranian economy was relatively small up until the early 1960s. Iran's revenue from oil exports started to become significant from the 1960s onwards, thanks to increased production and partly due to the increasing importance of Organisation of the Petroleum Exporting Countries (OPEC). But the main factor behind Iran's huge oil revenue was a price increase, which became substantial after the quadrupling of international oil prices in 1973-74.[18] Due to the policies followed by Shah, Iran experienced huge income inequality. There was excessive reliance on the petroleum sector, which stunted the growth of the other sectors. During the pre-revolutionary period, Shah was bitterly criticised for his economic policies, which put excessive oil wealth in the economy. The high level of oil production was seen as responsible for waste, corruption and the relative decline of the agricultural sector. Oil income has been a blessing, as it helped in sustaining GDP growth, but at the same time, it has also been a curse in inducing inflation, exchange rate volatility, and macroeconomic inefficiencies. Neglect of other sectors due to oil income, and at the same time, various macroeconomic inefficiencies due to excessive oil wealth in the economy became the reason diversification deemed necessary for the economy. But at the same time, Iran's energy sector provides the necessary fund needed for the diversification of the economy.

### 1.5 Diversification of Iranian Economy

Countries predominantly dependent on oil wants to diversify the economy from the oil. The oil sector has a weak linkage to the rest of the economy. Unlike, other industries which draw input of land, labour, and capital from a wide variety of smaller industries, which in turn invoke a wide range of productive activities, oil offer few such forward and backward linkages. The oil industry is characterised by uncertainty. Owing to Iran's huge dependence on oil, the spot price of crude and oil volatility directly affects the GDP of Iran. GDP of Iran in 1985 was $166.584 billion when the spot price of crude was $27.01, in 1993 the price of

[17] Yergin, Daniel (1991), *The Prize: The Epic Quest for Oil, Money, and Power*, New York: Simon and Schuster.

[18] Massoud, Karshenas and Pesaran, M. Hashem (1995), "Economic Reform and the Reconstruction of the Iranian Economy, *Middle East Journal*, 49(1): 89-111.

crude came down to $16.33 and GDP to $77.766 billion.[19] The oil prices came down by 39.5 per cent, GDP declined by 53.3 per cent. Iran's oil revenue has been extremely volatile, and much more than the price of oil in the international market. Moreover, the volatility of oil revenue is much more than the volatility of production and price that's why despite the fall in 40 per cent (approx.) price of crude brought 53.3 per cent decline in GDP of Iran.

Trade theory suggests that growth should be derived from the economic specialisation that is non-diversification, as there are limited resources, which need to be put to the reasonable uses. At the same time, specialisation in a narrow group of exports could lead to deterioration of trade, and instability in export earning, that has been labelled as a natural resource curse.[20] However, there is a difference in diversity and diversification. Diversity is a static concept, whereas, diversification is a dynamic one. Diversity is a variety of economic activity, which reflects the difference in economic structure. On the other hand, diversification means a flexible form of development which plays a role in industry sustainable growth by encouraging sustainable production systems in line with the available resources, technology and entrepreneurship. Diversification of economy helps in sustainable and stable economic growth, as it promotes stable incomes and low unemployment level.[21] Similarly, a diversified economy is less sensitive to internal and external shocks, which are ups and downs related to any particular industry or business sector. Risk is more evenly spread across a number of industries in a diversified economy. As the economy becomes more diversified, it becomes less sensitive to fluctuations by outside factors.[22]

According to Prebisch and Singer, resource-based growth would be discouraged by the decline in world prices of natural resources that is primary products. Closely related views forecasted that world demand for primary products would grow slower than that of manufactures. It implies that productivity growth would be faster in manufacturing.

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19 OPEC Annual Statistics Bulletin (1999), Organisation of the Petroleum Exporting Countries, Vienna.

20 Sachs, J. D. & Warner, A. M. (2001), "The curse of natural resources". *European Economic Review*, 45 (46): 827-838.

21 Akpadock, F. (1996). Diversification trends of the regional economy of mill-town communities in northeast Ohio, 1980-1991. *Community Development*, *27*(2), 177-196.

22 Hackbart, M. M., & Anderson, D. A. (1975). On measuring economic diversification. *Land Economics*, *51*(4), 374-378.

At the simplest level, industrialisation has its central characteristics, machine production. It is closely associated with the increase in the scale of production using machines. Industrialisation basically means the share of value added in manufacturing in GDP.

Shah's strategy for economic development favoured government planned large scale industrialisation, which increased its importance in the 1960s and 1970s with the growth of oil wealth. It is indeed because of oil wealth public sector remained dominant in Iran. The main feature of Iran's manufacturing sector by the mid-1970s was heavily geared towards the production of consumer goods. Consumer goods have weak linkages with other sectors, which became weaker over time. Growing reliance on imports for sustaining production and declining export capacity described the Iranian economy.[23] The small size of the market made it difficult for these plants to go beyond the assembly plant stage, and develop into integrated production process which could benefit from economies of scale.[24] Looney puts most of the blame for the disappointing performance of industry and imbalances in the economy, on the government import substitution policy.

Shah's industrialisation programme was rendered ineffective because of corruption, and wastage compounded with impulsive policies. However, in post-revolution Iran, the problem was exacerbated by a series of external events including war, trade sanctions and internal political strife. According to one estimate, Iraq's invasion on Iran imposed an astronomical cost of $790 billion economic damage to Iran.[25] There was a 20 per cent decline in industrial production from 1977/78 to 1980/81, and between 1978 and 1988 manufacturing employment declined by 14 per cent.[26] However, decades after war years, manufacturing industries in Iran started to grow largely because of the government's development plan and due to domestic need as there was trade embargo imposed on Iran. During this time Iran witnessed an increase in its industrial production, and automobile industry of Iran grew during these years.

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[23] Looney, R. E. (1986), "Origins of pre-revolutionary Iran's development strategy", *Middle Eastern Studies*, 22(1): 104-119.

[24] Karshenas, Massoud (1990), *Oil, State and Industrialization in Iran,* Cambridge: Cambridge University Press.

[25] Mofid, Kamran (1999), *The Economic Consequences of Gulf War*, NewYork, Routledge.

[26] Hassani, M. (2006), "Performance of Iran's Oil Sector: Oil Revenues and Developmental Challenges, 1970–2003", *India Quarterly*, *62*(1): 146-173.

## 1.6 Automobile Industry of Iran

The automobile industry is one of the most globalised industries with an oligopolistic structure that is dominated by a small number of leading companies.[27] Barriers to entry include leading companies' ownership of technology and the process involved in the design and development of the vehicles and presence of economies of scale in production. The automobile industry has strong forward and backward linkages and it supports many ancillary industries around it. While 80 per cent weight of the finished vehicle is steel part, automobile industry gives impetus for the development of metallurgical industries.

The assembly of cars and commercial vehicles from CKD (completely knock down) kits started in the early 1960s. This was concurrent with the implementation of import substitution policy based on the protection and promotion of domestic producers. Foreign capital was, however, prominent in the component producing sector particularly that required technical sophistication. However, the main driving force behind the growth of the industry in Iran was the rapid growth of domestic demand. Industry protected by tariffs high as much as 200 per cent, witness the increase in the production of passenger cars from 3000 in the 1960s to more than 120,000 by 1977.

The increase in demand reflects two things: a booming economy on account of newly injected oil revenue into the economy, and high tariffs that dissuaded import of automobiles. The increase in domestic demand was catered by the domestic automobile industry; however, the industry was highly dependent on foreign firms for technical know-how. Despite the government efforts to promote vertical integration of the industry, the local content achieved by the two largest producers, Iran National and Khavar Company was in the range of 47-50 per cent.[28] Despite having robust demand during Shah's era of expansionary fiscal policies, the automobile industry was still largely dependent on imported parts and components. Therefore, during the war period of 1987-1988, Iran Khodro (previously called Iran National) production declined to 9,686 from 90,866 in 1977-1988. During the war with Iraq, the industry redirected its activities to support the war effort.

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[27] Humphrey, J., & Memedovic, O. (2003), *The global automotive industry value chain: What prospects for upgrading by developing countries*, Vienna: UNIDO.

[28] Alizadeh, P. (1985), *The process of import substitution industrialisation in Iran (1960-78)*. Unpublished D.Phil dissertation, Institute of Development Studies, Falmer, Brighton, UK: Sussex University.

However, the automotive act of 1993 laid the foundation for the development of the national auto industry. The Automotive Law of 1992, enacted in 1993, underlined the importance of a nationally integrated auto industry, capable of exporting to the world. Following the growth of demand in the early 1990s, the government placed emphasis on the reconstruction and renovation of the automotive industry.[29] The most remarkable aspect of the auto sector development in Iran since the mid-1990s is the rapid expansion of domestic production that has increased from a very low level in the mid-1990s to more than 1.6 million in 2011. By 2011 Iran had risen to the thirteenth largest producer in the world.

[29] Bahar, A. (2005), "Reports on Iran's Automotive Sector", *Atieh Bahar Consulting Firm*, Tehran, Iran. URL: www.atiehbahar.com.

# CHAPTER II

# THE POLITICAL ECONOMY OF DIVERSIFICATION

## 2.1 Introduction

There is a big debate among low-income developing countries regarding the best way to achieve sustainable development. Proponents of specialisation refer to the Ricardian theory of comparative advantage, which stipulates that countries should do what they are good at. On the other hand, there is an argument in favour of diversification, which advocates the diversification of the production and exports, to make the economy less prone to economic shocks.

The discussion on specialisation and diversification has gained a new momentum owing to the empirical results by Imbs and Wacziarg. Their finding point to the U-Shaped curve for the relationship between specialisation and GDP (Gross Domestic Product) growth. U-Shaped curve signifies that at a low level of GDP countries tend to diversify into new products, and as the income level increases countries resort back to specialisation[1].

Here one can see that diversification and specialisation are not absolute, practically no country is totally specialised in one product, and there is no limit to the diversification in an economy. Diversification and specialisation are not easy to define, as these terms assume many meanings. Despite the lucidity of the term specialisation, it has been understood in many ways and continues to have a formidable impact on trade theories. Specialisation comes from the theory of comparative advantage propounded by David Ricardo, whereas, the lacunas of comparative advantage brought diversification into perspective.

David Ricardo has propounded the theory of comparative advantage. In his famous wine and cloth example where Portugal has an absolute advantage over both cloth and wine compared to England, Ricardo argued that opening of the trade will be beneficial to both countries. The theory of comparative advantage can be better understood by his famous example, where a shirt can be exchanged for a bottle of wine in the world market. Assuming

[1] Imbs, Jean and Wacziarg, Romain (2003), "Stages of Diversification", *American Economic Review*, 93(1): 63-86.

an economy where only two products are made, it takes 100 workers an hour to produce a shirt and similarly, it takes 120 workers an hour to produce a bottle of wine. There are 12000 workers in a country X, and the workforce in distributed equally in the production of shirt and wine respectively. With the equal distribution of the workforce, country X can produce 60 shirts (6000/100) and 50 bottles of wines (6000/120). Assuming, there is trade and country X employs its entire workforce into shirt production, as it has a comparative advantage over shirt production. By employing its entire workforce in production of shirts, country X produces 120 shirts (12000/100). In this scenario, it can trade half the shirts for 60 bottles of wines and still left with 60 shirts. Country X gained 10 bottles of wines from specialisation and trade[2]. Theory of comparative advantage favours free trade, and argue that trade protectionism is not beneficial for the economy in the long run.

On the other hand, there is no unified theory of diversification. Diversification as a strategy came from the failure of specialisation, and the economy's overdependence on any particular resources. Arguments in favour of diversification can be found in the dependency theory developed by Raul Prebisch. Proponents of free trade believe that economic growth is beneficial for everyone, though the benefits are not equally shared; everyone gets some benefit of economic growth[3]. But, the studies led by Prebisch and his colleagues came to a different conclusion. According to Prebisch, a higher level of economic activity in rich countries generally led to economic problems in poorer countries[4]. The reason for the serious economic problem in the underdeveloped countries is due to their dependence on the export of the primary products. Prebisch suggests that specialisation in the primary products would lead to 'secular falls' in the purchasing power of primary exports; therefore diversifying from primary products into manufacturing should be the primary objective of the developing nations[5]. Dependency theory is theoretically similar to realism or mercantilism, as it believes that each country has a distinct economic interest, which needs to be articulated. Dependency theory is in contrast with the theory of comparative advantage which advocates specialisation

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2 Numerical Examples of Comparative Advantage, [Online: web] Accessed 29 November 2017, URL: http://arnoldkling.com/econ/GMU/lectures/compadv.html.

3 Economic growth is beneficial for everyone comes from the concept of Pareto Optimal.

4 Dependency Theory: An Introduction by Vincent Ferraro, [Online: web] Accessed 23 November 2017, URL: http://arnoldkling.com/econ/GMU/lectures/compadv.html.

5 Prebisch, Raul (1950), *The Economic Development of Latin America and its Principal Problems*: *Economic Commission from Latin America*, New York: United Nations Department of Economic Affairs.

because specialisation flourishes under the environment of free trade. Dependency theory favours the import substitution and advocates the mercantilist principle of high tariffs and protection of domestic industries.

### 2.2 Debates around Specialisation

Liberal models of trade suggest that cumulatively countries gain from the opening up economies to trade. Trade is a stimulant for specialisation, countries specialise in the good in which they have a comparative advantage, in this way countries can allocate resources more efficiently[6]. According to Rodrik, countries' under-development which is associated with the lack of exposure to international markets implies that there is room for specialisation or specialisation is an important vehicle for development in these countries.[7] WTO (World Trade Organisation) has enumerated the benefits of free trade by raising the issue of comparative advantage. According to the website of WTO, where basics concepts are explained, under the heading: 'The case for Open trade', WTO has explained the advantage of free trade and comparative advantage as[8]

> The data show a definite statistical link between freer trade and economic growth. Economic theory points to strong reasons for the link. All countries, including the poorest, have assets — human, industrial, natural, financial — which they can employ to produce goods and services for their domestic markets or to compete overseas. Economics tells us that we can benefit when these goods and services are traded. Simply put, the principle of "comparative advantage" says that countries prosper first by taking advantage of their assets in order to concentrate on what they can produce best, and then by trading these products for products that other countries produce best.

Paul Krugman explained about the concentration of economic activities in certain areas and cities. The view that transportation costs decline with better and improved technologies tends to strengthen the mechanism of regional concentration of economic activities. As the transportation cost decline the necessity to be located close to the demand

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6 Kaulich, Florian (2012), *Diversification vs. specialization as alternative strategies for economic development: Can we settle a debate by looking at the empirical evidence?*, Vienna: UNIDO, 2.

7 Rodrik, Dani (2007), "One Economics, Many Recipes. Globalization, Institutions and economic growth", Princeton: Princeton University Press.

8 The Case for Open Trade, [Online: web] Accessed 24 October 2017, URL: https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact3_e.htm.

decreases. Therefore, with growth in better and cheaper transportation technology, the regional concentration of economic activities is expected to rise[9].

The concentration of economic activities implies specialisation. Specialisation ensures a better allocation of resources and minimises the waste generated in the economy, thus allowing for the efficient use of resources and mutual welfare increase.[10]

Despite the benefits of comparative advantage, there are certain limitations of comparative advantage, as the theory of comparative advantage fails to explain the current pattern of world trade and manufacturing. The primary focus of comparative advantage is on labour and opportunity cost. The theory assumes technology as a static factor, which does not change over time. Therefore, new developments like Asians countries becoming the hub of manufactured goods and also the exporters of primary products cannot be convincingly explained by the theory of comparative advantage.

The theory of comparative advantage assumes that the economies function in a perfectly competitive environment, so there is gain from the trade. In reality, most countries exhibit varying degree of monopoly elements.[11]

Another shortcoming of the theory of comparative advantage is that it postulates the prevalence of constant returns. This assumes that there is no change in the economic structure of the country.[12] This assumption is unrealistic, as, with the revolution of information and communication technology and globalisation, technology is disseminated easily, as can be witnessed by the rise of new manufacturing hubs.

The theory of comparative advantage is based on the premise that all countries can produce all commodities. In a pre-trade scenario where countries can produce all commodities, the relative cost of the commodities can be determined. Only after the determination of relative cost trade comes into the picture where countries gain by producing

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9 Krugman, Paul (1991), *Geography and Trade*, Cambridge: MIT Press.

10 Kurgman, Paul and Obstfeld, Maurice (2006), *International Economics: Theory and Policy*, Boston: Pearson, Addison-Wesley.

11 Nanda, Sushil, "What are the Merits and Demerits of Ricardian Theory of Comparative Advantage", [Online: web] Accessed 25 October 2017, URL: http://www.preservearticles.com/201102103979/merits-and-demerits-of-ricardian-theory-of-comparative-advantage.html.

12 *Ibid*.

specific commodities and exchange instead of producing everything. The theory assumes that free trade incentivises the countries to produce according to their comparative cost advantage, and is termed as a positive-sum game, which means it is an advantage for every party involved in the free trade.

However, according to Utsa Patnaik, there is a 'material fallacy' in the theory by Ricardo. All countries could not produce all commodities; therefore, the conclusion reached by Ricardo that trade benefit all is not true. Ricardo has conveniently ignored the fact that temperate and cold regions could not produce a large variety of tropical and subtropical crops. Therefore, with zero or insignificant output of tropical crops, the cost of production could not be defined or ascertained. This implies that relative cost also cannot be ascertained, hence, there is no basis to evaluate the comparative cost advantage[13].

Similar to the theory of comparative advantage, the Heckscher-Ohlin model explains the international trade pattern. Heckscher-Ohlin model explains about factor endowment and stipulates that countries export what can be plentifully and proficiently produced[14]. Heckscher-Ohlin model states that comparative advantage is a result of relative factor endowments across the regions and 'relative intensities' with which factors are employed across sectors[15]. Therefore, a country will have an advantage in respect of other countries in producing goods in those factors which a country is relatively more endowed with[16]. This model is used to assess trade between two countries that have a varying degree of specialities. The model primarily emphasises on the exportation of goods, the factor of production of which is in abundance in exporting country and the import of goods that the country cannot produce efficiently[17].

At its core, the goal of the Heckscher-Ohlin model is to arithmetically explain the production process of a country. There is an imbalance of resource throughout the world,

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13 Patnaik, U and Patnaik, P (2017), "*A Theory of Imperialism*", New York: Columbia University Press, 11-12.

14 [Online: web] Accessed 20 October 2017, URL: https://www.investopedia.com/terms/h/heckscherohlin-model.asp.

15 OECD (2011), Globalisation, Comparative Advantage and the Changing Dynamics of Trade, [Online: web] Accessed 20 October 2017, URL: http://dx.doi.org/10.1787/9789264113084-en, 152

16 *Ibid*.

17 [Online: web] Accessed 20 October 2017, URL: https://www.investopedia.com/terms/h/heckscherohlin-model.asp.

implying that resources a country lacks are available elsewhere, with different regions having different resources in abundance, the mismatch of resources make trade a prudent policy.

The model focuses on the importance of free trade. It emphasises on the global benefit of free trade where each country puts effort into exporting resources that are abundant and import resources which are scarce. Free trade according to this model is beneficial for everyone, similar to positive sum game[18].

Heckscher-Ohlin model and theory of comparative advantage are similar in a way that both enumerate the benefits of free trade occurring to the trading parties. Like the theory of comparative advantage, the Heckscher-Ohlin model does not explicitly mention about specialisation. However, the model emphasises that the countries should export only those resources, which they are better endowed with. Though the model does not overtly suggest about specialisation, however, free trade and theory of comparative advantage complement each other.

Heckscher-Ohlin model seems fairly logical and reasonable but economists disagree regarding empirical evidence that actually supports the Heckscher-Ohlin model. Various economic models explain that contrary to Heckscher-Ohlin model suggestion[19], developed and industrialised countries tend to trade with one another rather and rely less on trade with developing countries. The model theorises that trade occurs due to the difference in relative factor proportions. This model of trade suggests that trade is largely a supply-side phenomenon[20].

As opposed to the supply side approach of the Heckscher-Ohlin model, the Linder theory basically describes the demand-side approach of international trade. Linder believed that demand and preference play a greater role in the pattern of international trade. Countries largely produce goods for the domestic market and surplus is exported. Therefore, it is prudent to conclude that countries who are interested in importing the surplus would have

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[18] *Ibid*.

[19] Hecksher-Ohlin model suggests that industralised countries which are capital abundant should trade more with labour abundant developing countries.

[20] Bukhari, Syed Adnan Haider Ali et. al (2005), "An Empirical Analysis of the Linder Theory of international Trade for South Asian Countries", *The Pakistan Development Review*, 44 (3): 307-320, 309.

demand patterns similar to that of exporting countries[21]. Contrary to the Heckscher-Ohlin model, trade between countries arises because of 'overlapping demand'[22], where countries with similar factor endowment have similar demand pattern.

Ohlin was aware of the difference in relative factor pricing under the conditions of autarky. For instance, in a country with higher capital/labour endowment ratio consumer would have a strong preference for capital intensive goods, that under the autarky, price of capital intensive goods could be higher in countries with higher capital/labour endowment ratio. As a result, the opening of trade would result in capital abundant countries importing capital intensive goods and exporting labour-intensive goods. However, Ohlin believed that differences in relative factor endowment are usually more significant than differences in relative preferences of consumer in influencing patterns of trade[23].

Linder theory opines that the preference of consumers or demands of goods have a strong influence in international trade pattern is witnessed in many developing countries as well. Like the above example where a capital intensive country has a demand pattern similar to other capital intensive countries, similarly developing nations have demand pattern similar to that of other developing nations.

Table 2.1: Average Percentage of Imports Originating from Developing Nations[24]

| Countries | Time Period | Percentage of Total Import |
|---|---|---|
| Bangladesh | 1993-2002 | 18.43 |
| India | 1993-2002 | 15.45 |
| Pakistan | 1993-2002 | 20.01 |

Source: Statistical Yearbook for Asia and Pacific 2003.

The table demonstrates that the developing nations of South Asia have significant imports from the developing nations. Todaro estimates that about third of all developing countries import come from other developing countries. The figure includes only

[21] *Ibid*, 310
[22] *Ibid*.
[23] Baldwin, Robert. E (2008), "*The Development and Testing of Heckscher-Ohlin Trade Models: A Review*", Cambridge, MA: MIT Press, 2-3.
[24] Table taken from the article publish in *The Pakistan Development Review*. Bukhari, Syed Adnan Haider Ali et. al (2005), "An Empirical Analysis of the Linder Theory of international Trade for South Asian Countries", *The Pakistan Development Review*, 44(3): 307-320, 311.

manufactured goods[25], if the primary product is also included, the percentage of import from developing countries would be much higher.

Leontief empirically demonstrated the anomaly in the Heckscher-Ohlin model in the context of a developed nation. Analysing the trade pattern of the United States, Leontief concluded in 1947 the United States, the most capital abundant country at that time exported more labour intensive goods than capital intensive goods. The finding of Leontief was contradictory to the Heckscher-Ohlin trade model. Leontief compared the capital and labour component of million dollar worth of the United States export with the capital/labour component of million dollars worth of import. Surprisingly, Leontief discovered that the capital-labour ratio component in per million dollar bundle of the United States export was less than per million dollar bundle of the United States import[26]. In simple words, the United States imported more capital intensive goods that it exported; despite the fact, the United States is capital abundant country. This came to be known as Leontief Paradox.

Leontief, further made some specific calculations, according to his calculations the United States imports were 30% more capital intensive than its exports. He further calculated that the capital/labour ratio of the United States export was $14,300 and that of import was $18,200[27]. This calculation implies that to produce a million dollar worth of export the amount of capital employed was $14,300 and but similar amount import has $18,200 worth of capital component[28].

Bharadwaj studied the trade pattern of India and concluded that India trade pattern exhibit mixed response to the Heckscher-Ohlin model. India's exports were labour extensive that was consistent with the trade model. However, India trade with the United States was not consistent with the model, as India exports to the United States were capital intensive[29].

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[25] Todaro, M.P. (1997), *Economic Development*, Reading, Massachusetts: Addison Wesley Publishing House, mentioned in Bukhari, Syed Adnan Haider Ali et. al (2005), "An Empirical Analysis of the Linder Theory of international Trade for South Asian Countries", *The Pakistan Development Review*, 44(3): 307-320, 311.

[26] Baldwin, Robert. E (2008), "*The Development and Testing of Heckscher-Ohlin Trade Models: A Review*", Cambridge, MA: MIT Press, 63.

[27] Leontief Paradox, [Online: web] Accessed 5 December 2018, URL: http://www2.econ.iastate.edu/classes/econ355/choi/leo.htm.

[28] *Ibid*.

[29] Bharadwaj, R (1962), "Factor Proportions and the Structure of Indo-US Trade", *Indian Economic Journal*, 10: 105-116.

The entire discourse of WTO (World Trade Organisation) is premised on the benefits of free trade. The discourse of WTO where trade liberalisation is necessitated as the basic requirement for global welfare has its foundation in the theory of comparative advantage. However, it is surprising to know that the assumptions of the theory of comparative advantage and Hecksher-Ohlin trade model rest on the immobility of labour and capital between the countries. There are some other unrealistic assumptions like there are no trade imbalances, all resources are fully employed and international trade can be explained by a comparative static model[30]. The theory of comparative advantage assumes money as neutral and considers the function of money as a medium to facilitate international trade. According to Mills, Ricardo and succeeding classical economists have presented international trade as a form of barter, where the money is a neutral medium of exchange[31]. These assumptions are unrealistic and money and the exchange rate plays a significant role in international trade.

Theory of comparative and Heckscher-Ohlin trade model seems fairly logical and reasonable. These theories and models are mathematically consistent and logically they are congruent. However, these theories are based on some unrealistic assumptions that do not correspond to the real-life situation. The theory of comparative advantage cannot explain the prevalent trade pattern adequately. The United States in 1947, highly capital abundant country exports consisted of labour-intensive goods, similarly China of today a labour intensive country is exporting the most capital intensive goods[32].

### 2.3 Meaning of Economic Diversification

There is no unified theory of diversification. In fact, the discourse around diversification gains momentum because of the inadequacy of specialisation. The importance of diversification is highlighted by Simon Kuznets in his Nobel Prize lecture[33]

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30 Schumacher, Reinhard (2013), "Deconstructing the Theory of Comparative Advantage", *World Economic Review*, 2:83-105, 83

31 *Ibid*, 85.

32 Leontief Paradox, [Online: web] Accessed 5 December 2018, URL: http://www2.econ.iastate.edu/classes/econ355/choi/leo.htm.

33 Kuznet, Simon (1971), "Modern Economic Growth: Findings and reflection", Lecture delivered to the memory of Alfred Nobel on 11 December 1971, when received the Nobel Prize for Economics, [Online: web] Accessed 23 December 2017, URL: https://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1971/kuznets-lecture.html.

> A country's economic growth may be defined as a long term rise in capacity to supply increasingly diverse economic goods to its population, this growing capacity based on advancing technology and the institutional and ideological adjustments that it demands

The most ardent argument against the specialisation was forwarded by Prebisch and Singer. In their notable work popularly known as Prebisch Singer Hypothesis (PSH), they claimed that the relative price of primary commodities in comparison to manufactured goods exhibit a downward trend, or decline over time[34]. Prebisch and Singer argument was that the specialisation in the primary product export would exclude the developing countries from the gain of technological progress that had benefitted the industrialised countries. Their assertion was that economic growth cannot be based entirely on the export of primary products, as the price of primary products decline over time and are more volatile than manufactured goods. Demand for primary commodities is characterised by lower income elasticity, which means growth in income would reduce the demand for primary products. Further, improvement in raw material saving technology results in the sluggish demand for primary commodities[35].

Prebisch and Singer advocated for the industrialisation as a development policy for developing country due to the fact that the relative price of manufactures remained higher than that of primary commodities since the nineteenth century. Their justification was that strong labour unions in the industrialised world resulted in higher wages in manufacturing during an upswing, but the converse was not true during the downswing. However, the same was not the case in the developing countries, disorganised labour unions are unsuccessful to obtain same wage rise during upswings, and are unable to stop wage cut during a slump. Therefore, the price of primary commodities increases by a smaller amount than manufactures during an upswing and declines more during the slump[36].

Basically, PSH and the scholarship of Prebisch and Singer explicitly do not advocate for the diversification, but they are cautious of specialisation in the primary commodities as opposed to specialisation in manufacturing. Their argument is that specialisation in the

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[34] Cuddington, John T et al. (2002) , "Prebisch- Singer Redux", *Office of Economics Working Paper*, US International Trade Commission, Working Paper no: 2002-06-A.

[35] Kaulich, Florian (2012), *Diversification vs. specialization as alternative strategies for economic development: Can we settle a debate by looking at the empirical evidence?*, Vienna: UNIDO, 4-5.

[36] Cuddington, John T et al. (2002) , "Prebisch- Singer Redux", *Office of Economics Working Paper*, US International Trade Commission, Working Paper no: 2002-06-A, 5

wrong sector would deprive the country of technological progress, therefore, the country should specialise in the manufacturing[37]. Interestingly diversification can be termed as specialisation in industrialisation. Diversification can be in many fields, like agriculture and services, but here the chapter would mainly focus on the diversification as an attempt to industrialise.

Industrialisation is basically defined in three ways, first, as a production of all quantifiable goods not grown directly on the land. The second aspect of industrialisation definition limits its area, where industrialisation is defined as economic sector encompassing mining, energy, and manufacturing. The third definition of industrialisation is most inclusive and holistic in nature, where industrialisation is seen as a specific way of arranging production process and assumes there is a perpetual process of social and technical change which increases society's capacity to produce an extensive range of goods[38].

The third definition of industrialisation is in line with the definition and purpose of diversification. The chapter would not use diversification and industrialisation interchangeably, however, benefits and growth accruing from industrialisation are similar to that of diversification. As mentioned earlier, the purpose of diversification is to produce a diverse set of goods. Collier and Hoeffler have enlisted the problems faced by developing countries when they rely excessively on the export of primary commodities. Commodities prices are highly unstable, and countries have to face external shock destabilising their economy. Secondly, rents from the export of primary commodities are generally associated with poor governance. Lastly, a narrow range of natural resources export intensifies the risk of civil unrest as these resources need no further processing and can easily be exploited by rebel groups generating income for the rebel groups[39]. Therefore diversification of exports facilitates the stabilisation in export earnings.

The importance of Industrialisation is outlined in the 1987 World Development report published by World Bank. The 1987 report primarily focused on Industrialisation and

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[37] Kaulich, Florian (2012), *Diversification vs. specialization as alternative strategies for economic development: Can we settle a debate by looking at the empirical evidence?*, Vienna: UNIDO, 4-5.

[38] Hewitt, T et.al (1992) (eds), *Industrialization and Development*, Oxford: Oxford University Press, cited in Kiley, Ray (1998), *Industrialization and Development*, London: UCL Press, 3.

[39] Collier, Paul and Hoeffler, Anke (2005), "Resource Rents, Governance and Conflicts", *Journal of Conflict Resolution*, 49 (4): 625-633.

Foreign Trade. According to the report, World Bank has emphasised industrialisation policy as a means, not as an end. Industrialisation should act as a means to raise income and productivity[40].

The emphasis of World Bank to describe industrialisation policy as a means and not an end, underlines the fact, that different countries have different factors of production, and the factors of production should be employed in a prudent manner. According to the World Bank, countries should be prudent when deciding the industrialisation policies. This can be summed in the quotation[41]:

> Excessive emphasis on the industry for the industry's sake, above all heavy industry, may leave an underdeveloped country with a symbol of development rather than the substance. There are of course number of instances where the heavy industry may be justified….. But in general, capital should be applied where it brings the greatest return.

World Bank cautious approach towards industrialisation brings back the debate of comparative advantage and factor endowment, that a country should only produce those goods which it can produce efficiently. Therefore, the report highlights the efficient industrialisation.[42]

The cautious approach of World Bank does not suggest a water-tight compartmentalisation, that labour abundant country should not invest in industrialisation, rather, World Bank recommends the efficient organisation of resources, and if the heavy industry is not feasible for the economy it should focus more on consumer goods. Industry and Industrialisation should not be seen as a synonym of heavy industry.

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40 World Development Report (1987), [Online: web] Accesed 2 January 2018, URL: https://openknowledge.worldbank.org/bitstream/handle/10986/5970/WDR%201987%20-%20English.pdf?sequence=1, 2

41 World Bank memorandum to the United Nations Economic and Employment Commission (1949), quoted in World Development Report (1987), [Online: web] Accesed 2 January 2018, URL: https://openknowledge.worldbank.org/bitstream/handle/10986/5970/WDR%201987%20-%20English.pdf?sequence=1, 2

42 *Ibid*, 1

## 2.4 Industrialisation

Industrialisation is associated with machines, and generally, industrialisation is described as the process of transforming the agrarian society into an industrial society. Industrialisation is marked by large scale production, and the drive towards consumption to keep the idea of industrialisation alive. Industrialisation does not mean only producing capital intensive goods and machinery. Industrialisation should not be reduced to manufacturing that is factory produced goods.

Industrialisation is a holistic view, which characterises a form of productive technique based on advanced methods of production not only in manufactures but also in mining and agriculture[43]. Industrialisation is closely associated with an increase in the scale of production, agriculture which is considered as a sector with a decreasing return to scale has experienced an increased scale of production with improved production techniques[44]. Thus, industrialisation is not related to manufactures, industrialisation is also a process of systemic organisation of economy to get the optimum output. The main advantage of industrialisation is that due to increasing return to scale, cost per unit of producing goods and services falls, which will reduce overall cost. Industrialisation also brings some amount of standardisation in every aspect of social structure[45].

The process of industrialisation is not without its share of criticism, hassles, and setbacks. There is nothing linear and natural about the process of industrialisation. Industrialisation sometimes proved to be very successful and have changed the structure and living standard of society, sometimes the pace of industrialisation is excruciatingly slow. Despite the importance of industrialisation in uplifting the living standard, industrialisation is criticised for its lop-sided development and harm to the environment. E. F. Schumacher in his book *Small is Beautiful: A Study of Economics as if People Mattered* is critical of large scale industrialisation. He advocated the appropriate use of technology. He was against the

[43] Daneshkhu, Scheherazade (2004), *The Political Economy of Industriallisation in Iran, 1973-1978*, PhD Thesis, London School of Economics, Published in 2014 by ProQuest LLC, 70

[44] Malthus has associated agriculture with decreasing return of scale. According to Malthus food production grows in arithmetic progression, whereas, population grows in geometric progression. However, Malthus did not take into account the role of technology and improved farming techniques. As we are witnessing today, population growth is stable, and world food production is rising.

[45] Daneshkhu, Scheherazade (2004), *The Political Economy of Industriallisation in Iran, 1973-1978*, PhD Thesis, London School of Economics, Published in 2014 by ProQuest LLC, 71

idea where natural resources are treated as revenue, his idea was that natural resources should be treated as the capital as natural resources are finite in nature and would eventually deplete. He proposed the idea of the village economy. He maintained that earth resistance to pollution is limited; therefore, efforts need to be focused in the area of sustainable development[46]. Schumacher was greatly influenced by the idea and philosophy of Gandhi[47]. Like Gandhi, Schumacher felt that large scale industrialisation would be counterproductive in a labour intensive country like India. Further, Schumacher believed that India does not have the infrastructure to support the technology of large scale industrialisation[48]. Schumacher challenged the increasing return to scale, which implies 'bigger the better' with small is beautiful[49]. Many environmentalists have raised their voice against the rising pollution level, and global warming and they blame industrialisation for the current state.

There are proponents and opponents of industrialisation, but one should take into account the definitional aspect of industrialisation. Industrialisation is characterised by mechanisation, standardisation, and overall improving the living condition of people. Therefore, industrialisation benefits every aspect of life. Then the question arises why there are opponents? Even, Schumacher did not criticise the policy of industrialisation per se, he was critical of inappropriate technology, and lack of focus on sustainable development. However, this chapter is not examining the debate around industrialisation; rather industrialisation here is taken as a means to diversify the economy. As mentioned earlier, there is no unified theory of diversification and diversification roughly translates into industrialisation. In other words, industrialisation comes closest to diversification.

### 2.5 Rationale behind Diversification

Objectives of diversification are to rectify the problems that arise out of the concentration of particular economic activities. Diversification is not just diversifying into different products

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46 Schumacher, E. F. (1973), *Small is Beautiful: A Study of Economics as if People Mattered*, London: Blond and Briggs Ltd.

47 Ishii, Kazuya (2001), "The Socioeconomic Thoughts of Mahatma Gandhi: As an Origin of Alternative Development", *Review of Social Economy*, 59 (3): 298.

48 Varma, Roli (2003), "E. F. Schumacher: Changing the Paradigm of Bigger is Better", *Bulletin of Science, Technology, and Society*, 23(X): 5, [Online: web] Accessed 14 January 2018, URL: http://www.unm.edu/~varma/print/BSTS_Schumacher.pdf.

49 *Ibid*. 1.

but moving up in the value chain[50]. For example, an economy primarily producing wheat, if started producing corn and paddy along with wheat, then by definition the economy has diversified and is better prepared to face volatility in crop prices. But still, the economy is basically producing primary commodities, which are very volatile, and their price as compared to manufactures rises slowly and falls steeply[51]. On the other hand, if the economy instead of exporting primary commodities like wheat, process the grains, and sell as processed food, like breakfast cereals and cookies, the economy will face less volatility.

### 2.5.1 Price Instability and Terms of Trade

At a fundamental level, economic diversification is indispensable in order to tackle unfavourable market conditions, particularly deteriorating terms of trade and price volatility for primary commodities. The reasoning is that deteriorating terms of trade diminish the value of exports, and price volatility leads to large swings in macroeconomic indicators, the revenue of government and investment in the domestic market.[52] Economic diversification becomes more important in case of developing nations to combat export instability, as the government in these countries are unable to carry out policies needed to counterbalance the disruption caused by export instability.[53]

Since 1900 with there has been a long-term decline in terms of trade for primary commodities relative to manufactured goods. The decline is estimated to be 0.5 per cent per annum.[54] However, it should not be assumed that adding only manufacturing capacity could improve the terms of trade. Manufacturing should be complemented by skilled human capital, and substantial value addition then only manufacturing would ensure improved terms of trade.

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50 The processes and activities by which a manufacturer adds value to a product, which includes, production, incorporating new and innovative features, and after sales service.

51 Cuddington, John T et al. (2002) , "Prebisch- Singer Redux", *Office of Economics Working Paper*, US International Trade Commission, Working Paper no: 2002-06-A

52 UNFCCC Workshop on Economic Diversification, Framework Convention on Climate Change, Tehran, Islamic Republic of Iran, 18-19 October 2003.

53 Young, Alistair (1973), *Industrial Diversification in Zambia*, New York and London: Praeger.

54 UNFCCC Workshop on Economic Diversification, Framework Convention on Climate Change, Tehran, Islamic Republic of Iran, 18-19 October 2003.

### 2.5.2 Reduction of Risk

Economic diversification has the advantage of spreading out risks related to investment in various portfolios. Better diversification efforts would lead to enhancement in average capital output. Economic diversification also provides superior investment prospects at lesser risk. According to Acemoglu and Zilibotti, lack of economic diversification leads people to invest in a relatively safer portfolio, with a low rate of return. Lack of diversification deters people to invest in a riskier portfolio with a higher rate of return.[55]

### 2.5.3 Exhaustion of Mineral Resources

Mineral resources are by nature exhaustive in nature. It cannot be exploited forever. Extraction of mineral resources reach a peak level and from that point, output begins to decline. Moreover, mineral resources are primary commodities with high price instability. Basic knowledge of economics requires that other type of 'compensatory capital' should be developed in order to continue the flow of revenue for upcoming generations.[56] Therefore, economic diversification includes building-up of human capital (ability to learn and skill development), physical capital (infrastructure and manufacturing hardware), and natural capital.

### 2.5.4 Diversification as a Tool for Economic Development

Often economic development is reduced to economic growth, where development and growth are used interchangeably. However, development takes a more holistic and comprehensive account of the economy.

Growth in manufacturing due to industrialisation seems to be immediate and most obvious standards to measure the success of industrialisation. However, the larger objective of growth is to improve the living standard for the population. This was the view with which many developing countries followed the path of industrialisation[57]. Therefore, the question

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[55] Acemoglu, Daron, and Fabrizio, Zilibotti (1997). "Was Prometheus Unbound by Chance? Risk, Diversification, and Growth." *Journal of Political* Economy, 105(4): 709-51.

[56] Pezzey, John (1992), *Sustainable Development Concepts: An Economic Analysis*, Washington, D.C.: World Bank.

[57] Daneshkhu, Scheherazade (2004), "The Political Economy of Industriallisation in Iran, 1973-1978", PhD Thesis, London School of Economics, Published in 2014 by ProQuest LLC, p.74

arises, whether the growth is translated into a high living standard for the population, or growth has led to development.

Kaldor studied the link between industrial development and economic growth and came to the conclusion that the manufacturing sector is the engine of economic growth[58]. Many East Asian countries have witnessed the declining poverty level, whereas in some Sub-Saharan countries the number of poor people increased. The notable difference between the countries of East Asia and Sub-Saharan is that East Asian countries are rapidly catching up with industrialised nations, which is the reason for their economic growth. Higher economic growth in East Asian region resulted in a reduction in the poverty level[59].

Growth alone cannot automatically address the problem of development. There is broad consensus among the economists that growth is desirable, but the process of growth, whether it benefits the capitalists' class and foster inequality needs scrutiny. There is contradicting argument by Todaro. Rapid growth is very essential for the reduction in poverty, but growth is often associated with inequality. The literature on development work postulates that high-income inequalities as a necessary condition for the rapid and continued economic growth. The argument to defend the income inequalities is that high incomes result in high savings, which in turn were required for growth and investment[60].

Jagdish Bhagwati is also among the proponent of growth, and he believes that prolonged growth automatically results in development. Initially, during the growth phase, inequality might rise, but Bhagwati believes that sustained growth would result in enough

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58 Kaldor, Nicholas (1967), "*Strategic Factors in Economic Development. Ithaca*", New York State School of Industrial and Labor Relations, Cornell University mentioned in Haraguchi, Nobuya et al. (2016), "*The Importance of Manufacturing in Economic Development*", Department of Policy Research and Statistics, Working Paper 1/2016, Vienna: UNIDO, URL: https://www.unido.org/sites/default/files/2017-02/the_importance_of_manufacturing_in_economic_development_0.pdf

59 Kniivila, Matleena, "*Industrial Development and Economic Growth: Implications for Poverty Reduction and Income Inequality*", [Online: web] Accessed 14 Jnauary 2018, URL: http://www.un.org/esa/sustdev/publications/industrial_development/3_1.pdf.

60 Todaro, M. P. (1994), "*Economic development*", Singapore: Longman Publishers, mentioned in Kniivila, Matleena, "Industrial Development and Economic Growth: Implications for Poverty Reduction and Income Inequality", [Online: web] Accessed 15 October 2018, URL: http://www.un.org/esa/sustdev/publications/industrial_development/3_1.pdf.

resources at the disposal of the state, which state can later redistribute to mitigate the effects of initial inequality[61].

The process of industrialisation should not be seen as a tool to achieve growth only, but to bring in the discourse of development as well, which is an inclusive concept. Industrialisation efforts need to be supplemented by the redistributive efforts of the state. According to Amartya Sen, developing countries need to spend more on social infrastructure. Investing in education and health improve the capabilities, he advocates capabilities building, which improves the productivity of labour forces thereby increasing economic growth[62].

Szirami and Verspagen studied the contribution of manufacturing to Gross Domestic Product (GDP) per capita growth evaluating on the basis of education and stage of development. They concluded that manufacturing acts as a tool of growth for developing countries provided these countries have a satisfactory level of human capital. Service sector which is considered as a growth engine and employs a high level of human capital, such findings are missing in their study[63]. According to them, a higher level of human capital, with at least 7-8 years of education is necessary for manufacturing to make an impact on the economies of developing countries[64].

Here the noticeable aspect about industrialisation is the high-quality human capital. It is generally presumed that industrialisation means an installation of machines, making infrastructure to support the production by machines, like making roads for transportation and similar structures that complement the industrialisation process. Often, there is a rant in developing countries that they lack infrastructures to support industrialisation, but the component that is missed from the discourse of industrialisation is the development of human capital.

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61 Bhattacharya, Pramit (2013) "Everything You Wanted to Know about Sen-Bhagwati Debate", Mint, [Online: web] Accessed 14 Janury 2018, URL: http://www.livemint.com/Politics/zvxkjvP9KNfarGagLd5wmK/Everything-you-wanted-to-know-about-SenBhagwati-debate.html.

62 *Ibid*.

63 Development of service sector is another way to diversify the economy. However, the study is focusing on diversification as an attempt to industrialise and within industrialisation also focus is mainly on the manufacturing sector and diversity within manufacturing.

64 Szirmai, Adam and Bart, Verspagen (2015). "Manufacturing and Economic Growth in Developing Countries, 1950-2005", *Structural Change and Economic Dynamics*, 34: 46-59.

### 2.5.5 Nurturing of Human Capital and Employment of Labour

Human capital is an integral part of diversification. Diversification objectives cannot be fulfilled without the development of human capital. The importance of human capital is outlined by Apple CEO, Tim Cook while addressing Fortune Global Forum in December 2017[65],

> There is confusion about China. The popular conception is that companies come to China because of the low labour cost. I am not sure what part of China they go to but the truth is China stopped being the low labour cost country many years ago, and that is not the reason to come to China from a supply point of view. The reason is that skill, the quality of skill in one location and the type of skill.

Here two things are noteworthy, one the amazing set of skills developed by Chinese, and another important point which Tim Cook highlights is, Apple did not come to China from a supply point of view, as an outsourcing station, Apple has explored China as the market for its iPhone. China has become one of the largest markets for Apple iPhones and other devices. It is to be understood that highly skilled human capital not only ensures the advanced level of manufacturing, high human capital also has high spending which acts as a favourable market for the products.

Leontief paradox challenges the Heckscher-Ohlin trade model, which stipulates that countries would export products in which they have a comparative advantage. It implies that a capital abundant country would export capital intensive goods. However, Leontief pointed out that the United States despite being capital intensive country is exporting labour-intensive goods. Many economists have challenged the findings of Leontief, on the ground that labour is not a homogenous factor of production. Countries and particularly developed countries invest a lot in human capital in terms of higher education, training, and another set of skills. It was postulated that the United States labour force was trained and educated, therefore, the United States labour-intensive exports were 'skilled labour intensive

[65] Liebowitz, Glenn, "Apple CEO Tim Cook. This is the Number 1 Reason We Make iPhones in China (It's not what you think", [Online: Web] Accessed 16 January 2018, URL: https://www.inc.com/glenn-leibowitz/apple-ceo-tim-cook-this-is-number-1-reason-we-make-iphones-in-china-its-not-what-you-think.html.

products'[66]. Since states have invested in labour forces, skilled labour forces are considered as capital. Most of the inconsistencies and incongruities that generate dissatisfaction with Hecksher-Ohlin trade model arise from the unusual concept of capital used in the model of Leontief[67].

According to Kenen, the United States invested a huge sum in training and education of the labour force, and such investments in labour forces had become as large as physical capital. Therefore, the United States export of labour intensive goods was consistent with the Heckscher-Ohlin trade model[68].

Keesing had divided labour requirements into eight categories according to skills. Scientists and Engineers are at the top of the category, whereas, skilled and semiskilled workers feature at the bottom of the divided categories. Keesing found that at one end, exports of India and Hong Kong display a low level of skill labour requirement coupled with high requirements of unskilled labour. At the other extreme, the United States has a relative abundance in hard to acquire skills and is reflected in its export[69].

The importance of skills was highlighted by UNIDO in the following way[70]

> Economists, in analysing the relative value of inputs in manufacturing and related activities to total increases of output, have now been emphasizing the so-called "residual factor". The significant proportion of the increase in output up to about 30 per cent has been ascribed to residual factor, i.e. of growth not accounted for in increased inputs of capital, land and labour. The residual is generally explained by increased productivity brought about in part directly or indirectly by high levels of education and availability of better skills.

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66 A Critique of the Leontief Paradox, [Online: web] Accessed 22 January 2018, URL: https://www.tcd.ie/Economics/assets/pdf/SER/1997/Diarmaid_Smyth.pdf.

67 Kenen, Peter. B (1965), "Nature, Capital, and Trade", *Journal of Political Economy*, 73(5): 437-460, 440.

68 *Ibid*.

69 Keesing, Donald. B (1966), "Labor Skills and Comparative Advantage", *American Economic Association*, 56 (1/2): 249-258, 254.

70 International Symposium on Industrial Development (1967) held in Athens 29 November-20 December 1967, "*Issues and Problems in Manpower Development for Industrialization*", ID/CONF. 1/30, UNIDO, 4.

In the same conference, the problem of developing countries was highlighted regarding the development of skills. The main problem in case of developing countries is to impart skills in soonest possible time and at minimum cost[71].

Question of skilled and trained personnel is also related to nation building and sovereignty issues[72].

> The importance and urgency of the task are predetermined by the fact that practically all the main questions of independent industrial development, whether the advance of industry or agriculture, the building of infrastructure, setting up of a managerial machinery or organisation of national enterprise, cannot be solved in the interest of the countries themselves without their own skilled personnel. The need for training them is dictated by economic, social and other factors, including nationalist tendencies. Availability of national personnel is an expression of sovereignty and independence….

Most of the Gulf countries have a similar problem, they have capital but do not have enough of their own (citizen) skilled personnel. Most of the Gulf countries depend on the migratory labour forces for their infrastructures and managerial organisation. The overwhelming presence of expatriates in their economy, sometimes become the reason for the friction between the government and unemployed citizen.

Diversification into industries and manufacturing provides more employment opportunities for the growing population of developing countries. The belief that industrialisation offers more employment because the marginal rate of return in the industrial sector is higher than the agricultural sector[73]. In the case of developing countries, whose economies are primarily based on extractive industries, i.e. mining, the export of natural resources, and petroleum diversification becomes a more important strategy to absorb the labour forces. Oil production is a capital intensive industry, and employs less labour force; therefore, diversification into various industries would help in maintaining the balance between labour and capital requirements.

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71 *Ibid*, 5.

72 Kondratyev, V.A (1973), "Training of Industrial Personnel", in Tyagunenko, V.L. et.al (eds), *Industrialisation of Developing Countries*, Moscow: Progress Publisher, 320.

73 Daneshkhu, Scheherazade (2004), *The Political Economy of Industriallisation in Iran, 1973-1978*, PhD Thesis, London School of Economics, Published in 2014 by ProQuest LLC, 83.

### 2.5.6 Economies of Scale

There are many reasons listed above to diversify the economy, however, the importance of manufacturing is extraordinarily stressed when it comes to diversification. One of the most important reasons is that manufacturing offers a great prospect for economies of scale.[74] Another important point Romer pointed is that diversity in intermediate goods would enhance productivity in finished products sector.[75]

## 2.6 Evaluating Diversification

One obvious indicator to measure manufacturing could be the contribution of manufacturing in GDP (Gross Domestic Product). Most of the country release GDP data and contribution by sectors like agriculture, industries, and service sector. Therefore, one way to evaluate the manufacturing activity is to measure the share of manufacturing activity in the total GDP. This method is endorsed by The Centre for Development Planning, Projection and Policies of the United Nations Secretariat. This method indicates the relative stage of industrialisation[76]. Apart from the share of manufacturing activity in the total GDP, that can also be express as value added by the manufacturing, there is another index, Export Concentration Index (ECI). This index also helps in evaluating economic diversification.

### 2.6.1 Manufacturing Value Added (MVA)

There is a similar method employed by UNIDO, to measure the contribution of the manufacturing sector. UNIDO uses the concept of manufacturing value added (MVA). "MVA of an economy is the total estimate of net-output of all resident manufacturing activity units obtained by adding up outputs and subtracting intermediate inputs".[77] However, MVA is calculated of only those economic activities which are defined as the manufacturing sector by ISIC (International Standard Industrial Classification of All Economic Activities).[78]

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74 Romer, Paul M. (1986), "Increasing Returns and Long-Run Growth", *Journal of Political Economy*, 94(5): 1002-037.

75 Romer, Paul (1990), "Endogenous Technological Change", *Journal of Political Economy*, 98(5): 71-102.

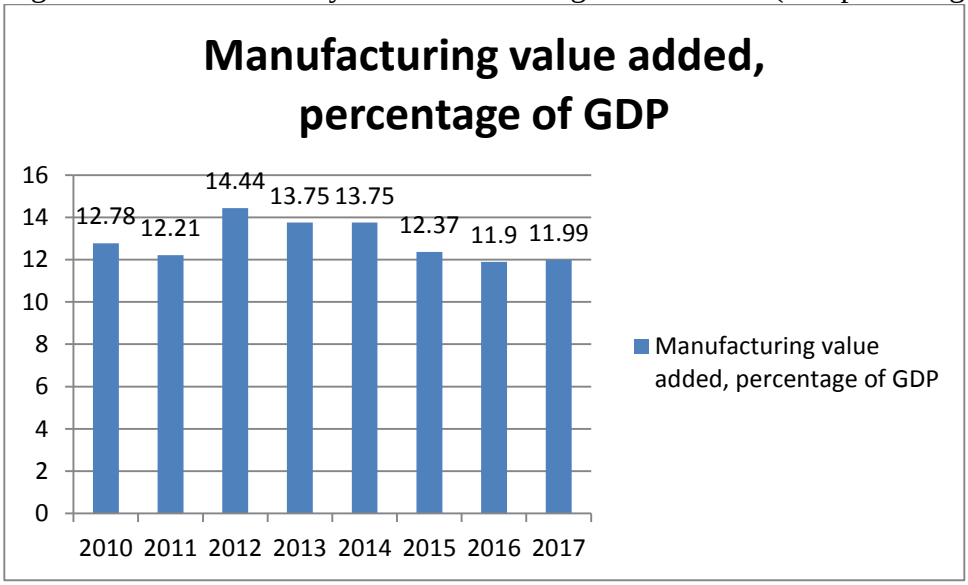
76 *Ibid*, 73.

77 What is manufacturing value added?, [Online: web] Accessed 1 February 2018, URL: http://stat.unido.org/content/learning-center/what-is-manufacturing-value-added%253f.

78 *International Standard Industrial Classification of All Economic Activities (ISIC) Rev*., 4 (2008), Department of Economic and Social Affairs, Statistics Division, New York: United Nations Publication, 85.

Manufacturing remains the major thrust of economic growth, and this thrust is largely characterised by innovation and higher productivity. World MVA witnessed positive growth until the 2008- 2009 financial crisis. Since 2010, MVA has been on a path of recovery, and the recovery is experienced in both industrialised countries and developing countries. According to the UNIDO report, global MVA was at an all-time high in 2014 amounting to $9228 billion. The MVA share of industrialised economies in GDP fell to 14.5 per cent in 2014 from 15.4 per cent in 1990. At the same time, MVA of developing countries rose to 20.5 per cent in 2014 from 16.2 per cent in 1990. MVA of developing countries has increased four folds compared with 1990. Higher MVA growth has led to poverty reduction and sustained economic growth in developing countries.[79]

Figure 2.1 Value added by the manufacturing sector of Iran (as a percentage of GDP)




Source: TheGlobalEconomy.com, The World Bank

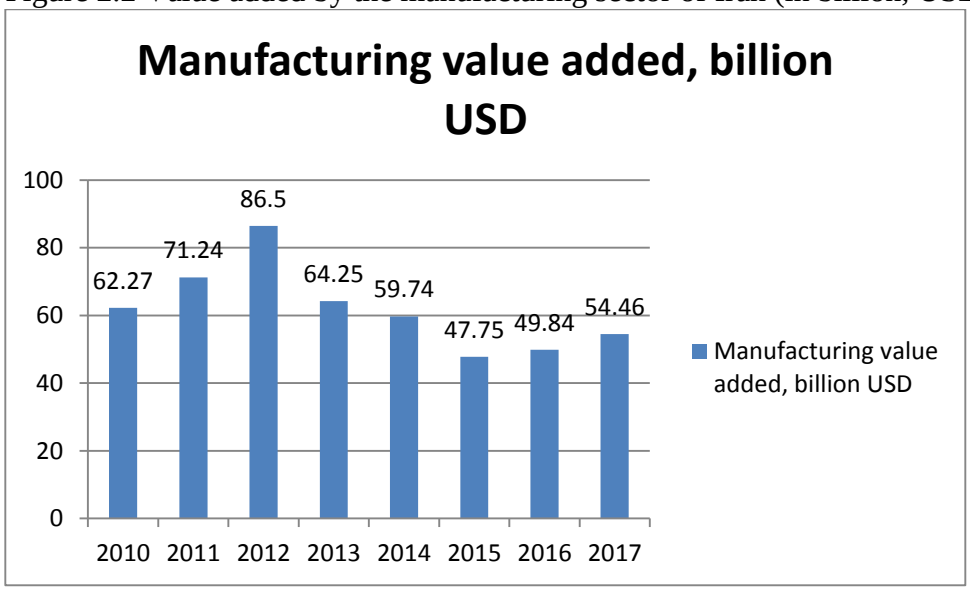
Manufacturing 'Includes the physical and or chemical transformation of materials, substances, or components in into new products….. The materials, substances, or components transformed are raw materials that are products of agriculture, forestry, fishing, mining or quarrying as well as products of other manufacturing activities. Substantial alternation, renovation or reconstruction of good is generally considered to be manufacturing'.

79 United Nations Industrial Development Organization (2015), *Industrial Development Report 2016:The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development*, Vienna: UNIDO, 174.

Above graph demonstrates the value added by Iran's manufacturing, and is expressed in terms of GDP percentage. In 2012, value addition by Iran's manufacturing sector peaked at 14.4 per cent of GDP, after that value added by the manufacturing sector falls gradually. In 2017, value addition increased by 0.09 per cent, which is an insignificant rise.

However, evaluating the value added by Iran's manufacturing sector in absolute terms speaks of a different scenario. In case of a certain year, it might be the case that value added by manufacturing in term of percentage of GDP is less than the reference year, but absolute addition could be greater than the reference year. It implies that the GDP size has grown in case of the particular year compared to the reference year, but the growth is size has not come from the value added by manufacturing. Therefore, the absolute addition also indicates about the size of the GDP.

Figure 2.2 Value added by the manufacturing sector of Iran (in billion, USD)




Source: TheGlobalEconomy.com, The World Bank

Above graph shows manufacturing value added in absolute terms. In this table as well, the greatest value added by manufacturing is witnessed in 2012, where manufacturing value added was $86.5 billion. Interestingly in 2015 manufacturing value added was 12.37 per cent of GDP, and a corresponding amount of the value addition is $47.75 billion. Similarly, in 2016 value addition was 11.9 per cent of GDP and the corresponding amount was $49.84 billion, and in 2017, with similar value addition of 11.99 per cent of GDP, value added was

$54.46 billion. The figure apart from speaking of value addition also reveal about the size of GDP. For instance, though the value-added as a percentage of GDP is less in 2016 and 2017 compared to 2015, however, the absolute value added is more 2016 and 2017 implying that the GDP of 2016 and 2017 was larger than GDP of 2015.

It is well established that the exporting manufactured goods accrue greater benefit than exporting primary commodities, largely because of the higher value added. Many DEIEs (Developing and Emerging Industrial Economies) have opted for export-led growth policies. These economies have diversified from the export of primary commodities to export of manufactured goods. Though these countries have achieved success in increasing their MVA by concentrating on manufactured goods, these countries lagged behind in terms of MVA per capita when compared with their industrialised peers.[80] MVA per capita is related to the population size of the country and value added. MVA per capita is a measure which tells the income generated by the manufacturing sector per person. This measure gives a broad understanding of an economy's 'industrialisation potential'.[81] In 2014 world MVA per capita was $1277, whereas, group of industrialised economies MVA per capita was $4773, almost four times the world average. In the same period, DEIEs MVA per capita was $553, which is significantly lower than the MVA per capita of industrialised countries. China has a better MVA per capita in its group of DEIEs but still lag behind that of MVA per capita of industrialised countries.[82]

MVA signifies innovation and technological advancement. MVA demonstrates technological complexities in the field of manufacturing. Increase in MVA implies a gradual shift from low tech product and activities to medium and high-tech products. The more technological and complex the manufacturing sector of an economy becomes, higher the prospects for technological breakthroughs and learning at different levels of production and across the sector.[83]

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80 *Ibid*, 14
81 *Ibid*, 174
82 *Ibid*, 174&175
83 *Ibid*, 180

### 2.6.2 Export Concentration Index (ECI)

Export Concentration Index (ECI) calculates for each economy, the amount of concentration of exported goods.[84] The index ranges from 0 to 1. An index value closer to 1 signifies a concentrated export, whereas a value closer to 0 indicates that exports are homogenously spread. The index does not take into account the export of services. The index measures if a large portion of the country's export consisted of a small number of goods or the exports are well distributed among many goods. Therefore, the index can be used as a cautionary signal of low diversification in exports of goods.

It is not surprising that 16 out of 20 most diversified countries with a low level of concentration are in Europe. According to 2017 figures, Italy (0.05) is the country with the least export concentration, and the only Asian country that managed to make its name in the list is Thailand (0.07). This implies that these countries export a substantial amount of manufactures, fuels, agricultural product, and product from extractive industries.[85]

On the contrary, countries with the highest export concentration are all developing nations or nations in transition. The list is topped by Niue (0.97) a small island country with a paltry economy, and the main export of this nation is ships and boat. Iraq (0.94) is second in the list with the highest export concentration, and the main export is petroleum. According to the list, most of the major economies with the highest concentration of export are exporters of petroleum.[86]

Though Iran is also among the countries with high export concentration, fortunately, Iran did not make it to the list of top ten countries with the highest export concentration. Iran has over the years have widened the portfolio of export from petroleum to agricultural products and metals, however, still, petroleum consists of a major part of Iranian exports.

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[84] Export Product Concentration Index, Indicators Explained#3, UNCTAD/STAT/IE/2019/1, UNCTADSTAT, 24 January 2019.
[85] *Ibid*.
[86] *Ibid*.

Table 2.2 Export Concentration Index of Iran (1995-1999)[87]

| Year | Export Concentration Index |
|---|---|
| 1995 | 0.722 |
| 1996 | 0.743 |
| 1997 | 0.693 |
| 1998 | 0.640 |
| 1999 | 0.635 |

Source: UnctadStat

Above table has taken indices of various years. UNCTAD (United Nations Conference on Trade and Development) has listed the concentration index from 1995 onwards, this is the reason the study has taken initial five years of data, and subsequently, data of last five years would be analysed to make a comparative study.

The table above displays the performance of Iranian exports from the year 1995-1999. In 1995, ECI was 0.722; though not high as Iraq still, the exports were fairly concentrated. For the same period, Saudi Arabia ECI was 0.687, which mean that Saudi Arabia has concentrated exports, but not as concentrated as Iran. In 4 years that is in 1999, Iran improved its performance and ECI score was 0.635, suggesting that Iran has diversified its export portfolio. For the corresponding period, Saudi Arabia score was 0.671, signifying that Saudi Arabia has also managed to diversify the products to be exported, but Iran's performance was better.

Table 2.3 Export Concentration Index of Iran (2013-2017)[88]

| Year | Export Concentration Index |
|---|---|
| 2013 | 0.575 |
| 2014 | 0.591 |
| 2015 | 0.513 |
| 2016 | 0.558 |
| 2017 | 0.537 |

Source: UnctadStat

[87] [Online: web] Accessed 20 January 2019, URL: https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx.

[88] *Ibid.*

The table above demonstrates the ECI of Iran from 2013 to 2017. These are the latest data available on the UNCTAD website. Iran has shown reasonable improvement in the last twenty years that is from 1995 to 2015. Export concentration came down to 0.513 in 2015 from a high of 0.743 in 1996. During the same period, Saudi Arabia also improved and managed to diversify its export basket, but Iran did a better job at this. Saudi Arabia ECI in 2017 was 0.585 which is marginally greater than Iran's score.

Despite Iran's improvement in expanding its export basket, it is still behind most of GCC countries. As of 2017, barring Saudi Arabia (0.585) and Kuwait (0.625), GCC countries have better performance than Iran. Qatar (0.502), Bahrain (0.326), Oman (0.395) United Arab Emirates (0.244) have far more diversified export than Iran. In fact, UAE (0.244) has an export basket that of a diversified nation, and Oman (0.395) and Bahrain (0.326) and index score similar to Norway (0.329).

Norway might seem an anomaly in this list, but Norway is one of the largest exporters of hydrocarbon in Europe. Nevertheless, the UAE has outperformed even a country like Norway.

### 2.7 Approach towards Diversification

There is no single fixed way to diversify the economy. Here in this study, diversification is basically associated with industrialisation, and therefore, the focus would be on the approach towards industrialisation. Ways to industrialisation are not static and they change over time. After the end of World War II, many countries opted for import substitution as a method to industrialisation; however, the recent trends show that import substitution has been replaced by export-led growth as a new path to industrialisation. As mentioned above-developed countries have higher per capita MVA, the higher MVA signifies the higher sophistication and technology, similarly the Imbs and Wacziarg study suggests that as the country develops it tends to specialise in high-end technology goods.[89] Exports of countries like Sweden, Germany and Japan are highly sophisticated and it reflects in their per capita income. Per capita income does not guarantee sophistication; rather sophistication and high-end

[89] Imbs, Jean and Wacziarg. Romain (2003), "Stages of Diversification", *American Economic Review*, 93(1): 63-86.

technology guarantee higher per capita income. GCC countries have one of the highest per capita incomes in the world, but the per capita income of GCC is on account of extractive industries, which is volatile, whereas the income from manufacture of high-end goods tends to be stable.

### 2.7.1 Export-led Growth

Export-led growth or Export-Oriented Industrialisation (EOI) is a policy juxtaposed against the policy of Import Substitution Industrialisation (ISI). Proponents of EOI consider ISI and EOI as non-compatible or mutually exclusive policy.[90] Neo-liberals and supporters of free trade advocate for the policy of EOI, because they think EOI is driven by market forces rather than state intervention which ensures efficient allocation of the resources. EOI brings back the debate of comparative advantage, whereas ISI came into the scenario to cater to the home market, EOI is basically for the world market. EOI states that the country should produce only those products in which it is good at. ISI is snubbed by the neo-liberals and proponents of free trade because ISI induces wastage and inefficiency.[91] According to neo-liberals ISI incentivise shirking and does not reward innovation as there is no incentive to innovate.

Ray Kiely in his book *Industrialization and Development: A Comparative Analysis* mentioned about EOI of South Korea. In his book, Kiely documented Korea's phenomenal boost in export. The book has also mentioned the changing component of Korean exports. Till 1960s Korea was the exporter of primary products, but in 1975 Korea began exporting processed and manufactured goods.[92] Contribution of manufacturing industries in Korea's GDP grew to 30 per cent from 14 per cent from 1960 to 1983.[93]

However, Kiely acknowledges the strong presence of the state in Korean 'miracle'. Ha-Joon Chang saw the same industrialisation process from the lens of ISI, where industries were established on the tenets of mercantilism, high tariffs, and state protection of the infant industry.

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90 Kiely, Ray (1998), *Industrialization and Development: A Comparative Analysis*, London: UCL Press, 93.
91 *Ibid*.
92 *Ibid*, 97.
93 Wade, R (1990), *Governing the Market*, Princeton: Princeton University Press, 44 cited in Kiely, Ray (1998), *Industrialization and Development: A Comparative Analysis*, London: UCL Press, 97.

One of the most important ingredients of EOI is an atmosphere of free trade. Only in the environment of free EOI could prosper. In the case of Iran, there is an apprehension against foreign presence, and sanctions discourage the free trade. Though policymakers in Iran often express their desire to make Iran an export powerhouse, no such concrete steps are taken in this regard. Moreover, Iran not being a member of the World Trade Organisation (WTO), financial sanctions by the United States and decline in FDI do not provide a favourable environment for EOI.

On the other hand, self-reliance is the primary goal of Iranian policymakers. Dependency on the export of primary commodities is detrimental to industrialisation, however, in the case of Iran, the revenue generated from the export of hydrocarbon helped Iran to industrialise. Iran because of its unstable relations with West relied on ISI to develop its industries.

### 2.7.2 Import Substitution Industrialisation

Post-1980, the discourse is mainly on the opening up economies, free trade, and neoliberal policies. Neoliberal discourse dominated the economy post-1980. Protectionism became the symbol of backwardness. In this scenario, Ha-Joon Chang reminds us that, most of the industrially advanced countries built their industries by protecting their home market, by different methods like tariffs, quotas, and import restrictions.[94] The measure adopted by developed countries to advance their industries can be termed as import substitution industrialisation.

The movement of Import Substitution Industrialisation (ISI) coincided with a wave of decolonisation. ISI in simple terms means protection and promotion of domestic industries and goods for domestic consumption. ISI objective is to lessen the dependence on imported goods, and the export of raw materials.[95] The aim is to reduce the export of elementary goods

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[94] Chang, Ha-Joon (2003), "Kicking Away the Ladder: The "Real" History of Free Trade", *Foreign Policy in Focus*, FPIF Special Report, [ Online: web] Accessed 25 January 2018, URL: http://www.personal.ceu.hu/corliss/CDST_Course_Site/Readings_old_2012_files/Ha-Joon%20Chang%20-%20Kicking%20Away%20the%20Ladder-The%20%E2%80%9CReal%E2%80%9D%20History%20of%20Free%20Trade.pdf.

[95] Kiely, Ray (1998), *Industrialization and Development: A Comparative Analysis*, London: UCL Press, 79.

on which not much processing is done. ISI aims to export highly processed goods but generally mistaken as opposition to export promotion.[96]

Though ISI is popularised in the 1950s, the tenets of ISI is used by all the developed countries for developing their industries. Interestingly, developed economies in the course of their development employed none of the recommendations and policies[97] which they suggest to developing countries.[98] The narrative of capitalism goes like this: Britain after the industrial revolution gained an upper edge and advocated for the free trade. Britain abandoned its protectionist mercantilist policies. Britain assumed the role of designing a new economic order based on the principles of *laissez-faire*. Except for the brief period of the Second World War, tariffs were lower and the world witnessed unprecedented growth in wealth because of the policy of free trade, and minimum state intervention. During the time of the Second World War, mercantilist policies were adopted by many nations, even Britain champion of free trade reconsidered of introducing protectionist measures.[99]

However, the simple and linear narrative of a successful history of capitalism is misleading and doesn't take into account the process of colonisation. During the mid-19th century, many European countries lowered tariffs rate. During the same time, barring USA most of countries in the world (erstwhile colonies) and independent countries (but with overwhelming foreign intervention, like countries of Latin America, China, Iran) were practising free trade. The free trade practised by colonies and independent countries was not voluntary; rather it was forced through unequal treaties, and process of colonisation.[100]

Though Latin American countries were independent since the 19th century, there exists an unequal system, where Latin American economy was reduced to the producer of primary raw materials for the industries of European countries. Prebisch defined the role of

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96 *Ibid*.

97 Developed countries suggest measures like free economy, low tariff barrier and less state intervention.

98 Chnag, Ha-Joon (2003), "Kicking Away the Ladder: Infant Industry Promotion in Historical Perspective", *Oxford Development Studies*, 31(1): 21-32, 21.

99 *Ibid*, 22

100 *Ibid*, 23

Latin America in the world system as "that of producing food and raw materials for the great industrial centres."[101]

For Prebisch only way to come out of this dependency was to industrialise the economy. Industrialisation adds value to the commodity, therefore exporting manufactured goods rather than primary commodities would fetch the greater value. Manufactured goods prices are relatively stable than the price of primary commodities. Prebisch wanted to reduce dependency, where the primary exports are dependent on the manufacturing industries of developed economies. However, Prebisch was not completely against the export of primary commodities, he maintained that there should be a gradual shift to industrialisation. Export of primary commodities is the major source of foreign reserve needed for the imports of machinery and technology for industrialisation.[102] Therefore, contrary to the popular belief that ISI discourages exports, there is an overwhelming number of evidence, which proves that most of the industrially developed countries built their industrial base on the tenets on ISI. Countries like Korea and Taiwan, who are now advocating the export promotion and export-led growth, built their industries by pursuing protectionist policies during the 1960s.[103] ISI demands a strong presence of state or state playing a dominant role in the allocation of resources in ISI strategy. State intervention does not translate into the establishment of public sector enterprises; state intervention also means incentivising private investors to establish diversified industries. These incentives include protection from cheap imports by imposing high tariffs, 'tax holidays', and protection of domestic industries.[104]

Ha-Joon Chang in his book *23 Things They Don't Tell You about Capitalism* has mentioned one such incident where due to government intervention a seemingly overambitious plan of government to establish integrated steel mill was materialised. South Korea in the 1960s was a labour intensive nation which lacked capital. Many analysts

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[101] Prebisch, Raul, "*The Economic Development of Latin American and its Principal Problems*", 1 cited in Puntigliano, Andres Rivarola, "*Prebisch and the World System: thinking globally from the periphery*", from the paper presented at: FLACSO-ISA Joint International Conference, Buenos Aires: Global and Regional Powers in a Changing World, [Online: web] Accessed 22 Januray 2018, URL: http://web.isanet.org/Web/Conferences/FLACSO-ISA%20BuenosAires%202014/Archive/777fc616-3512-471d-a509-04e7b03c8063.pdf.

[102] *Ibid*

[103] Weiss, John (2002), *Industrialisation and Globalisation: Theory and Evidence*, London and New York: Routledge, 22.

[104] Kiely, Ray (1998), "*Industrialization and Development: A Comparative Analysis"*, London: UCL Press, 79.

including World Bank dissuaded investors from investing in Korea's steel project because Korea's lack of capital and it does not have the raw material for steel manufacturing. However, because of government firm resolve not only South Korea established an integrated steel mill; it now became the world fourth largest manufacturer of steel.[105] All through the decades of the 1960s and 1970s government forced private enterprises to invest in industries. The government used carrots like tariff protection and subsidies as incentives for private enterprises to industrialise. In the case of LG which wanted to invest in textiles, the government forced to invest in cables and the cable industry later became the backbone of LG electronics. Similarly, the government forced Hyundai to invest in shipbuilding and today Hyundai is one of the biggest shipbuilders in the world.[106] ISI acts like a steppingstone for countries for achieving a greater degree of industrialisation.

For a nation like Iran that endured eight years of enforced war with Iraq, has been under the international sanctions for almost four decades, underwent a brain drain of some of its best entrepreneurs and professionals, it is inspiring to experience the level of technological progress Iran has achieved. The progress though seems elementary compared to the breakthroughs in developed industrialised nations, but it is Iran's policy of self-reliance that helped Iran in its development of industries. Iran's success in industrial expansion is an example of success in the Gulf region.

## 2.8 Conclusion

Economic diversification does not have any unified theory like that of specialisation. Economic diversification came as a reaction to the shortcomings of specialisation. There is no fixed way to diversify an economy, however, the diversified economy should have a homogenous basket of export and should not be dependent on any particular goods for the export revenue. Apart from equating diversification as export of diversified basket of goods, it could be also understood as in which a growing range of products is produced.

Diversification should not be seen in isolation, it is intrinsically linked with economic development. Economic development is a process where the real income of a nation rises

[105] Chan, Ha-Joon (2010), *23 Things They don't Tell You About Capitalism*, London: Allen Lane, 175.
[106] *Ibid*.

over a long period of time, without increasing income inequality and poverty. It is well established that countries witnessed a similar set of structural changes as their real per capita income rises, which include an increasing share of manufacturing in the country's GDP. Therefore, economic diversification is an indispensable part of economic development. In fact, economic diversification is a result of economic development rather than another way around. Economic diversification is not a distinct discourse from economic development, and should not be studied separately from economic development.

# CHAPTER III

# ECONOMIC DIVERSIFICATION IN RESOURCE RICH STATE:

# AN ASSESSMENT OF IRAN'S ECONOMIC PERFORMANCE

## 3.1 Introduction

IMF country report of 2015 on Iran suggests a stable and healthy growth of the Iranian economy despite the weak oil prices prevailing in 2014 and 2015. According to the report, the prospect after the lifting of sanctions is great, and Iran would grow at 4-5 per cent in 2016/17 to 2017/18.[1] The report also highlights the prudent policy adopted by the Iranian government in maintaining fiscal discipline. The fiscal deficit declined to 1.25 per cent of GDP in 2014/15 from the 2.25 per cent of GDP in 2013/14. Iran managed to achieve the reduction in the deficit by reforming its subsidy policies and increase in domestic revenue.[2]

Iran is a middle-income country. Iran with a GDP of $412.2 billion in 2016 is the second largest economy in the West Asian and North African region after Saudi Arabia[3]. However, the degree of dependence on oil revenue is relatively less in Iran than Saudi Arabia. Iran has a thriving agriculture and other non-oil industries.

Iran has faced more than three decades of sanctions imposed by the United States, European Union and United Nations. Despite the sanctions and eight years of Iraq-Iran war, Iran has managed to keep its economy buoyant. However, there are many diverse opinions on how post-revolution clerical regime has handled the economy of Iran. Jahangir Amuzegar is very critical of the clerical regime in Iran, and their handling of economic affairs, nonetheless he has raised one important issue about the claims made by the clerical regime and the assessment of the claim. He also acknowledges the fact that true assessment of the economic performance of Iran is difficult because of sanctions and Iraq-Iran war. He also

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1 Islamic Republic of Iran (2015), "IMF Country Report No. 15/349", [Online: web] Accessed 24 April 2018 URL: https://www.imf.org/external/pubs/ft/scr/2015/cr15349.pdf.

2 *Ibid*.

3 "The World Bank in Islamic Republic of Iran", [Online: web] Accessed 24 April 2018, URL: http://www.worldbank.org/en/country/iran/overview.

lamented the lack of reliable data in assessing the economy of Iran. He was critical of a healthy-looking picture of Iranian economy as projected by the clerical regime.[4]

Though Amuzegar laments the lack of reliable data and condemns the clerical regime for portraying the distorted picture of the Iranian economy, the Iranian regime has made some development in distributing the wealth from its hydrocarbons. Iran's economic growth follows the same trajectory as the rest of the oil-exporting Gulf countries.

Table 3.1 Economic Performance of West Asian Economy 1975-2002[5]

| Country | GDP 2002, PPP billion US $ | GDP Per Capita PPP US $ | GDP Per Capita annual growth rate 1975-2002 | GDP 2002, billion US $ |
|---|---|---|---|---|
| Iran | 483.3 | 6690 | -0.4 | 108.2 |
| Saudi Arabia | 276.9 | 12650 | -2.5 | 188.5 |
| Kuwait | 37.8 | 16240 | -1.2 | 35.4 |
| Qatar | 17.5* | 28634* | NA | 17.5 |
| UAE | 71* | 22051* | -2.8 | 71 |

*NA*: Not Available
*PPP*: Purchasing Power Parity[6]
Source: Human Development Report (2004), World Development Index (2004)

Above the table is taken from the book of Hossein Askari, the table is condensed to include only the economies of oil-exporting Gulf countries. The original table is much elaborate and includes other oil exporting countries as well. Here, the selective data and figures were lifted from the table to compare the economy of Iran, with similar countries in the West Asian region.

[4] Amuzegar, Jahangir (2004), "Iran's Economy: Status, Problem, and Prospects", paper presented in the conference entitled, *Iran After 25 Years of Revolution: A Retrospective and a Look Ahead*, held at Woodrow Wilson International Centre for Scholars on November 16-17, 2004

[5] Askari, Hossein (2006), *Middle East Oil Exporters: What Happened to Economic Development*?, Cheltenham UK: Edward Elgar, 84.

[6] PPP is an alternative to market exchange rate. PPP is a theory that compares two different currencies through basket of goods approach.

Above table illustrates the economic performance of major oil exporting countries of the region (barring Iraq). The table shows that Iran has the highest GDP in PPP terms; however, in nominal terms, Saudi Arabia is a bigger economy than Iran. An interesting point to note here is that the Amuzegar in his article *Adjusting to the Sanctions* has highlighted the precarious situation of Iran which is reeling under the pressure of sanctions and concluded that Iran's economic growth rate is steadier and healthier than many developing countries.[7] Amuzegar has nonetheless, made a valid point that the claims of clerical regime regarding their achievements were built on the institutions of Shah. Human capital in Iran is relatively better than other countries in the region, and this is due to Shah's modernisation programme. The clerical regime has also reaped the benefits of Shah's industrialisation programme. In short, economic policies are not changed at all from the time of Shah, the clerical regime has continued with the same policy, and similar structure.[8]

Redistribution of wealth rather the creation of wealth was the priority of the post-revolution government. Continuing the economic structure of Shah's era, economic ownership in the post-revolution government is largely public, and private ownership was limited to small and medium industries[9]. Mother industries[10] continued to be under public ownership, this is reiterated further by the constitution of Iran. Six million barrel per day of oil production during Shah's regime was derided by the clerical establishment as against the interest of future generation. Their objective was to reduce the production of crude oil and expand the non-oil sector of the economy. According to Amuzegar, the top priority of the Iranian government is to achieve the production level of the pre-revolution era.[11]

It is not to suggest that Iran has not achieved anything, rather the objective and aim of the economy keeps shifting. The inequality gap which became one of the main reasons for the resentment against the Shah regime has come down.

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7 Amuzegar, Jahangir (1997), "Adjusting to the Sanctions", *Foreign Affairs*, 76 (3): 31-41.

8 Amuzegar, Jahangir (2004), "Iran's Economy: Status, Problem, and Prospects", paper presented in the conference entitled, *Iran After 25 Years of Revolution: A Retrospective and a Look Ahead*, held at Woodrow Wilson International Centre for Scholars on November 16-17, 2004

9 *Ibid*.

10 Mother Industries are the main or core industries. These industries are the indispensable part of the economy, in case of Iran Mother industries include, oil, gas and mining.

11 Amuzegar, Jahangir (2004), "Iran's Economy: Status, Problem, and Prospects", paper presented in the conference entitled, *Iran After 25 Years of Revolution: A Retrospective and a Look Ahead*, held at Woodrow Wilson International Centre for Scholars on November 16-17, 2004

Table 3.2 Gini Coefficients Value of Iran[12]

| Year | Gini Coefficients Value |
|---|---|
| 1986 | 47.4 |
| 1990 | 43.6 |
| 1994 | 43.0 |
| 1998 | 44.1 |
| 2005 | 43.6 |
| 2006 | 44.8 |
| 2009 | 42.0 |
| 2013 | 37.4 |
| 2014 | 38.8 |

Source: Indexmundi.com

Gini Coefficient values over the year have demonstrated that Iran has successfully brought down the inequalities, which was the major concern of the clerical regime. However, the Gini coefficient has its own limitations and does not provide a comprehensive picture. There is a possibility that for a developing country Gini coefficient may rise due to an increase in income inequality, while at the same time population under poverty level decreases.[13] Gini coefficient measures the relative wealth and not the absolute wealth that is why despite the decrease in absolute poverty, the Gini coefficient may rise.

As pointed out Amuzegar lack of reliable data is the biggest problem in studying the Iranian economy, the discrepancies in data by institutions in Iran, and that of global institutions adds to the problem. CIA World Factbook calculates that 18.7 per cent (2007 estimates) population in Iran are under the poverty level[14]. The calculation and methodology through which the CIA has arrived at this astonishing figure are contended by Isfahani. According to Isfahani the wrong methodology used by the CIA, where the CIA has taken the poverty level as anyone whose expenditure is less than 50 per cent of National mean

[12] Iran GINI Index (World Bank Estimate) [Online: web] Accessed 25 April 2018, URL:https://www.indexmundi.com/facts/iran/indicator/SI.POV.GINI.

[13] *Ibid*.

[14] The World Factbook, [Online: web] Accessed 27 April 2018, URL: https://www.cia.gov/library/publications/the-world-factbook/fields/2046.html.

expenditure is termed as poor. 50 per cent of National mean expenditure in Iran's case is approximately $11 per day, which is much higher than the established international measure of $2 per day.[15] World Bank takes $1.9 per day as a yardstick to measure the level of absolute poverty.[16] Therefore, applying international standards of poverty measurement for developing countries that is $2 per day, the poverty rate in Iran in 2006 was calculated as 5.6 per cent instead of 18 per cent calculated by CIA World Factbook.[17]

Similarly, Iran has done a commendable job is making electricity and piped water available to a large part of the rural and urban population. Electricity and water are basic amenities and its developmental goal of all the developing countries. Since the revolution, Iran has made available these basic amenities to the majority of the population.

Table 3.3 Accesses to Services (Electricity and Water) 1977-2004.[18]

| Urban Area | | | Rural Area | | |
|---|---|---|---|---|---|
| Year | Electricity | Water | Year | Electricity | Water |
| 1977 | NA | NA | 1977 | 16.2 | 11.7 |
| 1984 | 99.5 | 96.2 | 1984 | 57.1 | 43.9 |
| 1989 | 99.6 | 96 | 1989 | 71.2 | 56.9 |
| 1994 | 99.7 | 97.9 | 1994 | 83.6 | 72.2 |
| 1999 | 98.9 | 99.9 | 1999 | 82.4 | 94.5 |
| 2004 | 100 | 99.1 | 2004 | 98.3 | 89.0 |

Above table shows the development made in the availability of electricity and water to the rural population. In 1997 only 16.2 per cent and 11.7 per cent of the rural population had access to electricity and water respectively, but in 2004 almost the entire population had

[15] Isfahani, Djavad-Salehi (2005), "Has Poverty Increased in Iran under Ahmedinejad?", *Brookings*, Op-ed, August 5 2008, [Online: web] Accessed 25 April 2018, URL: https://www.brookings.edu/opinions/has-poverty-increased-in-iran-under-ahmadinejad/.

[16] Poverty, [Online: web] Accessed 25 April 2018, URL: http://www.worldbank.org/en/topic/poverty/overview.

[17] Isfahani, Djavad-Salehi (2005), "Has Poverty Increased in Iran under Ahmedinejad?", *Brookings*, Op-ed, August 5 2008, [Online: web] Accessed 25 April 2018, URL: https://www.brookings.edu/opinions/has-poverty-increased-in-iran-under-ahmadinejad/.

[18] Isfahani, Djavad-Salehi (2009), 'Oil Wealth and Economic Growth in Iran', in Gheissari, Ali (Eds), *Contemporary Iran: Economy, State, Politics*, New York: Oxford University Press, 20.

access to these basic amenities. Iran has made continuous and gradual progress in reducing the urban-rural gap. During the regime of Shah, rising inequality, intensification of rural-urban migration along with corruption became the major reason for the discontentment among people.[19] At one point in time, rural migration was so intense that it accounted for 35 per cent of the urban population, which created pressure on the residential system, with a shortfall of 78,000 housing units in 1966. [20]

Having said that Iran is still largely a semi-rentier economy, where government revenues are overwhelmingly dependent on oil and gas. Oil and gas constitute a major export component of the Iranian economy and gives leverage for the subsidies. Iran has one of the largest subsidy programmes in the world where energy and food are heavily subsidised by the state.

The chapter would focus on the rentier nature of the state and would discuss what are the difficulties faced by resource-rich countries in their attempt to diversify their economy.

### 3.2 Characteristics of Resource Rich Countries

Countries with a larger amount of natural resource tend to grow at a faster rate than countries lacking natural resources or having limited natural resources. However, in practice, this is hardly the case, according to the study by Auty, resource-poor countries are better at diversification than resource abundant countries.[21] Resource-poor countries adopt manufacturing driven growth policies earlier than resource abundant countries and have relatively open trade policies. This leads to competitive diversification of the economy of resource-poor countries.[22]

This contradiction is theorised as 'paradox of plenty' or resource curse. Resource curse signifies the failure of resource abundant countries to benefit optimally from their natural resource wealth. It is manifested in forms of Dutch Disease, a higher rate of conflicts,

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19 Malley, Christopher (2016), "The Disinherited: Migration, Survival, and the Underclass in Tehran (1950-1980), *Yale Review of International Studies*, [Online: web] Accessed 25 April 2018, URL: http://yris.yira.org/essays/1703.

20 *Ibid*.

21 Auty, R.M. and Sampsa, Kiiski (2001). "Natural Resources, Capital Accumulation, Structural Change, and Welfare", Auty, R.M. (ed.), *Resource Abundance and Economic Development*, Oxford: Oxford University Press, 28.

22 *Ibid*.

and lack of economic stability. [23] Some scholars maintain that resource abundance could lead to deindustrialisation, and anaemic economic growth, in the absence of proper policies and governance.[24]

Resource abundance distorts economies in various different ways. There are a few ways discussed by Gylfason through which resource abundance hampered economic growth.

### 3.2.1 Dutch Disease and Foreign Capital

The abundance of natural resource crowd out the foreign capital. In case of resource abundance appreciation of currency which is generally associated with Dutch Disease makes other export less competitive. Natural resource-based industries pay a higher wage rate and interest than other industries.[25] Labour migration takes place to natural resource-based industries. Therefore, in order to retain labour other non-natural resource-based export units need to pay higher wages making them difficult to compete in the world market. Resource abundance makes other non-resource based industries less competitive.[26]

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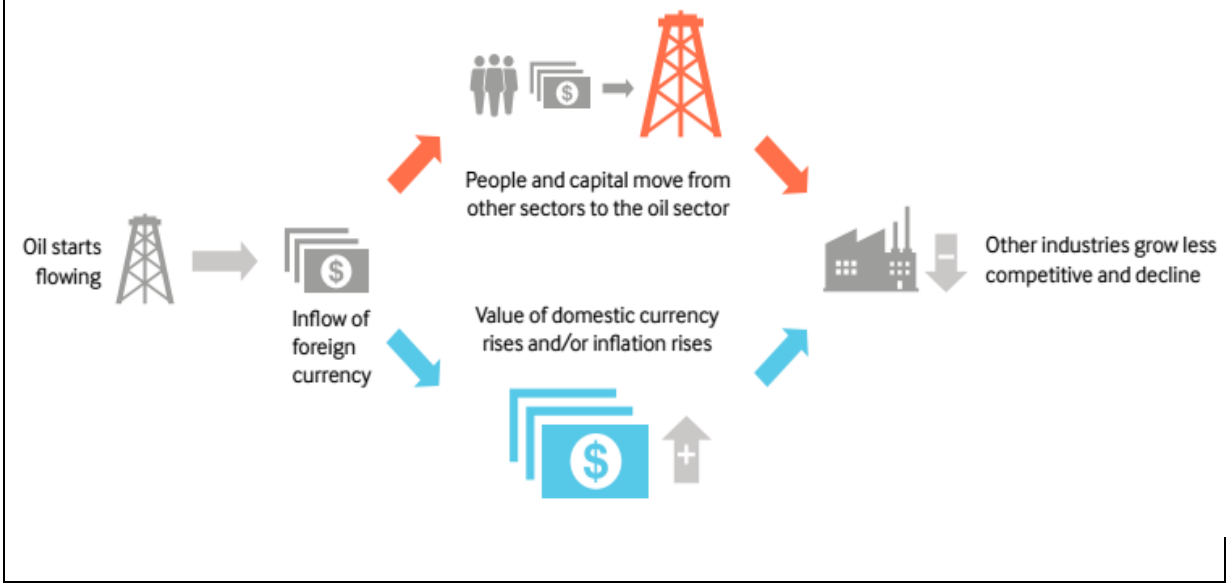
[23] National Resource Governance Institute, NRGI Reader, (2015), "The Resource Curse: The Political and Economic Challenges of Natural Resource Wealth", [Online: web] Accessed 25 April 2018, URL: https://resourcegovernance.org/sites/default/files/nrgi_Resource-Curse.pdf.

[24] Ahmadov, Anar (2012), "Political Determinants of Economic Diversification in Natural Resource Rich Developing Countries", [Online: web] Accessed 26 April 2018, URL: https://www.princeton.edu/~pcglobal/conferences/GLF/ahmadov.pdf.

[25] Gylfason, Thorvaldur (2004), "Natural Resources and Economic Growth: From Dependence to Diversification", [Online: web] Accessed 27 April 2018, URL: https://www.ethz.ch/content/dam/ethz/special-interest/mtec/cer-eth/resource-econ dam/documents/research/ws-and-conf/sgvs-2005/029.pdf.

[26] *Ibid*.

Figure 3.1 Dutch Disease




Source: National Resource Governance Institute (NRGI)

The above figure[27] describes the phenomenon of Dutch Disease in a very lucid manner. When oil starts flowing in the economy, it appreciates the domestic currency thereby making other sectors less competitive and inducing migration of labour into the oil industry from other industry. Oil exploration being a capital intensive industry absorbs fewer people from another sector, thereby further distorting the dynamics of the economy.

### 3.2.2 Rentier Nature of State

Another feature of resource curse or abundance of natural resource is that it crowds out social capital. In resource abundance countries it is generally observed that excessive state intervention in the market, ill-defined legal structures, and lax property rights lead to rent-seeking behaviour by state.[28] This rent seeking behaviour of state coupled with weak market structures, and missing institutions may have shocking consequences on the economy. In

[27] Above figure is adopted from an article, The Resource Curse: The Political and Economic Challenges of Natural Resource Wealth, National Resource Governance Institute, NRGI Reader, March 2015, URL: https://resourcegovernance.org/sites/default/files/nrgi_Resource-Curse.pdf

[28] Gylfason, Thorvaldur (2004), "Natural Resources and Economic Growth: From Dependence to Diversification", [Online: web] Accessed 27 April 2018, URL: https://www.ethz.ch/content/dam/ethz/special-interest/mtec/cer-eth/resource-econ dam/documents/research/ws-and-conf/sgvs-2005/029.pdf.

countries like Nigeria and Sierra Leone resource abundance and rent from resources were the major reasons for the civil war.[29]

Rentier State theory attempts to explain 'state-society' relations in countries that generate a huge share of their income from unproductive earn payments in form of payment for export of natural resources and royalties.[30] Resource abundance or rentierism may give a false sense of security to people and this emboldens governments to be oblivious to the necessity of growth-friendly good environment.[31]

Hussein Mahdavy has first discussed rentier nature of the state, and he was the first one to use the word 'rentier'.[32] Mahdavy has defined rentier state as a state which gets a huge amount of rent from foreign governments, individuals, and concerns.[33] However, the discourse around rentierism became prominent in the academic works on the Arab world and the democratisation prospects there. Beblawi's definition of a rentier state came close to the rentier nature of Arab states. According to Beblawi rentier state is one where rents arise from the foreign actor and accumulate with governments. He further pointed out that only a limited number of people are involved in the generation of wealth, the majority of the population are only involved in the distribution and consumption of wealth.[34]

The basis of rentierism is that the state by allocating wealth from the rent generated by natural resources effectively secures the public support, and those who are opposed to

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29 *Ibid*.

30 Gray, Matthew (2011), "The Theory of "Late Rentierism" in the Arab State of the Gulf", Centre for International and Regional Studies, Georgetown University, School of Foreign Service in Qatar, Occasional Paper No.7, 1.

31 Gylfason, Thorvaldur (2004), "Natural Resources and Economic Growth: From Dependence to Diversification", [Online: web] Accessed 27 April 2018, URL: https://www.ethz.ch/content/dam/ethz/special-interest/mtec/cer-eth/resource-econ dam/documents/research/ws-and-conf/sgvs-2005/029.pdf.

32 Gray, Matthew (2011), "The Theory of "Late Rentierism" in the Arab State of the Gulf", Centre for International and Regional Studies, Georgetown University, School of Foreign Service in Qatar, Occasional Paper No.7, 5.

33 Mahdavy, Hussien (1970), "Patterns and Problems of Economic Development in Rentier States: The Case of Iran" in Cook, M.A. (ed.), *Studies in Economic History of the Middle East*, London, Oxford University Press, p.428 cited in, Ross, Michael (2001), "Does Oil Hinder Democracy?", *World Politics*, 53, p. 329 of 325-361

34 Beblawi, Hazem (1987), "The Rentier State in the Arab World", in Beblawi, Hazem and Luciani, Giacomo, (eds.), *The Rentier State: Nation, State and the Integration of the Arab World*, London: Croom Helm.

state polices are dealt with a heavy hand.[35] The policy of securing the loyalty of public paves the way towards the autocratic regime. Rentierisim is not only about distributing economic rent. Rentierism is largely associated with the absence of democracy and the lack of transparent and suitable institutions. Norway, which generates huge rent from oil, is not classified as a rentier state, but at the same time, GCC countries exhibit varying degree of rentier state tendencies.

Huntington suggests that democracy may circumvent the states of West Asia since they are heavily dependent on oil export which strengthens the state bureaucracy and control.[36] Similarly, Ross suggests three ways in which resource abundance (particularly Oil) hinders democracy. In his article *Does Oil Hinder Democracy?* Ross put forward three 'causal mechanisms' explaining the linkage between a totalitarian state and oil exporting countries.[37] According to Ross, states in the West Asian region do not tax their citizen or even if there is tax, the burden is negligible because states derive maximum of their revenue from the sale of oil. The tax exemption makes the government less accountable towards its citizen. Secondly, states spend their oil wealth on securing loyalty and patronage. The 'spending effect' of the states stifles the democratisation process. Saudi Arabia, Kuwait and Libya spend a great amount of their oil wealth to ensure patronage of their population.[38] Another technique to suppress democracy is to prevent the formation of a large group. Studies have shown that government oil wealth has hindered the formation of groups and hence obstructed the transition towards democracy.

Ross has suggested another causal mechanism that is 'modernising effect'. According to Ross, economic development entails cultural and social changes which are prerequisites of democracy. However, in case economic wealth and development depend on oil revenue it

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35 Gray, Matthew (2011), "The Theory of "Late Rentierism" in the Arab State of the Gulf", Centre for International and Regional Studies, Georgetown University, School of Foreign Service in Qatar, Occasional Paper No.7.

36 Samuel P. Huntington (1991), *The Third Wave: Democratization in the Late Twentieth Century*, Norman: University of Oklahoma Press.

37 Ross, Michael (2001), "Does Oil Hinder Democracy?", *World Politics*, 53, p. 332-337 of 325-361. The three causal mechanisms are a) Rentier Effect b) Repression Effect c) Modernisation Effect.

38 Entelis, John. P (1976), ''OilWealth and the Prospects for Democratization in the Arabian Peninsula: The Case of Saudi Arabia,'' in Sherbiny, Naiem. A and Tessler, Mark. A (eds.), *Arab Oil:Impact on the Arab Countries and Global Implications*, New York: Praeger; Vandewalle, Dirk (1998), *Libya since Independence: Oil and State-Building*, Ithaca: Cornell University Press cited in Ross, Michael (2001), "Does Oil Hinder Democracy?", *World Politics*, 53: 333.

does not necessarily ensure changes conducive to democracy. Economic development based on oil wealth does not bring about social change that would push for liberalisation.[39]

### 3.2.3 Weak and Opaque Institutions

The dilapidated and weak state of institutions is associated with the resource abundant countries. It is not to suggest that institutions are inherently weak in the resource-abundant countries, but in resource abundant countries there are more incentives for elites to keep institutions weak and opaque.[40] It is a long established fact that per capita output in society is closely linked to the capital, technology and human capital. However, the question arises, what makes capital, technology, and human capital of one country more productive than others. The question boils down to the institutions. The fundamental question around institutions explains the difference in human capital, and technology of two countries with a similar level of resource endowment. Institutions explain why some countries make worse use of their technology and human capital compared to others.[41]

Different societies have different decision-making mechanism (dictatorship versus democracy), these mechanisms of governance and decision making impact the formation of institutions.[42] Therefore, political institutions and political power have a great influence on the development of institutions.

According to Acemoglu and Robinson, political power and political institutions have great bearing on the economic institutions. Economic institutions formulate incentives structure of main economic players in society. Economic institutions also decide the organisation of production function and influence the level of investment in technology, physical and human capital. Economic institutions apart from monitoring the growth trajectory are also entrusted with the distribution function. The problem of distribution brings

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39 Ross, Michael (2001), "Does Oil Hinder Democracy?", *World Politics*, 53.

40 The Resource Curse: The Political and Economic Challenges of Natural Resource Wealth, National Resource Governance Institute, NRGI Reader, (2015), [Online: web] Accessed 25 April 2018, URL: https://resourcegovernance.org/sites/default/files/nrgi_Resource-Curse.pdf.

41 Acemoglu, D., and Robinson, J. (2008), The role of institutions in growth and development, *World Bank, Washington DC*, [Online: web] Accessed 28 April 2018, URL: https://siteresources.worldbank.org/EXTPREMNET/Resources/489960-1338997241035/Growth_Commission_Working_Paper_10_Role_Institutions_Growth_Development.pdf accessed.

42 *Ibid*.

political power and institutions in the scene. Every individual and groups have different aspirations, and could not be addressed solely by the distribution of economic institutions, therefore the political power exercised different groups becomes instrumental in deciding the nature of institutions.[43]

Acemoglu and Robinson have divided political power as *de facto power* and *de jure power*. The power which is originated from the political institution of society is referred to as *de jure power*. Political institutions are similar to economic institutions as it determines incentives of and constraint on crucial political actors. On the other hand, *de facto* power is with the group or group or individuals. The power which is exercised in the form of protests, and revolts (armed and unarmed), is referred to *de facto* power.[44] The important distinction between *de jure and de facto* power is that *de facto power* does not derive power from the political institutions, rather it is exercised as a collective demand of discontented groups.

An attempt to bring reforms in economic institutions without bringing change in the political institutions may not bring equilibrium in the institutions. Therefore, only changing *de jure* power without any attempt to reform *de facto* power would have an insignificant effect on economic institutions and performances.[45]

While discussing the case of continuation of *de facto* power in Cambodia, Acemoglu and Robinson focused on how the change in *de jure* power if not complemented by the change in *de facto* power, would have a little or insignificant impact on the economic performance. The elites (*de facto* power) remain the same; therefore just a cosmetic change in the political institutions (*de jure* power) is not a sufficient condition for improvement in economic institutions.[46]

The case of Iran is peculiar in this regard. The revolution brought about the change in *de facto* power; however, the nature of institutions (*de jure power*) remains the same. This implies that a new ruling class emerged after the revolution, whereas, the economic institutions did not undergo any major change. There was not much change in the economic

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[43] *Ibid*.
[44] *Ibid*.
[45] *Ibid*.
[46] *Ibid*.

policies of the post-revolution government. Even after the revolution, the state played a greater role in the economy. Nevertheless, the priority of the state changed, oil revenues generated during Shah's regime were invested in mega infrastructure projects, economic growth was the priority, and distribution of income was not the priority.[47] However, due to the emergence of the new *de facto power*, the clerical regime, which is established after the revolution, made distribution of income as their priority.

### 3.2.4 Underdevelopment of Human Capital

Lee Kuan Yew, founding father of Singapore, which is one of the most prosperous countries in the world, is without any significant reserve of natural resources (oil, timber or minerals). He viewed human capital and capabilities in a totally different way. He considered human capital as resources. He described his views on resources as follows[48]

> I thought then that wealth depended mainly on the possession of territory and natural resources, whether fertile land..., or valuable minerals, or oil and gas. It was only after I had been in office for some years that I recognized ... that the decisive factors were the people, their natural abilities, education and training.

Resource-based industries are less labour intensive and generally considered as capital intensive. However, resource-based industries lack high-quality capital intensive industries.[49] As far as high quality of labour is concerned, it is relatively uncommon in primary industries to find high-quality labour and capital. This may explain why the abundance of natural resources, industries based on natural resources, and exports that are primary export hinder learning curve or learning by experience and economic growth.[50]

However, Iran, unlike other oil exporting countries, has better human capital. Iran has been the fastest growing country in the world in terms of scientific publications and

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47 Esfahani, H. S., & Pesaran, M. H. (2009), "The Iranian economy in the twentieth century: A global perspective", *Iranian Studies*, 42(2):177-211.

48 Quoted from Lee Kuan Yew (1998), *The Singapore Story, Memoirs of Lee Kuan Yew*, Singapore: Singapore Press Holdings, cited in Gylfason, Thorvaldur (2011), "*Natural Resource Endowment: A Mixed Blessing?",* CESifo Working Papers, Working Paper No. 3353, [Online: web] Accessed 26 April 2018, URL: http://www.cesifo-group.de/DocDL/cesifo1_wp3353.pdf.

49 Gylfason, Thorvaldur (2004), *Natural Resources and Economic Growth: From Dependence to Diversification*, URL: https://www.ethz.ch/content/dam/ethz/special-interest/mtec/cer-eth/resource-econ-dam/documents/research/ws-and-conf/sgvs-2005/029.pdf accessed on 27 April 2018

50 *Ibid*.

capabilities in the last two decades.[51] Iran progress in scientific capabilities and publications was 11 times faster than the world average, which is twice the rate of Turkey's progress. It is interesting to note that West Asia region has made reasonable progress in scientific capabilities, however, Iran stands distinct in its progress.[52]

Iran's progress in scientific capabilities did not come overnight, Iran Human Capital Index (HCI) which includes survival rate, schooling years and health, is among the best in the region.

[51] Archambault, Eric (2010), "30 Years in Science: Secular Movements in Knowledge Creation", Science-Matrix, [Online: web] Accessed 30 April 2018, URL: http://www.science-metrix.com/30years-Paper.pdf.
[52] *Ibid*.

Table 3.4 Human Capital Index and Components: Regional Benchmarks, 2018

| **Indicator** | **Iran** | **East Asia and Pacific** | **Europe and Central Asia** | **Latin America and Caribbean** | **Middle East and Noth Africa** | **North America** | **South Asia** |
|---|---|---|---|---|---|---|---|
| **HCI Component 1: Survival** Probability to Survival Age 5 | 0.985 | 0.978 | 0.993 | 0.980 | 0.984 | 0.994 | 0.957 |
| **HCI Component 2: School** Expected Years of School | 11.7 | 11.9 | 13.00 | 11.9 | 11.5 | 13.5 | 10.5 |
| Harmonised Score | 432 | 451 | 495 | 404 | 408 | 530 | 364 |
| **HCI Component 3: Health** Survival Rate from Age 15-60 | 0.921 | 0.873 | 0.900 | 0.861 | 0.906 | 0.921 | 0.841 |
| Fraction of Children under 5 not Stunted | 0.932 | 0.776 | 0.881 | 0.859 | 0.847 | 0.979 | 0.645 |
| **HCI** | 0.59 | 0.61 | 0.7 | 0.55 | 0.57 | 0.78 | 0.46 |

Source: The World Bank, Human Capital Project

The table illustrates the Human Capital Index (HCI) of Iran. Figures are of 2018, therefore can be assumed that HCI would not have changed much at the time of writing the thesis.

HCI of Iran is quite impressive considering the fact, that the country has suffered eight years of imposed war, and sanctions for almost four decades. Iran HCI lags behind Europe and North America indices, and marginally short of HCI of East Asia and Pacific. However, out of three components of HCI survival, school and health, Iran performance is better than East Asia and Pacific region in survival and health and lags behind in school. Iran has a better score than the Middle East and North African region. Despite all hardships faced by Iran, its HCI score is still better than most of the regions in the world.

Comparative study of HCI based on income groups reveals that except for High-Income group, Iran HCI is better than every group, whether it be Low Income, Lower Middle Income or Upper Middle-Income group.

Table 3.5 Human Capital Index and Components: Income Groups Benchmarks, 2018

| Indicators | Iran | Low Income | Lower Middle Income | Upper Middle Income | High Income |
|---|---|---|---|---|---|
| **HCI Component 1: Survival** Probability to Survival Age 5 | 0.985 | 0.929 | 0.961 | 0.983 | 0.995 |
| **HCI Component 2: School** Expected Years of School | 11.7 | 7.8 | 10.4 | 11.7 | 13.3 |
| Harmonised Score | 432 | 363 | 391 | 428 | 506 |
| **HCI Component 3: Health** Survival Rate from Age 15-60 | 0.921 | 0.745 | 0.807 | 0.863 | 0.923 |
| Fraction of Children under 5 not Stunted | 0.932 | 0.658 | 0.730 | 0.869 | 0.935 |
| **HCI** | 0.59 | 0.38 | 0.48 | 0.58 | 0.74 |

Source: The World Bank, Human Capital Project

The table above approves of Iran being an upper middle-income country. In fact, Iran is marginally sort of figures achieved by high-income countries. On the other hand, Iran has better indicators than the Upper Middle-Income group countries.

### 3.3 Difficulties in Diversifying away from Oil

Things can be perceived in two ways. They can be perceived as either made by machines, using labour and raw materials or it can be perceived as things are made by employing knowledge. Knowledge is the basis of any products. Even if machines, labour, and the raw material are analysed one can conclude that knowledge is at the root of constructing machines, identifying raw materials, and employment of labour skills. Therefore, products can be concluded as the things through which knowledge can be assessed.[53]

Market and similar organisational structures encourage the dissemination of knowledge that is previously proprietary of few to reach a large population. The market provides incentives for innovation and knowledge. The extent of knowledge in a country does not depend primarily on how much knowledge each individual possesses. The knowledge of society is reflected, in its ability to assimilate the knowledge of each individual and make use of the combined repository of knowledge through a composite network of interaction.[54]

The presence of a variety of products in the market structure tells a lot about information and knowledge that is required for the production of a variety of products. Therefore, the extent of knowledge of a country could be assessed by the diversity of different products that a country makes.[55] Diversity of product not only reflects the amount of knowledge that a country possesses, but it also reveals about the complexity of an economy, and how efficiently can a country combine its knowledge to come up with innovative and complex products.

Atlas of Economic Complexity has made an attempt to analyse the complexity of an economy, by analysing the ubiquity and nature of products made by an economy. Therefore, Economic Complexity is conveyed in the structure of a country's productive output and conveys about the knowledge structure of an economy. Augmented Economic Complexity reflects the ability of an economy to accumulate and make use of productive knowledge that

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53 Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., Simoes, A., & Yildirim, M. A. (2014). *The atlas of economic complexity: Mapping paths to prosperity*, Cambridge: MIT Press.

54 *Ibid*.

55 *Ibid*.

can be assessed from the variety of products that the country is able to produce.[56] Innovative products need capabilities that are largely missing because the other products or associated products that use them are lacking. This brings the products into the centre stage of economic complexity. Alternatively, economic complexity can be viewed from the perspective of product space. An economy's position in the product mix defines its economic complexity and prospects to enhance its knowledge structure.[57]

Therefore, analysing the country from the product mix approach would help in explaining why there is uneven development, where some regions successfully enhance their economic complexity whereas some countries lack.

An economy diversifies by moving from the products it specialises into another category of products that need related skills and capabilities, and therefore develop a similar product space. The economic complexity index is developed as an indicator to assess how challenging or easy it is for economies that specialise in a certain category of goods to diversify into other goods. It is interesting to note that crude oil is among the lowest ranking product in economic complexity index. This implies that oil shares a few common features with other products. Oil is among the 'most isolated' sector of the 'product space', making oil among the most difficult category of goods to diversify away from.[58]

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[56] *Ibid*.
[57] *Ibid*.
[58] Alsharif, Nouf and Bhattacharyya, Sambit and Intartaglia, Maurizio (2016), "Economic Diversification in Resource Rich Countries: Uncovering the State of Knowledge," Working Paper Series 098-2016, Department of Economics, University of Sussex.

Table 3.6 Product Complexity Table (in trillion dollars)[59]

| Community/Product | Average Product Complexity Index (PCI) | No of Products | World Trade | World Share |
|---|---|---|---|---|
| Machinery | 2.54 | 125 | 4.4T | 20.29 |
| Electronics | 2.25 | 52 | 3.6T | 16.71 |
| Oil | -2.08 | 4 | 2.3T | 10.49 |
| Chemical and Health | 2.52 | 64 | 1.6T | 7.47 |
| Other Chemicals | 1.67 | 24 | 1.2T | 5.49 |

Source: The Atlas of economic complexity

Above table demonstrates the characteristics of the oil which make it difficult to diversify away from. Chemical and Health sector has a higher product complexity, which means that this sector has a higher number of products compared to oil. Similarly, lubricating petrol oil and other heavy petrol oil which fall under the category of Chemical and Health have higher product complexity. These products are the raw material for many industrial units, and materials used in our daily life ranging from plastic, pharmaceutical, and synthetic clothing is derived from petrochemicals. This validates that crude oil is among least complex products, but when the industrial process is applied on crude oil, which is the function of human capital and physical capital, the resulting products that is petrochemical and other fuels are among the most complex products.

According to Product Complexity Index, Iran ranks 78 much below the ranking of Saudi Arabia of 32 for the period of 2011-16. This ranking tells about the nature of products produced by different countries. Japan tops the list of this index, indicating a variety of products produced by Japan. However, coming to Iran and Saudi Arabia, there is a huge gap in the ranking, despite the similar economy of both countries. The difference in the ranking can be explained by the fact, that Saudi Arabia is one of the largest producers of petrochemical in the world. SABIC (Saudi Basic Industries Corporation) is the world fourth

[59] Hausmann, R., Hidalgo, C. A., Bustos, S., Coscia, M., Simoes, A., & Yildirim, M. A. (2014). *The Atlas of economic complexity: Mapping paths to prosperity*, Cambridge: MIT Press.

largest chemical manufacturer. SABIC is the market leader in the products like methanol, polyethylene, polycarbonates, and engineering plastics and its derivatives.[60] SABIC is the world's third largest manufacturer of polyolefin.[61] Beside this SABIC also operates one of the largest integrated steel plants[62], and metals-related manufacture is considered as relatively more complex than oil. Apart from a wide range of complex products, SABIC also has more than 12000 global patents; this also proves the necessity of human capital in developing innovative products and industrial complex.

On the other hand, Iran also boasts a petrochemical unit, though the Iranian unit is not as large as SABIC and has a global presence like SABIC, it is the second largest producer of petrochemical in the region after SABIC. Similarly, Iran operates many large integrated steel units and is among the largest exporter of steel billets and blooms in the world, Iran is ranked way below Saudi Arabia. Iran also has a huge pool of educated workforce. Iran has made a significant improvement in scientific publications.[63]

The discrepancy in the ranking is because of the sheer size and production of complex chemical products by SABIC and its global presence, but it is not sufficient to explain the difference in the rankings, because Iran also manufactures similar products, and has decent human capital. This difference in the ranking points out the weakness of the Atlas of Economic Complexity.

The data used by the authors of *Atlas of Economic Complexity* are trade data rather the production data of respective countries. Therefore, the trade data gives a misleading picture of the country's complex economic activities.[64] For instance, according to *Atlas of Economic Complexity* Singapore is ranked the sixth most complex economy and Hong Kong

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60 Facts and Figures, Financial Performance, [Online: web] Accessed 3 May 2018, URL: https://www.sabic.com/en/about/corporate-profile/Facts-Figures.

61 *Ibid*.

62 *Ibid*.

63 MQ/MG (2017), "Iran makes notable progress in scientific publications worldwide", *Tehran Times*, Tehran, 9 April 2017, [Online: web] Accessed 4 May 2018, URL: http://www.tehrantimes.com/news/412445/Iran-makes-notable-progress-in-scientific-publications-worldwide.

64 Hickson, J. (2017), "The Atlas of Economic Complexity: A Review", *Newcastle Business School Student Journal*, 1(1): 27-33, 30, [Online: web] Accessed 4 May 2018, URL: http://novaojs.newcastle.edu.au/uonsbj/index.php/uonsbj/article/viewFile/15/63.

is ranked as the 33rd most complex economy.[65] However, upon analysing the real production of goods and services in these economies it was found that a large chunk of their export income is in the form of re-export[66] activities. Re-exporting has less to do with innovation and complexities and largely is a function of geography. Approximately Forty per cent of Hong Kong's GDP comprises of re-export earnings. In the period 1981-2001, 39.5 per cent of Hong Kong's GDP was from re-export earnings. Re-export earning forms a major part of Hong Kong's GDP.[67] Similarly, in the case of Singapore also, re-export activities accounted for more than forty per cent of total sales to other countries.[68] It is strange to note that Singapore's total export is more than the GDP of the country. Singapore's GDP in 2014 was $307.87 billion, whereas, Singapore's export was $519 billion. Singapore's export was almost 170 per cent more than Singapore's GDP. Similarly, Singapore's import is also greater than Singapore's GDP at $464 billion in 2014. It points out the fact, though Singapore is a top-ranked country in ECI (Economic Complexity Index) ranking, it is based on trade data, rather than production data or productive activities. It is not to deny the achievements of Singapore in field of complex products like semiconductors and machinery; however, taking only trade data into account gives a biased picture in favour of countries, where re-exports constitute formidable part of country's GDP.

In a similar manner, Iran which has gone into several arrangements to circumvent the provisions of the sanctions is ranked 78. Iran does not have the luxury of unfettered trade, so Iran has gone into several arrangements like barter, trade through third countries, and front companies. This form of trade which is necessitated by the sanctions does not appear in most of the trade data. Moreover, there is always a problem of data discrepancy in studying the economy of Iran. The discrepancy of data, along with Iran's several arrangements to circumvent the sanctions, does not feature in trade statistics, and accounting books of many

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65 Economic Complexity Rankings (ECI), [Online: web] Accessed 3 May 2018, URL: https://atlas.media.mit.edu/en/rankings/country/neci/.

66 Re-export can be defined as the product which is imported into country and later re-exported with no change in the nature, shape, form, or utility of the products. Basically, re-exporting depends on geographical location, rather than country's competitiveness in producing complex goods.

67 Ha, J., Fan, K., and Shu, C (2003), "Export Performance in Hong Kong—Offshore Trade and Re-exports", *Hong Kong Monetary Authority Quarterly Bulletin*, [Online: web] Accessed 4 May 2018, URL: http://www.hkma.gov.hk/media/eng/publication-and-research/quarterly-bulletin/qb200306/fa1.pdf.

68 Singapore Trade Statistics, Pacific Asian e-commerce Alliance, [Online: web] Accessed 4 May 2018, URL: https://paa.net/?page_id=607.

international banks, which makes an assessment of Iran's economic complexity very difficult.

Iran is among the largest manufacturer of steel, cement, and automobiles in the region[69], with non-oil export of Iran rising year on year (y-o-y), however, the ECI ranking gives a totally different picture of the Iranian economy. It is true that still large part of Iranian GDP comes from the sale of crude oil, and Iran is less efficient in producing complex petrochemicals like SABIC of Saudi Arabia. However, there are many sectors where Iran has become self-sufficient including machinery, these achievements of Iran are not reflected in the ECI rankings, which has ranked Saudi Arabia much ahead of Iran, despite the fact both economies share similar characteristics.

The Iranian economy is very complex, and it produces a wide variety of goods. However, sanctions add to the complications, as trade data are underreported and true account of manufacturing and other economic activities cannot be ascertained. Analysing any economy is a difficult task, but analysing Iranian economy in absence of reliable data makes the task more difficult. The chapter would make an attempt to analyse the economic performance of Iran. Since the focus is on the diversification of the Iranian economy, the chapter would focus on the non-oil activity of the Iranian economy.

### 3.4 Economic Performance of Iran

There is a general belief that economic diversification in the developing economies began with a severe decline in the contribution of the agricultural sector in employment and total output[70]. While, the share of agricultural sector decline in total output, manufacturing and service sector grows, and in later phase share of manufacturing also declines, and labour moves to the service sector from the manufacturing.[71] But, in the case of oil exporting Gulf

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69 "Iran's Global Ranking in Minerals, Auto Production), *Financial Tribune*, Tehran, 30 May 2015, [Online: web] Accessed 5 May 2018, URL: https://financialtribune.com/articles/economy-business-and-markets/17981/iran-s-global-ranking-in-minerals-auto-production.

70 It is not to suggest that country where agriculture contribute significantly to GDP and employs a decent workforce is not an advance economy. In a country like Australia, the Netherlands, and Spain agriculture forms formidable part of GDP and absorbs sizeable workforce and at the same time are among the advanced economies.

71 International Monetary Fund (2016, April), "Economic Diversification in Oil-Exporting Arab Countries" In *Annual Meeting of Arab Ministers of Finance*, prepared by the staff of the International Monetary Fund,

countries, agriculture was never the largest employer, nor the largest contributor to GDP. However, in Iran agriculture formed a significant part of GDP in the first half of the twentieth century.

The reference to agriculture is made here to point out that Iran has followed the traditional path of industrialisation in comparison to its Gulf neighbours. However, this does not imply that Iran has achieved a satisfactory level of industrialisation. The level of industrialisation is the main issue that the chapter would scrutinise in this section. For assessing the level of industrialisation or diversification efforts of Iran, macroeconomic indicators, planning and policies of the Iranian government need to be assessed. This section would also discuss the privatisation drive of the Iranian government. Last, the section would deal with some of the non-oil industry of Iran.

There are certain conditions that are considered a necessity for the robust diversification programme. Macroeconomic stability, liquidity organisation, effective financial policies, credit system, robust private sector, and FDI (foreign direct investment)[72] of a country ensures an effective diversification programme. Diversification is not just establishing factories and producing a different variety of goods, diversification is prudently planned industrialisation programme which is backed by healthy macroeconomic condition, robust demand, effective liquidity management, and thriving private sector.

Iran's economy is marked by cyclical booms and busts. The cycle of booms and busts are inherent in the economy, almost all the economies have to go through the cycle of booms and busts. However, in the case of Iran, the cycle occurs more frequently. It is common for the oil exporting countries to have frequent disruptions in the economy due to the vagaries of global oil prices. The frequency of disruption further intensifies in Iran largely because of sanctions and government policies in response to the sanctions.

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Manama, Bahrain, [Online: web] Accessed 6 May 2018, URL: https://www.imf.org/external/np/pp/eng/2016/042916.pdf.

[72] Above mentioned indicators are not an exhaustive list, beside these indicators there could be many measures to assess the industrialisation of a country.

### 3.5 Iran's Exchange Rate Volatility

Among many macroeconomic measures, the exchange rate is the one, which has suffered most because of sanctions and actions of the Iranian government. The exchange rate is an important factor in determining the demand for money. Previously, it was thought that only interest and income are important in determining the demand for money. In 1963 Nobel laureate, Robert Mundell proposed the idea, that exchange rate like interest and income could affect the demand for money.[73] Fluctuations in the exchange rate have two effects on the demand for money or domestic currency, currency substitution effect and wealth effect.

Suppose that investors estimate their asset portfolio in terms of the domestic currency, a decline in the exchange rate would promote the value of their foreign-held assets, and hence exchange rate depreciation leads to wealth enhancement. Therefore, to maintain the fixed share of wealth invested in assets domestically, investors would repatriate a portion of their foreign assets to maintain the level of domestic assets. The exchange rate depreciation, therefore, increases the demand for money domestically.[74]

In another instance, currency depreciation leads to a fall in demand for domestic currency through the substitution effect. If an investor develops an apprehension against the domestic currency that the exchange rate is expected to fall further after an initial depreciation, the investor would, therefore, respond by investing more in foreign assets. Currency depreciation entails higher opportunity cost of holding domestic currency; hence currency substitution is used to avoid any risk arising out of currency depreciation.[75]

The exchange rate is an important determinant of the money supply and the country's trade. The exchange rate has a significant influence on a country's export and import. Therefore, exchange rate stability is an important necessity for the diversification effort.

Exchange rate fluctuations are not a new phenomenon in Iran, though it has been exacerbated by the sanctions and Iranian government since long is finding difficult to

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[73] Mundell, R.A. (1963), "Capital Mobility and Stabilization Policy under Fixed and Flexible Exchange Rates", *Canadian Journal of Economics*, 29: 475-485.

[74] Sahadudeen, I. (2015), "*The Demand for Money Exchange Rate: Evidence for Wealth Effect in India"*, MPRA Paper No: 65560, [Online: web] Accessed 5 May 2018, URL: https://mpra.ub.uni-muenchen.de/65560/1/MPRA_paper_65560.pdf.

[75] *Ibid*.

manage the exchange rate stability. In an article *The Iranian Economy during the Second World War: The Devaluation Controversy*, Dadkhah pointed out Iran's controversial decision to devalue rial and adopting dual exchange rate.[76] During that period, Mossadeq accused Dr Naficy as a British agent, who has devalued the currency to pass the benefit to the British at the expense of Iran. However, the article has also focused on the Dr Naficy point of view, who accused the subsequent government of pursuing the same policy, if that was imprudent.[77] Dr Naficy stressed that since Iran is a loser nation, it cannot impose the conditions on the victor i.e. Britain. Moreover, Iran has its own monetary policy vis-à-vis other Gulf countries at that point of time, where Indian rupee was in circulation. The article also brings to the light that the dual exchange rate was prevalent since then. The exchange rates were different for exporters and importers. A pound fetched exporter 143 rials, whereas same pound cost importer 217.6 rials. This was due to the policy adopted by Iran, where importer needs to buy the certificate and exporter get the certificate half the value of the foreign currency.[78]

Exchange rate management always remained a difficult task for Iranian policymakers and economists. Iran has never developed a free market approach in dealing with exchange rates. Rather, one witness variations of flexible and fixed exchange rate rule in Iran. At times, there is a single exchange rate, but mostly, a complex and detrimental system of multiple exchange rates.[79] The government uses different exchange rates for exports and imports, and even different rates for various categories of export and imports. Besides the differential exchange rates, there are different market mechanisms for foreign reserve.[80]

Till March 1993, officially there were three exchange rates, one which is used for oil export also known as basic rate, other for import of basic necessities, and last for official international debt repayment. That month, all the prevailing rates were discontinued and were replaced by a single official rate, which resulted in a sharp decline in the value of rial to Rls1750/$, this rate was similar to market rate. In September that year, the policy of a single

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[76] Dadkhah, Kamran. M. (2001), "The Iranian Economy during the Second World War: The Devaluation Controversy", *Middle Eastern Studies*, 37(2): 181-198.

[77] *Ibid*.

[78] *Ibid*.

[79] Zangeneh, Hamid (2010), "Iran's Fixed, Flexible and Harmful", *World Policy*, [Online: web] Accessed 14 May 2018, URL: https://worldpolicy.org/2010/10/20/irans-fixed-flexible-and-harmful-economy/.

[80] *Ibid*.

exchange rate was abandoned and rial depreciated further to Rls2345/$. Rial was further devalued by the Iranian government to encourage exports and reduce imports.[81] In the case of Iran, the value of the rial vis-à-vis dollar is never determined by market forces; always the value has been fixed by the Central Bank on the basis of black market value.

In 1995, US sanctions coupled with high inflation forced the Central Bank to change the exchange rate to match the parallel market effectively black market rate. This leads to depreciation of rial to Rls3000/$. It is generally observed in Iran that government permits the parallel market to function alongside the official system until the difference between these two rates reaches a 'boiling point'. At this point, the Central Bank intervenes and develops a new mechanism to narrow the gap between two rates.[82]

After 1995 exchange rates were stable till Khatami's presidency. However, after the election of Ahmedinejad as the President of Iran, rial began to fluctuate again. In 2011, the United States accused Iran of money laundering and issued warning against financial institutions and the Central Bank of Iran. Following the American warning, Canada and the United Kingdom stopped doing business with Iran's Central Bank and other financial institutions. Curbing the reach and influence of financial institutions of Iran affected the exchange rate negatively, and the exchange rate again plummeted.[83]

IMF (December 2015), report on Iran suggests medium-term economic stability for the Iranian economy on account of sanction relief which will result in higher oil export and production. IMF report also suggests that despite low oil prices, rial would appreciate.[84] However, the sanctions relief were short-lived. Trump administration has announced that it will unilaterally pull out of the previously agreed agreement. Trump decision to pull out from

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81 *Ibid*.

82 *Ibid*.

83 Toumaj, Amir, (2014), "Iran's Economy of Resistance: Implications for Future Sanctions", A Report by the Critical Threats Project of The American Enterprise Institute, [Online: web] Accessed 14 May 2018, URL: https://www.criticalthreats.org/wp-content/uploads/2016/07/imce-imagesToumajA_Irans-Resistance-Economy-Implications_november2014-1.pdf.

84 International Monetary Fund, *Islamic Republic of Iran*, IMF Country Report No.15/349 (2015), Accessed 15 May 2018, URL: https://www.imf.org/external/pubs/ft/scr/2015/cr15349.pdf.

JCPOA (Joint Comprehensive Plan of Action)[85] has again destabilised rial. Rial value has witnessed southward pressure since then.

In April 2018, the rial depreciated by 20 per cent against the dollar in just two weeks. Many Iranians are apprehensive[86] about rial, and rushing to convert the rial into foreign currency in an attempt to hedge against further depreciation in the value of the rial.[87] Depreciation of 20 per cent in just weeks is detrimental to the Iranian economy. The Central Bank intervened in an attempt to unify the difference in the exchange rate between traders – 60000 rials to dollar and official government rate of 37000 rials to the dollar. The new single rate declared by the Central Bank is set at 42000 rials to the dollar.[88] The official rate was costly for the government to sustain, and the official depreciation would further reduce the imports. As of 4 July 2018, according to currency exchange website Bonbast free market rate is Rls79000-80000/$ against the official exchange rate of Rls42000/$.[89]

The massive volatility in the exchange rate is keeping new investments, the establishment of factories, and trade at bay. Traders have adopted a policy of wait and watch and unless the exchange rate is not stabilised they are exhibiting cautious approach in their dealings. Steel mills of Iran have halted their production and put on hold all the international sales on account of exchange rate volatility.[90] Many importers have put their consignment on hold, and they will resume their operations only when the dust around the exchange rate will settle.[91] Exchange rate volatility has a detrimental effect on the diversification efforts, and in the case of Iran, exchange rate fluctuation is slowing down the diversification programme.

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85 JCPOA is an agreement between Iran and P5+1. P5+1 refer to Permanent five members of the Security Council and Germany. This deal curtailed the nuclear activities of Iran in return many provisions of sanctions were withdrawn.

86 When apprehension is developed against the domestic currency regarding further depreciation, substitution effect come into play, and demand of domestic currency dampens.

87 Paivar, Amir (2018), "Iran sets single foreign exchange rate to rescue currency", *BBC News*, 10 April 2018, [Online: web] Accessed 15 May 2018, URL: https://www.bbc.com/news/world-middle-east-43715971.

88 *Ibid*.

89 Bonbast, Live Exchange Rate in Iran's Free Market, [Online: web] Accessed 4 July 2018, URL: https://www.bonbast.com/.

90 Aameer, Sayed (2018), "Iran: Steel Makers Awaiting for Government's New Exchange Rate", [Online: web] Accessed 5 July 2018, SteelMint App (Paid App).

91 Paivar, Amir (2018), "Iran sets single foreign exchange rate to rescue currency", *BBC News*, 10 April 2018, [Online: web] Accessed 15 May 2018, URL: https://www.bbc.com/news/world-middle-east-43715971.

### 3.6 Privatisation in Iran

Privatisation or private enterprises are other important determinants of diversification. IMF prepared a report of the Annual Meeting of Arab Ministers of Finance; the agenda of the meeting was *Economic Diversification in Oil Exporting Countries*. In that meeting privatisation or active private enterprise was acknowledged as a crucial vehicle for economic diversification.[92] Robust privatisation is important for the industrialisation of any economy. Private enterprises played a significant role in the industrialisation of Korea. As popularly believed, private investments are not the antithesis to the state establishments. Rather, powerful and strong states ensure nonviolent and peaceful privatisation. According to Kiren Chaudhry, who passionately argued that competitive markets are not created simply by reducing the state, which she has termed as 'smashing' the state, rather privatisation ensure efficient redeployment of state instrument to perform the more difficult task of administration and indirect regulation.[93] Privatisation is often conceived as an idea which is free of state institutions. However, a quick reality check tells that marketization and process of commodification requires a strong state. Michael Mann has termed it as 'infrastructure power', a state with robust capacity to regulate and build infrastructures that helps in the development of market and process of commodification.[94] Successful privatisation of State Owned Enterprises (SOEs) requires a robust state that is capable of commissioning and carrying out major transformational activities. According to Haggard and Kaufman, the paradox of privatisation is that government need to strengthen the state to reduce its role in the economy and increase the role of market forces. Therefore, a strong state is a must prerequisite for the privatisation.[95]

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92 International Monetary Fund (2016), "Economic Diversification in Oil-Exporting Arab Countries" in *Annual Meeting of Arab Ministers of Finance* prepared by the staff of the International Monetary Fund, Manama, Bahrain, [Online: web] Accessed 23 July 2018, URL: https://www.imf.org/external/np/pp/eng/2016/042916.pdf.

93 Chaudhry, Kiren (1993), "The Myths of the Market and the Common History of Late Developers", *Politics and Society*, 21: 254-274, 249; Harris, Kevan (2013), "The Rise of the Subcontractor State: Politics and Pseudo-Privatization in The Islamic Republic of Iran", *International Journal of Middle East Studies*, 45: 45-70, 47.

94 Mann, Michael (1993), *The Sources of Social Power*, vol. 2, Cambridge: Cambridge University Press, cited in Harris, Kevan (2013), "The Rise of the Subcontractor State: Politics and Pseudo-Privatization in The Islamic Republic of Iran", *International Journal of Middle East Studies*, 45: 45-70, 47.

95 Haggard, Stephan and Kaufman, Kaufman eds. (1992), "Institutions and Economic Adjustment," in *The Politics of Economic Adjustment: International Constraints, Distributive Conflicts, and the State*, Princeton,

Privatisation in Iran is not only dictated by economic need, but it is also shaped by the ideology of the state. In the case of privatisation in Iran, it can be said that revolutionary ideology takes the precedence over the economic consideration. Privatisation in Iran is one of its kind in the world and can be rarely seen anywhere in the world. Rising inequality during the Shah regime was one of the major reasons for brewing discontentment among people, which culminated into the Iranian Revolution of 1979. Therefore, for the post-revolution government redistribution became an important issue, and policies were designed accordingly. Privatisation in Iran is conditioned by the government's concern for low-income sections of society and income distribution.

Privatisation in Iran is unique in a way because the Constitution of Iran makes privatisation a difficult task, by prohibiting all mother industries, mines and minerals, and oil to be privatised. Article 44 of the constitution which prohibits privatisation of large industries is amended by the Iranian government in 2004. Though the amendment was made in 2004, it was not until 2007 it gathered pace. Dissatisfied with the pace of privatisation in 2007, Supreme Leader Khamenei ordered officials of the government to implement the guidelines mentioned in the amendment of Article 44.[96]

The task of privatisation is carried out by 'Iranian Privatization Organization' (IPO), which is affiliated to the Ministry of Economic Affairs and Finance (MEAF). As per the Articles of Association (AoA)[97], IPO is entrusted with[98]

1. Drawing up strategies for the facilitation of the development of the public participation to promote material and human productivity and development of the abilities of the private and cooperative sector and submission of the same to the Board of Ministers for due approval.
2. Representation of MEAF in divesting affairs

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N.J.: Princeton University Press, 25 cited in Harris, Kevan (2013), "The Rise of the Subcontractor State: Politics and Pseudo-Privatization in The Islamic Republic of Iran", *International Journal of Middle East Studies*, 45: 45-70, 47.

96 "What Future for Justice Shares?" (2015), *Financial Tribune*, January 26 2015, [Online: web] Accessed 24 May 2018, URL: https://financialtribune.com/articles/economy-domestic-economy/9791/what-future-for-justice-shares.

97 Article of Association (AoA) is a document that contains the purpose of the company as well as duties and responsibilities of its members defined and recorded clearly.

98 Article 4, Article of Association of the Iranian Privatization Organization, [Online: web] Accessed 25 May 2018, URL: http://www.en.ipo.ir/index.jsp?fkeyid=&siteid=83&pageid=289.

3. Planning for divesting SOEs shares, including the conditions and manner of divesting shares in the framework of related rules and regulations after the approval of the Board of Divesting

After the amendment in Article 44 of the constitution, large scale privatisation became possible, but there are certain entities and sector where privatisation is still not allowed. According to Article 2 of the General Policies of Principle (44) of the Constitution, privatisation is permitted excluding sectors like 1) mother communication network, 2) secret or necessary military facilities and production falling under the jurisdiction of armed force, 3) various banks of Iran including Central Bank, Bank Melli of Iran, Sepah Bank, Industry and Mines Bank, 4) National Iranian Oil Company (NIOC) and crude oil and gas drilling companies……..10) Dams and major irrigation networks and 11) Radio and TV.[99]

On papers, Iran's privatisation programme appears progressive like any other country's privatisation programme. Except for certain sectors related to security like communication, and the military government has allowed privatisation in most of the sectors. Government has also kept NIOC away from the purview of privatisation, as NIOC is not just an economic unit engaged in upstream and downstream activities. NIOC is also seen as the pride of the Iranian government, and apart from economic benefit, NIOC is recognized as a national symbol important in nation building.

Though Iranian privatisation programme appears progressive, scholars like Kevan Harris passionately argue that the privatisation programme in Iran does not follow the spirit of the programme and termed it as 'Pseudo-Privatization'.[100] According to one report commissioned on privatisation in Iran by the Iranian parliament, out of the SOEs (State Owned Enterprises) divested since 2006, a paltry 13.5 per cent of the shares are only transferred to private sectors. Here private sectors are identified as any entity which is not a non-governmental public sector. In the case of Iran, it is important to explain as what constitutes the private sector, because in the name of privatisation most of the shares of

[99] Article 2, Group 3, Law on Implementation of General Policies of Principle (44) of the Constitution, [Online: web] Accessed 25 May 2018, URL: http://www.en.ipo.ir/index.jsp?fkeyid=&siteid=83&pageid=1393.

[100] Harris, Kevan (2013), "The Rise of the Subcontractor State: Politics and Pseudo-Privatization in The Islamic Republic of Iran", *International Journal of Middle East Studies*, 45-70, 45.

government entities are transferred to the parastatal organisation. Cambridge dictionary has defined parastatal as 'a company or organisation which is owned by a country's government and often has some political power.'[101] However, the Oxford dictionary defines parastatal as an organisation 'having some political authority and serving the state indirectly.'[102] Oxford's definition of parastatal is closer to Iranian context. In Iran, parastatal organisations are the one who serves the state indirectly and commands huge political authority. In the Iranian context, parastatal organisations are the extension of the government, but not a government entity in itself. Parastatal organisations in Iran undertake welfare functions of the government, like providing pensions and medical insurance. The government take care of the welfare needs of the population, however, these parastatal organisations work along with the government to widen the reach of welfare measures. There are many cases where a family has multiple insurances because of overlapping of welfare measures.

In Iran privatisation is carried out in three ways namely:[103]

a) Shares of State Owned Enterprises (SOEs) sold through Tehran Stock Exchange (TSE), or either through public auctions and negotiations.
b) Shares of public enterprises transferred under the category of justice shares, which are under the cooperative sectors
c) Lastly, another way of privatisation in Iran is related to the change in Article 44 of Iranian Constitution in 2006, which allowed the government to settle their debt owed to parastatal organisations by transferring the equities of SOEs.

However, these divestments are not free of controversy, and it is often alleged that parastatal organisations close to government get a major chunk of the SOEs shares. In a 2009 parliamentary report, it is estimated that $54 billion worth of shares of 264 SOEs were divested from 2004 to 2009. Out of that more than half of the shares that are around 68 per cent went to Justice Shares, 20 per cent was transferred or negotiated through the stock exchange, and around 12.5 per cent goes towards debt cancellation. Justice shares and debt

[101] Cambridge Dictionary, [Online: web] Accessed 12 October 2018, URL: https://dictionary.cambridge.org/dictionary/english/parastatal.
[102] Oxford Dictionary, [Online: web] Accessed 12 October 2018, URL: https://en.oxforddictionaries.com/definition/parastatal.
[103] Harris, Kevan (2013), "The Rise of the Subcontractor State: Politics and Pseudo-Privatization in The Islamic Republic of Iran", *International Journal of Middle East Studies*, 45-70.

cancellation though are two headings, however, the ultimate beneficiaries of these transfers are parastatal organisation. Only 20 per cent of shares actually went to private entities.[104]

Among all the parastatal organisations, entities linked to the Iranian Revolutionary Guard Corps (IRGC) often make headlines. IRGC is often into news because of its pervasiveness in the Iranian economy. IRGC was formed to defend the ideals of the revolution. However, the institutionalisation of the IRGC over the period permitted it to undertake other roles in order to defend the ideals of the revolution. During the initial years of the Islamic Republic, the IRGC's primary task was to avert any military intervention or coup. Over the period along with the responsibility to defend the principals of the revolution, IRGC was tasked with an additional duty to keep the Iranian economy insulated from Western influence.[105]

It was during Rafsanjani period IRGC first ventured into commercial enterprises. Rafsanjani allowed IRGC to enter into the most lucrative business of reconstruction after the Iraq-Iran war. Not only had it helped in boosting funds, but IRGC also gained from the dual exchange rate that existed during the presidency of Rafsanjani. During the Khatami period, IRGC's involvement in commercial enterprises was not augmented, but IRGC's association with commercial entities were not minimised either. Khatami did not have any specific policy for IRGC; he carried out the policy of Rafsanjani.[106]

IRGC rose to prominence during the Iran-Iraq war rather than the 1979 revolution as believed by many. Iran-Iraq war created an atmosphere where institutions like IRGC strived for legitimacy. Participating in the prevalent view of self-sufficiency, IRGC followed the path of reverse engineering of technologies related to the military. IRGC began to involve in

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[104] *Ibid*.

[105] Bruno, Greg, Jayshree Bajoria, and Jonathan Masters (14 June 2013), "Iran's Revolutionary Guards", Council on Foreign Relations, [Online: web] Accessed October 20, 2018, URL: https://www.cfr.org/backgrounder/irans-revolutionary-guards.

[106] Robin, Matthew Douglas (2011), *Explaining the Economic Control of Iran by the IRGC*, Ph.D. Thesis, Florida: College of Sciences and in The Burnett Honors College at the University of Central Florida.

the production of munitions, missiles and tanks. This reverse engineering helped IRGC in setting up industrial infrastructure during the war years.[107]

IRGC's penetration into business enterprises deepened during Ahmadinejad's rule. His presidency helped the IRGC to take over the economy. Using his power of appointment, Ahmadinejad appointed the members of IRGC to top official position. He even appointed IRGC members in his cabinet.[108] These appointments of IRGC members gave IRGC needed leverage in the economy. Appointment of IRGC official was not new in the Iranian political system, but during Ahmadinejad rule, nine members with a link to IRGC were appointed in his cabinet, this was unprecedented in Iranian political history. They held significant positions like the Ministry of Defence and Arm Force Logistic, Ministry of Petroleum, and the Ministry of Energy. This tendency further accentuated in 2009.[109]

The vastness of IRGC can be gauged by the fact that during the 24th anniversary of Khatam-al-Aniba (Engineering arm of IRGC) in 2013, General Abdullah announced in a press conference in Tehran that they (IRGC) have developed 1504 projects of national importance till now. Further, he added that they had 205 big projects going on.[110] Projects of IRGC engineering arms include dams, water diversion, canals, highways, pipelines, and hydrocarbon offshore and onshore infrastructures. IRGC is a military unit; therefore, IRGC is often analysed with a tinge of cynicism. Many intellectuals and journalists have indicted IRGC of involvement in illegal activities and supporting black market practices. IRGC is also accused of using its influence to get government contracts through unfair means.

According to Ali Alfoneh, IRGC using its front companies is involved in many scandals in Iran. He views the privatisation process of Iran as IRGC led privatisation that is

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[107] Harris, Kevin, "All the Sepah's Man: Iran's Revolutionary Guards in Theory and Practice", in Grawert, Elke and Abul-Magd, Zeinab (2016) (eds.), *Businessmen in Arms: How the Military and Other Armed Groups Profit in the Mena Region*, London: Rowman and Littlefield.

[108] Robin, Matthew Douglas (2011), *Explaining the Economic Control of Iran by the IRGC*, Ph.D. Thesis, Florida: College of Sciences and in The Burnett Honors College at the University of Central Florida.

[109] *Ibid*.

[110] Harris, Kevin (2016), "All the Sepah's Man: Iran's Revolutionary Guards in Theory and Practice", in Grawert, Elke and Abul-Magd, Zeinab (eds.), *Businessmen in Arms: How the Military and Other Armed Groups Profit in the Mena Region*, London: Rowman and Littlefield.

the reason he termed privatisation in Iran as militarisation.[111] He has pointed some instances like, after the United States' sanctions on IRGC, because of its increasing role in the Iranian economy, IRGC was awarded a contract of $880 million in March 2010 to develop pipeline project. Similarly, fearing sanctions, next month a Turkish firm withdrew from South Pars gas project, and that project was also awarded to IRGC's engineering arm. The value of South Pars gas project is estimated to $7 billion.[112] He has supported the sanctions on IRGC, he is critical of the size of IRGC, and according to him, IRGC gets this leverage to garner big contracts because of its financial arm. He further went on to say, that in order to be successful, sanctions need to be extended to the financial arms of IRGC.[113]

Alfoneh has made some sweeping statements, and his views resonate with that of the yellow press[114] of Iran. He has raised some issues, like lack of transparency in giving a contract, no fair bidding process, and awarding contracts of some of the important infrastructures like oil and gas terminal to IRGC. However, terming the privatisation process as militarisation is a hyperbole.

Kevin Harris has deftly dealt with this matter. He has comprehensively examined the rise of IRGC and other parastatal organisation. He has made claims like the privatisation process in Iran is 'pseudo-privatisation' and Iran behaves like a subcontractor state, where state subcontracts its responsibilities to its parastatal organisation. However, Harris has never made any sweeping statement similar to yellow journalists and Alfoneh, that IRGC is looting state coffers.

Harris acknowledges the fact that IRGC is a dominant force in the Iranian economy, but it is not the only player. There are many parastatal organisations similar to IRGC. He has pointed out about large pension funds and revolutionary organisations, which are similar in scale and nature of IRGC and associated organisations. Social Security Organisation (SSO) is among one of the major parastatal organisation of Iran. SSO is tasked to provide health

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[111] Alfoneh, Ali (2010), "The Revolutionary Guards Looting of Iran's Economy", *American Enterprise Institute for Public Policy Research*, No.3, [Online: web] Accessed 12 November 2018, URL: http://www.aei.org/wp-content/uploads/2011/10/03-MEO-2010-g.pdf.

[112] *Ibid*.

[113] *Ibid*.

[114] Yellow press or Yellow Journalism is a type of journalism that present little or no legitimate well-researched news, and instead uses catchy, distoreted and often false headlines to sell more newspaper.

insurance, disability insurance, and retirement benefit to nearly 30 million Iranians that is almost half of Iran's population.[115] According to Harris, since 2006 government of Iran has divested massive blocks of public entities shares through an auction on the stock market, transfer to cooperatives, and settling its debt by transferring company shares to parastatal organisations, also known as a non-governmental organisation. The main recipient of the government's divestment is the pension fund company of the SSO.[116] In order to service the retirement benefit, insurance, and health care benefit of Iran's ageing population, SSO like many pension funds in the world has expanded its portfolio into riskier investments, because riskier investments are correlated to higher returns. On the other hand, it is mandated by the Iranian law to keep the SSO finance in healthy condition, and as the consequence of that, large public entities are transferred to the public pension fund. These entities include petrochemical complex, cement factories, and pharmaceutical facilities.[117] Before the revolution portfolio of SSO was totally different from the present one. Earlier SSO used to invest employees contribution largely in fixed-term long deposit, by one estimate even in 1989 an approximately fourth fifth of SSO's pension contribution was in a low-risk long term fixed deposits. However, by early 2000, long term fixed deposit share in SSO's investment shrunk to ten per cent, whereas, two third of SSO's portfolio comprised of direct and indirect investment in the Iranian economy.[118] In 2000, SSO owned companies in Iran produced 35 per cent of rubber in Iran, one-fourth of fireproof products, 35 per cent of the television sets, one-third of cement produced in the country and almost half of pharmaceutical and hygienic products.[119] By some estimates, parastatal organisations control 50 per cent of Iranian GDP.

Parastatal entities are very influential in the Iranian economy, and this influence is critically scrutinised by Harris. Harris neither eulogised or blatantly criticised the formation of a parastatal organisation, rather he has examined the parastatal in a balanced way. He has a

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[115] Harris, Kevan (2013), "Why the Revolutionary Guards Do Not Run Iran's Economy", *The Diplomat*, March 21, 2013, [Online: web] Accessed 4 September 2018, URL: https://thediplomat.com/2013/03/why-the-revolutionary-guards-do-not-run-irans-economy/?allpages=yes.

[116] *Ibid*.

[117] *Ibid*.

[118] Harris, Kevan (2013), "Vectors of Iranian Capitalism: Privatization Politics in the Islamic Republic" in Hertog, Steffen, Luciani, Giacomo and Valeri, March (2013) (eds.), *Business Politics in the Middle East*, London: Hurst Publishers.

[119] *Ibid*.

holistic view, and factors in sanctions and the political culture of Iran to explain the rise of the parastatal organisation.

Harris categorises the parastatal of Iran as conglomerates.[120] Conglomerates are more common in the context of Japan and Korea. He pointed out that parastatals of Iran can be equated to ownership structure of 'stakeholder model' of Japan and Germany, in which huge firms amass broad shareholdings and depend greatly on banking capital and finance.

Many parastatals in Iran have their banking and financing arms, which give the parastatals a cushion to undertake large projects. It is generally argued that back door subsidies and unwarranted government support to parastatals crowd out the private investments. This claim seems to appear logical; however, if one examines it deeply, the claim appears somewhat different. For instance, IRGC engineering arms boasts that almost 70 per cent of their contracts are subcontracted to the private sector in Iran.[121]

Another dimension of parastatal organisations is that, due to the support from the government, parastatals are able to procure materials needed to run the industries. Sanctions have also cut Iran financially, making it difficult for the private sector to get sufficient finance to bid for the projects.[122] In this scenario, parastatals came as a boon for the Iranian economy, which have healthy finance to undertake large domestic projects.

It is not to suggest that parastatals have circumvented the sanctions totally, and there is no significant effect of sanctions on the Iranian economy. It is difficult to assess the impact of sanctions on each and every sector of the economy, and it is beyond the scope of this thesis. The chapter rather than focusing on the sanctions and its impact would primarily

[120] A conglomerate is a corporation that comprises of different business entities, each engaged in unrelated activities. In a conglomerate setting, one parent company owns a controlling or majority stake in a various smaller companies. Each of these divisions operates independently, but these individual companies report to parent company. Conglomerates are generally private entities, rarely government owned organisations function like that of conglomerate. Conglomerate strategy of venturing into many unrelated business is a way of diversifying risk. Government entities are generally not much concerned with risk; therefore, in government setup one will rarely find a conglomerate. Examples of conglomerates organisations are TATA, Samsung, Reliance, and Hyundai. This is not an exclusive list of conglomerates, but the names are mentioned to give an idea about conglomerate and its functioning. Whereas, if we take big public sector companies of India, like SAIL, IOC, HP, Bharat Petroleum, they all specialised in particular product

[121] Harris, Kevin, (2016), "All the Sepah's Man: Iran's Revolutionary Guards in Theory and Practice" in Grawert, Elke and Abul-Magd, Zeinab (2016) (eds.), *Businessmen in Arms: How the Military and Other Armed Groups Profit in the Mena Region*, London: Rowman and Littlefield.

[122] *Ibid*.

discuss the manufacturing sector of Iran. However, in the course of dealing with Iran's manufacturing sector, the impact of sanctions would be dealt with.

### 3.7 Iran's Manufacturing Sector

An economy is divided into many sectors, like tourism, transportation, manufacturing, aviation and agriculture. However, there are three broad categories in which the economy is divided, namely, agriculture sector, manufacturing sector and service sector. The chapter would focus on the manufacturing aspect of the economy.

As far as the manufacturing industry is concerned, there are certain sectors which are considered as the backbone of any economy, for instance in India, there is an index of core industries (ICI). These industries are 'core' in nature and are very important indicators of economic activities. These industries are quite significant for other industries as well. In the case of India, there are eight core industries, namely: steel, cement, petrochemicals refined products, coal, natural gas, crude oil, electricity and fertiliser.[123] Different weights are assigned to each industry, and it changes every year according to the performance of the economy. Likewise, every country has its own core industries; on the other hand, for the simplicity, core industries have other classification, which is divided into three categories, namely: metal, machinery and chemicals.[124] Since core industries form the background of the economy; they also form the major part of the Index of Industrial Production (IIP). In India, the eight core industries form the 40.27 per cent of Index of Industrial Production (IIP).[125] Every economy has its own intricacy, and the weights are assigned to each core industries accordingly, depending upon the complexities and priorities of the economy.

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[123] "Index of Eight Core Industries", *Arthapedia*, [Online: web] Accessed October 12, 2018, URL: http://www.arthapedia.in/index.php?title=Index_of_Eight_Core_Industries.

[124] Li, Junchen (2016), Product Space, Unrelated Diversification, and Economic Development." Master's thesis, Lund: Lund University.

[125] Office of the Economic Advisor, Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India, "Index of Eight Core Industries" (2019), [Online: web] Accessed 2 February 2019, URL: http://eaindustry.nic.in/eight_core_infra/eight_infra.pdf. The same index also tells about the weightage that each core industry is assigned is 2019. In descending order the weightage are as follow: Petroleum Refined Products is 28 per cent of weight, Electricity is assigned 19.8 per cent of weight, Steel Production is assigned 17.92 per cent of weight, Coal is assigned 10.33 per cent of weight, Crude Oil Production is assigned 8.98 per cent of weight, Natural Gas Production is assigned 6.88 per cent of weight, Cement Production is assigned 5.37 per cent of weight and Fertiliser is assigned 2.63 per cent of weight.

Similarly, apart from Indian example, the other classification of the core industry, where metal, machinery and chemical are considered as the core industry have a similar bearing on the economy. In his Master's Thesis Li has established that out of product mix of 754 products, core industries constitute major share. Among the top 300 products chemical, metal and machinery constitute 20 per cent, 19 per cent, and 27 per cent respectively. Totally core industry constitutes 66 per cent of top 300 products. Among the top 100 products, the share of core industry further rises to 91 per cent. Metal, chemical and machinery, constitutes 1 per cent, 18 per cent, and 72 per cent of top 100 complicated products.[126]

In the Indian context, the core industry formed 40.27 per cent of Index of Industrial Production, and in the global context, the core industry constitutes 46 per cent of all products.[127] The comparison is drawn to show that in India and internationally core industry form a significant part of the product mix. Therefore, the question arises, why there are eight core industries in India, and internationally there are just three sectors.

India has taken the basic components as core units, like coal, steel, natural gas, crude oil, refined petrochemical and electricity. Basic units are, for instance, coal which is a must ingredient in making steel, cement and to generate electricity at thermal power plants. Similarly, steel is a basic unit for making any machinery, tools and construction. The core industry act as an input for the other industry and not much value is added to the core industry, as they are extractive in nature. Except for petrochemical refined products most of the components of the core industry are extractive in nature. Petrochemical refined products are processed from crude oil, and huge value is added to it, and these petrochemical products act as a raw material to other industry as well. Therefore, there is a double value addition in the case of petrochemical refined products. This is the reason the petrochemical refined product has a lion share in the Index of Industrial Production (IIP). Now, if we analyse carefully, India's core industry list and international list are not very different. International category of core industry comprises of metal, machinery and chemicals. Chemicals are similar to petrochemical products, metal is similar to steel, and machinery is exponential value addition of metal and other basic inputs like electricity.

[126] Li, Junchen (2016), "Product Space, Unrelated Diversification, and Economic Development", Master's thesis, Lund: Lund University.
[127] From footnotes 123 and 124.

In the case of Iran, the chapter would follow the India categorisation of core industry to assess the manufacturing industry of Iran. As said earlier, each economy assigns different weight to a different component of the core industry according to the complexities of their economy. In the case of Iran, it is natural that crude oil production and natural gas would be assigned greater weight. However, the chapter is focused on the non-oil manufacturing of the Iranian economy, hence, crude oil production and natural gas production would not be discussed in the chapter. Apart from crude oil production and natural gas production, the chapter would not discuss fertiliser and coal either.

Coal is not attended to in the chapter because coal does not play a major role in the Iranian economy. Though Iran has huge coal reserves, most of the coal extracted from these reserves go into steel making, and not electricity generation.[128] Iran primarily depends on natural gas, oil, and hydropower for electricity generation. Therefore, coal is not a focus of the chapter. Secondly, the chapter would not deal with the fertiliser as well; fertiliser is basically a commodity petrochemical product, which uses natural gas as a primary feedstock. The fertiliser can be clubbed into the petrochemical sector, however, value addition in fertiliser is less than petrochemical refined products.

### 3.7.1 Steel Industry of Iran

Steel industry in Iran is one of the major industry in Iran. Iran is the second largest steel producer in the region after Turkey. However, the journey to becoming one of the biggest producers in the world is not smooth. Iran has faced many political and technical setbacks in setting up the steel industry. Iran first planned a smelting plant in 1927, to produce rails domestically. However, the plan did not materialise due to the technical reason, as coal needed for the steel production was almost 100 miles away from the proposed plant. In 1938, an agreement was reached between Iran and German consortium to build a steel plant, but due to the Second World War, the project did not see the light of day.[129] Finally, in 1956 a

[128] "Iran's Coal Production Surges 25%", 6 January 2019, [Online: web] Accessed March 16, 2019, URL: http://www.iran-daily.com/News/236964.html?catid=3&title=Iran-s-coal-production-surges-25-.

[129] "Steel Industry in Iran", *Encyclopedia Iranica*, [Online: web] Accessed October 17, 2018, URL: http://www.iranicaonline.org/articles/steel-industry-in-iran.

contract with USSR was signed to erect and finance a steel plant in Isfahan. The plant came into operation in 1971 and started its production.[130]

From having a first integrated steel plant as late as in 1971[131], Iran has come a long way to become one of the biggest producers in the region. In 1988, Iran production did not exceed even one million tons annually. However, in 2000 Iran production crossed more than 6.5 million tons. In just twelve years, growth in steel production was more than 1200 per cent.[132] According to the World Steel Association, Iran has become the tenth largest steel producer in the world. Iran in 2018 produced, 25 million tons of steel, to replace Italy as the tenth largest producer.[133] From one million tons of steel in 1988 to 25 million tons of steel in 2018, Iran has increased its production 25 folds in three decades.

Table 3.7 Iran's Annual Steel Production and World Ranking[134]

| Year | Production (in million tons) | World Ranking |
|---|---|---|
| 2013 | 15.4 | 15 |
| 2014 | 16.3 | 14 |
| 2015 | 16.1 | 14 |
| 2016 | 17.9 | 14 |
| 2017 | 21.2 | 13 |
| 2018 | 25 | 10 |

Source: World Steel in Figures, 2018-2014

[130] *Ibid*.

[131] It is not to suggest that there was no steel plant in Iran before 1971. However, the scale of production was insignificant, and it was largely by few small private players.

[132] *Ibid*.

[133] "Iran Ranked World's 10th Largest Steel Producer in 2018: WSO" (2019), Tehran Times, Tehran, [Online: web] Accessed 2 February 2019, URL: https://www.tehrantimes.com/news/432301/Iran-ranked-world-s-10th-largest-steel-producer-in-2018-WSO.

[134] World Steel in Figures (Various Years from 2018-2014), World Steel Association, World Steel Figure of 2019 is not published ( at the time of writing thesis), however the information regarding the production of 2018 is available on many newspaper websites and website of World Steel Association.

Iran has exhibited tremendous growth in this sector, however, the rate of growth compared to the first decade is slower, and Iran has an ambitious target of producing 55 million tons of steel by 2025, which appears bit farfetched. To achieve the target of 55 million tons, Iran needs to extract around 160 million tons of iron ore, this requires 100 million tons increase in current iron ore production. Liquidity crisis along with sanctions, which restricts the import of latest technology, is thwarting Iran's expansion plans.[135]

Iran has not just become one of the biggest producers in the world, Iran has also become the net exporter of the steel. In 2014, Iran was among the top ten importers of steel, and Iran's net import was 3.7 million tons.[136]

From the net importer in 2014, in 2017, Iran became the net exporter of the steel from being the net importer in 2014. In 2017, Iran exported 4.4 million tons of steel, making Iran among the top ten exporters of steel. India with an annual production of more than 100 million tons exported 7.5 million tons of steel, whereas, Iran with an annual production of more than 20 million tons exported 4.4 million tons.[137] The achievement of Iran is commendable in steel production.

Despite being the net exporter of steel, iron and steel constitutes a major share of Iran's import basket. However, the import of iron and steel is declining over the period, but it still dominates the import basket by value as well as volume.

[135] "Iran 2025 Steel Target No Mirage", Financial Tribune, December 31, 2016. [Online: web] Accessed November 15, 2018, URL: https://financialtribune.com/articles/economy-business-and-markets/56605/iran-2025-steel-target-no-mirage.

[136] World Steel in Figures (2015), World Steel Association, [Online: web], Accessed 25 November 2018, URL: http://www.nass.org.uk/Publications/Publication4079/1.%20World%20Steel%20in%20Figures%202015.pdf

[137] World Steel in Figures (2018), World Steel Association, [Online: web] Accessed 25 September 2018, URL: https://www.worldsteel.org/en/dam/jcr:f9359dff-9546-4d6b-bed0-996201185b12/World+Steel+in+Figures+2018.pdf.

Table 3.8 Value of Import of Iron and Steel[138]

| Year | Value of Import (in million Dollars) | Percentage change | Percentage Share of Import |
|---|---|---|---|
| 2009/10 | 8166 | - | 14.8 |
| 2010/11 | 9235 | 13.09 | 14.3 |
| 2011/12 | 8357 | -9.5 | 13.5 |
| 2012/13 | 6121 | -26.7 | 11.5 |
| 2013/14 | 3684 | -39.8 | 7.4 |
| 2014/15 | 4210 | 14.2 | 7.9 |
| 2015/16 | 3095 | -26.4 | 7.5 |
| 2016/17 | 2509 | -18.9 | 5.7 |

Source: Annual Review, Central Bank of Islamic Republic of Iran

Above table shows that iron and steel form the important part of Iran's import component, however, the rate of import over the year is declining. This implies that the production of iron and steel in Iran is growing, that is satiating the domestic demand.

### 3.7.2 Cement Production in Iran

In India, cement has the lowest weight apart from fertiliser. The low weight assigned to cement is because of its poor backward and forward linkages. Cement is only used as concrete in the construction industry. Apart from construction, there is no other substantial use of cement. Value addition in cement is very low, unlike metals and chemicals. This is the reason, cement is not considered as a core industry in international classification.

Apart from its poor forward linkages, and least value addition, cement has low price to weight ratio. Low price to weight ratio implies, that compared to the price of cement, the freight or carriage cost of cement is quite high.[139] Low price to weight ratio is the reason that less than 20 per cent of globally manufactured cement is traded internationally. This characteristic of cement gives a distinct advantage to local producers, as they experience low

[138] Annual Review ( 2010/11- 2016/17), Central Bank of The Islamic Republic of Iran

[139] Ghaffarzadegan, Navid, Tajrishi, Amir T and Hosseini, Niyoush, "Economic Transition Management in Iranian Cement Industry", [Online: web] Accessed on 4 November 2018, URL: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.486.2472&rep=rep1&type=pdf.

transport cost. Globally, the export of cement is in decline, because of the aforementioned reasons. Major global exporters are experiencing a decline in their exports. In 2017, cement exports of China were down by 27.1 per cent, Pakistan by whopping 60.3 per cent, Turkey by 28 per cent, and Vietnam by 43.7 per cent and the United States by 24 per cent.[140] More and more cement is manufactured locally either by local players and global players investing in the local market.

Conversely, the scenario in Iran is different. Construction is the most robust sector in Iran; this makes the cement industry in Iran quite significant. Secondly, investment in the real estate sector is a prudent strategy against inflation.[141] Iran has one of the highest inflation rates in the world, among the big economies. Therefore, it is imperative that investment in real estate sector in Iran is quite high. This can be gauged by the fact, that there is a glut of luxury housing in Iran. There were 620,000 unoccupied flats in 2006-07, which increased to 1,650,000 in 2011, and in 2017 it is estimated that 2 million homes were unoccupied throughout the country.[142] However, due to a glut in the housing sector, Iran is experiencing negative growth in the housing sector, since 2014. But that does not belittle the significance of the cement industry in Iran.

Iran is the world's fourth largest manufacturer in the world. With the production of 70 million tons in 2012, Iran has maintained this spot.[143] Despite the slump in global export of cement, Iran cement industry has an optimistic outlook. Iran is among the few countries whose cement export went up, during the first four months of the fiscal year 2018, Iran's cement export increased by 32 per cent. Iran exported cement to Afghanistan, Iraq, Kuwait, Oman and Bangladesh. Clinker export to Kuwait and Oman experienced substantial growth.[144] Iran will be greatly engaged in reconstruction effort of Syria, and to fulfil the need

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[140] "Top Cement Exporting Countries", World's Top Exports, 15 November 2018, [Online: web] Accessed November 22, 2018, URL: http://www.worldstopexports.com/top-cement-exporting-countries/.

[141] Smith, Lisa (2019), "How to Profit from Inflation", *Investopedia*, [Online: web] Accessed 15 March 2019, URL: https://www.investopedia.com/articles/investing/080813/how-profit-inflation.asp.

[142] Affianian, Mohammad (2017), "Iran's Property Market Prospects for Foreign Investors", *Financial Tribune*, 4 March 2017, [Online Web] Accessed 19 June 2018, URL: https://financialtribune.com/articles/economy-business-and-markets/60787/irans-property-market-prospects-for-foreign-investors.

[143] Taib, Mowafa, Wallace, Gelnn J., and Mobbs, Philip M. *et al* (2015), "The Mineral Industries of The Middle East", *2012 Minerals Yearbook: The Middle East*, U.S. Department of Interior and U.S. Geological Survey.

[144] "Iran's Cement Exports up 32%", *International Cement Review*, 17 September 2018 [Online: web] Accessed December 10, 2018, URL: https://www.cemnet.com/News/story/164905/iran-s-cement-exports-up-32-.html.

for the construction material, cement from Iran would be exported to these countries, where reconstruction of huge scale will take place.[145] According to some estimates reconstruction effort in Syria will go on for many years, would cost at least $300-$400 billion. Iran would get a huge share of this reconstruction effort. In August 2018, Syria agreed to award a contract to an Iranian company to build 30,000 housing units in Aleppo, Homs, and Damascus.[146] As discussed earlier, because of the low price to weight ratio cement cannot be transported over a long distance, therefore, the Iranian cement industry has a significant opportunity in Syria's reconstruction plan. Iran has a border with three war-torn countries, namely: Afghanistan, Iraq and Syria, and these countries are recuperating from the effects of prolonged war, hence, reconstruction is the prime agenda of all these countries, therefore Iranian cement industry could expect a healthy demand in coming years.

### 3.7.3 Petrochemical Industry of Iran

Petrochemical refined products have been assigned the highest weight in Indian Core Industry. Same is corroborated by the international classification, where chemicals are assigned the highest weight in the top 300 products, compared to the other two core industrial components namely metal and machinery. In the modern world, life without petrochemicals could not be imagined. From the pharmacy, cosmetics, computers, vehicles, communication device, wind turbine and aviation petrochemicals are everywhere.

The petrochemical industry has immense applications in the modern day times, from the agricultural field in the form of fertiliser to aeronautical engineering in the form of carbon fibre, petrochemical has enormous uses. Petrochemical industries are among the biggest industries in the developed economies. Any economy making any complex chemical product has a robust petrochemical industry.

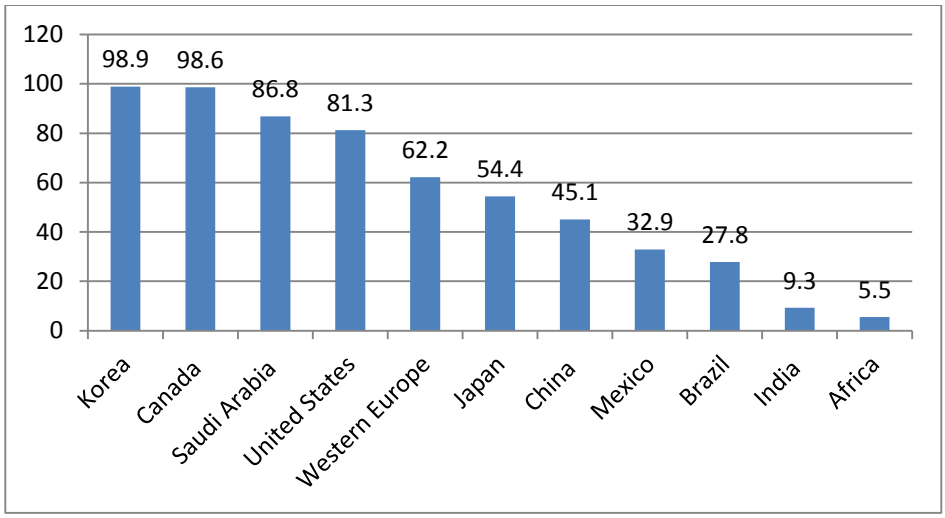
It is estimated that petrochemical would account for more than one-third of the growth in oil demand by 2030. This suggests that there is a shift in oil demand from motor

[145] Alfoneh, Ali (2019), "Iran Eyes Share in Syria's Reconstruction", 10 February 2019, [Online Web] Accessed 22 February 2019, URL: https://thearabweekly.com/iran-eyes-share-syrias-reconstruction.
[146] *Ibid*.

fuels to petrochemicals.[147] Therefore, petrochemicals will largely drive the demand for oil in the future.

Developed economies like Western Europe, Korea and the United States currently use 10 times more plastic per capita basis than developing economies like India, South Asian countries and some African countries. Developed economies also use more fertiliser per capita basis than developing the economy, therefore it underscores the huge potential for petrochemical products.

Figure 3.2 Per Capita Demand for Major Plastics in 2015 (figures are in kg/capita)[148]




Source: International Energy Agency

Above table show the huge difference in per capita plastic consumption of countries like Korea, Canada with that of India and Africa. There is huge potential for growth in the petrochemical sector.

Iran foray into the area of petrochemical was very late. Ironically, oil was first discovered in Iran in the region. However, Iran's venture into this value-added industry fairly behind the global standard. In 1950-51 when the oil industry was set to nationalise, the

[147] "Petrochemicals Set to Be Largest Driver of Oil Demand: IEA", *The Economic Times*, 5 October 2018, [Online Web] Accessed 2 November 2018, URL: https://economictimes.indiatimes.com/industry/indl-goods/svs/petrochem/petrochemicals-set-to-be-largest-driver-of-oil-demand-iea/articleshow/66082484.cms?from=mdr.

[148] "The Future of Petrochemicals: Key Findings", *International Energy Agency*, [Online: web] Accessed 20 October 2018, URL: https://www.iea.org/petrochemicals/.

petrochemical industry was still not an important issue then. Iran experienced with its first petrochemical industry was in the form of a fertiliser factory in 1963 in Marvdasht.[149] In 1964, for the development of the petrochemical industry, National Petrochemical Company (NPC) was formed.

Today Iran is the second largest producer of petrochemical in the region after Saudi Arabia. Iran has the biggest gas reserve in the region and the second largest oil reserve in the region. This makes Iran an ideal place for the production and export of petrochemicals.

As of 2016, Iran has 52 petrochemical plants with an installed capacity of around 60 million tonnes and production output of 51 million tonnes.[150]

Iran no longer manufactures only low-end petrochemicals like urea and ammonia. Iran now produces complex petrochemical products as well. In fact, primary exports of Iran's petrochemical industries are ammonia, urea, methanol, polyolefins, monoethylene glycol (meg), and para-xylene.[151]

The contribution of petrochemicals in the non-oil sector increased to 43.2 per cent in 2008-09 from 2.7 per cent in 1989.[152] Around half of Iran's non-oil export constitutes of petrochemicals.

[149] "Petrochemical Industries in Iran", *Iran International*, October 2014, URL: http://www.iraninternationalmagazine.com/issue_72/II72-sp.pdf

[150] "A New Era of Iran Petrochemicals", August, 2017, *KPMG*, [Online Web] Accessed 23 October 2018, URL: https://assets.kpmg/content/dam/kpmg/uk/pdf/2017/08/a-new-era-for-iranian-petrochemicals.

[151] *Ibid*.

[152] "Petrochemical Industries in Iran", *Iran International*, October 2014, [Online Web] Accessed 25 October 2017, URL: http://www.iraninternationalmagazine.com/issue_72/II72-sp.pdf.

Table 3.9 Performance of the Petrochemical Industry in Iran[153]

| Particulars | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 |
|---|---|---|---|---|---|
| Production (thousand tons) | 41,064 | 40,574 | 44,511 | 46,411 | 50,614 |
| Export Volume (thousand tons) | 15,757 | 12,827 | 15,886 | 18,809 | 20,851 |
| Export Value (million dollars) | 12,061 | 9,869 | 10,273 | 9,586 | 9,803 |
| Share of the value of petrochemical export in the total value of industrial export (in percentage) | 48.0 | 39.3 | 35.3 | 35.7 | 32,7 |

Source: Annual Review, Central Bank of Islamic Republic of Iran

Above table shows that petrochemical is an important non-oil export of Iran. In 2012/13, Iran exported $15.75 billion worth of petrochemical goods. In the same period, the volume of petrochemical export was 15.75 million tons. However, in subsequent years, export volume has increased but the value of the petrochemical export is declining continuously. In 2016/17, Iran exported 20.85 million tons of petrochemical goods but raked in less than what it earned in 2012/13. In 2016/17, Iran collected $9.8 billion from the export of petrochemical goods. Compared to 2012/13, Iran exported approximately 32 per cent more petrochemical goods in 2016/17, but during the same Iran export earning of petrochemical, goods fetched around 37 per cent less amount than 2012/13 petrochemical exports earnings.

[153] Annual Review (2016/17), *Central Bank of the Islamic Republic of Iran*, 59 (redacted version).

Though petrochemical exports are classified as non-oil exports, petrochemical goods are primarily petroleum based. Crude oil has a volatile nature, and its volatility has effects on the petrochemical sector. In 2012, the average annual OPEC crude oil price was $109.45 per barrel, which was $40.68 per barrel in 2016 and was $52.51 per barrel in 2017.[154] Price of crude oil in 2017 was approximately 52 per cent less than the price in 2012, but the fall in revenue was 37 per cent. Therefore, it shows that petrochemical goods are volatile but compared to crude oil, it is less volatile.

### 3.7.4 Electricity Generation in Iran

Electricity is the most important thing in the modern world. One cannot imagine the world without electricity. Electricity keeps the world running. Sustained electric supply is a basic premise for the industrialisation. In India's classification of the core industry, electricity has been assigned the second highest weight behind the petrochemical sector. The idea of electricity corroborates with that of international classification. In international classification, machinery has been assigned a quite high weight, and machines generally run on electricity, therefore, indirectly international classification also acknowledges the importance of electricity.

Iran is the biggest producer of electricity in the region. At the same time, Iran is the most energy-intensive country in the region. Iran's energy intensity is almost twice as the regional average.[155] High energy intensity entails high domestic energy consumption, which leaves little energy for export. One problem in front of Iran is to increase electricity production in tandem to domestic demand. Another problem for Iran is huge subsidies which Iran provides to electricity consumers. The subsidy induces wastage of electricity that leaves less electricity for export. In 2000, electricity subsidies constitute a major portion of electricity prices. Subsidies made up 66 per cent of the average annual electricity prices in the public sector, 81 per cent in the residential sector, 47 per cent in the industrial sector and

[154] "OPEC Oil Prices 1960-2018 Statistic", *Statista*, [Online Web] Accessed 2 March 2019, URL: https://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/.

[155] Farahani, Shabnam-Mirsaeedi (2015), *Energy Sector Diversification in Iran: Evolving Strategies and Interests in the Electricity Sector*, Berlin: Springer.

a whopping 94 per cent in the agricultural sector.[156] The real cost of electricity increased by 8 to 10 per cent annually from 2000 to 2010, however, still the shares of subsidies formed a major part of electricity cost: 56 per cent in public sector, 45 per cent in the industrial sector, 75 per cent in the residential sector, and 91 per cent in the agricultural sector.[157]

Since 2010, the first phase of subsidy reforms was implemented and price for the residential sector went up approximately eight times the per-unit price in 2000 and more than three times the price in 2010. The increased price showed its intended results, and consumption of electricity came down by 11 per cent in January 2011.[158]

Apart from reforms in electricity reforms, Iran has achieved many milestones in electricity generation. Iran is the biggest producer of electricity in the region with an installed capacity of 80,299 MW at the start of 2019. In 2013, Iran's electricity generation was 68,941 MW. In 1979, Iran capacity stood at approximately 7000 MW.[159] In the span of forty years Iran has increased its power generation capacity by more than 11 times.

Iran has not only made great development in power generation but in manufacturing power generating equipment as well. Iran is among the few countries which manufacture a gas turbine. Iran has many second generation gas turbines, which Iran is upgrading with indigenously developed MGT-70 turbine. The latest turbine has increased the efficiency to 36.4 per cent and will generate 15 per cent more power than the second generation turbine.[160] The upgradation of the gas turbines would add 5000 MW to the national grid, without adding any capacity and using less fuel.[161]

Iran is the net exporter of electricity. Iran is the biggest importer as well as exporter of electricity in the region, but the export volume is more than import, making Iran the net

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156 Glossner, Shabnam Mirsaeedi (2013), "Iran's Flourishing Regional Influence: Electricity Exports as a Loophole to Sanctions," *Science & Diplomacy*, 2(3).

157 *Ibid*.

158 *Ibid*.

159 "Iran's Power Generation Capacity Increased over 11 times in 40 Years," *IranDaily*, 20 January 2019, [Online Web] Accessed 29 January 2019, URL: http://www.iran-daily.com/News/237639.html?catid=3&title=Iran-s-power-generation-capacity-increased-over-11-times-in-40-years.

160 "Iran's MAPNA Unveils Improved, Best-in-Class Gas Turbine", *Financial Tribune*, 10 July 2017, Accessed 25 October 2018, URL: https://financialtribune.com/articles/energy-economy/68067/irans-mapna-unveils-improved-best-in-class-gas-turbine.

161 *Ibid*.

exporter of electricity. Iran which was the net importer in 2004 has established itself as a net exporter in 2009. Iran exports electricity to most of its neighbours. Iraq, Afghanistan, and Pakistan are the main importers of Iranian electricity.[162]

Iran's electricity export is not just a simple economic activity; it has strategic implication as well. Iran has used its electricity to dodge the sanctions. Sanctions have basically targeted the energy industry of Iran namely oil and gas, but it does not say anything about trade in electricity. Iran has used its abundant cheap gas to generate electricity, and export the electricity to neighbouring countries.[163] In a way, Iran is converting its natural gas into a value-added product, which is less volatile.

Unlike a trade in general commodities, that can be halted at any short notice. Trade in electricity requires the establishment of transmission lines, which is a long term planning, countries involved in electricity trade signs long term contract, therefore, trade in power is least affected by sanctions.[164]

Iran is far from utilising its potential to the fullest. Iran's power plants are among the least efficient in the world, there is a huge transmission loss. Though Iran has embarked upon its subsidy reform plans, still Iran has the biggest energy subsidy in the world. In 2017, Iran spent $45.1 billion in energy subsidies, which is highest in the world.[165] The amount spent on energy subsidies equals to 15 per cent of global energy subsidy and 10.4 per cent of Iran's GDP.[166]

### 3.8 Non-Oil Exports of Iran

As discussed in previous chapter, ECI (Export Concentration Index) is an important parameter to assess the diversification of an economy. The chapter has covered the non-oil core manufacturing sectors of Iran, and assessed their exports. However, exports from the non-oil core sector does not offer a comprehensive picture. Exoprt from agricultural,

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[162] Glossner, Shabnam Mirsaeedi (2013), "Iran's Flourishing Regional Influence: Electricity Exports as a Loophole to Sanctions," *Science & Diplomacy*, 2(3).
[163] *Ibid*.
[164] *Ibid.*
[165] "Iran Ranks First On Energy Subsidies Globally", 1 November 2018, [Online Web] Accessed 25 December 2018, URL: https://en.radiofarda.com/a/iran-ranks-first-on-energy-subsidies-globally/29576746.html.
[166] *Ibid*.

handicraft, and advanced manufacturing are not considered in the study of non-oil core manufacturing. A comprehensive evaluation of non-oil export would offer a better understanding about economic diversification of Iran.

Time and again the importance of non-oil export is highlighted by the leadership of Iran. In the wake of the sanctions, when the oil industry is categorically targeted, non-oil sector has become more significant to counter the US sanctions.[167] Another aspect of non-oil sector is that it is less vulnerable to price fluctuations when compared to crude oil. Therefore, development of non-oil sector is the main agenda of economic planning of any oil exporting nation.

Iran has made significant progress in non-oil sector. According to the World Bank, share of non-oil export has increased to 10 per cent of GDP in 2017/18 from 6 per cent in 2012/13.[168] Despite the sanctions Iran's non-oil export to European Union four big economies, also known as EU4 (France, Germany, Italy, and United Kingdom), increased by 11 per cent to $587.33 million during the year 20 March 2019.[169] Similarly, Iran's non-oil export to Arab League nations has increased significantly. In the Iranian financial year ending March 20, 2019, Iran's non-oil export to Arab League nations was $16.64 billion. The figure indicates 11.2 per cent growth in non-oil export to Arab League nations.[170] During same period import from the Arab League nations were valued at $7.11 billion, which was 32.27 per cent less than the previous year. As a result Iran had non-oil trade surplus of $9.53 billion with the states of Arab League.[171]

The gap between oil and non-oil export revenue is gradually closing. There are many reasons for this. First, the sanctions have specifically targeted the oil industry of Iran,

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[167] "Iran to Keep Enriching Uranium despite U.S. Move: Parliament Speaker", *Reuters*, 4 May 2019 [Online Web] Accessed 17 June 2019, URL: https://www.reuters.com/article/us-iran-usa-sanctions/iran-must-resist-u-s-sanctions-through-oil-non-oil-exports-rouhani-idUSKCN1SA05S.

[168] "Overview: Islamic Republic of Iran", *World Bank*, [Online Web] Accessed 17 June 2019, URL: https://www.worldbank.org/en/country/iran/overview.

[169] "Iran's Non-Oil Exports to EU4 Up 11%", *Financial Tribune*, 30 June 2019, [Online Web] Accessed 1 July 2019, URL: https://financialtribune.com/articles/domestic-economy/98691/irans-non-oil-exports-to-eu4-up-11.

[170] "Iran's Non-Oil Exports to Arab League States Top $16b", *Financial Tribune*, 29 June 2019, [Online Web] Accessed 30 June 2019, URL: https://financialtribune.com/articles/domestic-economy/98670/irans-non-oil-exports-to-arab-league-states-top-16b.

[171] *Ibid*.

resulting in decreased sales. Second, increased domestic demand and lower international demand is the reason Iran is experiencing low oil revenues. Besides this, because of enhanced production of shale oil in the US, there is global supply glut, which leads to low oil prices. Finally, Iran is focusing more on non-oil exports as a way to circumvent the provisions of the sanctions. In 2011, Iran generated $114 billion from export of oil, which in 2013 plunged to around $62 billion.[172] The renewed sanctions ensures the trend of decreasing oil revenue, therefore increasing significance of non-oil export. If the trend continues, then the non-oil export would be as signiifacnt as oil export in near future.[173]

Table 3.10 Value of Iran's Export (million dollars)

| Year | Value of Oil Export | Value of Non-Oil Export |
|---|---|---|
| 2010/11 | 90,191 | 22,596 |
| 2011/12 | 118,232 | 26,642 |
| 2012/13 | 68,135 | 29,899 |
| 2013/14 | 64,540 | 28,369 |
| 2014/15 | 55,406 | 33,569 |
| 2015/16 | 31848 | 31,147 |

Source: Annual Review, Central Bank of Islamic Republic of Iran

The table above demonstrates the significance of non-oil export, and at the same time the table also shows volatility of oil export, and Iran decreasing revenue from oil. In 2010/11, Iran oil export was $90.191 billion, and in the same year non-oil export of Iran was $22.596 billon. In 2011/12 revenue from the oil export peaked to $118.232 and thenafter never regained same level. However, in the corresponding period non-oil export grew steadily to $26.642 billion. After the 2011/12, oil revenue dropped sharply, and in 2015/16 revenue from the oil export was just $31.848 billion. Revenue from oil export in 2011/12 was almost four times[174] more than the oil export revenue in 2015/16. Nevertheless, the revenue from non-oil sector did not witness any such volatility, and continued its steady growth. In

[172] Samii, Massood V (2015), "Non-Oil Exports from Iran" in Elahee, Mohammad, Farid Sadrieh, and Mike Wilman (eds), *Reintegrating Iran with the West Challenges and Opportunities*, London: Emerald Group Publishing.

[173] *Ibid*.

[174] $181.232billion÷$31.848billion=3.71 ( which is rounded to 4).

2015/16, revenue from non-oil export was $31.147 billion. The difference between oil export revenue and non-oil export revenue in 2015/16 was marginal.

There was slight fall in non-oil export revenue in 2016/17, but it again bounced back in 2017/18. However, in the corresponding period revenue from the oil export rose significantly. In 2016/17 non-oil export revenue was $28.226 billion and in 2017/18 it rose to $32.324 billion. In the same period income from oil export was $55.752 billion and $65.818 billion respectively.[175]

There is shift in Iran's trading partners. Before the sanctions, Iran's major trading partners were European nations and the US. However, after the 1979 Revolution trade of Iran shifted East Asian nations and neighbouring countries. A major reason for the shift was sanctions imposed by European Union and the US. Exports to the US declined gradually and finally stopped altogether in recent years. Exports to European Union also dropped substantially. However, drop in exports in these regions was compensated by the rise in export to Afghanisatn, Iraq, China, and the UAE.[176]

### 3.9 Conclusion

Iran appears as a fairly diversified economy, where a country manufactures most of the core industrial products domestically. However, this does not give the true picture of Iran's economy. Iran is still overwhelmingly dependent on the export revenue of oil and gas, and its half of non-oil export consists of petrochemical products, which are primarily based on oil. Iran has reached global milestones in the production of steel, cement, petrochemicals, and electricity, but none of its products is globally competitive. Iran's cement industry is one the most energy-intensive industry, Iran exports steel at a highly subsidised price, and same is the case with electricity. On the other hand privatisation in Iran seems working, but in reality most the public sector entities are being transferred to parastatal organisations. Similarly, despite having a vibrant manufacturing sector, Iran exhibits the feature of a rentier economy.

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[175] Annual Review (2017/18), *Central Bank of the Islamic Republic of Iran*

[176] Samii, Massood V (2015), "Non-Oil Exports from Iran" in Elahee, Mohammad, Farid Sadrieh, and Mike Wilman (eds), *Reintegrating Iran with the West Challenges and Opportunities*, London: Emerald Group Publishing.

It is not that Iran has failed to achieve anything in 40 years since the revolution. Iran has come a long way from the 1979 revolution and eight years of Iran-Iraq war. Government healthcare care programme covers almost the entire population. Electricity has reached to the most rural parts of Iran, and these have effects on the human capital as well. Iran's human capital is among the most advanced in the region.

# CHAPTER IV

# DIMINISHING IMPORTANCE OF OIL:

# REASONS TO DIVERSIFY AWAY FROM OIL

## 4.1 Introduction

This chapter focuses on the oil industry of Iran. Oil is the most important element of the Iranian economy, as Iran's economy is heavily dependent on the oil. Though the thesis revolves around the diversification of the economy, it is very important to discuss the oil industry of Iran. As the Iranian economy is intensely dependent on oil, it becomes essential to outline the oil industry of Iran, as to know how far Iran is successful in diversifying its economy away from oil.

Iran has the fourth largest reserve of oil in the world and the second largest reserve in the region. From the high of six million barrel crude per day in the mid-1970s, in 2016 Iran was producing approximately four million barrel crude per day.[1] Iran also went through a phase in 1980, when its production of crude went abysmally low to 500,000 barrel per day (bpd). These huge fluctuations in production have severely affected the economy of Iran. There are various reasons for the fluctuations in the price of oil and these fluctuations in price affects production as well.

The demand for oil greatly depends on economic growth. During the Asian Crisis of 1997 and 2008 financial crisis price of oil came down considerably.[2] Another unique feature of oil is its geographical distribution. Oil distribution is much skewed, a considerable amount of world proven reserves are located in West Asian and North African region, which is politically unstable. This region has witnessed many wars and conflicts. 1973 War, 1980 Iran-Iraq War, 1991 Gulf War, and 2003 Iraq invasion are few major wars that have greatly affected the price of the oil. Many studies have found that crude oil prices are more volatile

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1 Trading Economics, "Iran Crude Oil Production", [Online: Web] Accessed 12 February 2017, URL: http://www.tradingeconomics.com/iran/crude-oil-production.

2 OPEC Annual Statistical Bulletin of Various Years

than other commodities.[3] Moreover, the skewed distribution of crude oil in the politically unstable region makes oil very volatile. The volatile nature of oil has impacted the investments in the oil sector, as volatility affects the rate of return on the capital invested. Similarly, Iran has its own set of challenges; the oil economy of Iran is different from other oil economies in many ways, which warrants the need to diversify away from the oil. Lastly, the usage of oil has changed over the period of history, when oil was first discovered it was used for the lighting purpose, and with the development of ICE (Internal Combustion Engine), oil usage changed, oil was also used largely for the power generation, and that has been replaced by other sources of energy. Today, the primary use of oil is in the form of fuel in the transport sector, but as the global warming issue is gaining momentum, many countries are reducing their consumption of oil, in favour of more efficient ICE and electric cars. Therefore, the current global development advocates for the diversifying away from the traditional use of oil. The chapter is basically divided into three segments. The first part of the chapter deals with the general characteristics of oil, and the problems in the development of the oil sector. The Second part deals with the problems peculiar to the Iranian economy and would show in what way Iran's problems are unique compared to the other oil economy. Lastly, the third part deals with the future prospect of the oil, and how the demand for oil as fuel is going to diminish in the coming years. This part would also focus on the usage of oil and how usage of oil has changed over the period. Therefore, by diversifying away from the oil, does not mean abandoning the oil industry, here diversifying implies, diversify away from the traditional uses of oil. However, this chapter would not focus on the diversification of usages of oil; rather this chapter would stick to the problems of the oil industry which warrants the diversification from the current usage of oil.

### 4.2 Volatility

Generally, oil price volatility is more in news compared to the price movement of other commodities. Often, global economic performance is linked with oil price movement, this makes oil price volatility a very significant indicator. There is a notion that oil prices have

[3] Regnier, Eva (2007), "Oil and Energy Price Volatility", *Energy Economics*, 29:405-427, 405.

been more volatile than prices of most of the other commodities.[4] This notion was strengthened by the crisis of 1973, which forced many developed nations to make energy policies, and hampered the growth of many countries. This alleged reason of price volatility has been used to rationalize the measures adopted by oil importing nations. Measures include price and allocation controls, subsidies for energy efficiency, and policies to expand energy sources beyond oil.[5] There are studies confirming the higher volatility of oil prices compared to the price of other commodities. In the article, '*Oil and Energy Price Volatility'*, Eva Regnier mentioned that crude oil and related products like natural gas and refined petroleum price are most volatile than the price of 95 per cent of commodities sold by domestic producers.[6] Volatility in the price of oil affects the price of goods which are derived from oil, like heating oil, automotive fuel and other associated products.

Plourde and Watkins found that the volatility of oil prices during the period of 1985-1994 was higher than the price volatility of other commodities[7]. Similarly, other studies found out that during the period of 1975-1984, volatility in price was more in agricultural commodities.[8] However, by late 1970s price volatility of most of the commodities return to the level existed before 1973, but oil price volatility continues to increase and exceeded the price volatility of most the commodities, and that volatility in the price of still continues today.[9] Energy produces are important because they are a key input requirement to so many industries and economic activities.[10] According to the International Energy Agency (IEA), 48 per cent of industrial material and energy expenditure are for energy produces, this makes energy price and its volatility an important factor in industries.[11]

In a perfect competition market (an ideal situation where there is no uncertainty) decision of optimal investment is taken easily by profit maximising firm. In practicality,

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4 Fleming, J. and Ostdiek, B. (1999), "The impact of energy derivatives on the crude oil market", *Energy Economics*, 21 (2): 135.

5 Regnier, Eva (2007), "Oil and Energy Price Volatility", *Energy Economics*, 29:405-427, 406.

6 *Ibid* 405. Here domestic producer means the producer of United States.

7 Plourde, A., and Watkins, G. (1998), "Crude oil prices between 1985 and 1994: How volatile in relation to other commodities", *Energy Economics*, 20 (3): 245–262.

8 Clem, A. (1985), "Commodity price volatility: Trends during 1975–1984", *Monthly Labor Review*, 108 (6): 17–21.

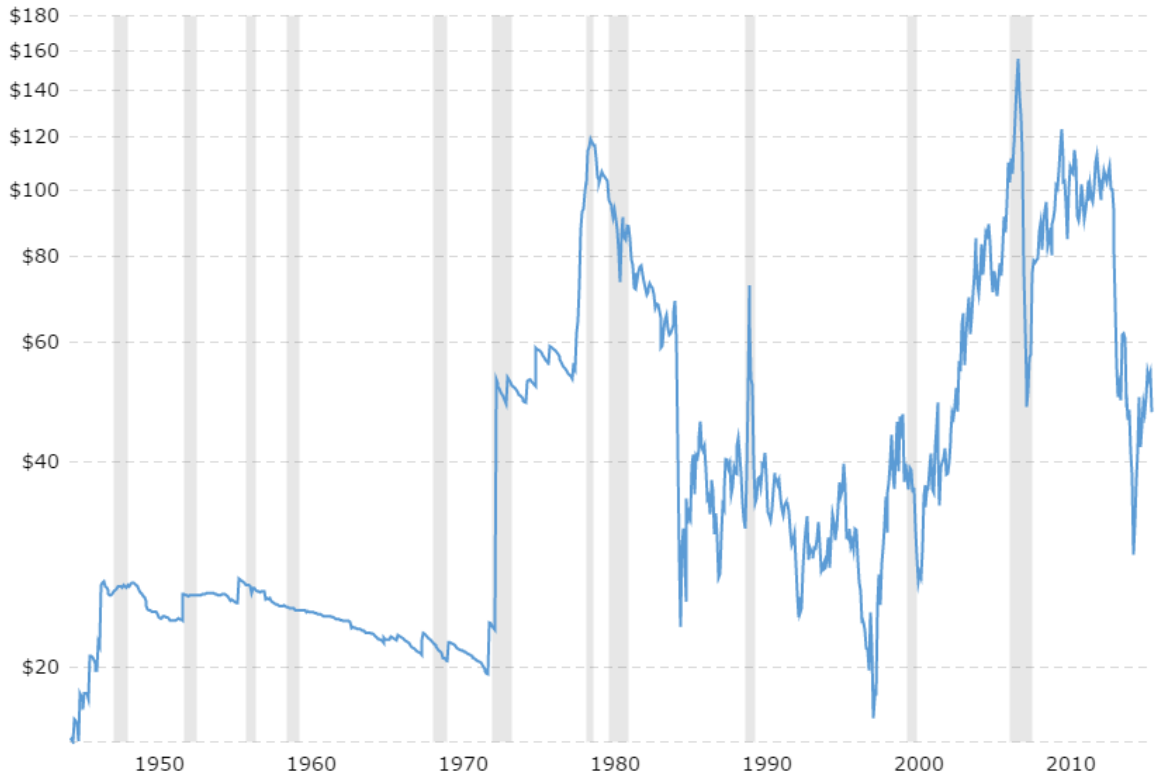
9 Regnier, Eva (2007), "Oil and Energy Price Volatility", *Energy Economics*, 29:405-427, 406.

10 *Ibid* 407.

11 *Ibid*.

however, in the absence of perfect information, it is often very challenging for firms to ascertain the optimal amount of investment. In practice, investment decisions are characterised by over or underinvestment. The result other than optimal investment, that is, over and underinvestment is due to lack of information or less than perfect information.

Figure 4.1: Crude oil Price (WTI)[12] of Past 70 Years adjusted for Inflation.[13]




Source: Macrotrends

Figure 4.1 show the price chart of WTI crude over the 70 years. Figures are here adjusted to inflation. Price of WTI crude in 1980 was $37.96[14], but the graph above which takes inflation into account, oil prices can be seen as hovering around $115- $120. Similarly, oil prices in years after 2010 has shown great fluctuation. For instance, the WTI price in 2015 was $38-40, but in absolute terms, the price was $48.66. The volatility in the price of crude is so much

[12] WTI is West Texas Intermediate. It is used as benchmark crude oil price beside Brent Crude and Dubai Crude. It is light sweet crude oil, and lighter than both Brent Crude and Dubai Crude.

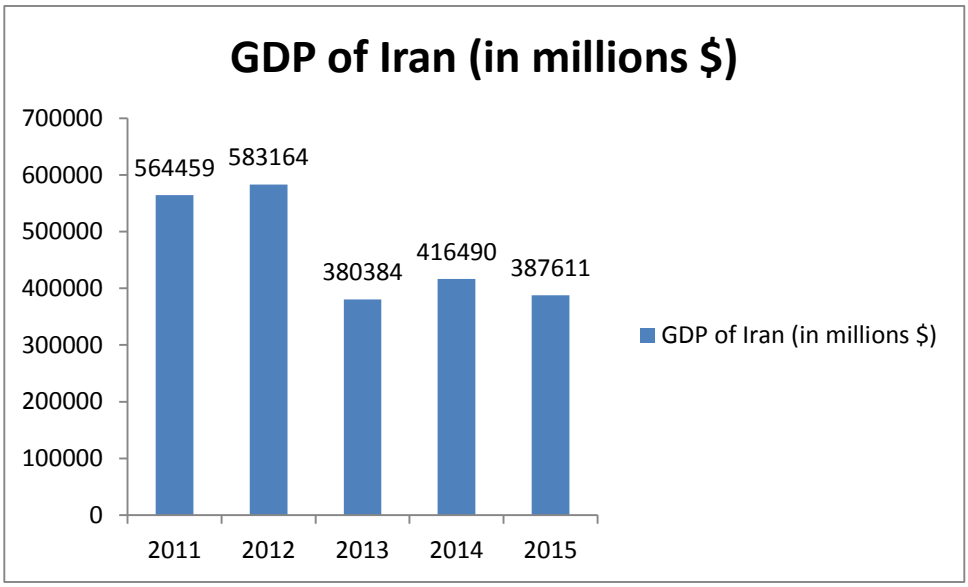
[13] Macrotrends, "Crude oil price history chart", [Online: web] Accessed 20 March 2017, URL: http://www.macrotrends.net/1369/crude-oil-price-history-chart.

[14] Statista, "West Texas Intermediate Oil Prices", [Online: web] Accessed 20 March 2017, URL: https://www.statista.com/statistics/266659/west-texas-intermediate-oil-prices/.

that price levels of 2015 and 1980 are almost the same in nominal terms. Though in real terms[15] 1980 prices are almost 200 percentages higher than the 2015 price level.

Similarly, GDP (Gross Domestic Product) of Iran has also fluctuated a lot owing to the volatility in the price of oil. GDP of Iran in 2011 was $564.459 billion, which increased to $583.164 billion in 2012. But in 2013 GDP of Iran decreased to $380.384 billion, and further GDP did not reach the level of 2011 and was lingering at $387.611 billion in 2015.

Figure 4.2 GDP of Iran from 2011 to 2015.

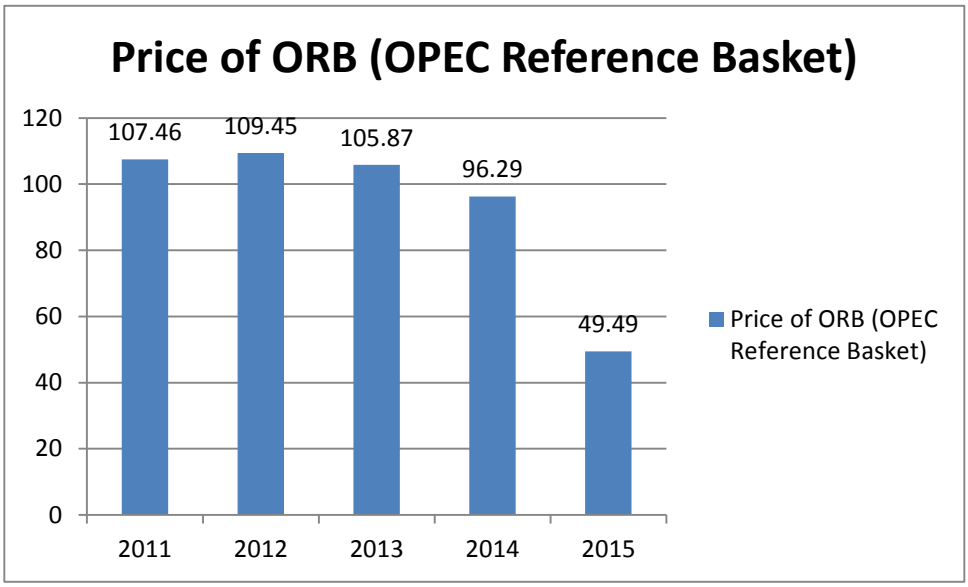



Source: Calculated from various years of OPEC Statistical Bulletin.

Similarly, the price of oil during the 2011-2015 period moved along the direction of the GDP. It would be risky to conclude that the GDP of Iran is entirely dependent on the price of oil, but the price of oil plays an important part in the GDP of Iran.

[15] Nominal value is current market price, whereas real value takes inflation into account and is more reliable measure.

Figure 4.3 Price of Oil from 2011 to 2015 (OPEC Reference Basket)




Source: Calculated from Various Year OPEC Statistical Bulletin

Fig. 4.3 and Fig. 4.2 are quite similar, oil prices were highest in 2012 and it corresponds to the GDP figure of that year, which was highest in Fig. 4.2. A similar trend can be drawn from the data of 2011 oil price and GDP. But as said earlier, it is risky to take only oil price as a factor in GDP determination. In 2013 the price of oil went down slightly to $105.87, which is 3.38 per cent less than the 2012 price level, whereas, the GDP of Iran in 2013 was $380.384 billion. In 2013 GDP shrunk by more than 34 per cent.[16] In contrast, oil price fell in 2014 as well, but GDP rose in 2014, and in 2015 both the price of oil and GDP had a steep fall.

### 4.3 Investment

Oil has low demand elasticity because it cannot be readily substituted with other fuel. A small variation in supply translates into high fluctuation in market price. The USA, for example, has a short term price elasticity of demand for crude oil of -0.0495, which means

[16] Though price fell marginally in 2013, but it was a phase where international sanctions were intensified. European Union also imposed sanctions on Iran, and was as harsh as American sanctions. European Union and USA have banned the insurance of ships and tankers of Iranian origin or tankers carrying Iranian crude. 90 per cent of world's tanker insurance are covered by European Union. Sanctions by European Union was not just confined to tankers, European Union sanctions included any energy related service such as insurance, transportation, and transfer of payment through banking channels.

that a 1 per cent increase in price shows down demand by approximately 0.05 per cent. But this also means that one per cent increase in supply depresses price by 20 per cent and vice versa.[17]

In a perfect competition market (an ideal situation where there is no uncertainty) decision of optimal investment is taken easily by profit maximising firm. In practicality, however, in the absence of perfect information, it is often very challenging for firms to ascertain the optimal amount of investment. In practice, investment decisions are characterised by over or underinvestment. The result other than optimal investment, that is, over and underinvestment is due to lack of information or less than perfect information.[18]

Business is all about information and the extent, to which information is correct. Investment decisions are based on this information, any information that is less than perfect give rise to uncertainty. Uncertainty arises out of many reasons like the uncertainty of exchange rate, the uncertainty of input cost, and many others. Uncertainty not only affects the value of the firm, but it also has its bearing on investment decisions as well. According to Goldman Sachs, oil prices in the past has become an important factor of uncertainty and established its importance in affecting firm decisions on investment. Oil price volatility is likely to be of greater concern in the future.[19]

The rise in the price volatility of oil changes the payoff matrix of investments; higher price volatility of oil increases the option value of waiting to invest.[20] The prolonged wait decreases the incentive to invest in the oil stock.[21] Investment decisions can be changed but investment expenditures are irreversible, therefore it is a prudent decision to postpone the investment decisions on part of investors in the environment of uncertainties.[22]

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17 Labban, Mazen (2008), *Space, Oil and Capital*, New York: Routledge, 125.

18 Henriques, Irene and Sadorsky, Perry (2010), "The effect of oil price volatility on strategic investment", *Energy Economics*, 33: 79.

19 *Ibid*.

20 Value investing is a simple concept, where investor decides the best time to invest in particular stock. The main idea is if investor knows the true value of something, investor can get better returns on his/her investments. Here excessive price volatility is impediment in ascertaining the true value of oil stock so investor has incentive to wait until he/she can determine the true value of stock.

21 Bernanke, B.S. (1983), "Irreversibility, uncertainty and cyclical investment", *Quarterly Journal of Economics*, 98: 85–106.

22 *Ibid*.

The flow of capital into the oil industry must be regulated in a way that not too much nor too little is invested in the production of oil resources. High investment results in the building of stocks, a decline in price, and devaluation of capital already fixed in production. Little investment protects monopoly profits, for capital already invested but makes less productive more profitable leading, eventually, to oversupply, the decline in profits, and erosion of monopolies. Thus, the competition among oil companies and resource owning states is fundamentally competition to control investment in the production of resources.[23]

Therefore, resources owning states have to face the prospect of undersupply. Keeping production low leads to an increase in market price and eventually slows demand and revenues. More critically, the high market price allows the entry of less productive fields and fields in high-cost regions into profitable production. This leads to the migration of capital into new geographical regions and other energy sectors, creating new competition and potential oversupply in the market. Hence the contradiction for oil producers: making oil artificially scarce results in making undesirably abundant.[24]

Oil price volatility would have a bearing on investment decisions because it is linked with more energy input uncertainties,[25] which eventually affects the marginal cost of capital.[26] Companies generally defer their investment decisions during a time of uncertainty as waiting might clear the ambiguity around the uncertainty of oil prices. In the face of uncertainty delay in investments allow another competitor to capture the opportunity.[27]

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23 Labban, Mazen (2008), *Space, Oil and Capital*, New York: Routledge, 125

24 *Ibid*.

25 Nearly 98 per cent of everything that consumers buy uses oil at some point of value chain.

26 Pindyck, R. (1991), "Irreversibility, uncertainty and investment", *Journal of Economic Literature*, 29: 1110-1148. Marginal Cost of Capital is the cost of another unit of capital raised.

27 Henriques, Irene and Sadorsky, Perry (2010), "The effect of oil price volatility on strategic investment", *Energy Economics*, 33: 79-80.

### 4.3.1 Present Scenario of Investment in Oil and Gas Sector

Oil prices have dropped dramatically after the mid of 2014. According to OPEC statistical bulletin of 2016, oil prices have plunged significantly in 2015 from the level of 2014. In 2014 the price of ORB (OPEC Reference Basket) was $96.29 per barrel, that in 2015 plunged to $49.49 per barrel. It was a drop of almost 50 per cent. In the absence of coordination between OPEC members, especially between Saudi Arabia and Iran, a situation of surplus has been developed, where supply has exceeded demand.[28]

Wall Street Journal has predicted that oil prices would not touch triple digit in 2025, it has predicted the price of $76 per barrel in 2025, citing a draft strategy document of OPEC[29]. Further, the market has been flooded with other unconventional sources of oil like oil from tar sands of Canada, and shale oil from the United States of America. Shale oil has become a formidable player in the oil market, and significantly increased the oil production of the United States. The increase in crude oil production of the United States, and lack of cooperation among OPEC members to fix cut in production, eventually led to the oil glut. This oversupply depressed the prices of oil. The data accessed from EIA (Energy Information Administration) shows that the price of oil in the last six years is inversely proportional[30] to the production of crude in the United States. Production of crude in the United States has increased to 9.02 million bpd from 5 million barrel in 2008. At the same time, the price of oil (Brent Crude) has collapsed to $55.27.

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[28] Davis, Rob (2016), "Oil price falls as Saudi Arabia and Iran argue over output" [Online: web] Accessed 17 April 2017, URL: https://www.theguardian.com/business/2016/nov/04/oil-price-falls-as-saudi-arabia-and-iran-argue-over-output.

[29] [Online: web] Accessed 23 March 2017, URL: http://www.livemint.com/Industry/HoBd8qp19igXB2eHzUc8FM/Opecs-estimate-for-2025-crude-prices-is-a-blessing-for-Indi.html.

[30] It is not to suggest that price and production always moves in inverse direction. It happened in this case as the production of crude went up in United States, price of oil plunged. But there are years when price of oil increased despite the increase in production, but those increases in production were marginally high. There are other global factors beside oil from unconventional sources in southward trend of price.

Table 4.1 American and Saudi Arabian Oil Production and Oil Prices[31]

| Period | U.S. Production (mbd) | Saudi Production (mbd) | Brent Price (Year average or month end) |
|---|---|---|---|
| 2008 | 5 | 9.26 | 96.94 |
| 2009 | 5.35 | 8.25 | 61.74 |
| 2010 | 5.48 | 8.9 | 79.61 |
| 2011 | 5.65 | 9.46 | 111.26 |
| 2012 | 6.5 | 9.83 | 111.63 |
| 2013 | 7.45 | 9.7 | 108.56 |
| January 2014 | 7.96 | 9.94 | 108.16 |
| April 2014 | 8.22 | 9.7 | 108.63 |
| July 2014 | 8.69 | 9.84 | 104.94 |
| August 2014 | 8.74 | 9.74 | 101.12 |
| September 2014 | 8.9 | 9.64 | 94.67 |
| October 2014 | 9.05 | 9.74 | 84.17 |
| November 2014 | 9.02 | 9.64 | 71.89 |
| December 2014 | n/a | n/a | 55.27 |

Source: Energy Information Administration
Mbd: Million barrel per day
Prices are in the dollar ($) per barrel.

[31] Gause, George. F. (2015), "Sultan of Swings? The Geopolitics of Falling Prices", *Foreign Policy at Brookings*, Doha: Brookings Institution, 3.

The table above shows the production of Saudi Arabia and the United States from 2008 to 2014. Price of oil dropped dramatically in 2009, but it was not accompanied by a rise in crude production of the United States. Low price in 2009 was largely due to a slowdown in the global economy as a result of the 2008 financial crisis. The price collapse that started more steeply at the beginning of September 2014 was largely due to an increase in United States production of crude oil. Saudi Arabia produced roughly much oil in 2014 as Saudi did in 2008 -2013.[32] The price collapse was the result of slow realisation of the market to identify that supply has surpassed the global demand. Saudi Arabia is the largest exporter of crude oil in the world, and the only state with the swing capacity, despite this, the incidence of the plunge in price in 2014 beyond the control of Saudi Arabia. The fluctuation in the price of oil is due to many factors, there were times when fluctuations in prices were attributed to the policies of oil exporting nations.[33] Now, because of technological advancement, other sources of unconventional oil, and emphasis on other forms of energy, oil price fluctuations are largely due to exogenous factor.

The southward trend in oil prices since September 2014 has reduced the industry capacity to self-fund the expenditure. Companies have cut down the expenditures, and it has affected the dividend distribution as well. Many oil companies and stock are de-rated by the credit agencies, bearing of the downgrading by credit agencies are that it has made borrowing for the companies costlier.[34] Similarly, various legislations in the United States, European Union, and Japan have made an investment in the oil and gas sector difficult. Dodd-Frank Act in the United States stresses on transparency and accountability of the financial system. It also emphasised on the need to end the risky and abusive financial services and practices.[35] The act ensures the increased transparency in business undertakings like making payment to governments, hedging, awarding contracts, and speculation. The tightening of regulations has made financing difficult for oil and gas sector. Another similar legislation like Dodd-Frank

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[32] Saudi Arabia produced one million barrel less in 2009, largely because of low global demand for oil. It was the year after 2008 finanical crisis, which slowed down the global economy.

[33] Oil exporting nation here largely refer to the oil producers of Gulf region. These states of Gulf region had enough influence in the past to alter the price of oil. Though, this region still has the lowest cost of production, but they no longer have the same leverage as they use to have in 1980s and 70s.

[34] Mitchell, John and Marcel, Valèrie *et al* (2015), *Finance Investment and Climate Change Policy*, London: Chatham House, 10.

[35] Dodd-Frank Wall Street Reforms and Consumer Protection Act, Public Law 111-203, 111th Congress.

Act is Foreign Corrupt Practices Act (FCPA)[36], though passed in 1977, but was strongly enforced by Security and Exchange Commission (SEC) and Department of Justice (DOJ) post-2012.[37] FCPA also emphasises transparency and accountability. It calls for the maintenance of internal accounts in a transparent manner and prohibits influencing foreign officials through bribery. In 2012 a Japanese firm was found in violation of FCPA act, the firm agreed to $54.6 million in a penalty, as the firm found guilty of gaining contract by bribing Nigerian government officials.[38] There is similar legislation in the European Union and Japan, which has made an investment in the oil and gas sector increasingly difficult.

Since 2011, there emerged a gap between the index of credit agency S&P 500 index and market valuation of oil and gas stocks, as capital did not yield expected returns. The mismatch, in combination with other shortcomings of the sector like escalating cost, new acquisitions not creating added value for the shareholders led to the downgrading of the sector by credit agencies, as a result of that companies seek other ways to finance their projects[39]. Mitchell and Marcel have pointed out other implications of the mismatch.[40]

> "There is increasing differentiation between oil and gas companies and between oil and gas exporting countries. Some companies and countries are much better placed than others to deal with the mismatches. A period of adjustment can be expected in which financially strong companies will acquire strong assets currently belonging to weak companies that financially unable to exploit them. High-cost and high-risk will be abandoned and deferred. Companies whose existence relies on such project will be taken over or broken up, and countries that depend on them for future development will come to revise their strategies

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36 Foreign Corrupt Practices Act, Public Law 95-213, 95th Congress.

37 A Resource Guide to the U.S. Foreign Corrupt Practices Act, By the Criminal Division of the U.S. Department of Justice and the Enforcement Division of the U.S. Securities and Exchange Commission, [Online: web] URL: www.justice.gov/criminal/fraud/fcpa and www.sec.gov/spotlight/fcpa.shtml.

38 Press Release (2012), "Marubeni Corporation Resolves Foreign Corrupt Practices Act Investigation and Agrees to Pay a $54.6 Million Criminal Penalty", [Online: web] Accessed 20 April 2017, URL: https://www.justice.gov/opa/pr/marubeni-corporation-resolves-foreign-corrupt-practices-act-investigation-and-agrees-pay-546.

39 Mitchell, John and Marcel, Valèrie *et al* (2015), *Finance Investment and Climate Change Policy*, London: Chatham House, 11.

40 *Ibid.*

Figure 4.4 Cuts in Company Investment Plans[41]

| Company | Capex cuts reported as of end-March 2015 |
|---|---|
| BG | -30% |
| BP | -13% to US$20bn in 2015 from US$22.9bn in 2014 (guidance had been US$24–25bn in 2015) |
| Chevron | -13% to US$35bn in 2015 |
| CNOOC* | -35% in 2015: exploration -21%, development -67% and production -10% |
| ConocoPhillips | -20% to US$13.5bn in 2015 |
| Continental Resources | From US$4.6bn in 2014 to US$2.7bn in 2015 |
| ENI* | -17% to 48bn in 2015 (plus dividend cut) |
| ExxonMobil | -11.6% to US$34bn in 2015; 'a little less' in 2016–17 |
| Gazprom* | -40% in 2015 |
| NNPC* | -40% in joint ventures in 2015 |
| Pemex* | -15% |
| Pertamina* | -50% in 2015 |
| Petrobras* | -25% in 2015 |
| Petronas* | -15–20% in 2015 |
| Rosneft* | -30% to US$23.3bn in 2015 |
| Royal Dutch Shell | -US$15bn 'over the next 3 years': phasing not specified but 'steady in 2015' (new figures expected when the BG deal is finalized) |
| Saudi Aramco* | -20% in 2015: delaying Khurais development and Red Sea exploration |
| Statoil* | -10% in 2015 |

* Denotes state-owned or state-controlled company.
Sources: Company announcements reported in press January–March 2015.

Figure 4.4 demonstrates the situation of oil companies. There is a capital expenditure (CapEx) cut in all of the companies mentioned above. Private as well as National Oil Companies (NOCs) are going for the cut in capital expenditure. In fact, the highest cut in capital expenditure is announced by Pertamina, an Indonesian Public Oil and Gas company. NOCs are having bigger cuts than private companies, which suggest NOCs are facing problem in securing finance either from markets abroad or from the government of their respective countries.

[41] Snapshot from the article: Mitchell, John and Marcel, Valèrie *et al* (2015), *Finance Investment and Climate Change Policy*, London: Chatham House, 12. Here CapEx means Capital Expenditure.

### 4.4 Why Iran needs to diversify away from Oil

Oil being the crude commodity is supposed to be volatile, but oil is more volatile than other crude commodities. The volatility in oil affects decision making and obstructs the projection of growth and GDP. Volatility is the most prominent feature of oil, oil exporting nations have to face the volatility, some are better equipped and some are not. In this regard, Iran due to its domestic policies and exogenous factors is more vulnerable to the oil economy compared to other oil exporting nation in the region.

#### 4.4.1 Budget deficit and Oil revenue.

The Iranian economy is more exposed to the danger of the oil economy, the distinct role of oil revenue in social security programs, and government structures distinguish the Iranian economy from other oil exporting nations. Despite high oil prices before the collapse of oil price in mid-2014, Iranian budget deficits are still perplexing issue.

Figure 4.5 Breakeven price of Oil of different countries, 2014[42]

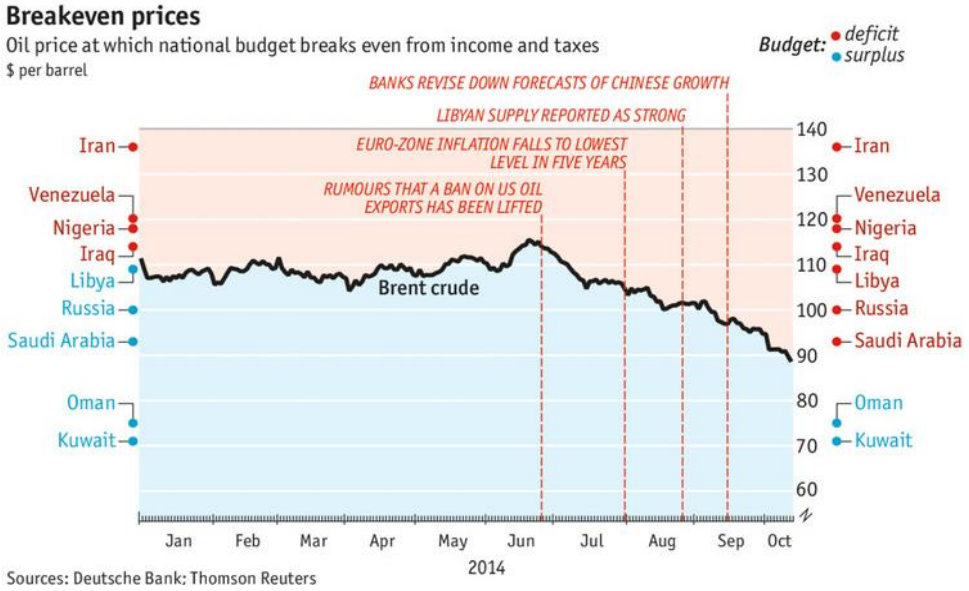


Figure 4.5 demonstrates the breakeven price[43] of oil in different countries. The figure above shows the breakeven price for the year 2014, and the oil price movement. The figure puts the breakeven price of $130-$140 per barrel for Iran, which compared to $90-$100 per barrel for Saudi Arabia is quite high. Iran from the starting of the year was running budget deficit which further increased at the end of the year. In comparison, Saudi Arabia was experiencing budget surplus till September.

High breakeven price seems anomaly compared to the low marginal production cost[44] of producing oil in Iran. Iran has a low marginal cost of production similar to other oil exporting countries of the West Asian region.

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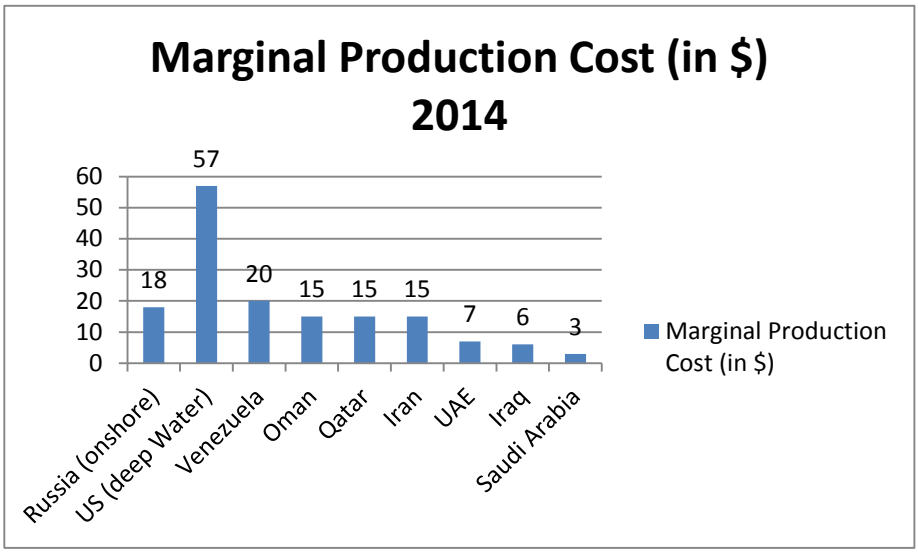
42 Plumer, Brad (2014), "How falling oil prices are squeezing Russia, Iran, and Saudi Arabia", [Online: web] Accessed 20 April 2017, URL: http://www.vox.com/2014/10/14/6975977/which-countries-suffer-most-when-oil-prices-plummet. This is an image copied from above mentioned hyperlink.

43 Breakeven price is the price level at which the budget of country is neither surplus nor deficit. Oil exporting countries in West Asian region have lower tax base and large welfare programme. These large and generous welfare programmes could be undertaken because of high oil prices. Though the extraction cost is still lowest in the region their welfare programmes and energy subsidies put pressure on fiscal health of country. Therefore, to maintain the fiscal health countries in the region desire high oil prices.

44 Marginal Production Cost is the cost of producing one extra barrel of oil.

Figure 4.6 Marginal Production Cost of Oil[45]




Source: knoema.com

Despite having a low marginal cost of production Iran has a high breakeven point. Figure 4.6 illustrates the marginal production cost of producing oil in different countries. Iran's marginal production cost is same as Oman and Qatar, but the breakeven price of Iran is much higher than that of Oman. Russia and Venezuela have higher marginal production cost but have a lower breakeven price than Iran. Therefore, breakeven price and marginal production cost are related, but one variable cannot fully justify the movement of others. Besides the marginal cost of production, there are many factors affecting the breakeven price.[46]

[45] "Cost of Oil Production by Country", [Online: web] URL: https://knoema.com/vyronoe/cost-of-oil-production-by-country?action=export. Russia extracts oil from Arctic also, but in this study only cost of onshore oil field is taken. Similarly, United States produce oils from Shale deposits, but here marginal cost of deep water extraction is taken into account.

[46] It is logical to derive at conclusion that low marginal production cost will also lower the breakeven price. But, there are situations where welfare programmes, and wastage in the economy obliterates the advantage of low marginal production cost. Saudi Arabia has similar welfare progammes like Iran, but Saudi has low breakeven price. Low breakeven price of Saudi is because of huge production, in fact, Saudi is more dependent on oil than Iran, for its GDP, but huge reserve and the status of largest oil exporter in the world keeps breakeven point low in Saudi Arabia. Russia has high marginal production cost than Iran, but at the same time Russian economy is more diversified than Iran, and energy subsidy is also low, so it keeps breakeven price lower than Iran there. These are not dynamic conditions and could be changed depending on government policies, government spending on welfare and subsidies, and marginal cost of production.

Combination of low oil price and the high breakeven price is not healthy for the country's budget and fiscal health. Consistently low oil price along with high breakeven price would lead to the budget deficit. Possible ways to finance budget deficit are privatisation, foreign borrowings, issuance of state bonds and in oil exporting countries sovereign wealth fund/ oil fund. Iran uses methods like bonds issuance, privatisation, and withdrawal from Oil Stabilisation Fund (OSF).[47]

Figure 4.7 Financing Iran's Budget Deficit (in percentage)[48]

| | 2007 | | 2008 | | 2009 | |
|---|---|---|---|---|---|---|
| | Budget | Actual | Budget | Actual | Budget | Actual |
| Participation Bonds | 3.2 | 3.8 | 1.8 | 0.0 | 0.0 | 0.0 |
| Foreign borrowing | 2.1 | 0.0 | 1.6 | 0.0 | 1.4 | 0.1 |
| Privatization | 30.9 | 3.1 | 20.6 | 5.0 | 43.7 | 15.3 |
| Oil Stabilization Fund | 57.5 | 85.6 | 71.5 | 83.1 | 49.8 | 70.6 |
| Others | 6.2 | 7.5 | 4.5 | 11.8 | 5.1 | 14.0 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

Source: Karafarin Bank, Annual Report and Financial Statements

Figure 4.7 explains how Iran finances its budget deficit. The budget has already allocated various heads from which Iran would finance its budget deficit. Iran finances its deficit by various means like bonds, borrowings, privatisation, and Oil Stabilisation Fund (OSF). Every head has been allocated the burden of financing deficit, but as seen from the figure, OSF is overburdened than rest of other heads or categories. Iran has set an ambitious target of 30.9 per cent in 2007 to finance its budget from privatisation. However, Iran managed to realise much lower than targeted privatisation, and the burden of financing deficit again fell on OSF. Against the allocated 57.5 per cent share of OSF in financing deficit, 85.6 per cent of OSF was used in financing deficit.

Figure 4.8 explains the absence of any effective control mechanism in the case of Iran's OSF. In 2009, against the allocated 49.8 per cent share of OSF to finance deficit, the

[47] Markwardt, Gunther and Farzanegan, Mohammed. R. (2009), "The effects of oil price shocks on the Iranian Economy", *Energy Economics*, 31: 134-151.

[48] Source: Karafarin Bank (2010), Annual Report and Financial Statement for the Year ended 20 March 2010

Iranian government used more than 70 per cent fund from OSF to keep budget in a balanced position. Iran's OSF is not ranked in the Santiago Compliance Index 2013, owing to the lack of transparency and little available public information.[49] The expenditure from OSF beyond the sanctioned amount leads to inflationary pressure and at the same time affects the exchange rate of Iranian currency.

### 4.4.2 Inflation and Oil Price fluctuation

Iran is among one of the biggest consumers of petroleum products in the region. Iran imports the refined petroleum products for domestic consumption, given the limited refinery capacity of Iran. Importing refined petroleum products along with huge energy subsidies have a huge impact on the government budget. In order to finance the deficit budget government overwhelmingly relies on OSF. Financing of deficit using OSF is similar to distributing oil revenue; it increases the money supply in the economy, which put inflationary pressure on the economy.[50]

### 4.4.3 Positive Oil Shocks and Effects on the Economy

Positive oil price shock is a condition when the price of oil rises suddenly. Increased oil prices culminate into increased oil revenue. Increased oil prices lead to more government expenditure. In Iran the government has an overwhelming role in the economy; the increase in the revenue would increase capital and current government expenditure. Increase in oil price would also lead to an increase in net foreign reserve of the Central Bank of Iran; the money supply in the economy will increase. The increased government expenditure and money supply would increase the demand, moving demand graph upward. Similarly, an increase in oil revenue appreciates currency and brings in a significant amount of foreign currency. Appreciation in domestic currency makes import cheaper and export loses its competitiveness. Increase in import implies rightward movement in the supply curve. However, the inefficiency and limited capacity of domestic industries obstruct the swift

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49 "The Santiago Compliance Index 2013: Rating Governance Standards of Sovereign Wealth Funds", *GeoEconomica Benchmarking Series 2014*, [Online: Web] Accessed 2 May 2017, URL: https://www.nzsuperfund.co.nz/sites/default/files/documentssys/Santiago%20Compliance%20Index%202013%20-%20public.pdf.

50 Markwardt, Gunther and Farzanegan, Mohammed. R. (2009), "The effects of oil price shocks on the Iranian Economy", *Energy Economics*, 31: 134-151.

adjustment of supply to increase demand. Moreover, sanctions have burdened the already inefficient production facilities. Therefore, the mismatch of demand and supply would increase the production price in the economy.[51]

### 4.4.4 Exchange Rate and Oil Price

Exchange rate of a currency is a dependent variable, which is dependent on the movement of the price of oil. Oil being relatively inelastic commodity[52] has a stable demand in case of exchange rate appreciation. The phenomenon of appreciation in the exchange rate due to the export of commodity is termed as 'Dutch disease'.[53] The 'Dutch disease' is a prolonged exchange rate appreciation caused by the export of cheap and abundant natural resources, whose export is harmonious with the appreciated exchange rate.[54] The marginal production cost of oil is less in West Asian region including Iran, which makes oil competitive even with appreciated exchange rate, in contrast to tradable sectors which loses its competitiveness in an environment of appreciated exchange rate.[55] The price growth causes the real exchange rate appreciation and cut the effectiveness of the domestic industry. Harm to the domestic industry is difficult to compensate when the commodity price falls over numerous price cycles, the country loses its industrial base which is essentially non-resource based.[56]

The decline in competitiveness of the domestic industry causes the tradable goods industry to contract, and the lost industry is difficult to recuperate in the eventual price decline. During the period of contraction, tradable goods industry loses its comparative advantage and investments in these industries also dries up in the face of upcoming volatility. The subsequent de-industrialisation is detrimental to long term growth as the manufacturing

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51 *Ibid*.

52 Inelastic commodity implies that demand of oil is less sensitive to price movements. Oil does not have perfect substitutes; still oil is the most used fuel in the transportation sector.

53 Dutch disease is a term coined by 'The Economist' in 1977, in a response to the anomaly in the economy of Netherlands.

54 Pereira, Luiz, C.B. (2013), "The value of exchange rate and the Dutch disease", *Brazilian Journal of Political Economy*, 33 n° 3 (132): 371-387.

55 *Ibid*.

56 Torvik, R (2001), "Learning by Doing and the Dutch Disease", *European Economic Review*, 45: 285-306.

industry is more dynamic, and tends to be more innovative and competitive than other sectors.[57]

In the case study of resource-rich countries, Auty found that over expansion state sector is prevailing practice in those countries.[58] Gelb from his study of oil exporting countries of Ecuador, Nigeria, Venezuela, Indonesia, Trinidad and Tobago, and Algeria found that spending levels should have been calibrated to rise in income levels more prudently than they actually were.[59] In a study, it has been established that institutions play a constructive role in the period of resource booms. The period of resource booms prompt higher level of expenditure, focused on the informal sector, but with the right arrangements of institutions "a strong legal-political institutional infrastructure" the structure of rent-seeking group could be reformed.[60] However, there is no universality or consistency in the claim that resource booms, in general, appreciate the exchange rate.[61] Norwegian Krone shows a very weak relationship with respect to the movement of oil.[62] This implies that the price movement of oil does not bring significant change in the exchange rate of Norwegian currency. A similar relationship can be seen in the Canadian Dollar as well. The Canadian dollar also exhibits a weak relationship with the price movement of oil.[63] Though Norway and Canada are one of the biggest exporters of oil, the currencies of these countries cannot be categorised as 'petrocurrency'.[64]

The Government Pension Fund Global (GPFG) is the sovereign wealth fund of the Norwegian government. It is similar to the Oil Stabilisation Fund of Iran. All the revenue that

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57 Neary, J.P and Wijnbergen, S. Van, "Natural Resources and the Macroeconomy: A Theoretical Framework", in Neary, J.P. and Wijnbergen, S. van (1986) (Eds.), *Natural Resources and the Macroeconomy*, Oxford: Basil Blackwell, Oxford, 13-45.

58 Auty, R.A. (2001),"*Resource Abundance and Economic Development*", Oxford University Press, Oxford.

59 Gelb, A. (1988), "*Oil Windfalls: Blessing or Curse?",* New York: Oxford University Press.

60 Tornell, A. and Lane, P.R (1999), "The Voracity Effect", *American Economic Review*, 89: 22-46.

61 Rickne, Johanna (2009), "*Oil Prices and Real Exchange Rate Movements in Oil Exporting Countries: The Role of Institution*", IFN Working Paper No.810, Research Institute of Industrial Economics, Stockholm, Sweden.

62 Akram, Q.F. (200), "*PPP despite real shocks: An empirical analysis of the Norwegian real exchange rate"*, Norges Bank Working Paper 7 and Bjørnland, Hlide C. and Hungnes, Harvard (2005), "*The Commodity Currency Puzzle*", Discussion Paper No. 423, Statistics Norway, Research Department.

63 Gauthier, C. and Tessier, D. (2002), "Supply Shocks and Real Exchange Rate Dynamics: Canadian Evidence", *Bank of Canada Working Paper 31*.

64 Petrocurrency is used here to describe the importance of oil in determining the exchange rate of the currency. If the currency exchange rate is highly dependent on the price movement of oil, then the currency is termed as petrocurrency.

is incurred to the Norwegian government from oil is deposited in this fund. The dual purpose of the fund is to provide a long term source of wealth to the advantage of future generations. Secondly, to sustain fluctuation in government receipt that arises because of oil price fluctuation.[65] Oil Stabilisation Fund (OSF) of Iran was also constituted with the same aim to 'save a portion of the fund for the future generation' and to insulate the government form the shocks of price fluctuations.[66]

The Norwegian GPFG adheres to strict institutional discipline, but the same discipline is lacking in Iranian OSF. GPFG is managed by the Ministry of Finance. The Norwegian government can withdraw from the fund but there is an annual cap of 4 per cent. The fund is invested in bonds and equities; it has an annual return of 4 per cent (approx.) after taking inflation in the account.[67] The Norwegian GPFG is ranked number one in Santiago Compliance Index[68] for its investment strategy, good governance, transparency, and accountability.[69]

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65 "Fact Sheet: Government Pension Fund of Norway, Legislative Council Secretariat", FSC50/13-14 [Online: Web] Accessed 2 May 2017, URL: http://www.legco.gov.hk/research-publications/english/1314fsc50-government-pension-fund-of-norway-20140902-e.pdf.

66 [Online: web] Accessed 3 May 2017, URL: http://en.ndfi.ir/About-NDF/History.

67 "Fact Sheet: Government Pension Fund of Norway, Legislative Council Secretariat", FSC50/13-14 [Online: Web] Accessed 2 May 2017, URL: http://www.legco.gov.hk/research-publications/english/1314fsc50-government-pension-fund-of-norway-20140902-e.pdf.

68 Santiago Compliance Index is rating system for the Sovereign Wealth Funds (SWFs), which is based on their governance, accountability, transparency, and strategy. There are 24 parameters against which the SWFs are assessed and rated.

69 The Santiago Compliance Index 2013: Rating Governance Standards of Sovereign Wealth Funds, GeoEconomica Benchmarking Series 2014, [Online: web] Accessed 2 May 2017, URL: https://www.nzsuperfund.co.nz/sites/default/files/documentssys/Santiago%20Compliance%20Index%202013%20-%20public.pdf.

Figure 4.8 Santiago Compliance Index, 2013.[70]

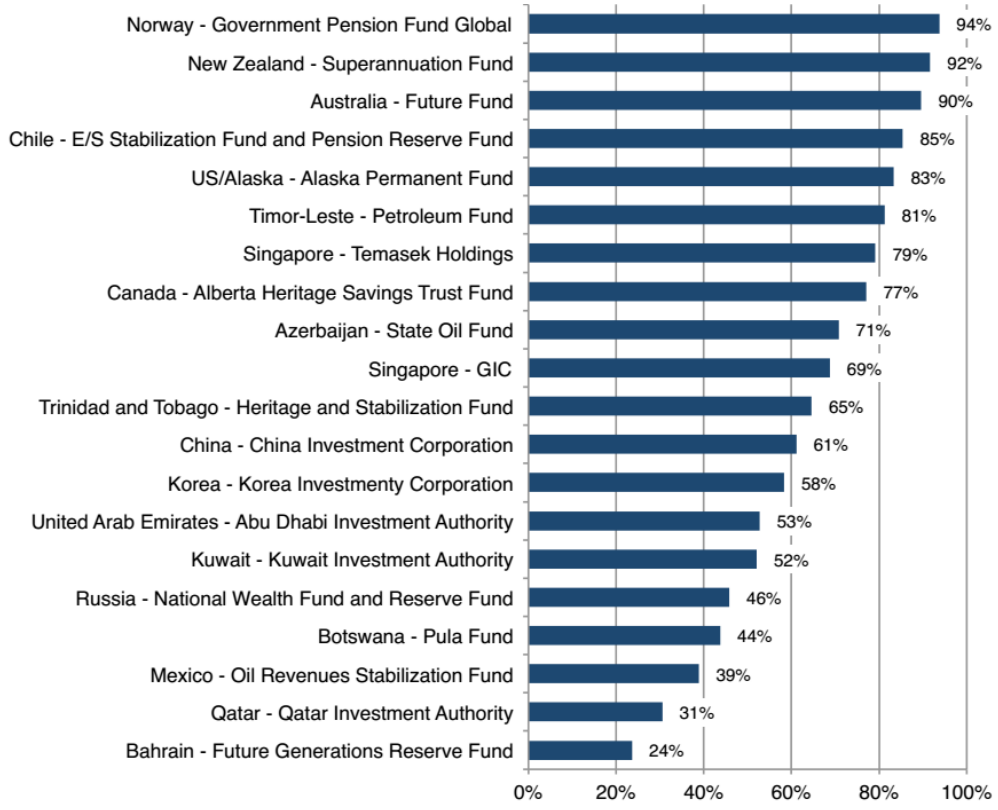


Figure 4.8 shows the exemplary transparency and accountability of the GPFG. Norway ranks first in the compliance index, where from the West Asian region only UAE and Kuwait wealth fund have satisfactory performance. In this index, Iran is not ranked, as there is very less public information available. Moreover, Iran's Fund lacks a clear investment strategy. For example, generally investment in the domestic sector is prohibited from the wealth fund, but on the contrary, Iran invests heavily in domestic sector out Oil Stabilisation Fund.[71]

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70 "The Santiago Compliance Index 2013: Rating Governance Standards of Sovereign Wealth Funds", *GeoEconomica Benchmarking Series 2014*, [Online: Web] Accessed 2 May 2017, URL: https://www.nzsuperfund.co.nz/sites/default/files/documentssys/Santiago%20Compliance%20Index%202013%20-%20public.pdf.

71 "Oil Stabilisation and National Fund of Iran", *Vale Columbia Centre of Sustainable International Investment*, [Online: web] Accessed 3 May 2017, URL: http://ccsi.columbia.edu/files/2014/04/nrf_Iran_February_2014_RWI_VCC.pdf.

Iranian OSF comes with similar provisions like that of GPFG, but the execution of decisions lacks discipline and proper planning. Most of the fund in OSF is utilised for financing the deficit and keeping the budget balanced.[72]

### 4.4.5 Negative Oil Price and Inflation

It seems to be an anomaly that a negative oil price could also be a source of inflation. But in countries like Iran, inflation can be prompted by a downward spiral in oil prices. Negative oil price affects the exchange rate. The response of the negative oil price is depreciation in the real exchange rate. Government foreign reserves dwindle following this foreign reserve of government also decrease. Therefore, it would be difficult for the government to maintain a fixed exchange rate. The devaluation of rial leads to more expensive import. Dearer import would hamper the domestic industry of Iran, as Iranian manufacturing have higher import content.[73]

The level of import plunges as the oil prices drop further. Consequently, the domestic manufacturing level declines. This implies a shift in the supply curve towards the left. On the other hand budget deficit (because of negative oil price) is financed by OSF which increases the money supply, shifting the demand curve to the right. These shifts in the supply and demand curve point to a mismatch in production level and general price levels. In the environment of reduced production levels and increased price levels economy suffers from inflationary pressure.[74] It is strange that both in positive and negative oil price shocks economy faces inflationary pressure.

## 4.5 Inter-Governmental Relations and the Iranian Constitution

Apart from economic reasons to diversify away from the oil, there are other political reasons to expand the economy away from oil. There are certain common features which are associated with every oil economy, like lack in investment, bleak future of oil, and volatility.

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72 [Online: web] Accessed 3 May 2017, URL: http://en.ndfi.ir/About-NDF/History.

73 Iranian manufacturing have higher import content. Basically the industries in Iran are processing industries where imported raw materials are processed into finished manufactured goods. Therefore, dearer imports would hamper the domestic manufacturing industry in Iran.

74 Markwardt, Gunther and Farzanegan, Mohammed. R. (2009), "The effects of oil price shocks on the Iranian Economy", *Energy Economics*, 31: 139-140.

However, Iran has its own set of economic problems which is peculiar to Iran, like inflation in both negative and positive oil price shock, and volatility in the exchange rate. These all problems, however, general or specific are economic in nature. Apart from economic problems, Iran has many political and legislative issues which necessitate the need to diversify away from the oil economy.

### 4.5.1 Iran- Saudi Arabia Relationship

There are many factors which define Iran's relationship with Saudi Arabia. Sunni and Shia issues are mostly at the centre when discussing these countries affairs. The Sunni-Shia divide and politics around it not only affects the political relationship, but it also seeps into the economic sphere as well. The economy gets affected by the policy of the country, as policies are the function of a cordial relationship between the two countries. Beside the sectarian divide, these two countries also compete for the regional influence and esteem[75]. Saudi Arabia and Iran have a major military establishment in the Gulf region, and they are the two biggest economies there. There are many facets of the Saudi Arabia-Iran relationship; however, the present study would primarily focus on the effect of Saudi Arabia-Iran relationship on the price and production of oil.

Andrew Scott Cooper in his book *The Oil Kings: How the U.S., Iran and Saudi Arabia Changed the Balance of Power in the Middle East* has given the inside accounts based on the declassified document. He has explained how Saudi King in connivance with the United States has destabilised the regime of Shah of Iran. There was a period of slight cooperation between Saudi Arabia and Iran when OPEC successfully managed to quadruple the price of oil to $11.65 in 1973. Saudi Arabia is the most important member in the OPEC, as it is the largest exporter and a swing producer.[76] The price rise of 1973 was because of Saudi Arabia's assent to the price rise. Contrary to the OPEC decision of 1973, to embargo oil shipment to the United States, Iran did not join the embargo.[77]

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[75] Jahner, Ariel (2012), "Saudi Arabia and Iran: The Struggle for Power and Influence in Gulf", *International Affairs Review*, XX(3): 37-40, 38.

[76] Swing Producer is a producer with sizeable global deposit and spare production capacity.

[77] Sorkhabi, Rasoul, "*The First Oil Shock*", [Online: web] Accessed 3 May 2017, URL: http://www.geoexpro.com/articles/2015/06/the-first-oil-shock.

It appears that Iran and Saudi Arabia role as an ally of the United States has been reversed. Today Saudi Arabia is the most important ally of the United States in the Gulf region, this position of 'the most important ally' was bestowed to Iran during Nixon administration, when Kissinger was the Secretary of the State.

The phenomenal rise in the price of crude oil in the 1970s had adverse effects on the American economy. Nixon acknowledged the negative effect of increasing oil prices on the American economy; nevertheless, he was hesitant to put pressure on the Shah because of the strategic importance of Iran in cold war politics and Nixon's personal relationship with the Shah. Kissinger had his reasons to support Iran. Iran had different views on using oil as a weapon to pressurise America. Contrary to the Iranian view, Saudi Arabia heavily depended on oil as an instrument to force the United States to reduce its backing for Israel.[78] Kissinger partiality for Iran can be gauged by his statement to Deputy Secretary of Defence before the oil embargo 1973, "We wouldn't give damn about Saudi Arabia if it didn't have most of the oil in the region".[79]

Iran did not join the embargo to the United States, but Iran according to Yergin was the most 'aggressive and outspoken country' to advocate for the increase in oil prices.[80] Usually, Iran assumes the role of price hawk, and Saudi Arabia, as opposed to Iran, is in the role of price moderator or price dove.[81] The main difference between Saudi Arabia and Iran apart from Shia and Sunni divide arises out of the difference in their outlook over the oil production and price mechanism. Countries like Kuwait and Saudi Arabia were comfortable to let their oil sit idle (not extracted) because these countries have a large proven reserve compared to Iran, and their economies were not in a position to absorb the increased revenue from the high oil price. Whereas, Iran was totally dependent on the increasing oil revenue to finance its 1970s budget. Shah's plan of building strong military complex, industrialisation, and rapid infrastructure building hinged on the increasing oil revenue.[82] Iran pressed for 10 to

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78 Mirzadegan, Amin, "*Nixon's Folly: The White House and the 1970s Oil Price Crisis*", [Online: web] Accessed 30 April 2017, URL: http://historicalreview.yale.edu/sites/default/files/files/mirzadegan.pdf.

79 *Ibid*

80 Yergin, Daniel, (1991), *The Prize: The Epic Quest for Oil, Money, and Power*, New York: Simon & Schuster, 625.

81 Mirzadegan, Amin, "Nixon's Folly: The White House and the 1970s Oil Price Crisis", [Online: web] Accessed 30 April 2017, URL: http://historicalreview.yale.edu/sites/default/files/files/mirzadegan.pdf.

82 *Ibid.*

20 per cent yearly price increase until 1977; on the other hand, Saudi Arabia advocated for price moderation and often supported price freeze.[83] Another reason, Saudi Arabia supporting lower prices was the apprehension of Iran's rapid development and rise.

Even Kissinger who was enamoured with the Shah of Iran could not overlook Saudi Arabia's effort to reduce price and increase oil production.[84] This stance of Saudi Arabia as a price moderator paved the way for the United States and Saudi Arabia partnership, which is continued till today.

A very interesting inside account of separate meetings that took place between ambassador of Iran to the United States and President Ford, and ambassador of Saudi Arabia to the United States and President Ford before Doha Agreement is mentioned in the book by Andrew Scott Cooper *The Oil Kings: How the U.S., and Iran, and Saudi Arabia Changed the Balance of Power in the Middle East*.[85]

President Ford was apprehensive about Doha meeting and potential price increase. President had a meeting with the Iranian Ambassador to the United States, but the Ambassador has made it clear that the price rise was unavoidable. On December 14 1976, oil ministers of OPEC arrived in Doha to discuss the degree of the price increase. Sheikh Zaki Yamani of Saudi Arabia communicated to newspersons that Saudi Arabia preferred a six-month moratorium on the price increase, and even 5 per cent increase in price would be devastating for the economies of Western industrialised nations, as they are still recovering from the price shock of 1973-74.[86] At the same time in Washington, Saudi Ambassador to the United States handed a letter to President Ford from Saudi King guaranteeing to reach an acceptable minimum increase in the price of oil.[87]

Back in Doha except for UAE (United Arab Emirates), no one seriously took Yamani's call for a price check. Yamani faced obstruction from his counterparts on the matter of price rise, following this he flew back to Riyadh to consult about their next plan of

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83 *Ibid.*
84 *Ibid*.
85 Cooper, Andrew S. (2011), *The Oil Kings: How the U.S., Iran, and Saudi Arabia Changed the Balance of Power in the Middle East*, New York: Simon and Schuster, 353-387.
86 *Ibid* at 358
87 *Ibid*.

action.[88] Meanwhile, other cartel members except UAE favoured the price rise to take effect in two stages, while Yamani was in Riyadh. The price rise was to take effect from January 1 1977, at first price would rise by 10 per cent to $12.7 per barrel, and the second stage would be implemented from July 1 1977, that would further raise prices by 5 per cent.[89]

On December 15 1977, Yamani announced that Saudi Arabia would not accept the decision of price rise by 15 per cent. Instead, Saudi Arabia would set free its 'petropower' and challenge the price rise by intervention in the market which will have far-reaching effects.[90] Saudi Arabia was in favour of a modest increase of 5 per cent as an alternative to 10 per cent reinforced by Iran.[91] This created a two-tier[92] pricing system.

The rebellious act of Saudi Arabia going against the decision of other OPEC member states (except UAE) exposed the economies of member countries, especially Iran. Iran was heavily dependent on safeguarding the high price of oil, though the announcement by Yamani was a respite for consumer nations, it threatened to "run hawks from the market and drive their economies to the wall".[93]

Saudi Arabia increased the production to such an enormous scale that actually the price of oil plummeted; it did not even rise by 5 per cent as suggested by Saudi Arabia. The two-tier pricing system wreaked disorder in Iran's economy, and it also implies a turning point in Iran's relationship with the United States.[94] President Ford had finally executed a plan in connivance with Saudi Arabia against the Shah of Iran, to prevent the rising oil price. The subsequent tragedy resulted in the overthrow of the Shah. Saudi Arabia by its defying action brought Iran nearly to a standstill.

Similarly, in the 1986 oil price crash, Saudi Arabia flooded the market with cheap oil. Saudi Arabia has one of the biggest proven oil reserves in the world, and the marginal cost of

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88 *Ibid*.
89 *Ibid*.
90 *Ibid* at 359.
91 *Ibid* at.360.
92 Two-tier pricing system in this case refers to pricing at two different levels. Saudi increased production and priced its oil differently from rest of OPEC countries (Except UAE).
93 *Ibid*.
94 Mirzadegan, Amin, "Nixon's Folly: The White House and the 1970s Oil Price Crisis", [Online: web] Accessed 30 April 2017, URL: http://historicalreview.yale.edu/sites/default/files/files/mirzadegan.pdf.

production in Saudi Arabia is among the lowest in the world. After the oil price shock of the 1970s, oil of the North Sea had become economical, as prices have been trebled. The flow of North Sea Oil in the market, and the oil being traded mostly in the spot price brought down the price of oil in the market.[95] The fall in price was accompanied by increased energy efficiency which further reduced the effective demand. OPEC members convened meeting at the International Hotel in London to cut down production, to maintain the steady price. Other OPEC members other than Saudi Arabia did not adhere to the decision of meeting and kept on producing more than their allocated quota. To gain its market share, and to regulate oil from non-OPEC countries, Saudi Arabia increased the production of oil.[96] West Texas Intermediate (WTI) plummeted to $10 at the end of November 1985, from the high of $31.75.[97]

As of 2016, Saudi Arabia with its daily production of 12.387 million barrel per day is almost three times bigger producer than Iran, which produces 4.138 million barrel per day.[98] It is really difficult to ignore or produce independently of Saudi Arabia, being a country with the largest proven reserve and lowest marginal cost Saudi Arabia has a final say in matters related to oil production and price mechanism in OPEC countries. It is difficult for Iran to compete with Saudi Arabia in the field of oil.

### 4.5.2 Sanctions: Targeting the Oil Sector

Sanctions imposed on Iran are of the nature that primarily targets the oil industry of Iran. Sanctions for the first time were imposed by the United States in 1979. Sanctions were imposed on Iran as a response to the hostage crisis.[99] After the hostage crisis, the United States imposed a series of sanctions against Iran, which is one of the longest sanctions imposed by the United States against any nation. In a series of numerous sanctions, the first

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95 Yergin, Daniel (1991), The Prize: The Epic Quest for Oil, Money, and Power, New York: Simon & Schuster, 718.

96 In fat, the increase from Saudi Arabia and OPEC member added just 3 per cent of world total production, but the increased in production with the commitment of Saudi Arabia to gain its market share was enough to drive down the prices.

97 Yergin, Daniel (1991), The Prize: The Epic Quest for Oil, Money, and Power, New York: Simon & Schuster, 750.

98 [Online: web] Accessed 1 May 2017, URL: https://www.eia.gov/beta/international/.

99 On November 4 1979, Iranians seized the American Embassy in Tehran, and took over embassy staffs as hostage. The events of 1979 and their aftermath was completely unanticipated event for the United States that had transformed a dependable regional ally to implacable foe.

measure was imposed on 8th November 1979, by suspending the shipment of $300 million worth of military parts which Iran had paid for. On 12th for the first time sanctions were imposed on Iranian oil. Under section 232 of Trade Expansion Act of 1962, import of Iranian oil and refined products were banned in the United States.[100] Beside these sanctions there are many sanctions affecting different aspects of the Iranian economy, however, the present study would focus on the sanctions that had its effects on the oil industry of Iran.

The main objective of sanctions was to hamper the development of the oil industry of Iran, which accounts for 80 per cent of government revenue. The United States had a complete ban on trade and investment with Iran only in 1995, so the oil industry was affected significantly before 1995.[101] Disruption in supply and revenue prior to 1995 was mainly because of Iraq-Iran war.[102] After the issuance of an executive order by President Clinton in May 1995, the United States trade with Iran came to a complete halt, this immediately led to a fall in the value of the rial. Clinton executive not only disrupted the trade of Iranian oil, but it also created a problem for the now exploration and expansion of the oil industry.[103] Clinton's Executive Order forced Iran to replace imports from the United States including the drilling equipment. There was a direct loss in finding new supplier, and most of the Iranian oil rigs were based on American technology.[104]

Clinton signed the Iran Libya Sanctions Act of 1996 (ILSA). ILSA had a great impact on oil industry of Iran, ILSA not only prohibited the sale of Iranian oil and refined products, but it also put the limit or cap on the amount to be invested in the Iranian oil industry. ILSA was extraterritorial in nature; it was even applicable to the companies that are not from the United States.[105] The act restricted the amount of investment that a company can invest in Iran. Companies cannot make an investment in excess of $40 million in one year, and not more than $20 million in subsequent years.[106] The extraterritorial nature of the legislation

[100] Trade Expansion Act of 1962 (19USC 1862)
[101] Torbat, Akbar, E (2005), *Impact of the US trade and financial Sanctions on Iran*, Oxford: Blackwell Publishing.
[102] Bina, C. (2009), "Petroleum and Energy Policy of Iran", *Economic and Political Weekly*, 44 (1): 19-23.
[103] Amuzegar, Jahangir (1997), "Iran's Economy and the US Sanctions", *The Middle East Journal*, 51 (2): 185-199
[104] *Ibid*.
[105] Iran and Libya Sanctions Act of 1996.
[106] *Ibid*.

was severely criticised by the European Union, however, many countries pulled or withdrew, and reduced their investment in Iran due to the pressure of the United States.

There was evident repercussion after the imposition of ILSA. South Africa deal with Iran to stock up 15 million barrel oil by South Africa was postponed.[107] Similarly, Azerbaijan withdrew from National Iranian Oil Company (NIOC) led consortium, where Azerbaijan had the stake of five per cent, was largely due to the American pressure. However, the effect of this legislation was minimal on the investments in Iran, but that changed after the European Union endorsed the sanctions in 2012. Many European companies withdrew from Iran. Royal Dutch Shell in March 2010 announced that no longer it will sell gasoline and other refined products to Iran[108]. Following the suit, the TOTAL of France has also declared that it would not sell any refined products to Iran. In 2012, going a step further Royal Dutch Shell has stopped buying crude oil from Iran.[109]

Besides the withdrawal of investments by many European firms, top crude oil buyers of Iranian crude have gradually cut down the purchase of the Iranian crude. Countries like India, China, and European Union, which emerged as top buyers of Iranian crude after 1984, were gradually cutting down the purchase from Iran, in order to be eligible for the waiver from the sanctions granted by the President of United States, under section 9 (c) of ILSA.[110]

[107] Amuzegar, Jahangir (1997), "Iran's Economy and the US Sanctions", *The Middle East Journal*, 51(2): 185-199.

[108] Pepitone, Julianne (2010), "Royal Dutch Shell Halts Gasoline Sales to Iran." [Online: web] Accessed May 12, 2017. https://money.cnn.com/2010/03/10/news/companies/shell_gas_iran/index.htm.

[109] "Iran 'stops oil exports' to UK and France", [Online: web] Accessed 11 May 2011, URL: http://www.aljazeera.com/news/middleeast/2012/02/201221913203691810.html.

[110] Iran and Libya Sanctions Act of 1996, Section 9 (c).

Table 4.2 Top Buyers of Iranian Crude and Reduction (Figures in barrel per day)[111]

| Country/Bloc | 2011 Average | 2013 Average |
|---|---|---|
| EU (Particularly Italy, Spain, and Greece) | 600,000 | Negligible |
| China | 550,000 | 435,000 |
| Japan | 325,000 | 230,000 |
| India | 320,000 | 225,000 |
| South Korea | 230,000 | 150,000 |
| Turkey | 200,000 | 140,000 |
| South Africa | 80,000 | 0 |
| Malaysia | 55,000 | 10,000 |
| Sri Lanka | 35,000 | 10,000 |
| Taiwan | 35,000 | 10,000 |
| Singapore | 20,000 | 10,000 |
| Other | 55,000 | 20,000 |
| Total | 2.5mbd | 1.25mbd |

Source: International Energy Agency and rough estimates based on CRS conversations with foreign diplomats and press reports. Actual volumes might differ and import volumes may fluctuate dramatically over short periods of time as actual tanker deliveries occur.

Table 4.2 clearly points out the effect of sanctions on the energy industry of Iran. All the major buyers of Iranian crude oil have drastically cut down their purchase to get the waiver from the United States. India, which imported 325,000 barrel of oil per day in 2011

[111] Katzman Kenneth (2013), Iran Sanctions, *Congressional Research Service*, Library of Congress, 7-5700, 20.

reduced it to 225,000 barrel per day, it was a reduction of 31.25 per cent, the similar reduction has been made by all the major buyer of Iranian crude. South Africa is the most interesting case, which imported about 80,000 barrel per day in 2011, stopped buying oil from Iran completely.

The oil sector is easy to target and is vulnerable to sanctions. Sanctions not only hit the export volume of Iran, but it also made difficult for Iran to transport its oil. Moreover, insurance for the Iranian tankers and tankers carrying Iranian became very difficult after the European Union endorsed the Iranian sanctions. Nuclear sanctions also affected the oil industry. European Union sanctions have targeted nuclear technology, which also sanctioned the oil machinery and exploration technology, as oil technology can be diverted for the nuclear purpose.

However, Iran-United States relations improved under the presidency of Obama. In 2016, under the Joint Comprehensive Plan of Action (JCPOA), Iran met the first set of commitments. Various sanctions relief measures were announced by the United States[112], and the European Union[113]. Iran could access its billions of dollar frozen in the foreign banks.[114]

Nevertheless, the rapprochement between the United States and Iran was short lived. 'President Trump has made no effort to conceal his disdain for the Joint Comprehensive Plan of Action (JCPOA) agreement, regarding Iran's nuclear agreement'[115]. Iran can still face the sanctions under President Trump, who has termed the contract with Iran as a "horrible contract".

### 4.5.3 Constitution of Iran Regulating Oil Industry

Constitution of Iran regulates the industries of Iran. Before the nationalisation of the oil industry, there was an overwhelming presence of International Oil Companies (IOCs) in Iran

[112] For the United States sanctions relief details, [Online: web] URL: https://www.treasury.gov/resource-center/sanctions/OFAC-Enforcement/Pages/jcpoa_implementation.aspx.

[113] European Union sanctions relief details, [Online: web] Accessed 17 May 2017, URL: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1452981266132&uri=OJ:JOL_2016_011_I_0001.

[114] US, EU Implement JCPOA Iran Sanctions Relief, [Online: web] Accessed 17 May 2017, URL: http://www.steptoeinternationalcomplianceblog.com/2016/01/us-eu-implement-jcpoa-iran-sanctions-relief/.

[115] "Waive it Goodbye? How the Trump Administration Might Attack the Iran Nuclear Agreement", [Online: web] Accessed 17 May 2017, URL: http://www.steptoeinternationalcomplianceblog.com/2017/02/waive-it-goodbye-how-the-trump-administration-might-attack-the-jcpoa/.

also known as Seven Sisters; IOCs determined the price and production. In a way, Iran did not have total control over its oil industry, and policies. It was the apprehension against IOCs and the overthrow of the Mossadegh government, which shaped the constitution of Iran. The concern to insulate the country from external influence could be seen in the Iranian constitution.[116] Iranian constitution includes the complete elimination from imperialism and also mentions the prevention of foreign influence completely.[117] This uneasiness against foreign presence is detrimental to the oil industry, as it discourages the international investors and firms. Iran's constitution advocates for achieving economic independence by restraining foreign influence over the country's economy.[118] Apart from the apprehension against foreign influence, the Iranian constitution prohibits private capital in the heavy and large industry in Iran. Iran's constitutions restrict private investment and ownership to a few small and medium industries, no private investment is permitted in the oil industry. According to article 44 of Iran's constitution, all mother industries, large scale irrigation networks, dams, rails, radio, and television are completely owned and administered by the state.[119]

When Mossadegh started the nationalisation programme, his main agenda was the unequal or unreasonable concessions given to the IOCs. The constitution of Iran reflects the agenda of Mossadegh, granting of concessions to foreigners for the formation of companies dealing with the mining industry, and commerce is strictly prohibited in the Iranian constitution.[120] Oil and other extractive industries are categorised as the mining industry and according to the Iranian constitution foreign ownership are not allowed in the mining industry. However, Iranians have devised a way to circumvent the prohibitions of the constitution. Iran has come up with buyback contracts, where foreign companies are not given right of ownership but are given a return on their investment. This arrangement, however, turns out to be expensive for Iran. Iran ends up paying a higher rate of return to foreign companies investing in the Iranian oil sector. Iran pays around 15-18 per cent rate of return to the foreign companies, which are much higher than the prevailing rate of return of

[116] The Constitution of Islamic Republic of Iran, 1979, Preamble
[117] *Ibid*, Article 3.
[118] *Ibid*, Article 43.
[119] *Ibid*, Article 44.
[120] *Ibid*, Article 81.

industry, because of political risk and constitutional prohibition.[121] Constitution of Iran affects the investment environment of the country and forces Iran to sign unfavourable contracts, putting pressure on the economy.

### 4.6 Future Demand for Oil

There are many reasons attributed to the sharp fall in prices of oil since mid of 2016. According to British Petroleum (BP) Energy Outlook 2035, demand for oil will slow and supplies will be abundant in the future. Oil demand will witness an increase of 0.7 per cent a year over a couple of decades, marginally more than half the rate in the previous two decades.[122] Energy Outlook 2035, forecasted that by 2030 transportation sector would not be the crucial force for the growth in demand for oil.[123]

According to BP Energy Outlook, the world continues to electrify, nearly 65 per cent of global energy going into the power sector. Similarly, since 1990s share of oil in power generation is decreasing at a very fast rate. In 1990, 348.3 Million tonnes oil equivalent (MTOE) were used for generating electricity, which in 1995 comes down to 291.2 MTOE. In 2015 it further comes down to 238.9 MTOE. It is estimated by BP Energy Outlook, by 2035, 164 MTOE of oil will only be used for the power generation. Comparing the forecasted share of oil in 2035 with that of 1990 demonstrates that consumption of oil in power generation will come down by more than 50 per cent.[124]

Bob Dudley, Chief Executive Officer (CEO) of the BP, said "there is a continuous de-carbonisation of the fuel mix. Oil demand continues to grow over the next 20 years, but energy efficiency will moderate the growth in demand."[125] Daniel Yergin in his book *The Quest: Energy, Security, and the Remaking of the Modern World* have termed efficiency as

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[121] Torbat Akbar (2005), *Impact of the US trade and financial Sanctions on Iran*, Oxford: Blackwell Publishing.

[122] Katakey Rakteem, "BP See a Future of Slowing Oil Demand Growth, Abundant Supplies", [Online: web] Accessed 16 May 2017, URL: https://www.bloomberg.com/news/articles/2017-01-25/bp-sees-a-future-of-slowing-oil-demand-growth-abundant-supplies-iyd1s0zo.

[123] *Ibid*.

[124] "BP Energy Outlook Summary Tables", [Online: web] Accessed 15 May 2017, URL: http://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html.

[125] Katakey Rakteem, "BP See a Future of Slowing Oil Demand Growth, Abundant Supplies", [Online: web] Accessed 16 May 2017, URL: https://www.bloomberg.com/news/articles/2017-01-25/bp-sees-a-future-of-slowing-oil-demand-growth-abundant-supplies-iyd1s0zo.

'the fifth fuel'.[126] Yergin has termed 'efficiency' as having the 'potential to have the biggest impact of all'.[127] Efficiency is intangible, unlike pipeline oil does not flow through it, it does not have the grandeur of tall wind turbines, and nor it flows through the wire like electrons.[128] Efficiency is not a source of energy or fuel, yet it has the same impact as a source of energy. It is known by many names like conservation, energy productivity, and energy efficiency.[129] In the case of the transport sector, increased engine efficiency has greatly reduced the demand for oil. As per Energy Outlook demand of oil in upcoming decades is projected to grow at a slower pace than the previous decades. The transport sector is the biggest end user of the oil, but the demand from the transport sector is increasing at a sluggish rate.[130] By an estimate of Energy Outlook, by 2035 the transport sector will be not the biggest consumer of oil.

Table 4.3 Projection of Consumption of Energy by Transport Sector[131]

| Million tonnes of oil equivalent | 1990 | 2000 | 2010 | 2020 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Oil | 1411.9 | 1751.2 | 2142.4 | 2536.8 | 2719.2 | 2756.2 |
| Gas | 1.7 | 3.2 | 29.6 | 54.6 | 105.1 | 138.7 |
| Coal | 13.7 | 4.6 | 3.4 | 2.5 | 2.2 | 2.1 |
| Renewables | 7.3 | 9.2 | 59.7 | 87.1 | 117.2 | 129.7 |
| Total Transport | 1434.6 | 1768.2 | 2235.1 | 2681 | 2943 | 3027 |

Source: BP Energy Outlook 2035: January 2017

Figure 4.3 demonstrates the slow growth rate of demand for oil in the transport sector. In 1990, 1441.9 MTOE of oil was used in the transport sector, which grew to 1751.2 MTOE of oil in 2000. From 1990 to 2000 there was an increase of 24 per cent in the consumption of oil in the transport sector, whereas, gas and renewables witnessed a rise of 88 per cent and 26

[126] Yergin, Daniel (2011), '*The Quest: Energy, Security, and the Remaking of the Modern World*', New York: Penguin Press.
[127] *Ibid* at 1178.
[128] *Ibid*.
[129] *Ibid*.
[130] BP Energy Outlook (2017) Slide Number 29 [Online: web] Accessed 15 May 2017 URL: http://www.bp.com/en/global/corporate/energy-economics/energy-outlook.html.
[131] Figures taken from BP Energy Outlook 2035: January 2017, Work Book, from the excel sheet.

per cent respectively. Following the decade of 2000 to 2010, oil consumption increased to 2142.4 MTOE, this was an increase of 22 per cent. Similarly gas and renewables in the same period saw a growth of a whopping 825 per cent and 548 per cent. The projected consumption of oil in 2020 is estimated at 2536.8 MTOE, which is an increase of 18 per cent. The projected growth of gas and renewables in 2020 is 84 per cent and 34 per cent. Similarly, the estimated consumption of oil by 2035 is 2756.2 MTOE, which when compared to the projected consumption of 2030 is just 1.3 per cent higher than the 2030 estimates. In the case of gas and renewables, the projected consumption in 2035 is 138.7 MTOE and 129.7 MTOE respectively. Gas and renewables exhibit growth 32 per cent and 11 per cent respectively when compared with 2030 projected figures.

Figure 4.3, exhibits the decrease in the oil consumption pattern, whereas, gas and renewables are increasingly gaining the market share. Gas and renewables saw a phenomenal rise in the decade of 2000-2010. Another pattern that emerged from the above figure is that oil demand is increasing at a very slow rate, which implies that all the new demand for oil is coming from non-OECD countries. Climate change issues and de-carbonisation of fuel have obligated the countries of the world to opt for renewables and cleaner fuel. The obligation falls more on the OECD (Organisation of Economic Co-operation and Development) countries, as they have pledged the greater carbon cuts in the climate change meetings and summit. In future demands from OECD countries will fall continuously, and new stimulus will mainly come from Asia and Africa. In Asia, the two biggest fuel consumers are India and China, and new demands will arise from mainly these countries. However, these countries have also pledged to reduce their carbon footprint and investing heavily in the renewables. India and China have pledged that in a future substantial amount of energy demand will be fulfilled from the renewables. India and China are investing in some of the biggest solar farms in the world, besides these, they are also heavily investing in wind and another form of renewables.

Table 4.4 Projection of Consumption of Liquid Fuel by Regions of the World[132]

| Millions of tonnes of oil equivalent | 1990 | 2000 | 2010 | 2020 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| North America | 922.2 | 1061.1 | 1040.3 | 1039.1 | 947.1 | 894.9 |
| S & C America | 175.9 | 234.3 | 294.6 | 330.5 | 336.0 | 372.2 |
| Europe | 729.1 | 763.6 | 733.3 | 666.7 | 596.0 | 552.9 |
| CIS | 399.1 | 169.1 | 178.0 | 188.4 | 218.0 | 226.5 |
| Middle East | 171.4 | 242.8 | 368.3 | 447.3 | 521.3 | 550.0 |
| Africa | 96.4 | 119.6 | 164.5 | 201.3 | 254.8 | 284.8 |
| Asia Pacific | 663.6 | 997.3 | 1300.9 | 1684.1 | 2018.4 | 2140.4 |
| Total Liquid Consumption | 3157.7 | 3587.7 | 4079.9 | 4557.6 | 4921.7 | 5021.8 |

Source: BP Energy Outlook 2035: January 2017

Figure 4.4 explains the consumption pattern of oil in a different region of the world. In 1990s North America was the biggest consumer, and Europe was the second biggest consumer. The Asia Pacific was, however, the third largest consumer, in two decades that is in 2010, Asia Pacific region has become the biggest consumer, and North America was a distant second consuming 20 per cent less than the Asia Pacific region. Europe lagged far behind in oil consumption, Europe's consumption was 43 per cent less than that of Asia's consumption. The peak of North America and Europe's consumption was in 2000 after that consumption fell in both regions. Most of the OECD countries are in Europe and North America and their consumption decreased in 2010 to that of their 2000 consumption. Projected consumption of 2035 would be less than that on the 1990 level. On the other hand, the Asia Pacific is yet to witness its peak moment, consumption is growing until the projected period of 2035, but the growth rate of consumption slows in the projected period. Therefore no new demand will come from the developed countries, and the demand from Asia would slow down in the future.

[132] Figures taken from BP Energy Outlook 2035: January 2017 Work Book, from the excel sheet.

IPCC has concluded in 2014 that recent trends in global warming are likely to be caused by increased concentration of Green House Gases (GHGs) in the atmosphere, as a result of human activities. According to IPCC (Intergovernmental Panel on Climate Change) report, currently, fossil fuel provides for the 80 per cent of global energy and is responsible for two-thirds of global emission of GHGs.

The pressure to limit the GHGs is such that, President Xi Jinping of China in 2014, for the first time, raised the China's concern for the Climate change policies, and he also commits to a peak[133] in China's GHSs emission around 2030.[134] Besides this, there are several intergovernmental agreements and initiatives that sought further limits on GHGs. GHG emission needs to bring down to a third of the present level. If the governments around the world robustly follow the 2˚ policy[135], then there will fewer investment opportunities for oil.

### 4.7 Electric Cars

Oil is packed with tremendous energy, its energy is easy to store in liquid forms and that makes oil idle for the transport sector. According to Yergin "If the oil is King, its realm of unquestioned supremacy is the transport sector[136]". Transport sector for has been the biggest consumer of the liquid fuel, or conversely the phenomenal growth of oil production was stimulated by the transport sector. The transport sector will continue to be the biggest consumer of oil, but according to BP Energy Outlook, the lead of the transport sector would continue till 2030. Ironically, the transport sector would not shrink, but the energy to drive the transport sector would increasingly be not derived from oil.

Electric cars are still in elementary stage, they are expensive, and have many shortcomings of charging points, long drives and so on. However, there is certain euphoria about electric cars. Association with electric cars exhibits concern towards the environment.

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[133] Using 'peak' is a misnomer like the concept of 'most favored nation (MFN). Peak emission means, that by 2030 China emission will start reducing, by 2030 China will have the maximum emission, after that it see a decline.

[134] Mitchell, John and Marcel, Valèrie *et al* (2015), *Finance Investment and Climate Change Policy*, London: Chatham House, 21.

[135] 2˚ policies are measures taken to ensure that global warming is limited to 2˚ above the pre-industrial levels.

[136] Yergin, Daniel (2011), *The Quest: Energy, Security, and the Remaking of the Modern World*, New York: Penguin Press, 1275.

According to one estimate by OPEC, by 2040 electric cars would make one per cent of world vehicle, combined this with the increased fuel efficiency of engines, demand of would fall.

Norway will phase out all fossil fuel cars by 2025.[137] By 2025 every car in Norway would run on electricity. Though Norway is a small country and has no significant carbon footprint, the decision of Norway has great symbolic value. Following Norway, Sweden and many European countries have proposed to phase out fossil fuel cars completely.[138] Many countries are subsidising the purchase of electric cars, and with rapid development in technology, the electric car is being affordable and getting better in terms of performance. The future prospect of an electric car is tremendous, Tesla Motors which sells a fraction of cars sold by General Motors (GM), has surpassed GM in term of market capitalisation. GM sold 10 million cars in 2016 compared with Tesla's 76000 units.[139] GM has sold 100 times more cars than the rival Tesla, but Tesla seems to future potential. Tesla Motors had a loss of more than $700 million in 2016, yet investors are betting for the future of Tesla Motors. Tesla Motors capitalisation reached more than $50 billion.

### 4.8 Conclusion

Primary produce is very volatile in nature, and oil has attested the volatility in the last four decades. Oil is more volatile than most of the primary product, the volatility in the price of oil severely affects the national income of the countries that are dependent on the oil revenue. Similarly, oil exploration is a capital intensive industry, investors prefer less volatility in return on their investments. Volatility in the price of the oil disturbs the investment scenario. The demand for the oil grew because of the rapid economic progress which the world witnessed after the Second World War. Oil which was largely used in the power sector to generate power has been replaced by cheaper coal, cleaner gas, and renewables. Oil is still the primary fuel for most of the automobiles; therefore the biggest consumer of oil is the

[137] Staufenberg, Jess (2016), "Norway to Completely Ban Petrol Cars by 2025", [Online: web] Accessed 17 May 2017, URL: http://www.independent.co.uk/environment/climate-change/norway-to-ban-the-sale-of-all-fossil-fuel-based-cars-by-2025-and-replace-with-electric-vehicles-a7065616.html.

[138] "Several Countries to Follow Norway's Lead, Ban Fuel- Powered Cars", [Online: web] Accessed 17 May 2017, URL: https://pedestrianobservations.com/2016/04/01/several-european-countries-to-follow-norways-lead-ban-fuel-powered-cars/.

[139] "Tesla Passes General Motors to become the most valuable US Automaker", [Online: web] Accessed 18 May 2017, URL: http://www.cnbc.com/2017/04/10/tesla-passes-general-motors-to-become-the-most-valuable-us-automaker.html.

transport sector. However, due to climate change issues and the rise of electric cars, the future of oil as a fuel appears bleak. Many reports indicate that there would not be a new demand for oil coming from the developed nations and even in developing nations demand of oil would increase at a very slow rate. The changing global scenario makes imperative for every country to diversify away from the oil.

# CHAPTER V

# AUTOMOBILE INDUSTRY: A CASE STUDY OF IRAN

> My heart was pounding. I turned the crank. The engine started to go 'put-put-put' and the future sounded with regular rhythm. We both listened to it for a full hour-
>
> Karl Benz[1]

## 5.1 Introduction

The sound of the future which Benz's invention made in 1878 has changed the world forever. It has changed the way people travel; it has greatly reduced the distance and has become the backbone of the modern world economy. OCIA (Organisation Internationale des Constructeurs d'Automobiles) which in English translates into (International Organisation of Motor Vehicle Manufacturers) claims that 'if automobile manufacturing were a country, it would be the sixth largest economy'.[2] The vehicles are important for the smooth functioning of the global economy. The level of output by global automobile manufacturers is equivalent to €2 trillion.[3] The huge scale of the automobile industry can be gauged by its global output level. However, the figure just includes the manufacturing output level and does not consider other services associated with the automobile industry, like automotive insurance, repairs and maintenance. Taking these services into account would further accentuate the contribution of the automotive sector in the global economy.

Automobiles though contribute immensely to the economy, but it cannot be reduced to just any other commodity, which has an economic utility. The chapter would focus on the economic aspect of the automobile industry, however, one cannot deny the cultural impact of automobiles and how they come to be equated with individualism and freedom. Besides this automobile is not just any machine; it has an emotional relationship with its owner. No wonder, one can find a huge collection of cars with the monarchs of West Asia, and often rich people have their collection of cars. There are few machines which have an emotional

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1 Bailey, Diane (2016), *How the Automobile Changed History*, Minneapolis: Essential Library(Imprint of Abdo Publishing).

2 "Economic Contributions", OICA, [Online: web] Accessed 9 October 2018, URL: http://www.oica.net/category/economic-contributions/.

3 *Ibid*.

appeal like that of cars. This is the reason, many cities organise the vintage car rallies, and owning a vintage car is a matter of pride. Therefore, an automobile needs to be analysed in totality. It can be just reduced to a machine with economic utility; it has to be understood in a holistic manner.

History of automobiles and automobile industry is explained as to differentiate between industrial practice and niche production of the automobile. Besides the automobile industry, different production techniques are also discussed, to explain the development and innovation that took place in the automobile industry over the years. Automobile industry transformation from mass production to lean production is discussed to give details about the various developments that took place in the automobile industry. However, mass production and lean production are not completely mutually exclusive; automakers exhibit characteristics of both: mass production and lean production technique. Mass production ensures the economy of scale, whereas, lean production technique guarantees constant innovation, better quality at a viable cost.

The chapter explicates about the automobile industry of Iran, however, a brief history of the automobile industry is needed to know about the nature and importance of the automobile industry. Similarly, the production techniques were also explained to elucidate the journey of the automobile industry, and how the automobile industry constantly innovates, and to highlight the importance of economy of scale. History of the automobile industry and discussion on production techniques also describe the changing nature of consumers.

## 5.2 History of the Automobile Industry

Cars as we know it today first time introduced to the world as an engine developed by Karl Benz. Since then cars have undergone many changes in design and engine power, however, the basic design of the engine is still the same that is internal combustion engine (ICE). Though electric cars are touted as the future of automobiles, ICE still dominates the automobile industry. This design was pioneered by Karl Benz.

However, automobiles did not become instantly popular, and people were hesitant regarding the use of automobiles, and abandoning their traditional horse carriage. Though

Karl Benz is attributed for the development of automobile and ICE, it was his wife Berta who was instrumental in popularising the engine developed by Benz. One fine morning, of August 1888, Berta took her two teenage sons Eugen, 15 and Richard, 13, in what could be world's first road trip, driving from Mannheim to Pforzheim, at a top speed of 10 miles per hour.[4] This road trip was the first road trip; the trip was the first automobile promotion event, the trip was also the case of first automobile repairs, and interestingly, it was the first case of violation of highway laws.[5] The 96.5 kilometres trip does not seem exciting today, but it was certainly a defying task in those days. There were no gas stations, and repair shops in those days. The only place to buy fuel was pharmacies, and every 12 miles the engine needs to be refilled with water to cool off the engine.[6] This road trip also established the importance of advertisement in the case of automobiles. Today, the automobile industry is one of the biggest advertisers in the world. The automotive industry's combined expenditure on advertising totals $47 billion in 2015. Volkswagen alone spent $6.6 billion in advertising in 2015.[7]

Apart from Benz, there were other people who were developing engines independently. In fact, the first prototype of an automobile was built more than a century ago than Karl's first engine. The automobile developed by Nicolas Joseph Cugnot though cannot be considered as an automobile in the modern sense, like that of developed by Karl Benz. However, some historians believed, the vehicle made by Cugnot to be the first automobile in history. Cugnot's creation was powered by steam, unlike Benz's machine which used gasoline as a fuel. Cugnot's steam engine added so much weight to the machine that it was not feasible at all, and the funding to this project dried up.[8] Besides this, there were other people as well who contributed to the development of the automobile. The modern form of

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4 Tweney, Dylan (2010), "Aug. 12, 1888: Road Trip! Berta Takes the Benz", *Wired*, 8 December 2010, [Online: web] Accessed 15 September 2018, URL: https://www.wired.com/2010/08/0812berta-benz-first-road-trip/.

5 *Ibid*.

6 *Ibid*.

7 McGavin, Stephanie Hernandez (2016), "Volkswagen Group Leads Automotive Spending on Advertising", *Automotive News*, 9 December 2016, [Online: web] Accessed September 17, 2018, URL: https://www.autonews.com/article/20161209/RETAIL03/161209824/volkswagen-group-leads-automotive-spending-on-advertising.

8 Bellis, Mary (2018), "The First Cars Were Powered by Steam!", *ThoughtCo*, 24 September 2018, [Online: web] Accessed 17 October 2018, URL: https://www.thoughtco.com/history-of-steam-powered-cars-4066248.

automobile which we use today is the successor of the automobile developed by Benz and Gottlieb Daimler. However, it is not fair to accredit any one man for the invention of the automobile.[9] Rather, automobile invention is not an event. The automobile which we know today was not invented in a single stance or by any single person. Automobile development is the story of evolution. There are more than 100,000 patents filed in the evolution of automobiles what we see today, and the evolution process is still going on.[10]

Though cars came into existence in the early 1890s and car manufacturing started in late 1890s, however, the manufacturing of cars at that stage could not be qualified as an industry. Mass production, standardisation, and the mechanisation are the symbol of industrialisation, but during its initial stage, automobile production did not exhibit any of the characteristics associated with the industrialisation. The automobile is not invented in a single day, it is a long process of evolution; therefore, it took some time even after the production of cars to associate the production with industry.

The birth of automobile took place in Europe; however, the cars first produced were work of craftsmanship rather than engineering. There was no standard operational instruction; therefore, the automobiles produced during this period were beleaguered by many defects. Since, there were no standard operational instructions, fixing of defects would require a tireless session of trial and errors.[11]

### 5.3 Making of an Industry

By 1900, Karl Benz was rolling out approximately 600 automobiles annually from its manufacturing plant. However, the manufacturing process lacked standardisation process, and could not be termed exactly like the birth of the automobile industry. However, various automatic tools were used during this first phase; further, better-measuring tools were also used for better precision. It was during the first phase that research centres in collaboration

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9 Bellis, Mary (2018), "Who Invented the Car?", *ThoughtCo.*, 24 September 2018, [Online: web] Accessed 17 October 2018, URL: https://www.thoughtco.com/who-invented-the-car-4059932.

10 Bellis, Mary (2018), "The First Cars Were Powered by Steam!", *ThoughtCo*, 24 September 2018, [Online: web] Accessed 17 October 2018, URL: https://www.thoughtco.com/history-of-steam-powered-cars-4066248.

11 Gobetto, Marco (2014), *Operations Management in Automotive Industries: From Industrial Strategies to Production Resources Management, through the Industrialization Process and Supply Chain to Pursue Value Creation*, Heidelberg: Springer.

with universities began to function with the main objective of maintaining efficiency, consistency, and standard operational instructions. [12]

First automobiles were developed in Europe, but it was in America, where the manufacturing process was standardised. As a result of standardisation, labour productivity increased, and so does the quality and efficiency of vehicles also improved. Henry Ford developed the first assembly line for the automobiles. He and his team of engineers borrowed the idea from a meat packaging unit, where carcasses of pig passed meat cutters, who then removed various parts according to the work assigned to them.[13]

Ford used interchangeable components, he further employed a division of labour to create his assembly line, the result was gain in productivity and price cuts. Ford employed F.W. Taylor's idea of a *scientific organisation of work*:[14]

- interchangeable components of the vehicle
- production organised by predefined method and working times
- specialisation of the job task

The benefit of this model was the ease with which it could be employed in the manufacturing process, lowering the labour cost.

Initially, Ford built the cars in the same as other manufacturers that is one at a time. The result was low production, and high labour cost. Labour cost was high because highly trained mechanics were needed to assemble the cars. Therefore, to increase the production rate automation was required. Therefore, to accomplish Ford's objective of mass production which in turn would ensure mass consumption, an assembly line was created. On the newly developed assembly line, a chassis stopped at each station, where workers fitted the part until the vehicle was finally assembled. Furthermore, Ford has introduced interchangeable parts

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12 *Ibid*.

13 "Swift & Company's Meat Packing House, Chicago, Illinois, Splitting Backbones and Final Inspection of Hogs, 1910-1915", *The Henry Ford*, [Online: web] Accessed 20 October 2018, URL: https://www.thehenryford.org/collections-and-research/digital-collections/artifact/354536/.

14 Gobetto, Marco (2014), *Operations Management in Automotive Industries: From Industrial Strategies to Production Resources Management, through the Industrialization Process and Supply Chain to Pursue Value Creation*, Heidelberg: Springer.

that could be easily assembled by unskilled labourers; therefore, assembly line in combination with interchangeable parts reduced the labour cost.[15]

As envisaged by Ford, everything at the plant was moving. Each department in the production process was divided into its constituent parts. As a result of this setting, production rate increased, sometimes the production rate was up to four times faster. The effective combination of accuracy, speed and continuity gave the world its first mass-produced car in the form of Model T. Ford Model T was the world's first assembly line produced the car in true sense.[16] Model T production reached new heights in the mid-1920s, at its peak of production, one car was completed in every 10 seconds every working day. Due to increased productivity, Ford was able to lower the price of Model T. When Ford began production of Model T in 1908, it was priced at $850, but by the early 1920s, Model T price was around $300. The innovation, increased productivity, along with reduced prices made Model T truly a peoples' car. At one point of time, 9 out of 10 cars in America were Model T.[17] Ford has not only managed to cut down prices, but he also doubled the wages of daily labourers to $5. The rise in wage permitted the workers to buy the car which they are assembling. This ensured mass consumption for mass-produced Model T cars.

Like every beautiful story has an end, the success story of Model T came to an end in the late 1920s. There are reasons behind the downfall of Model T in the late 1920s. By 1920, Model T appeared dull and old; it came only in one colour that is black, making it monotonous. Moreover, there was a frequent breakdown problem in Model T, though it could be easily fixed. Model T was a dependable car, but it has its own set of mechanical problem and lacked aesthetic appeal. Ford has one more limitation that is the lack of new models. People with different income levels have to contend with the same car.

The shortcomings of Ford were noticed by Alfred P. Sloan Jr. executive of General Motors (GM). If Ford has brought assembly line production and automation to the

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15 "History & Heritage", *The Henry Ford Story, Ford UK*, [Online: web] Accessed 21 October 2018, URL: https://www.ford.co.uk/experience-ford/history-and-heritage#.

16 Some automobile historians claim Oldsmobile Curved Dash which began production in 1901 as first mass produced car, but it lacked the parameter of mass production like automation, consistency and accuracy. Moreover, quality of Oldsmobile Curved Dash was not that of like Ford Model T.

17 Vaughan, Daniel (2006), "1910 Ford Model T History, Pictures, Value, Auction Sales, Research and News", *Conceptcarz.com.*, March 2006, [Online: web] Accessed 22 October 22 2018, URL: https://www.conceptcarz.com/vehicle/z6976/ford-model-t.aspx.

automobile industry, GM is credited with introducing new models periodically, and constant innovation. The purported objective of GM was 'a car for every purse and purpose'.[18] The goal was to build a responsive company that could cater to diverse consumer preferences. Consumer preferences are quite diverse, and in case of cars, consumer preference becomes a very sensitive matter, because the car is not just a means of transportation, it is a 'statement and reflection' of consumers' aspirations and status. This fact was well understood by GM.[19]

From 10,000 units in 1908 to 2 million Model Ts in 1923, Ford had more than 50 per cent market share, but by 1927 GM sales were double than that of Ford. Ford's strategy was to keep things unchanged and focus on trimming down costs by refining production methods. While Ford's goal was to streamline production and focus on one product that is Model T, GM's strategy was 'constant upgrading of the product'. The strategy of constant upgrading is often termed as 'planned obsolescence', which make the cars obsolete after a point of time. In this way, GM established cars a disposable object and ensured the buoyancy and longevity of the automobile industry.[20] GM's cars are no longer just a utilitarian vehicle. They were prized possession, reflecting the owner's status and taste.[21]

Once customers started searching for newer options and more tailored products, Ford's strategies began to exhibit some limitations. GM, on the other hand, was the proud owner of Buick, Cadillac, Chevrolet, Pontiac, Oldsmobile brands. Under the management of Sloan, GM strategy was to build cars with wide product range reflecting customer's economic needs.[22]

### 5.4 Development of the Automobile Industry

By the end of the 1920s, the automobile sector was an established industry. Though early automobiles were developed in Europe, and assembly plants were established there, it did not

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18 Choudhry, Rachna (2017), "What Associations Can Learn from Alfred Sloan, Not Henry Ford", *Digital Marketing in DC | Amplified Growth | KiKi L'Italien*, 3 February 2017, [Online: web] Accessed 22 October 2018, URL: https://amplifiedgrowth.net/2017/02/03/associations-can-learn-alfred-sloan-not-henry-ford/.

19 *Ibid*.

20 Bailey, Diane (2016), *How the Automobile Changed History*, Minneapolis: Essential Library, an Imprint of Abdo Publishing, a Division of ABDO.

21 *Ibid*.

22 Gobetto, Marco (2014), *Operations Management in Automotive Industries: From Industrial Strategies to Production Resources Management, through the Industrialization Process and Supply Chain to Pursue Value Creation*, Heidelberg: Springer.

take the form of industry. In Europe, after the Benz had started assembling the automobiles, there were many small and medium car manufacturers who began their production. However, it was American automobile manufacturers who have standardised the sector and introduced automation to it.

By the 1960s, two established automakers GM and Ford exported their expertise worldwide. They also established significant production capacities in Western Europe, the Far East, and Latin America. During the same period, many Europeans manufacturers also followed the suit of Ford and GM, and exported a significant number of cars to North American markets, and built the new assembly plant in developing economies. For instance, Fiat and Renault were present in the USSR and COMECON[23] nations.[24]

Meanwhile, in the Far East, Japanese carmakers had begun using production and managerial techniques of their American and European counterpart. Surprisingly, by 1970s Japanese carmakers have improved their standard to such an extent that automobile became one the major export of Japan, with Europe and North America is the main export destination for the Japanese cars.[25]

During 1980s automobiles became more complex than their predecessors. Introduction of electronics in engine control, and air conditioning system were the key features in the automobiles of 1980s. By 1980s, there were three hubs for automobile manufacturing. These three hubs were in three different continents. They were Japan, Germany, and the USA. These three countries dominated the automobile industry from the 1970s onwards. All these centres have their own distinct model of working.

The German Model: Germany is one of the biggest producers of automobiles in the world. Apart from being one of the largest producers, Germany is known for its constant innovation and superior quality. German model encourages local suppliers into R&D

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[23] Organisation for International Economic Cooperation. An organisation established in January 1949 to facilitate and coordinate the economic development of the eastern European countries belonging to the Soviet bloc.

[24] Gobetto, Marco (2014), *Operations Management in Automotive Industries: From Industrial Strategies to Production Resources Management, through the Industrialization Process and Supply Chain to Pursue Value Creation*, Heidelberg: Springer.

[25] *Ibid*.

(Research and Development). For instance, there is an alliance of innovation between Mercedes and Bosch (supplier of automobile parts).[26]

The Japanese Model: Japan is a late entrant in the field of the automobile industry, however in the short span of time Japan has emerged as the world's topmost automobile producer. Japanese automobiles are known for their superior quality and fuel efficiency. In Japan carmakers support the supply chain, as the first step of their R&D activities, linking them through their investment and capital participation. For instance, Toyota controls majority stakes in Denso, a firm supplying automobile parts.[27]

The American Model: Americans pioneered the mass production of automobiles. In fact, automobile production was industrialised by the Americans. Americans are more profit-oriented and focus mainly on economic results. They prefer independent suppliers with a large market share, outsourcing labour intensive jobs to countries with low manufacturing cost.[28]

### 5.5 Advancement of Production Techniques

Production techniques are quite important in the development of the automobile industry. Europ, where first automobiles were developed, did merely an assembling job without any division of labour. It was a classic case of craftsmanship, where each vehicle was made individually from scratch. This made productivity significantly low, and could not ensure consistency and quality. The first important change in the automobile industry was brought by Ford, he standardised the production, introduced moving assembly line, and identified area of work where the division of labour could be possible. This resulted in a massive increase in productivity, and a significant improvement in quality. Later, the method of mass production was adopted by many carmakers like GM, and European carmakers like Volkswagen, Renault and Fiat.

[26] *Ibid.*
[27] *Ibid.*
[28] *Ibid.*

### 5.5.1 Mass Production

Mass production became the standard production practice of automobile industry. Mass production has its set of advantages; it gives us quality vehicle at affordable rates. However, it has some limitations as well; mass production is not compatible with the variety. Mass production technique employs narrowly skilled professionals to design vehicles that are assembled by semi-skilled or unskilled workers, resulting in unitary purpose vehicles.[29] By 1950s, more than three decades after Ford pioneered high-volume mass production, mass production spread out of America to Europe. Many European automobile manufacturers like Volkswagen, Fiat and Renault were producing vehicles at a scale comparable to America. Mass producers churn out a high volume of the standardised vehicle because machinery costs so much and disruption in production adds to the unit cost, therefore to lower down the unit cost, mass producers produce in greater quantities. Producing in greater quantities entails provision for many buffers, namely extra supplies, extra space to ensure smooth production, and extra workers.[30] Similarly, due to limited mobility of the machines used in mass production, frequent change to a new product is not a prudent option that is why mass producers keep the standard design in production for many years or as long as possible. As a result, the consumer gets a vehicle at a lower price, but at the expense of diversity. However, it is not to suggest that no new innovation took place during this period. European innovation in the decade of 1960s and 1970s included disc brakes, unitised body, front wheel drive, fuel injection, engines with greater power to weight ratios, and five-speed transmission.[31] Similarly, across the Atlantic, the focus of American automobile manufacturers was more on comfort and interiors. Air conditioning, stereos, power steering, massive engines, and automatic transmission was incorporated in automobiles. However, producing a variety of models in the mass production model is quite capital intensive. Apart from the lack of variety, the monotonous nature of work in mass production facilities is dispiriting and boring for the workers.[32] In fact, during the 1980s, European workers continued to find mass production work so monotonous and unrewarding that first priority in labour negotiations

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[29] Womack, James P., Daniel T. Jones, and Daniel Roos (1997), *The Machine That Changed the World: Based on the Massachusetts Institute of Technology 5-million-dollar 5-year Study on the Future of the Automobile*, New York: Simon Et Schuster.

[30] *Ibid*.

[31] *Ibid*.

[32] *Ibid*.

continued to be less working hours in manufacturing plants. The situation of the stagnant system of mass production prevalent in Europe and the USA would have probably continued if the new automobile industry had not developed in Japan.

### 5.5.2 Lean Production

Credit for the development of lean production goes to Japanese automakers, and particularly Toyota. The idea of lean production did not arise out of a vacuum. Rather it emerged from the limitations of mass production, which no longer seem to work.

Mass production as its name suggests needing massive production to achieve economies of scale. Before, the introduction of lean production technique by Japanese, the standard method of producing vehicles was to stamp major parts of the vehicle, under the massive industrial press. The press were of massive size and designed to churn to high volume. However, due to difficulty in changing dies, because of massive size and precision problem, often a press is dedicated for specific vehicle part. This production method was only possible if the sales of vehicles are in large number.

However, in the case of Japan, Toyota's entire annual production was a few thousand vehicles, which was way below the production of GM and Ford. Therefore, the mass production method was not suitable for the Japanese automaker. Secondly, the Japanese market was relatively small and demanded a wide variety of automobile for a different purpose, a feat which was impossible to achieve by way of mass production. The mass production method is rigid in nature and there is little room for flexibility.

Ohno was a brilliant engineer working for Toyota realised the limitations of mass production on his visit to Ford's Rouge complex. He realised that there required a minimum scale for economical operation, which could not be fit into Japanese conditions. Another problem with the massive industrial press was a change of a die (A die is simply a hard piece of metal in the precise shape the sheet metal should assume under pounding). Change of die would normally take one day and would require a specialist to change the die. It was a task of

high precision, and slight mismatch in alignment would result in defective automobile parts.[33]

Ohno's idea was to develop a simple technique, where stamping dies can be changed easily, and without any need of specialists. Ohno wanted to stamp multiple parts out of the single press, contrary to the American practice of dedicating single press for specific parts. The frequent change of die would reduce the capital cost needed for the heavy press. Ohno procured some press from the USA, and started working on it, by 1950s, he has reduced the time required to change the die from a day to an unbelievable 3 minutes. He has developed such a simple technique that specialists were no longer required to change die. Moreover, there was an unexpected discovery, contrary to the mainstream conviction that larger batches bring down the per unit cost and are more economical, it was found that small batches of stampings are more economical than large batches and costs less per part. There are two reasons for this; small batches reduced the carrying cost of maintaining huge stock and inventories. Secondly, making a few parts before assembling into a car, immediately bring to notice the mistakes done in stamping. [34] Immediate identification of mistakes saves a huge cost of rework, which is done on an overtime basis.

It is not only cost-effectiveness that made lean production favourite of automakers, the issue of quality and variety is also an important issue when it comes to lean production technique. Unlike mass production, which uses semi-skilled workers to assemble a single purpose vehicle, lean production resembles more to the nineteenth-century craft production. In early days of craft production, few skilled mechanics with few simple and versatile tools used to create tailored-made vehicles as per customer's needs. Lean production, on the other hand, engages teams of multi-skilled workers with relatively flexible automated machines to produce a wide range of vehicles, and of superior quality than mass-produced vehicles.[35] It was also discovered that lean producers took less time than mass producers for final assembly of a vehicle. It took 17 hours for plants in Japan to assemble a vehicle, 21 hours for

[33] *Ibid*.
[34] *Ibid*.
[35] Rubenstein, James M. (2001), *Making and Selling Cars: Innovation and Change in the U.S. Automotive Industry*,Baltimore (Md.): J. Hopkins University Press.

Japanese automaker with their plant in North America, 25 hours at American owned North American plant, and 36 hours at European plants.

Lean production cannot be reduced to versatile, and flexible automation, another most important thing in lean production is skills of workers, or in other words learning capacity. In 1980s GM invested a whopping $80 billion in automation. The company further invested in robotics by form a joint venture with a Japanese firm. However, GM did not reap the intended benefit from the investment in new technology.[36] The automation further reduced the productivity of GM plant, and the machine malfunctioning further added to the woes of the company.

Instead of mindlessly investing in advance automation, GM should have overhauled the existing machines and management. The change in management could be brought by training, meticulous screening process, and through the efficient organisation of inventory. Lean production is about superior quality, but at the same time, lean production is about continuous evolution and improvement. The continuous improvement which Japanese companies have exhibited is not only from automation. The major contributor to the philosophy of continuous improvement is the Japanese workforce. Japanese workers are better trained, that ensures, minimal wastage, efficient movement of inventory, and problem-solving approach. Therefore, when a problem arises, it could be fixed by Japanese workers by a simple mechanical fix, rather dismembering every part and starting all over again.[37]

Mass producers take into account the acceptable number of defects in the automobile manufacturing process, and this reflects in the cost of automobiles. There is basically a set target of an acceptable number of defects, and it is termed as a success if a number of defects are within the target. However, in the case of lean production, there is no such notion as success and perfection. Lean production is a continuous and never-ending process of improvement.

Though greater efficiency is achieved by the lean production technique, the profitability was an issue. Compared to their American counterpart, Japanese automakers

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[36] *Ibid*.
[37] *Ibid*.

were making less profit per unit. Toyota's administrative cost was twice high as GM's, despite the fact, GM being the least efficient company in the United States.[38] Therefore, to maintain the level of profitability, a new system of logistics and supply chain was the need of the time.

### 5.5.3 Supply Chain

The supply chain is the most important part of the automobile industry. OEMs (Original Equipment Manufacturers)[39] are responsible for more than two third of the total value added of an automobile. The process to manufacture an automobile includes fabricating and engineering more than 10,000 parts and assembling them into 100 major components, like transmissions, suspensions, and steering gears and so forth.

It may seem stress-free that the OEMs manufacture the parts needed and assemblers assemble the parts into the automobile, thus adding the value of the assembled machine. However, easy it may appear, there is a problem of coordination. Coordinating the process so that the components needed arrives at the right time, ensuring high quality and low cost has been an unending challenge for the automobile industry.

During the initial years of the twentieth century, automobiles were assembled completely through parts procured from various suppliers. However, there was a problem of reliability when it comes to uninterrupted supply from the suppliers. Many automakers during that period ceased production because of dependence on unreliable suppliers for the supply of assembly parts. The procurement of parts from unreliable suppliers implied that automakers were afflicted by problems of loss of materials, low productivity, lack of standardization, and uncertainty of the quality of the final product. There was another problem as well; any unwanted problem in suppliers' manufacturing plant could prove

[38] *Ibid*.

[39] A company making parts primarily destined for installation in new vehicles is called an original equipment manufacturer (OEM). A company making parts sold primarily as replacements in older vehicles is known as an aftermarket supplier.

disastrous for small car makers that had inadequate operating capital or no provision for reserves.[40]

This continuing challenge of ensuring uninterrupted supply, maintaining high quality and low cost is the main concern of the automobile industry. The challenges of the supply chain are still the same; however, the ways to address the problem of the supply chain have changed over the years. During the era of mass production, a complete integrated approach was adopted.

Vertical integration implies a complete integration of the production system into one vast organisational command structure with instructions coming down from the top. Mass producers embraced a varying degree of vertical integration, ranging from about 25 per cent to 70 per cent depending on the company. Small and niche carmakers like Porsche and SAAB made 25 per cent parts in-house, whereas, a big name like GM and Ford produced up to 70 per cent parts in-house. At one point of time, Ford achieved 100 per cent vertical integration at its Rouge plant.[41]

To achieve complete vertical integration, Ford established the largest industrial complex in America's history. During its peak that was before World War II, the Rouge complex employed 110,000 employees, which was spread in 2000 acres. Raw materials like iron ore, coal arrived at one end of River Rouge Complex and finished vehicle came out of another end of the complex. The degree of vertical integration was such that Ford has erected its own steel smelting plant and foundry to cast different metal plants. Ford went a step ahead and invested in plantation to secure the supply of lumber, as wood was used extensively in the body of Model T. Ford also invested in rubber plantation for tyres and other rubber parts of Model T.

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[40] Rubenstein, James M (2001), *Making and Selling Cars: Innovation and Change in the U.S. Automotive Industry*, Baltimore (Md.): J. Hopkins University Press.

[41] Womack, James P., Daniel T. Jones, and Daniel Roos (1997), *The Machine That Changed the World: Based on the Massachusetts Institute of Technology 5-million-dollar 5-year Study on the Future of the Automobile*, New York: Simon Et Schuster.

Work at Rouge complex was organised into six broad categories:[42]

1. Processing of coal and iron ores, primary raw materials.
2. Generation of electricity, nearby raw material processing zone
3. Casting components made of iron
4. Production of steel and steel components
5. Production of other miscellaneous parts
6. Final assembly of vehicles

Since, Ford was manufacturing only one model, which is Model T, Ford strategy of complete vertical integration made sense. Not only the single model made vertical integration feasible, but the sheer number that is coming out of factory also had the advantage of economies of scale. On the other hand, GM had a different model of vertical integration, GM came out with relatively more models than Ford, so complete integration like that of Ford was not feasible. Therefore, GM acquired many companies manufacturing parts for GM vehicles. Ford built the world largest factory, to bring everything to one site, as it focused on a single model, whereas, GM vision was acquisition and expansion that could guarantee an acceptable level of saving and return to the company.[43]

One thing is clear, that vertical integration is a prerogative of big companies. The ability to make parts oneself gave a distinct advantage to companies like Ford and GM. Smaller carmakers can compete with big automakers in price and quality, but not in both at the same time. Smaller companies have to charge a competitive price for the vehicle of inferior quality or else charge the higher prices than GM or Ford for the car of similar quality. Therefore, only big companies could afford to invest in vertical integration operations. The economy of scale that can be achieved at higher output drove out smaller automakers.[44]

GM's vertical integration was different from that of Ford. GM has acquired many component making companies in contrast with Ford, whose entire focus was to make every

[42] Rubenstein, James M (2001), *Making and Selling Cars: Innovation and Change in the U.S. Automotive Industry*, Baltimore (Md.): J. Hopkins University Press, 58-60.
[43] *Ibid*, 57-58.
[44] *Ibid*, 57.

part from scratch at one big facility. GM has in a way has outsourced the parts making to its associated companies. However, those companies were not independent and completely owned by GM.

The need to acquire various companies in contrast with Ford's practice of making every part in-house comes from the fact that Ford only made one model, whereas, GM was a pioneer in introducing new models at some interval of time. Therefore, making parts for every model was not feasible, but to control the supply chain, GM acquired many companies, making various parts for various models. The trend was acknowledged by Ford, and Ford realised that focusing on just one model is futile, thus, the complete vertical integration practice of Ford is rendered impractical in changing scenario.

However, things changed with the advent of Japanese automakers. They not only came up with new production techniques, but they also revolutionised the supply chain management. Lean production technique, not only focused on cost, but also on continuous innovation, and enhancing product quality. In the conventional supply chain model, designers draw the blueprints and ask the suppliers to provide the components as per the blueprints. The lowest bidder gets the project, whether it is an in-house company or an independent supplier. The suppliers are required to ensure that components are of specified quality, and at the lowest cost. However, in this process, suppliers are not at all engaged in any innovation, they manufacture components independently of other suppliers. To overcome this problem, Toyota organised suppliers into different functional levels. Different responsibilities were given to firms in each level. Toyota adopted a method where product specification was given to suppliers and was not told how to make it.[45] Before Toyota, big automakers specified products as well as methods to make it. This unique approach of Toyota initiated communication between different layers of producers. In this way, Toyota did not totally vertically integrate the supply chain like Ford, neither it disintegrates the companies into totally independent units like GM. Thus, Toyota introduced a new approach,

[45] Womack, James P., Daniel T. Jones, and Daniel Roos (1997), *The Machine That Changed the World: Based on the Massachusetts Institute of Technology 5-million-dollar 5-year Study on the Future of the Automobile*, New York: Simon Et Schuster.

where communication between different tiers of suppliers seemed possible, and at the same time having some control of the suppliers.[46]

### 5.6 Backward and Forward Linkages

The automobile is not simple manufacture, many entities are involved to make production possible. For example, a food processing company does not have much backward linkage and have fairly simple raw materials. However, in the case of the automobile industry, there is a huge backward linkage. There are often many suppliers of spare parts, and those suppliers coordinate among each other to bring the automobile to life.

For instance, an average car has about 30,000 individual parts, and it needs huge coordination effort among various tiers suppliers and OEMs to put things at the right place. In addition to the employment provided by the assembling units, if employment provided by suppliers are also taken into account, the figure would be much larger. The automobile industry is not only the biggest employment provider, but the automobile industry is also the biggest employment generator as well. It not only provides employment in its facilities it also generates employment in ancillary industries.

The automobile industry generates employment through ancillary industries, which are there to cater to the need of the automobile industry. Basically, it means that automobile and its peripheral industries are generating employment. However, the automobile also generates employment is many unrelated and unconnected industries. It is well established that different sectors in the economy get the boost with the arrival of the automobile, whether it be the tourism industry or agricultural sector. For instance, with the arrival of cars and buses, many areas which were inaccessible became accessible and connected, thus increasing the potential for tourism and associated industries, like hotels and retails. The arrival of the automobile also ensures a better network of highways and supporting infrastructures, which further increase the opportunities for employment.

A study concerning the backward linkages of the automobile industry could be undertaken in a concrete way. Backward linkages include the linkages with the suppliers and basic industries like steel, glass, tyre and petrochemicals. The term ‘concrete way’, means

[46] *Ibid*.

the figures can be arrived at, for instance how much steel and petrochemical products are consumed in the automobile industry. Similarly, the value added by the automobile industry can also be determined in case of backward linkages, by doing simple arithmetic. The total value of input deducted from the final output price gives the value added by the automobile sector. Calculations related to the backward linkages are fairly simple and depends upon the availability of the data. Nevertheless, the automobile industry is important for its forward linkages. The automobile is a final product and rarely used as an intermediary product to be developed into some other product. Rather, the automobile is used as a final product, and mainly employed in the service sector. For instance, the transportation sector is among the largest service sector in any country, and the automobile is the backbone of the transportation sector. Similarly, the automobile is quite significant for the tourism and agricultural sector.

The calculations that could be easily deduced for backward linkages are difficult in case of forward linkages, suggesting that numerically value addition or contribution of the automobile industry cannot be derived convincingly. Forward linkages include the use of automobiles in the service sector to enhance the services. For instance, a boost in the tourism sector, retail business, and similar prosperity in other sectors because of the arrival of automobiles is associated with forward linkages. However, associating the boom and prosperity of service sector with the automobiles only would be a reductionist argument. Automobile enhances the service of the service provider, but it is not the only cause of the success of various sectors. For example, a place has the potential for tourism because of its rich cultural heritage, in this case, automobile helps people to reach the destination to appreciate that place. The place has an intrinsic value because of its cultural heritage and not because of automobile accessibility. The automobile has just facilitated the connectivity, and due to enhanced connectivity more tourists would visit the place. In this scenario, the actual value addition or contribution of the automobile sector is difficult to determine, which could be easily done in case of backward linkages. It is a complex situation, tourism depends on connectivity, associated infrastructures like hotels, and on the intrinsic feature of a particular place. In this equation, it is hard to single out the contribution of automobiles, from the rest of the factors. Though not impossible, it is a challenging task. It is common knowledge that automobiles do have an effect on service delivery. Therefore, it is reasonable to believe that automobiles would have a positive effect on the service sectors, like tourism and retail.

However, it would be unwise to associate automobiles to just tourism and retail business. The significance of the automobile industry's forward linkage can be gauged from the fact that sales of automobiles are considered to be an important economic indicator. Automobile sales tell a lot about the health of an economy.[47] Automobiles have revolutionised the way business is conducted and opened new avenues for businesses.

Automobiles connected the villages with the cities before the advent of automobile contact between city residents and people who lived in the countryside were minimal. Automobiles connected the people and thus opened new opportunities, it also helped in the development of suburbs. Automobiles instilled a new sense of autonomy and freedom. It popularised vacations, where people and families can go on long road trips, visit famous landmarks and national parks. This gives rise to new enterprises like a motel, which is a combination of two words 'motor' and 'hotel'.[48] A whole lot of fast food chains propped up because of the expansion of highway networks. In nutshell, in today's modern world any business without the automobile could not be imagined. It is the backbone of logistic, which is needed for the smooth operation of any business.

The chapter has discussed the journey of the automobile industry. Automobile from being a piece of craftsmanship went to become one of the most important industry. Global output of automobile industry is comparable to big economies, this is enough to highlight the magnificence of the automobile industry. Automobile industry anywhere is often the biggest employer and contributor to the country's GDP. The chapter would make an attempt to analyse Iran's automobile industry on the similar lines discussed above.

### 5.7 Iran's Automobile Industry

Iran is the second largest automobile producer in the region after Turkey. Iran is not only the second largest producer of the automobile in the region, but its automobile industry is also one of the largest employers in the country. The chapter focuses on the automobile industry because the study is on diversification of the Iranian economy, and the automobile because of

[47] Kenton, Will (2019), "Auto Sales", *Investopedia*, 12 March 2019, [Online: web] Accessed 26 June 2019, URL: https://www.investopedia.com/terms/a/autosales.asp.

[48] Bailey, Diane (2016), *How the Automobile Changed History*, Minneapolis, MN: Essential Library, an Imprint of Abdo Publishing, a Division of ABDO.

its backward and forward linkages can be an acceptable parameter of diversification. In fact, any country with robust automobile industry is invariably a diversified economy.

Iran has a robust automobile industry in terms of production. In terms of production, Iran ranked 12th in the world in 2009. In 2010, Iran slipped a rank and was the 13th largest producer of automobiles in the world.

Table 5.1 Automobile Production in Iran 2008-2011

| Year | Cars | Commercial Vehicle | Total | Percentage change |
|---|---|---|---|---|
| 2008 | 1,048,307 | 225,474 | 1,273,781 | ___ |
| 2009 | 1,170,503 | 223,572 | 1,394,075 | 9.4 |
| 2010 | 1,367,014 | 232,440 | 1,599,454 | 14.7 |
| 2011 | 1,412,803 | 236,508 | 1,649,311 | 3.1 |

Source: OICA Statistics

Above figures give the impression that Iran has a robust automobile industry with an impressive growth rate. In the year 2011, production of total vehicles peaked at 1,649,311. Though the growth rate was reduced to 3.1 per cent compared to 14.7 per cent in 2010, total production was more than 1.5 million vehicles.

From the above figure, one can conclude that Iran has a healthy automobile industry; however, the above figures do not give the true picture of Iran's automobile industry. Iran's automobile industry is a barometer of Iran's economy. Therefore, like the Iranian economy, Iran's automobile industry is fairly volatile. Iran's automobile industry is very sensitive to external influences. Movement in oil prices affects Iran's automobile industry. Similarly, sanctions have a great bearing on Iran's automobile industry. Sanctions directly affect Iran's automobile industry, as it involves the transfer of technology. Therefore, sanctions have an immediate effect on Iran's automobile industry.

Table 5.2 Automobile Production in Iran 2012-2017

| Year | Cars | Commercial Vehicles | Total | Percentage change |
|---|---|---|---|---|
| 2012 | 856,927 | 143,162 | 1,000,089 | ___ |
| 2013 | 630,639 | 113,041 | 743,680 | -25.6 |
| 2014 | 925,975 | 164,871 | 1,090,846 | 46.7 |
| 2015 | 884,866 | 97,471 | 982,337 | -9.9 |
| 2016 | 1,074,000 | 90,710 | 1,164,710 | 18.6 |
| 2017 | 1,418,550 | 96,846 | 1,515,396 | 18.19 |

Source: OICA Statistics

Production of automobile which peaked in 2011, to 1.649 million came down to 1 million in 2012. In 2012, automobile production decreased by more than 600,000. Production in 2012 falls by astonishing 39.3 per cent. Coincidentally, 2012 was the year European Union (EU) imposed tougher sanctions on Iran; in fact, EU sanctions were as harsh as American sanctions.[49] The immediate effect of sanctions was seen on automobile production. In 2013, production further declined to 743,680, that was the lowest output in the last ten years from 2008-18. After the imposition of sanctions by the EU in 2012, Peugeot and Renault withdrew from Iran, which resulted in a fall in output.[50] Similarly, in 2016 the sanctions were lifted after the implementation of JCOPA (The Joint Comprehensive Plan of Action), the output of automobiles reached 1.164 million. In 2017, output further increased to 1.515 million units, which was less than the peak production of 2011, but in the last 5 years, was the highest production.

The table above also shows the resilience of Iran's automobile industry. The output which was decreased to 743,680 in 2013, from a peak of 1.649 million vehicles in 2011, quickly regained the loss of output in subsequent years.

[49] O' Sullivan, Meghan L (2010), Iran and the Great Sanctions Debate, *The Washington Quarterly*, 33 (4): 7-21

[50] Sadrieh, Farid. *Reintegrating Iran with the West Challenges and Opportunities*. London: Emerald Group Publishing, 2015

Iran has a long history of volume vehicle production, and this, in turn, is supported by robust local demand, with a strong potential for export.[51] Iran automobile industry came into existence in 1959. Iran is a late entrant into the automobile industry when Europe and the USA had a fairly developed automobile industry. However, before the revolution, Iran's auto industry was merely an assembling industry, assembling the imported parts.[52] Though the automobile industry came into existence in the 1960s, it was in 1962, Iran Khodro (IKCO) was established. Initially, it was originally named Iran National.[53] The first Iranian made automobile that came out of IKCO was Paykan, often touted as the national car of Iran.[54] Paykan was quite popular among Iranians. Paykan was a trademark of Rootes Group, a British firm. In Britain, Paykan was known as Hillman Hunter. In 1967, Paykan has completely assembled in Iran from CKD (Complete Knock Down) kits exported to Iran, from Rootes Group. However, by mid-1970s, Iran has established a full-scale manufacturing facility of Paykan (without engine). In 1977, Peugeot took over the Rootes Group. Peugeot ceased the production of Paykan also known as Hillman Hunter in Ireland. Following this, the entire engine making facility was moved to Iran, where Paykan was manufactured on a full scale under the licence of Peugeot until its production was stopped in 2005.

According to 2003 available figures, IKCO has the highest market share. IKCO has a market share of 60 per cent, and SAIPA (another big automobile manufacturer in Iran) has a market share of 35 per cent. Together these two companies have a market share of more than 90 per cent.

IKCO and SAIPA are both started their journey as licenced producers. IKCO went into an agreement with Rootes of Britain in 1966 to produce Paykan cars. From just 10 passenger cars in 1966, IKCO increased its production to 98,000 Paykan cars in 1977.[55] In a

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51 Ibid, p. 59

52 Forouzan, Alireza and Mirassadallahi, Kave, *An Investigation into Iran's Auto Industry and Analyzing the Effects of Importation on its Growth: A System Dynamics Approach*, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.408.7693&rep=rep1&type=pdf

53 Mojtahedzadeh, Rouhollah, and Veeri Chettiar Arumugam. "Determinants of TQM in the Iranian Automotive Industry: A Theoretical Approach." *International Journal for Quality Research.* 5, no. 1 (2011): 21-32.

54 Abedini, Javad, and Nicolas Péridy (2009), "The Emergence of Iran in the World Car Industry: An Estimation of Its Export Potential", *World Economy*, 32(5): 790-818, [Online: web] Accessed 23 October 2018, URL: 10.1111/j.1467-9701.2008.01153.x.

55 "Home Page", IKCO Introduction, [Online: web] Accessed 9 November 2018, URL: https://www.ikco.ir/en/Intro.aspx.

period of ten years, IKCO increased its production by more than 3000 per cent. In 1977, when Peugeot took over Rootes, IKCO was in talks with Peugeot, to replace Paykan with Peugeot 305. Production line of IKCO got disrupted during the Iranian Revolution and eight-year Iraq-Iran war. In 1988, IKCO inked a three-year contract with Peugeot to manufacture Peugeot 405 sedan. With the end of the Eight Years War, the focus shifted to public vehicle. Peugeot shop in IKCO is converted to produce 6000 buses annually.[56] IKCO mainly produces vehicles under the licence agreement of Peugeot. In 2006, IKCO also collaborated with Renault and produced vehicles like Tondar 90, which outside Iran is known as Renault Logan.[57]

It should not give an impression that IKCO is just making vehicles under the licencing agreements, and there is no indigenous model from IKCO. SAPCO (Supplying Automotive Parts Company of Iran Khodro) was founded in 1991.SAPCO gave impetus to designing of spare parts; there was a boost in domestic automotive parts production both quantitatively and qualitatively. As a result of constant innovation, and improvement in production techniques, Iran received ISO 9000 certification in 1998. [58] In 2002-03 Iran started the mass production of indigenously developed Samand cars. The car was developed indigenously, but it was mounted of Peugeot chassis.[59]

Apart from voluminous domestic production, Iran automotive industry has strong export potentials.[60] Therefore, to realise this, IKCO has established production lines in Senegal, Venezuela, Belarus, Azerbaijan and Syria. In 2008, IKCO was conferred with the award of Top Exporter and received the Export National Award.[61]

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56 *Ibid*.

57 *Ibid*.

58 ISO 9000 is defined as a set of international standards on quality management and quality assurance developed to help companies effectively document the quality system elements needed to maintain an efficient quality system. They are not specific to any one industry and can be applied to organizations of any size.

59 "Home Page", IKCO Introduction, [Online: web] Accessed 9 November 2018, https://www.ikco.ir/en/Intro.aspx.

60 Abedini, Javad, and Nicolas Péridy (2009), "The Emergence of Iran in the World Car Industry: An Estimation of Its Export Potential", *World Economy*, 32(5): 790-818, URL: 10.1111/j.1467-9701.2008.01153.x.

61 "Home Page", IKCO Introduction, [Online: web] Accessed 9 November 2018, URL: https://www.ikco.ir/en/Intro.aspx.

SAIPA another major automobile manufacturer followed a trajectory similar to IKCO's timeline. SAIPA started as SAIPAC (Sociètè Anonyme Iranienne de Production Automobile Citroën). The name suggests that the entity was established to assemble vehicles of French automaker Citroën in Iran. In 1975, 'C' representing Citroën is dropped from the company name.[62] SAIPA was founded in 1967, and the first car rolled out from its facility was Dyan in 1967. In the case of IKCO, licence partner Peugeot appears rather dominant, however, in case of SAIPA, there is no such dominant licence partner. Ironically, the company was established to assemble vehicles of Citroën in Iran, but before dropping the Citroën from its name in 1975, SAIPA went into an agreement with Renault in 1973 to produce Renault 5, in two doors and four doors version.[63] IKCO went into an agreement with Renault in mid-2000.

SAIPA also collaborated with Japanese and Korean carmakers like Nissan and KIA, to produce pickup vehicles. In 1999, SAIPA produced Pride Safari, a pickup vehicle under the licence agreement of KIA motors. The important point here is, SAIPA achieved a significant level of localisation, 81 per cent localisation was achieved in case of Pride Safari, and 79 per cent localisation was achieved in case of Nissan pickup vehicles.[64] Like IKCO, SAIPA has also got many international quality certifications. In 2001, SAIPA received prestigious QS9000 certification. QS9000 was developed by Big Three automakers of the US; it especially pertains to automobile quality issues. Likewise, in 2004, SAIPA has also got appreciation letters for 'Best Exporter of Auto and Parts'.[65] Apart from French, Japanese and Korean automakers, SAIPA is producing vehicles in collaboration with Chinese automakers.

Iranian automobile industry primarily dominated by European automakers, French automakers to be precise. In the commercial vehicle segment like trucks and buses influence of German automakers could be seen. Iran Khodro Diesel (IKD), a subsidiary of IKCO is responsible for assembling trucks and buses, has collaboration with Daimler Benz of

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62 "History", [Online: web] Accessed 19 November 2018, URL: http://www.saipacorp.com/en/saipagroup/history.
63 *Ibid*.
64 *Ibid*.
65 *Ibid*.

Germany.[66] IKD has commanding control over the commercial vehicle segment. IKD has 70 per cent of the truck and 80 per cent of the bus market share in Iran.[67] Besides impressive market control, IKD has extensively exported to overseas market. Some of the export destinations of IKD are UAE, Saudi Arabia, Kuwait, Libya, Azerbaijan, and Turkmenistan.[68]

However, when it comes to passenger cars, French automakers are the undisputed leader in Iran's automobile industry. Peugeot, Renault and Citroën are all French automobile brands, and these automakers were instrumental in the establishment of Iran's automobile industry. What Suzuki is to India in the context of Maruti cars; Peugeot has the same significance in Iran.

India which built its automobile industry on Japanese technology, experienced a linear development, whereas, Iran's journey is not so smooth and have seen many ups and down. This does not imply that French collaboration is an impediment in Iran's automobile development vis-à-vis Japanese technology. At the same time, the superiority of Japanese technology cannot be denied, and Iran has instances of association with Japanese automakers. Therefore, it is clear that the association does matter, but what matters more is political stability and external conditions.

Iran's automobile sector is the victim of both external disturbance and domestic political instability. Though Iran has an early start compared to India, Iran could not realise its full potential. Iran is a middle-income country and moreover, its geography provides an ideal condition for the automobile industry to flourish. However, Iran automobile journey has many crests and troughs, therefore, Iran's automobile industry cannot be termed as an absolute failure, neither is a success story in a commercial sense. Despite sanctions and other external disturbance Iran has still managed to produce automobiles speaks a lot about its resilience, on the other hand, Iran's inability to manufacture quality vehicle without imported technology and spare parts tells about the abysmal stage of Iran's automobile industry.

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66 IKD History. Accessed November 19, 2018. http://www.ikd.ir/EN/History.aspx.

67 Ale Ebrahim N., Golnam A. (2006), "Heavy Duty Fleet and Transportation in Iran the Past, the Present Condition, the future perspectives and its interaction with Economy", *FISITA World Automotive Congress*, Yokohama: 1-12.

68 *Ibid*.

## 5.8 Iran's Automobile Industry Predicament

Iran's automobile industry is lately associated with the sanctions, and all the problems that are arising in the automobile industry are attributed to the sanctions. There is some grain of truth in this assertion; however, it does not give a complete comprehensive picture of the problem. Iranian media and scholars largely blame the sanctions for the appalling state of the automobile industry. On the other hand, international scholars and media largely blame mismanagement and policies of the Iranian government.

The section would make an attempt to examine underlying problems of automobile industry of Iran. The section would examine both domestic as well as external issues affecting the performance of the industry. The chapter would also attempt to seek that problem pertaining to the automobile industry is peculiar to Iran, or it is the trajectory of development in the automobile industry.

### 5.8.1 Internal Problems

There is a little academic discussion about the trajectory in which the automobile industry is moving. It was extensively believed that once the industry reached maturity, would naturally move to 'leading developing countries'.[69] It is believed because markets are growing more rapidly in developing nations, and at the same time wages are substantially lower than OECD countries. However, the threshold production level for developing nation wanting to establish a domestic industry appears to have risen. Developing nations harbouring ambitions to export automobiles to OECD countries have not met with great success so far.

Iran's automobile industry pertains to that of a developing nation, where it is assumed there is a rapidly growing market. However, in the case of Iran, there is a high dependence of the Iranian automobile market on the state of Iran's economy.[70] This is natural with any domestic automobile industry, that a state of country's economy will determine its health. However, the condition accentuates in the case of Iran, because Iranian automobile export revenue is not steady and is largely dependent on domestic consumption.

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[69] Jones, Daniel T., and James P. Womack (1985), "Developing Countries and the Future of the Automobile Industry", *World Development*, 13(3): 393-407, URL:10.1016/0305-750x(85)90137-8.

[70] Saberi, Behzad (2017), "Problems of Iran's Automotive Industry Competitiveness", 102-10, [Online: web] Accessed 25 December 2018, URL: http://jne.usue.ru//download/70/9.pdf.

The statistics reveal another troubling tendency, that five decades after the establishment of Iran's automobile companies, they have not occupied an appropriate place in the world market. There are two reasons for it, one is economies of scale, where Iran is having difficulty competing Japanese and European carmakers. The second factor is more troubling that is the quality of domestic products.[71]

Issues regarding the quality of vehicles are a matter of great concern. Quality issues act as a deterrent. It creates a trust deficit, and deter people from buying cars. A clear example of this trust deficit can be seen among Iranian consumers when they formed a group by name '*Kharide Khodroe Sefr Mamno*' (Prohibition of the Purchase of New Cars) in social media in 2015.[72] As a result of this campaign, for a few months, the sale of the vehicles plummeted. It can be attested by the fact that the total production of 2015 was less than 2014 figures. In 2014, 1,090,846 vehicles were produced, whereas, in 2015 there was an approximate fall of 10 per cent in production, and total vehicle production fell to 982,337 vehicles.[73] Ironically, 2015 was the year when Iran reached a historic agreement in the form of Joint Comprehensive Plan of Action (JCPOA). Ideally, production of vehicles should rise in 2015, but as a result of a delayed purchase, sales were affected, which in turn affected the production. Iranian government took some urgent measures to contain the damage. The government arranged a loan of $7500 to consumers to stimulate demand, but it was of little use because the main concern regarding the quality of cars was not addressed.[74]

Iranian automobiles are notorious for low-quality level; in 2006, low quality of Iranian cars became the issue of debate in the Iranian parliament.[75] Similarly, The Iran Standards and Quality Control Company calculated that technical faults in Iranian cars are exponentially more than European cars. According to their own estimates, if technical faults of European cars can be counted in tens, then technical faults in case of Iranian cars can be counted in hundreds.[76] A quality audit report of 2017 by The Iran Standards and Quality

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71 *Ibid*.
72 *Ibid*.
73 Various years of OICA statistics
74 Saberi, Behzad (2017), "Problems of Iran's Automotive Industry Competitiveness", 102-10, [Online: web] Accessed 25 December 2018, URL: http://jne.usue.ru//download/70/9.pdf.
75 Mather, David, Yassamine Mather, and Majid Tamjidi (2007), "Making Cars in Iran: Working for Iran Khodro", *Critique*, 35(1): 9-21.
76 Ibid.

Control Company found that none of the Iranian brands competes with international brands in terms of quality.[77] Ironically, the international brands are assembled in Iran by the same manufacturers who make Iranian brands, primarily IKCO, and SAIPA. Moreover, the assembled international brands have localised content too. For instance, according to the report, cars like Suzuki Grand Vitara, Hyundai i20, and Renault Sandero manufactured by Iran Khodro Khorasan, Kerman Motors and Pars Khodro respectively have a satisfactory quality level. On the other hand, Iranian brands like Samand, Saina and Tiba manufactured by IKCO and the last two by SAIPA did not have a satisfactory quality level.[78]

Issues related to quality are not the only concern for Iran's automotive industry; there are other issues as well. There is a problem with the economy of scale. The automobile industry is oligopolistic in nature; production is concentrated in hand of few companies. This concentration took place in America in the 1950s, where production was concentrated in the hands of three big companies GM, Ford and Chrysler, popularly known as Big Three. Similarly, in the case of Europe, there are few big producers who control the automobile industry of Europe. However, in Europe, this trend is visible in the late 1970s. In Europe, there are four big producers namely, Volkswagen, Peugeot, Renault, and Fiat. In the case of Japan also 88 per cent production is controlled by four companies. Toyota, Honda, Mazda, and Nissan are the major producers there.[79] At the beginning of the century when the automobile industry is taking its shape there were more than 300 companies in the USA alone, however with time those companies were either shut or amalgamated by the big companies. The automobile industry is a capital intensive industry, with little flexibility (until the arrival of Japanese automakers), and high fix cost. Therefore, the industry has a high breakeven point. Because of its huge fixed cost, a widely accepted number of 2 million vehicles is fixed as industry standard to achieve economies of scale.[80] However, there are no hard and fast rules for economies of scale, with improvement in technology and management the numbers to achieve economies of scale could be reduced. In developed countries, the automobile industry constitutes 10 per cent of GDP, which is substantially higher than

[77] Domestically Manufactured Cars National Assessment Report, Iran Standard and Quality Inspection Co., Ministry of Industry, Mine and Trade. (23 July 2017- 22 August 2017).
[78] *Ibid*.
[79] Jones, Daniel T., and James P. Womack (1985), "Developing Countries and the Future of the Automobile Industry", *World Development*, 13(3): 393-407, doi:10.1016/0305-750x(85)90137-8.
[80] *Ibid*.

Iranian automobile industry's share in GDP, which is 2.5 per cent.[81] The low share of GDP contribution explains the problem of economies of scale in the Iranian automotive industry.

A similar situation is with the export of Iranian automobiles. Exports are steadily declining. Sanctions have a role to play in the declining export, but at the same time poor quality, with high breakeven point makes Iranian cars less sought after the vehicle in the overseas market.

Fathi and Ahmadian in their article *Competitiveness of the Iran Automotive Industry for Entrancing into Foreign Markets*, have formulated eight parameters. The parameters were ranked on the scale of 1-5, where a score above 3 was considered an obstacle or problem to Iran's auto industry, whereas, a score of 3 or below signifies that it has no significant role in the failure of Iran's automobile export.[82]

The chapter would not deal with each parameter individually; rather, the chapter would explicate the results by Fathi and Ahmadian. The researchers used SPSS (Statistical Package for the Social Sciences) software to analyse their results and verify their hypotheses.

According to their analysis:[83]

a) The Firms strategic, structure and rivalry scale got an average score of 2.72 which is not considered a problem and barriers for Iran's automobile export into overseas market. The samples of this scale are organisation hierarchy regarding decision making, type of ownership and approach of management.
b) The R&D scale with an average score of 3.38 is considered as one of the biggest obstacles in the export of Iranian vehicles. The points to be considered in this scale are, the importance of R&D in the export market, providing proper training to design a new platform, and develop new products.
c) The Factor scale with an average score of 2.72 is not a significant obstruction in the export of automobiles. The factor scale includes conditions like access

[81] Saberi, Behzad (2017), "Problems of Iran's Automotive Industry Competitiveness", 102-10, [Online: web] Accessed 25 December 2018, URL: http://jne.usue.ru//download/70/9.pdf.
[82] Fathi, Abolfazl, and Sahar Ahmadian (2016), "Competitiveness of the Iran Automotive Industry for Entrancing into Foreign Markets", *Procedia Economics and Finance*, 36: 29-41. doi:10.1016/s2212-5671(16)30013-2.
[83] *Ibid*.

to infrastructures like energy and fuel, expectations and wages of workers, and knowledge and expertise of specialists and workers.

d) The Related and Supporting Industry scale scores 3.25, which is more than 3. Therefore, related and supporting industry is playing an important role in obstructing export of Iranian automobile. The scale discusses points like the capability of the organisation is each step of the value chain, technological and scientific maturity of the country, and the condition of related and ancillary industries such as petrochemical, glass, steel, textile and tyre industries.

e) The Demand Condition scale with the score of 2.82 is not considered an obstacle in the export of Iranian made cars. The scale focuses on factors like after-sales service in the overseas market, overseas market growth rate, overseas customers' purchasing power, and size of the international market.

f) The Chance scale with an average score of 3.58 is one of the most significant obstacles in the export of Iranian vehicles. The scale has the second highest score. Therefore, this scale is considerably hampering the export potential of Iran's automobile industry. The points discussed in the scale are such, which are beyond the control of Iran, so they are categorised under the chance scale. The factors in this scale are international sanctions, foreign investment in Iran's automotive industry, currency fluctuation in the international market, and oil price volatility and its effect on the automobile industry.

g) The Absorbing scale sores 2.76, which could not be considered as the problem for export. The absorbing scale includes the preference of customers, comfort and ergonomics, and regular up-gradation and update of products.

h) The Government scale scores an astonishing 4.14, which implies that it is the biggest impediment in the export of automobiles. Government scale includes factors related to policymaking. The scale deals with, general plan of government towards automotive industry, investment in the sector, government international dealing or relations with other countries, performance of the government which results in change of interest rates and

inflation, financial policy of the government to support the industry, and government rule with to support Iranian automobile industry.

Apart from the problem mentioned above, there is one more thing that hampers the export prospects of Iranian cars, that is high import duty, and a periodical ban on import of cars. In June 2018, Iran has banned the import of cars. After the pull-out from JCPOA by Trump administration, the value of rial plummeted, therefore, to prevent further fall, the government has banned the import of cars and other luxury items.[84] The ban on import of cars along with some 1400 other items would save $4 billion outflows.

It is not only internal policies and market conditions are the reason for the unsatisfactory performance of the automobile industry. International sanctions and external events also have a detrimental effect on the automobile industry. Sanctions have a disastrous effect on the automobile industry of Iran; they have crippled the healthy growing industry, and the recent sanctions imposed by president Trump have devastated the industry. The chapter would highlight the effects of sanctions on the automobile industry.

### 5.8.2 Sanctions affecting the Automobile Industry

Iran is under the sanctions since 1979, and still at the time of writing this thesis Iran is facing one of the toughest imposed sanctions. Primarily, the target of the sanctions was Iran's oil and gas industry, but lately, the automotive industry is also targeted by the sanctions. The effects EU sanctions on automotive industry were seen in terms of a sharp drop in production in 2012-13. Iran reached a landmark deal in the form of JCPOA to end the era of sanctions. But the US under Trump administration pulled out of the historic deal and, and re-imposed sanction. The resumption of sanctions by the US has dealt a 'hammer blow' to Iran's automotive industry[85], which was recuperating from the effect of 2012 sanctions.

Automobile production in Iran reached an impressive figure of 1.5 million in 2017; the figure was 18 per cent higher than the previous year figures. The rise in the production

[84] Trend, "Iran's Private Sector to Suffer Most from Car Import Ban – Iran Auto Importers Association", *Azernews*, 27 June 2018, [Online: web] Accessed 13 November 2018, URL: https://www.azernews.az/region/133987.html.

[85] Gibbs, Nick (2018), "Cracking under Sanctions", *Automotive Logistics*, 20 August 2018, [Online: web] Accessed 15 November 2018, URL: https://www.automotivelogistics.media/21366.article.

was due to the fact that automakers like Peugeot and Citroën returned back to Iran following an international agreement which was designed to relax sanctions. Peugeot and Citroën took the risk to return because an agreement was already reached and an appeal of the largely untapped market made the risk appear sensible.

Donald Trump through Executive Order 13846 of August 6, 2018, has targeted the petroleum and automotive sector. According to the document, on or after August 7, 2018, sale, supply, or transfer to Iran of significant goods or services used in connection with the automotive sector of Iran is prohibited.[86]

The provision of the Executive Order is applicable to foreign firms as well. Since it was the US that withdrew from JCPOA taking a decision unilaterally, therefore, companies with no presence in the US market could, technically, continue business with Iran. French automakers, Peugeot, Renault and Citroën have not significant business operations in the US. On top that EU backed the deal, and was determined to salvage European companies trading with Iran.[87] However, the future prospect in the US market weighs more than the current business in Iran. And moreover, the US because of its disproportionate control over international finance, could easily target the companies doing business with Iran. Therefore, Renault, Citroën and Peugeot did not take chance and pulled out of the Iranian market immediately, after the re-imposition of sanctions. PSA has written off the $170 million financings in its new joint venture with SAIPA.[88]

Similarly, other foreign automakers like Daimler-Benz and Swedish truck manufacturer Scania has cancelled all orders and ceased their Iranian operations. On the other hand, because of the ban on auto import, there is nit business to chase by other multinational firms.[89]

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[86] Executive Order 13846, "Reimposing Certain Sanctions With Respect to Iran", *Federal Register*, 6 August 2018, 83: 152.

[87] Gibbs, Nick (2018), "Cracking under Sanctions", *Automotive Logistics*, 20 August 2018, [Online: web] Accessed November 15, 2018, URL: https://www.automotivelogistics.media/21366.article

[88] *Ibid*.

[89] *Ibid*.

Sanctions have not only impacted the automobile industry, but also the automotive parts industry as well. The Executive Order has defined 'automotive industry of Iran' as:[90]

> Manufacturing or assembling in Iran of light and heavy vehicles including passenger cars, trucks, buses, minibuses, pick-up trucks, and motorcycles as well as original equipment manufacturing and after-market manufacturing relating to such vehicles.

In the fiscal year that ended in March 2019, Iranian auto parts makers racked up losses of more than $791 million. The cost of raw materials after the imposition of sanctions went up by 250 per cent.[91]

### 5.9 The Resilience of Iran's Automobile Industry

The current situation of Iran's automobile portrays a scenario, where everything appears to be over. There is no hope left for the revival of the industry, and with further tightening of the sanctions, the industry would totally collapse. The news coming out of various media outlets including Iranian media confirms the present apprehensions.

*Financial Tribune* a business newspaper of Iran covers the news of automotive industry extensively. According to a news report of May 18, 2019, in *Financial Tribune*, IKCO and SAIPA are struggling to sustain their business and are unable to meet the overdue orders of customers. The sanctions have caused a sharp decline in production, and a backlog of car orders which the companies have presold are piling up.[92] In another news report in the same paper, the sharp decline in annual car production is reported. In the fiscal year ended in March 2019, total vehicle production declined by 37.8 per cent to 955,923 vehicles, which include commercial vehicles and cars.[93] Iran automobile output experienced the sharpest decline in 18 years. Iranian automakers made 1.34 million automobiles in 2018, which is 40 per cent below than the previous year. In terms of absolute numbers, Iran has made more

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[90] Executive Order 13846, "Reimposing Certain Sanctions With Respect to Iran", *Federal Register*, 6 August 2018, 83(152).

[91] "Iranian Parts Makers Lose $791 Million", *Financial Tribune*, 10 April 2019, [Online: web] Accessed 14 April 2019, URL: https://financialtribune.com/articles/auto/97387/iranian-parts-makers-lose-791-million.

[92] "Iranian Carmakers' Woes Deepen", *Financial Tribune*, 18 May 2019, [Online: web] Accessed 25 May 2019, URL: https://financialtribune.com/articles/auto/98033/iranian-carmakers-woes-deepen.

[93] "Iran Annual Auto Output Report: 2018-19", *Financial Tribune*, 29 April 2019, [Online: web] Accessed 14 May 2019, URL: https://financialtribune.com/articles/auto/97664/iran-annual-auto-output-report-2018-19.

vehicles in 2018 than in 2012. However, in 2012, the decline was registered at 39 per cent compared to 40 per cent in 2018.[94]

Reports like this are disheartening, but it does not diminish the importance of the automobile industry. The very fact that in the new Executive Order, the automotive industry is targeted along with petroleum industry highlights the importance of the automobile industry. It is already the second largest employer in the country and contributes 2.5-4 per cent of GDP. Iran's automobile industry has a long history of bouncing back, and that too in a very short period of time. The resilience of Iran's automotive industry can be gauged by the fact that in 2013 following the EU sanctions, Iran's total vehicle production dropped to 743,680 units. It was a sharp decline of 25.6 per cent. However, in 2014, Iran bounced back and production climbed by astonishing 46.7 per cent to 1,090,846 vehicles. In just one year time Iran regained its production.[95] Iran's total vehicle production was 80,000 units in 1997, in 2006, achieved yearly production of 817,200 units. This implies that Iran's annual production grew at 33 per cent per annum.[96]

Iran's automobile industry particularly IKCO workers in recent years have become fairly familiar with modern management techniques, such as lean production. IKCO managers are also acquainted with neo-liberal ideology and support deregulation of the industry.[97]

They also invest in advanced techniques in automation at their designated research centres, which are run in collaboration with Iranian and European engineering departments.[98] Workers at IKCO get themselves acquainted with Japanese techniques of quality control because as discussed above Iran is infamous for its bad quality cars. Beside this management is keen to automate and systemise production line. Hazardous work of paint shop has already been automated by IKCO.[99]

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94 "Iran Auto Output Suffers Sharpest Decline in 18 Years", *Financial Tribune*, 8 April 2019, [Online: web] Accessed 5 May 2019, URL: https://financialtribune.com/articles/auto/97349/iran-auto-output-suffers-sharpest-decline-in-18-years.

95 Refer to the table in the same chapter.

96 Abedini, Javad, and Nicolas Péridy (2009), "The Emergence of Iran in the World Car Industry: An Estimation of Its Export Potential", *World Economy*, 32(5): 790-818.

97 Mather, David, Yassamine Mather, and Majid Tamjidi (2007), "Making Cars in Iran: Working for Iran Khodro", *Critique*35, 1: 9-21.

98 *Ibid*.

99 *Ibid*.

Operating independently of the rest of the world is not new for the country, Iran is used to this. While Renault and Peugeot made the headlines when they pulled out of the country, the majority of vehicles are made by local firms with high localised content.[100] For example, the best-selling car SAIPA Pride is based on discontinued KIA Pride. Similarly, best-selling cars of IKCO, Peugeot 206, 405 and Pars bear Peugeot logo. However, Peugeot's exit from Iran does not imply that these cars would be discontinued. These vehicles are manufactured from nearly 100 per cent local content, and Peugeot involvement is merely to claim licence fees.[101] Peugeot and Renault exit would not hamper much the production of old automobiles.

Iran was anticipating the re-imposition of the sanctions and was preparing for it. IKCO realised that sanctions would lead termination of the contract with Renault to make Tondar 90. IKCO persuaded its dealers to push the Chinese automaker's Dongfeng H30 Cross instead of Renault. In fact, withdrawals by European carmakers push Iranian automakers to engage with Chinese counterparts in an attempt to lessen the impact of the crisis. The vacuum created by the withdrawal of European automakers accentuates the role of Chinese automakers the Iranian automobile industry.[102]

The signs of Chinese making strong inroads into the Iranian market are already visible. Chinese automobile brands Chery, Brilliance and Dongfeng are among the best-selling cars. Chery was the fifth best-selling brand which was locally constructed. After the re-imposition of sanctions, China accounts for 50 per cent of automotive parts imports into the country. Chinese have around 8-10 per cent market share and expected to grow steadily.[103]

As perceived by many, Iranian automakers are not merely marketing companies. Iranian automakers are responsible for the assembling, designing of parts, and after-sales service. IKCO and SAIPA have one of the most unique CKD operations, where the role of

[100] Gibbs, Nick (2018), "Cracking under Sanctions", *Automotive Logistics*, 20 August 2018, Accessed 15 November 2018, URL: https://www.automotivelogistics.media/21366.article.
[101] *Ibid*.
[102] *Ibid*.
[103] *Ibid*.

overseas automakers supplying kits seems marginal. The supply chain of Iran's major automakers SAIPA and IKCO is complex and fairly developed.[104]

Lastly, despite the inefficiencies and poor quality of vehicles manufactured by Iranian automakers, they are catering to the country in time of need. They are ensuring that Iran keeps on moving. No matter in whatever shape is the automobile industry of Iran, they are serving the economy and preventing the economy from collapsing or going into chaos. Even after four decades of sanctions if a country is surviving, then its automobile industry shares credit for it.

The study did not come across any data about the backward linkages expressing consumption of steel and other items in Iran's automobile industry. However, analysing the trend of the automobile industry of Iran, it is reasonable to believe that basic industries and different tier of suppliers must have benefitted from Iran's automobile industry.

On the other hand, there is no reason to believe that Iran's service sector especially the tourism industry did not benefit from Iran's automobile industry. However, as mentioned earlier, it is difficult to deduce the contributions numerically for forward linkages because of the complexities involved in it. Iran's booming tourism industry is a testimony of contribution of Iran's automobile industry. Iran's tourism industry grew by 1.9 per cent to reach 6.5 per cent of GDP.[105]

## 5.10 Conclusion

Automobile manufacturing is one of the biggest industry globally. In developed nations, the industry contributes 10 per cent of GDP, and often it is among the largest employer. Automobile from mere an assembling exercise has come a long way to establish itself has one of the most fundamental industries. This is partly due to strong backward and forward linkages of the automobile industry. It ensures a robust core industry like steel, petrochemical, and electricity. On the forward linkages, a huge network of vehicles ensures better highways, augment tourism, and expand retail services. A good highway system

[104] *Ibid*.

[105] "Iran Tourism Grows 1.9% to Account for 6.5% of GDP", *Financial Tribune*, 23 June 2019, [Online: web] Accessed 27 June 2019, URL: https://financialtribune.com/articles/domestic-economy/98599/iran-tourism-grows-19-to-account-for-65-of-gdp.

ensures connectivity, and traders do not need to stock goods needlessly. They can order the goods just-in-time that would reduce the working capital for the traders.

The automobile industry of Iran is dynamic and resilient, despite sanctions targeting the industry. Though the industry's performance is not as per the established global standards, it is making an attempt to set the standards. The management of automobile companies are well aware of new techniques, and managerial skills and they are open to change as well, but sanctions and Iran's government policy are acting as a dampener. Nevertheless, the contribution of Iran's automobile industry in nation-building cannot be denied.

# CHAPTER VI

# CONCLUSION

Diversification is a challenging task to execute. At the outset, the problem begins with the theorisation of economic diversification. There is no cohesive theory of diversification like many economic and international trade theory. In fact, the discourse on diversification gains momentum because of the ills of specialisation. The specialisation is advocated by the theory of comparative advantage, which stipulates that a country should produce what it is best at. The theory, therefore, advocates for the trade and specifies that trade is mutually beneficial for every party involved in it. The underlying assumption of the theory is that a country cannot produce everything; therefore, it should focus on the products which it can produce at low relative cost. The theory rests on the reasoning that there are limited resources that should be used in a competitive way. An economy should produce what it is endowed with. A labour intensive country should produce labour-intensive goods and similarly, a capital intensive country should focus on capital intensive goods.

However, there is a problem, some commodities like minerals and oil are only found at a certain geographical location, or some agricultural produce, for instance, tropical fruits and spices could only be grown in a tropical climate. Therefore, the exclusiveness of the commodity or agricultural produce would render the concept of relative cost futile. For instance, in a cold and temperate region, any tropical fruit and spices could not be grown, as a result, the relative cost of growing tropical fruits in the region could not be determined because the region is not conducive for the tropical crops. The case thus demonstrates the limitations of the theory of comparative advantage. The theory does not consider technology and innovation and maintains that a country should produce what it is good at. As a result, the theory cannot explain the rise of East Asian economies, where it transformed itself from a producer of primary commodities to manufacturing hub. Another problem that the theory could not explain convincingly is the preference of consumers. It was found that a capital intensive country has a preference for capital intensive goods, contrary to the notion of the theory of comparative advantage. According to the theory, the difference in resource endowment is the basis of trade, which to some extent is not substantiated by the studies. The

US is one of the most capital intensive countries in the world, at the same time, the US is among the biggest importer of capital intensive goods, and exports labour-intensive goods. The empirical phenomenon is not explained appropriately by the theory. The shortcoming of the theory does not diminish the importance of the theory; however, it started the debate on alternative approaches like diversification.

Diversification is often put against the theory of comparative advantage because of theory advocates for the specialisation. However, the two are not totally mutually exclusive. It is not that country is specialised in one or basket of product and continue to produce so, neither it is advisable that the country manufactures everything itself. There is no unified theory of diversification, but it could be best understood as moving the economy away from dependence on the export of primary commodities. Prices of primary commodities are very volatile and the country economy suffers in case of volatilities. Whereas, manufactured goods are relatively stable than primary commodities, therefore, the economy is insulated from the volatilities.

Diversification is also perceived as producing a wide variety of goods. There is nothing wrong in this idea of diversification, however, it does not guarantee the protection against the unpredictability. For instance, country exporting oil diversifies its export to mineral ores, here the nature of good remained the same that is, the country is still producing a primary commodity. The country would still be vulnerable to price instability because the country diversified horizontally. Therefore, the main objective of diversification is moving up the value chain, that diversifying vertically. Moving up the value chain requires complex technology and knowledge creation. Therefore, trained and educated human capital is the most important prerequisite for diversification.

Diversification should be conceived in a holistic way. It cannot be reduced to establishing manufacturing units. Manufacturing is an indispensable part of diversification, however, diversification is not only about manufacturing. Manufacturing implies moving up the value chain using complex knowledge. Manufacturing is the reflection of the knowledge production of a country. Therefore diversification is not only protecting against the volatilities, but it also ensures the development of human capital. Diversification is a subset of economic development, thus the larger goal of diversification is to maintain stable growth

over a longer period of time, with a steady rise in per capita income. The steady growth over a longer period of time implies insulation from the uncertainties of primary commodities. The objectives of diversification are manifold, as the development of human capital, achieving economy of scale, and diversifying export basket.

There are various means to evaluate the diversification of an economy; however, a largely accepted way is to assess the contribution of manufacturing in the GDP. It gives a comprehensive picture of the county's diversification effort. Apart from this export concentration of a country is also studied for the better and deep understanding of the diversification of an economy.

Oil is among the most volatile commodities in the world. Oil prices fluctuate more than any other commodity. Therefore, oil price fluctuations have an immediate effect on the GDP of the countries which are tremendously dependent on oil for its revenue. The oil industry is in a declining phase throughout the globe, thus diversifying away from the oil economy has become more important than any other point of history. Globally, international oil companies are cutting on their capital expenditure related to exploration and production, further decarbonisation of the economy is affecting the oil industry. Agreements related to climate change and global warming are focused on renewable energy with an objective of cutting down global demand of hydrocarbons especially coal and oil.

Iran is primarily an oil exporting country, affected by the volatility of the international price of oil. Iran's overwhelming dependence on oil makes Iran more vulnerable to oil price instability. Apart from a global trend that is going against the oil industry, Iran has some intrinsic problem with its oil industry. Iran oil revenue is more volatile than other Gulf countries oil revenue. The volatility in oil prices severely affects the GDP of Iran which in turn affects the exchange rate and other macroeconomic indicators. Iran energy subsidy programme is among the largest in the world; as a result of this domestic consumption is increasing leaving less oil for the export. In recent years Iran has rationalised its subsidy programme, still, its insufficient and subsidy in Iran induce wastage. Another predicament with regards to the oil industry is that Iran's constitution prohibits foreign ownership in the oil industry. Iran's constitution which is written after the 1979 Revolution is

apprehensive of foreign influence in the country; as a result, the Iranian constitution prohibits foreign ownership in the oil industry.

Apart from the domestic factor, Iran's oil revenue is greatly affected by the external environment. Iran and Saudi Arabia do not share a cordial relationship, and Saudi Arabia is the biggest producer of crude in the region, with the largest spare capacity in the world. There are instances when Saudi Arabia has flooded the market with cheap oil, devastating Iran's economy. Besides, not so cordial relationship with Saudi Arabia, Iran has another problem that is international sanctions.

Sanctions are imposed on Iran since 1979, primarily targeting Iran's oil industry, the backbone of the Iranian economy. International sanctions are mainly imposed by the US, occasionally endorsed by the European Union and the United Nations Security Council. More than any other factor, sanctions have the greatest effect on Iran's oil industry. Sanctions not only prohibit the sale of Iranian oil in the international market, but it also prohibits any investment and technology transfer in Iran's oil industry. Iran employs various means to circumvent the sanctions, but the sanctions have greatly reduced the output of oil and made oil sales increasingly difficult.

Amidst Iran's unfriendly relationship with Saudi Arabia and one of the toughest sanctions ever imposed on Iran targeting its oil industry, it is imperative for Iran to diversify away from oil. However, diversification in resource-rich countries is quite a challenging task. There are certain conditions which are considered a prerequisite for successful diversification programme. Macroeconomic stability and successful privatisation programme are among a few preconditions for successful diversification programme.

Macroeconomic indicators in the case of Iran do not appear to be stable. The exchange rate is very volatile experiencing big swings, which affects the investment in Iran. Secondly, there is no consistency in the GDP growth, subject to external conditions and oil prices GDP fluctuates greatly. High inflation is compounded by the high unemployment rate does not provide an ideal ground for diversification. Apart from unstable macroeconomic indicators, Iran's privatisation programme is criticised as pseudo-privatisation. In the name of privatisation, most of the state-owned enterprises are transferred to parastatal organisations

run by Iranian Revolutionary Guard Crops. The privatisation programme of Iran is criticised on the ground that regime obtains the loyalty of the IRGC and other post-revolution organisation by transferring them the state-owned enterprises in the name of privatisation. Iran privatisation programme may appear counterintuitive when compared to the conventional privatisation scheme. However, in the case of Iran absence of national capitalist class, and extreme external conditions made this arrangement of privatisation reasonable. To circumvent the sanctions there is a need for a large organisation which can dodge the provision of sanctions. The parastatal organisations are close to the government, therefore, enjoy government patronage, which helps them to bypass the provisions of the sanctions. Parastatal organisations do not stunt the growth of private economic agent, in fact, in the case of Iran where there are not large private players; parastatals outsource their 70 per cent work to private players.

Parastatals are the backbone of the Iranian economy; they control the production of major industrial units including steel, cement, petrochemicals, and automobiles. Iran in recent decades has remarkably improved its industrial output. Iran in 2018 became the world's tenth largest steel manufacturer; Iran is the largest cement manufacturer in the region. Iran has become the net exporter of steel. Petrochemical products act as a raw material for various industries is considered as a complex product, which implies that a great deal of knowledge is needed for the petrochemical products. Iran is producing various complex petrochemical products. Similarly, Iran is manufacturing advance machines; Iran is among the few countries which can manufacture a hybrid gas turbine. Iran is the biggest producer of electricity in the region and the net exporter. Among other complex products, Iran manufactures automobiles.

Iran is the biggest automobile manufacturer in the Gulf region. The automobile is one of the most complex products and highly knowledge-intensive product. It has great backward and forward linkages. A great deal of value is added in the production of the automobile. A vibrant automobile industry ensures vibrant ancillary industry like steel, petrochemical, textile and tyre industry. It uses input from various sectors. On the other hand, the automobile has forward linkages where it serves the service sectors like tourism and retail.

An automobile is critical for the success of any business. Automobiles literally run the wheel of the economy.

Iran has made much advancement in the automobile industry. Iran is among the biggest producers in the region. Iran's reached an impressive milestone of 1.649 million vehicles in 2011. However, the effects of the sanctions are seen immediately on this industry. Iran's automobile industry performance is correlated with the intensity of the sanctions. The 1.649 million vehicles which Iran produced in 2011, dropped to one million in 2012. It was in 2012, the European Union endorsed the American version of sanctions.

A similar effect was seen when the US reimposed the sanctions in 2018. After the JCPOA agreement in 2015, Iran's automobile production climbed up in 2016 and 2017. However, the renewed sanctions of 2018 had an immediate effect on Iran's automobile industry. The renewed sanctions categorically targeted the automotive industry of Iran. In 2018, Iran's automobile production plunged by more than 40 per cent. The drop in production was due to Iran's dependence on foreign carmakers, especially European automakers for technical assistance. Interestingly, European carmakers mainly Peugeot and Renault have an insignificant business in the US; however, it is the risk of being cut off from the global financial system that forced the European automakers out of Iranian market. However, it is too early to write off Iran's automobile industry.

Iran's automobile industry is remarkably resilient. From the low of 743,680 units in 2013, Iran more than doubled its production of automobiles in 2017 to 1,515,396 units. It demonstrates the flexibility of the industry and ability to bounce back. The fact, that renewed sanctions have categorically targeted the automobile industry, speaks a lot about the significance of Iran's automobile industry in the Iranian economy. The sanctions have slowed down the production, but Iran's automobile industry is still functioning. Iran has indigenously developed which helps them operating despite the sanctions. IKCO and SAIPA, Iran's two major automakers have achieved a high level of localisation, and have engine manufacturing units. Besides this, the vacuum created by the withdrawal of European carmakers is making way for the Chinese automakers. Sales of Chinese automobiles rose after the renewed sanctions.

Analysing Iran's economy is a complex task, largely because of lack of data, and secondly, conventional assessment techniques emphasise too much on the figures and the facts, which could not be authenticated in the case of Iran. There is often a discrepancy between data of international institutions and Iranian institutions, this makes an assessment of Iran a complex task. Iran economy should be best viewed in a holistic way, which apart from figures considers the impact of domestic policies on human capital. It is proposed in this study that the policies of the Iranian government and Iran's disproportionate dependence on oil revenue are the reason for the inadequate level of Iran's economic diversification. It is well established by many studies that economic diversification is difficult in a resource-rich country. Moreover, in the case of Iran, government's ambiguous policy on privatisation and mismanagement of exchange rate reinforce the notion that government policies are responsible for the inadequate level of diversification. However, this is the very narrow understanding of the diversification and dynamism of Iran which give rise to this conclusion. Diversification is a dynamic process, and there is no such stage where it can be said with certainty that the task of diversification is over. There is always room for improvement. Though true to a large extent Iran has not achieved the desired level of diversification, and still largely dependent on oil revenues, but it is not enough to write off the achievements of the Iranian economy. Iran has greatly diversified its export basket, and the export concentration index score is improving. Iran has narrowed the gap between .between oil and non-oil export revenue. It is among the few OPEC countries achieving this feat. There is a question on policies of Iranian government; at first, it appears that the policies of the Iranian government are responsible for the inadequate level of diversification, but again the counterfactual argument would be, it is because of Iran's protectionist policies they survived the four decades of sanctions. Not only Iran survived the sanctions, but it also made remarkable achievement in the field of human capital and redistribution effort. Despite the four decades of sanctions, Iran has one of robust human capital in the region, with a low level of inequality, and universal healthcare. Economic diversification if assessed in a holistic way, considering it as a subset of the economic development programme, Iran has made progress in the field of economic diversification programme.

Similarly, in the area of automobiles, Iran has a fairly developed vertically integrated automobile industry, where Iran can make vehicles on its own. However, in terms of value

addition or quality Iranian automobiles could not compete with international companies. Iran is a voluminous producer, but in terms of efficiency and quality, it is still a long way to go. Iran is still at the lower end of the learning curve. The vertically integrated automobile industry is an adequate indicator of diversification. It is well established that any country with a well-developed vertically integrated automobile industry is fairly diversified. However as mentioned earlier diversification not only means producing a wide variety of goods, it also signifies moving up the value chain, constant innovation and manufacturing high-quality superior products. In this regard, the Iranian automobile industry could be classified as self-sufficient and fairly diversified, but the observation should be read with caution, as Iran's automobile industry still lags in quality and safety measures.

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# APPENDICES

# APPENDIX- I



**Summary**

**Merchandise: Product concentration and diversification indices of exports and imports, annual**

**Item:** Concentration Index

**Item code:** 6036

**Notes:**

**Concentration index:**

Concentration index, also named Herfindahl-Hirschmann Index (Product HHI), is a measure of the degree of product concentration. The following normalized HHI is used in order to obtain values between 0 and 1:

$$H_j = \frac{\sqrt{\sum_{i=1}^{n} \left(\frac{x_{ij}}{X_j}\right)^2} - \sqrt{1/n}}{1 - \sqrt{1/n}}$$

where

$H_j$ = country or country group index
$x_{ij}$ = value of export for country $j$ and product $i$

$$X_j = \sum_{i=1}^{n} x_{ij}$$

and
$n$ = number of products (SITC Revision 3 at 3-digit group level).

An index value closer to 1 indicates a country's exports or imports are highly concentrated on a few products. On the contrary, values closer to 0 reflect exports or imports are more homogeneously distributed among a series of products.

# APPENDIX- II

What is The Atlas of Economic Complexity?

The Atlas of Economic Complexity is a powerful data visualization tool that allows people to explore global trade flows across markets, track these dynamics over time and discover new growth opportunities for every country. The Atlas places the industrial capabilities and knowhow of a country at the heart of its growth prospects, where the diversity and complexity of existing capabilities heavily influence how growth happens.

Developed at Harvard's Center for International Development, The Atlas combines trade data with synthesized insights from CID's research in a way that is accessible and interactive. As a dynamic resource, the tool is continually evolving with new data and features to help answer questions such as:

- What does a country import and export?
- How has its trade evolved over time?
- What are the drivers of export growth?
- Which new industries are likely to emerge in a given geography? Which are likely to disappear?
- What are the GDP growth prospects of a given country in the next 5-10 years, based on its productive capabilities?

**Appendix- III**

**Iran Standard & Quality Inspection Co.**

**Ministry of Industry, Mine and Trade**
**Iran Standard and Quality Inspection Company**

# Domestically Manufactured Cars
# National Assessment Report

**Vehicle Engineering Inspection Department**

**From 23 July 2017 to 22 August 2017**

Total 100565 vehicles were produced in 23 July 2017 to 23 August 2017 that 99 percent of production size is light and remaining one percent is heavy vehicle. Vehicles produced in the country in that period including 49 models in light vehicle and 6 models in heavy vehicle categories, respectively.

## Light vehicle category:

### 1. Pick-up Sector

In pick-up sector, Tondar has the highest quality of domestically manufactured vehicles in this month by getting the 3 stars quality level.

### 2. Passenger car Sector

In passenger car sector, in price class 1, New Mazda3 and Suzuki Grand Vitara, in price class 2, Hyundai i20 and Kia Cerato, in price class 3 Hyundai i10, in price class 4, Renault Sandero, Automatic Tondar 90 plus, Automatic Tondar 90, Automatic Peugeot 207 and Pars Tondar, have the highest quality of domestically manufactured vehicles in this month by getting the 4 stars quality level.

**Table-light vehicle quality level(pick-up)**

**From 23 July 2017 to 22 August 2017**

| Category | Price class (million Rials) | Quality rating | Vehicle | Manufacturer | Quality level |
|---|---|---|---|---|---|
| Pick-up | Less than 500 | 1 | Tondar | Iran Khodro | ★★★☆☆ |
| | | 2 | Saipa 151 pick-up | Bonro | ★★☆☆☆ |
| | | 3 | Mazda-Kara 2000 single cab pick-up | Bahman Motor | ★☆☆☆☆ |
| | | 4 | Mazda-Kara 2000 double cab pick-up | Bahman Motor | ★☆☆☆☆ |
| | | 5 | single fuel Nissan pick-up | Zamyad | ★☆☆☆☆ |
| | | 6 | Arisan pick-up | Iran Khodro Diesel | ★☆☆☆☆ |
| | | 7 | dual fuel Nissan pick-up | Zamyad | ★☆☆☆☆ |

## Table- Quality level of light vehicles

**From 23 July 2017 to 22 August 2017**

| Category | Price class (million Rials) | Quality rating | Vehicle | Manufacturer | Quality level |
|---|---|---|---|---|---|
| Passenger Car | more than 1000 | 1 | New Mazda3 | Bahman Motor | ★★★★☆ |
| | | 2 | Suzuki Grand vitara | Iran Khodro Khorasan | ★★★★☆ |
| | 750-1000 | 1 | Hyundai i20 | Kerman Motor | ★★★★☆ |
| | | 2 | Kia Cerato | Saipa | ★★★★☆ |
| | | 3 | Tiggo5 | Modiran Khodro | ★★★☆☆ |
| | | 4 | Jac(S5) | Kerman Motor | ★★★☆☆ |
| | 500-750 | 1 | Hyundai i10 | Kerman Motor | ★★★★☆ |
| | | 2 | Arizo5 | Modiran Khodro | ★★★☆☆ |
| | | 3 | Jac(J5) | Kerman Motor | ★★★☆☆ |
| | | 4 | Brilliance H330 | Pars Khodro | ★★★☆☆ |
| | | 5 | Automatic Ario | Bonro | ★★☆☆☆ |
| | | 6 | MVM550 | Modiran Khodro | ★☆☆☆☆ |
| | | 7 | LifanX60 | Kerman Motor | ★☆☆☆☆ |
| | 250-500 | 1 | Renault Sandero | Pars Khodro | ★★★★☆ |
| | | 2 | Automatic tondar 90 plus | Iran Khodro | ★★★★☆ |
| | | 3 | Automatic tondar 90 | Iran Khodro | ★★★★☆ |
| | | 4 | Automatic Peugeot 207 | Iran Khodro | ★★★★☆ |
| | | 5 | Pars Tondar | Pars Khodro | ★★★★☆ |
| | | 6 | Tondar 90 Iran khodro | Iran Khodro | ★★★☆☆ |
| | | 7 | Tondar 90 Pars khodro | Pars Khodro | ★★★☆☆ |
| | | 8 | Ario | Bonro | ★★★☆☆ |
| | | 9 | Rana | Iran Khodro | ★★★☆☆ |
| | | 10 | Dena Plus | Iran Khodro | ★★★☆☆ |
| | | 11 | Peugeot 206 SD | Iran Khodro | ★★★☆☆ |
| | | 12 | Peugeot 206 | Iran Khodro | ★★★☆☆ |
| | | 13 | New MVM315 | Modiran Khodro | ★★☆☆☆ |
| | | 14 | Dena | Iran Khodro | ★★☆☆☆ |
| | | 15 | Dongfeng H30 | Iran Khodro | ★★☆☆☆ |
| | | 16 | Samand Soren | Iran Khodro Tabriz | ★★☆☆☆ |
| | | 17 | Samand Tabriz | Iran Khodro Tabriz | ★☆☆☆☆ |
| | | 18 | Peugeot 405 Khorasan | Iran Khodro Khorasan | ★☆☆☆☆ |
| | | 19 | Peugeot Pars Tehran | Iran Khodro | ★☆☆☆☆ |
| | | 20 | Peugeot Pars Mazandaran | Iran Khodro Mazandaran | ★☆☆☆☆ |
| | | 21 | Peugeot Pars Fars | Iran Khodro Fars | ★☆☆☆☆ |
| | | 22 | Saina | Saipa Kashan | ★☆☆☆☆ |
| | | 23 | Tiba2 | Saipa | ★☆☆☆☆ |
| | | 24 | Tiba | Saipa Kashan | ★☆☆☆☆ |
| | | 25 | MVM 110S | Modiran Khodro | ★☆☆☆☆ |
| | less than 250 | 1 | Saipa X111 | Saipa Kashan | ★☆☆☆☆ |
| | | 2 | Saipa X132 | Saipa | ★☆☆☆☆ |
| | | 3 | Saipa X131 | Saipa | ★☆☆☆☆ |
| | | 4 | Saipa X131 Pars khodro | Pars Khodro | ★☆☆☆☆ |

# Table- Quality level of light vehicles

**From 23 July 2017 to 22 August 2017**

| Category | Price class (million Rials) | Quality rating | Vehicle | Manufacturer | National Audit | | |
|---|---|---|---|---|---|---|---|
| | | | | | July 2017 | August 2017 | Qualitative Variation |
| | | | | | Quality level | Quality level | |
| Passenger Car | more than 1000 | 1 | New Mazda3 | Bahman Motor | ★★★★☆ | ★★★★☆ | - |
| | | 2 | Suzuki Grand vitara | Iran Khodro Khorasan | ★★★★☆ | ★★★★☆ | - |
| | 750-1000 | 1 | Hyundai i20 | Kerman Motor | ★★★★☆ | ★★★★☆ | - |
| | | 2 | Kia Cerato | Saipa | ★★★★☆ | ★★★★☆ | - |
| | | 3 | Tiggo5 | Modiran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 4 | Jac(S5) | Kerman Motor | ★★★☆☆ | ★★★☆☆ | - |
| | 500-750 | 1 | Hyundai i10 | Kerman Motor | ★★★★☆ | ★★★★☆ | - |
| | | 2 | Arizo5 | Modiran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 3 | Jac(J5) | Kerman Motor | ★★★☆☆ | ★★★☆☆ | - |
| | | 4 | Brilliance H330 | Pars Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 5 | Automatic Ario | Bonro | ★★☆☆☆ | ★★☆☆☆ | - |
| | | 6 | MVM550 | Modiran Khodro | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 7 | LifanX60 | Kerman Motor | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | 250-500 | 1 | Renault Sandero | Pars Khodro | ★★★★☆ | ★★★★☆ | - |
| | | 2 | Automatic tondar 90 plus | Iran Khodro | ★★★★☆ | ★★★★☆ | - |
| | | 3 | Automatic tondar 90 | Iran Khodro | ★★★★☆ | ★★★★☆ | - |
| | | 4 | Automatic Peugeot 207 | Iran Khodro | ★★★★☆ | ★★★★☆ | - |
| | | 5 | Pars Tondar | Pars Khodro | ★★★★☆ | ★★★★☆ | - |
| | | 6 | Tondar 90 Iran khodro | Iran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 7 | Tondar 90 Pars khodro | Pars Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 8 | Ario | Bonro | ★★★☆☆ | ★★★☆☆ | - |
| | | 9 | Rana | Iran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 10 | Dena Plus | Iran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 11 | Peugeot 206 SD | Iran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 12 | Peugeot 206 | Iran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 13 | New MVM315 | Modiran Khodro | ★★☆☆☆ | ★★☆☆☆ | - |
| | | 14 | Dena | Iran Khodro | ★★☆☆☆ | ★★☆☆☆ | - |
| | | 15 | Dongfeng H30 | Iran Khodro | ★★☆☆☆ | ★★☆☆☆ | - |
| | | 16 | Samand Soren | Iran Khodro Tabriz | ★★☆☆☆ | ★★☆☆☆ | - |
| | | 17 | Samand Tabriz | Iran Khodro Tabriz | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 18 | Peugeot 405 Khorasan | Iran Khodro Khorasan | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 19 | Peugeot Pars Tehran | Iran Khodro | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 20 | Peugeot Pars Mazandaran | Iran Khodro Mazandaran | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 21 | Peugeot Pars Fars | Iran Khodro Fars | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 22 | Saina | Saipa Kashan | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 23 | Tiba2 | Saipa | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 24 | Tiba | Saipa Kashan | ★★☆☆☆ | ★☆☆☆☆ | ▼★ |
| | | 25 | MVM 110S | Modiran Khodro | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | less than 250 | 1 | Saipa X111 | Saipa Kashan | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 2 | Saipa X132 | Saipa | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 3 | Saipa X131 | Saipa | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 4 | Saipa X131 Pars khodro | Pars Khodro | ★☆☆☆☆ | ★☆☆☆☆ | - |
| Pick-up | less than 500 | 1 | Tondar | Iran Khodro | ★★★☆☆ | ★★★☆☆ | - |
| | | 2 | Saipa 151 pick-up | Bonro | ★☆☆☆☆ | ★★☆☆☆ | ▲★ |
| | | 3 | Mazda-Kara 2000 single cab pick-up | Bahman Motor | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 4 | Mazda-Kara 2000 double cab pick-up | Bahman Motor | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 5 | single fuel Nissan pick-up | Zamyad | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 6 | Arisan pick-up | Iran Khodro Diesel | ★☆☆☆☆ | ★☆☆☆☆ | - |
| | | 7 | dual fuel Nissan pick-up | Zamyad | ★☆☆☆☆ | ★☆☆☆☆ | - |

## Heavy vehicle category:

### 1. Truck Sector

In this sector, Volvo FH500, Scania G410 have the highest quality of domestically manufactured vehicles in this month by getting the 4 stars quality level.

### 2. Bus Sector

In this sector, Scania Maral 4212 is the sole manufactured vehicle.

**Table-heavy vehicle quality level**

**From 23 July 2017 to 22 August 2017**

| Category | Quality rating | Vehicle | Manufacturer | Quality level |
|---|---|---|---|---|
| Bus | 1 | Scania Maral 4212 | Oghab Afshan | ★★☆☆☆ |
| Light truck | 1 | ISUZU NPR75K | Bahman Diesel | ★★★☆☆ |
| | 2 | FAW | Siba Motor | ★★☆☆☆ |
| Truck | 1 | ISUZU NPR75M | Bahman Diesel | ★★★☆☆ |
| trailer | 1 | Volvo FH500 | Saipa Diesel | ★★★★☆ |
| | 2 | Scania G410 | Mammoth Diesel | ★★★★☆ |

## Table- Quality level of light vehicles

**From 23 July 2017 to 22 August 2017**

| Category | Quality rating | Vehicle | Manufacturer | National Audit | | |
|---|---|---|---|---|---|---|
| | | | | July 2017 | August 2017 | Qualitative Variation |
| | | | | Quality level | Quality level | |
| Bus | 1 | Scania Maral 4212 | Oghab Afshan | ★★☆☆☆ | ★★☆☆☆ | - |
| Light truck | 1 | ISUZU NPR75K | Bahman Diesel | ★★★☆☆ | ★★★☆☆ | - |
| | 2 | FAW | Siba Motor | ★★☆☆☆ | ★★☆☆☆ | - |
| Truck | 1 | ISUZU NPR75M | Bahman Diesel | ★★★☆☆ | ★★★☆☆ | - |
| trailer | 1 | Volvo FH500 | Saipa Diesel | ★★★★☆ | ★★★★☆ | - |
| | 2 | Scania G410 | Mammoth Diesel | ★★★★☆ | ★★★★☆ | - |
| Pick-up | | | | | | |

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# Presidential Documents

## Title 3—
## The President

## Executive Order 13846 of August 6, 2018

## Reimposing Certain Sanctions With Respect to Iran

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the International Emergency Economic Powers Act (50 U.S.C. 1701 *et seq.*) (IEEPA), the National Emergencies Act (50 U.S.C. 1601 *et seq.*) (NEA), the Iran Sanctions Act of 1996 (Public Law 104–172) (50 U.S.C. 1701 note), as amended (ISA), the Comprehensive Iran Sanctions, Accountability, and Divestment Act of 2010 (Public Law 111–195) (22 U.S.C. 8501 *et seq.*), as amended (CISADA), the Iran Threat Reduction and Syria Human Rights Act of 2012 (Public Law 112–158) (TRA), the Iran Freedom and Counter-Proliferation Act of 2012 (subtitle D of title XII of Public Law 112–239) (22 U.S.C. 8801 *et seq.*) (IFCA), section 212(f) of the Immigration and Nationality Act of 1952 (8 U.S.C. 1182(f)), and section 301 of title 3, United States Code, in order to take additional steps with respect to the national emergency declared in Executive Order 12957 of March 15, 1995,

I, DONALD J. TRUMP, President of the United States of America, in light of my decision on May 8, 2018, to cease the participation of the United States in the Joint Comprehensive Plan of Action of July 14, 2015 (JCPOA), and to re-impose all sanctions lifted or waived in connection with the JCPOA as expeditiously as possible and in no case later than 180 days from May 8, 2018, as outlined in the National Security Presidential Memorandum–11 of May 8, 2018 (Ceasing United States Participation in the Joint Comprehensive Plan of Action and Taking Additional Action to Counter Iran's Malign Influence and Deny Iran All Paths to a Nuclear Weapon), and to advance the goal of applying financial pressure on the Iranian regime in pursuit of a comprehensive and lasting solution to the full range of the threats posed by Iran, including Iran's proliferation and development of missiles and other asymmetric and conventional weapons capabilities, its network and campaign of regional aggression, its support for terrorist groups, and the malign activities of the Islamic Revolutionary Guard Corps and its surrogates, hereby order as follows:

**Section 1**. *Blocking Sanctions Relating to Support for the Government of Iran's Purchase or Acquisition of U.S. Bank Notes or Precious Metals; Certain Iranian Persons; and Iran's Energy, Shipping, and Shipbuilding Sectors and Port Operators.* (a) The Secretary of the Treasury, in consultation with the Secretary of State, is hereby authorized to impose on a person the measures described in subsection (b) of this section upon determining that:

(i) on or after August 7, 2018, the person has materially assisted, sponsored, or provided financial, material, or technological support for, or goods or services in support of, the purchase or acquisition of U.S. bank notes or precious metals by the Government of Iran;

(ii) on or after November 5, 2018, the person has materially assisted, sponsored, or provided financial, material, or technological support for, or goods or services in support of, the National Iranian Oil Company (NIOC), Naftiran Intertrade Company (NICO), or the Central Bank of Iran;

(iii) on or after November 5, 2018, the person has materially assisted, sponsored, or provided financial, material, or technological support for, or goods or services to or in support of:

(A) any Iranian person included on the list of Specially Designated Nationals and Blocked Persons maintained by the Office of Foreign Assets

Control (SDN List) (other than an Iranian depository institution whose property and interests in property are blocked solely pursuant to Executive Order 13599 of February 5, 2012); or

(B) any other person included on the SDN List whose property and interests in property are blocked pursuant to subsection (a) of this section or Executive Order 13599 (other than an Iranian depository institution whose property and interests in property are blocked solely pursuant to Executive Order 13599); or

(iv) pursuant to authority delegated by the President and in accordance with the terms of such delegation, sanctions shall be imposed on such person pursuant to section 1244(c)(1)(A) of IFCA because the person:

(A) is part of the energy, shipping, or shipbuilding sectors of Iran;

(B) operates a port in Iran; or

(C) knowingly provides significant financial, material, technological, or other support to, or goods or services in support of any activity or transaction on behalf of a person determined under section 1244(c)(2)(A) of IFCA to be a part of the energy, shipping, or shipbuilding sectors of Iran; a person determined under section 1244(c)(2)(B) of IFCA to operate a port in Iran; or an Iranian person included on the SDN List (other than a person described in section 1244(c)(3) of IFCA).

(b) With respect to any person determined by the Secretary of the Treasury in accordance with this section to meet any of the criteria set forth in subsections (a)(i)–(a)(iv) of this section, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of such person are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in.

(c) The prohibitions in subsection (b) of this section apply except to the extent provided by statutes, or in regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order or, where specifically provided, the effective date of the prohibition.

**Sec. 2**. *Correspondent and Payable-Through Account Sanctions Relating to Iran's Automotive Sector; Certain Iranian Persons; and Trade in Iranian Petroleum, Petroleum Products, and Petrochemical Products.* (a) The Secretary of the Treasury, in consultation with the Secretary of State, is hereby authorized to impose on a foreign financial institution the sanctions described in subsection (b) of this section upon determining that the foreign financial institution has knowingly conducted or facilitated any significant financial transaction:

(i) on or after August 7, 2018, for the sale, supply, or transfer to Iran of significant goods or services used in connection with the automotive sector of Iran;

(ii) on or after November 5, 2018, on behalf of any Iranian person included on the SDN List (other than an Iranian depository institution whose property and interests in property are blocked solely pursuant to Executive Order 13599) or any other person included on the SDN List whose property and interests in property are blocked pursuant to subsection 1(a) of this order or Executive Order 13599 (other than an Iranian depository institution whose property and interests in property are blocked solely pursuant to Executive Order 13599);

(iii) on or after November 5, 2018, with NIOC or NICO, except for a sale or provision to NIOC or NICO of the products described in section 5(a)(3)(A)(i) of ISA provided that the fair market value of such products is lower than the applicable dollar threshold specified in that provision;

(iv) on or after November 5, 2018, for the purchase, acquisition, sale, transport, or marketing of petroleum or petroleum products from Iran; or

(v) on or after November 5, 2018, for the purchase, acquisition, sale, transport, or marketing of petrochemical products from Iran.

(b) With respect to any foreign financial institution determined by the Secretary of the Treasury in accordance with this section to meet any of the criteria set forth in subsections (a)(i)–(a)(v) of this section, the Secretary of the Treasury may prohibit the opening, and prohibit or impose strict conditions on the maintaining, in the United States of a correspondent account or a payable-through account by such foreign financial institution.

(c) Subsections (a)(ii)–(a)(iv) of this section shall apply with respect to a significant financial transaction conducted or facilitated by a foreign financial institution for the purchase of petroleum or petroleum products from Iran only if:

(i) the President determines under subparagraphs (4)(B) and (C) of subsection 1245(d) of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112–81) (2012 NDAA) (22 U.S.C. 8513a) that there is a sufficient supply of petroleum and petroleum products from countries other than Iran to permit a significant reduction in the volume of petroleum and petroleum products purchased from Iran by or through foreign financial institutions; and

(ii) an exception under subparagraph 4(D) of subsection 1245(d) of the 2012 NDAA from the imposition of sanctions under paragraph (1) of that subsection does not apply.

(d) Subsection (a)(ii) of this section shall not apply with respect to a significant financial transaction conducted or facilitated by a foreign financial institution for the sale, supply, or transfer to or from Iran of natural gas only if the financial transaction is solely for trade between the country with primary jurisdiction over the foreign financial institution and Iran, and any funds owed to Iran as a result of such trade are credited to an account located in the country with primary jurisdiction over the foreign financial institution.

(e) Subsections (a)(ii)–(a)(v) of this section shall not apply with respect to any person for conducting or facilitating a transaction for the provision (including any sale) of agricultural commodities, food, medicine, or medical devices to Iran.

(f) The prohibitions in subsection (b) of this section apply except to the extent provided by statutes, or in regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order or, where specifically provided, the effective date of the prohibition.

**Sec. 3**. ''*Menu-based*'' *Sanctions Relating to Iran's Automotive Sector and Trade in Iranian Petroleum, Petroleum Products, and Petrochemical Products.* (a) The Secretary of State, in consultation with the Secretary of the Treasury, the Secretary of Commerce, the Secretary of Homeland Security, and the United States Trade Representative, and with the President of the Export-Import Bank, the Chairman of the Board of Governors of the Federal Reserve System, and other agencies and officials as appropriate, is hereby authorized to impose on a person any of the sanctions described in section 4 or 5 of this order upon determining that the person:

(i) on or after August 7, 2018, knowingly engaged in a significant transaction for the sale, supply, or transfer to Iran of significant goods or services used in connection with the automotive sector of Iran;

(ii) on or after November 5, 2018, knowingly engaged in a significant transaction for the purchase, acquisition, sale, transport, or marketing of petroleum or petroleum products from Iran;

(iii) on or after November 5, 2018, knowingly engaged in a significant transaction for the purchase, acquisition, sale, transport, or marketing of petrochemical products from Iran;

(iv) is a successor entity to a person determined by the Secretary of State in accordance with this section to meet any of the criteria set forth in subsections (a)(i)–(a)(iii) of this section;

(v) owns or controls a person determined by the Secretary of State in accordance with this section to meet any of the criteria set forth in subsections (a)(i)–(a)(iii) of this section, and had knowledge that the person engaged in the activities referred to in those subsections; or

(vi) is owned or controlled by, or under common ownership or control with, a person determined by the Secretary of State in accordance with this section to meet any of the criteria set forth in subsections (a)(i)–(a)(iii) of this section, and knowingly participated in the activities referred to in those subsections.

(b) Subsection (a)(ii) of this section shall apply with respect to a person only if:

(i) the President determines under subparagraphs (4)(B) and (C) of subsection 1245(d) of the 2012 NDAA that there is a sufficient supply of petroleum and petroleum products from countries other than Iran to permit a significant reduction in the volume of petroleum and petroleum products purchased from Iran by or through foreign financial institutions; and

(ii) an exception under subparagraph 4(D) of subsection 1245(d) of the 2012 NDAA from the imposition of sanctions under paragraph (1) of that subsection does not apply.

**Sec. 4**. *Agency Implementation Authorities for ''Menu-based'' Sanctions.* When the Secretary of State, in accordance with the terms of section 3 of this order, has determined that a person meets any of the criteria described in subsections (a)(i)–(a)(vi) of that section and has selected any of the sanctions set forth below to impose on that person, the heads of relevant agencies, in consultation with the Secretary of State, as appropriate, shall take the following actions where necessary to implement the sanctions imposed by the Secretary of State:

(a) the Board of Directors of the Export-Import Bank of the United States shall deny approval of the issuance of any guarantee, insurance, extension of credit, or participation in an extension of credit in connection with the export of any goods or services to the sanctioned person;

(b) agencies shall not issue any specific license or grant any other specific permission or authority under any statute or regulation that requires the prior review and approval of the United States Government as a condition for the export or reexport of goods or technology to the sanctioned person;

(c) with respect to a sanctioned person that is a financial institution:

(i) the Chairman of the Board of Governors of the Federal Reserve System and the President of the Federal Reserve Bank of New York shall take such actions as they deem appropriate, including denying designation, or terminating the continuation of any prior designation of, the sanctioned person as a primary dealer in United States Government debt instruments; or

(ii) agencies shall prevent the sanctioned person from serving as an agent of the United States Government or serving as a repository for United States Government funds;

(d) agencies shall not procure, or enter into a contract for the procurement of, any goods or services from the sanctioned person;

(e) the Secretary of State shall deny a visa to, and the Secretary of Homeland Security shall exclude from the United States, any alien that the Secretary of State determines is a corporate officer or principal of, or a shareholder with a controlling interest in, a sanctioned person; or

(f) the heads of the relevant agencies, as appropriate, shall impose on the principal executive officer or officers, or persons performing similar functions and with similar authorities, of a sanctioned person the sanctions described in subsections (a)–(e) of this section, as selected by the Secretary of State.

(g) The prohibitions in subsections (a)–(f) of this section apply except to the extent provided by statutes, or in regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order or, where specifically provided, the effective date of the prohibition.

**Sec. 5**. *Additional Implementation Authorities for ''Menu-based'' Sanctions.*
(a) When the President, or the Secretary of State or the Secretary of the Treasury pursuant to authority delegated by the President and in accordance with the terms of such delegation, has determined that sanctions described in section 6(a) of ISA shall be imposed on a person pursuant to ISA, CISADA, TRA, or IFCA and has selected one or more of the sanctions set forth below to impose on that person or when the Secretary of State, in accordance with the terms of section 3 of this order, has determined that a person meets any of the criteria described in subsections (a)(i)–(a)(vi) of that section and has selected one or more of the sanctions set forth below to impose on that person, the Secretary of the Treasury, in consultation with the Secretary of State, shall take the following actions where necessary to implement the sanctions selected and maintained by the President, the Secretary of State, or the Secretary of the Treasury:

(i) prohibit any United States financial institution from making loans or providing credits to the sanctioned person totaling more than $10,000,000 in any 12-month period, unless such person is engaged in activities to relieve human suffering and the loans or credits are provided for such activities;

(ii) prohibit any transactions in foreign exchange that are subject to the jurisdiction of the United States and in which the sanctioned person has any interest;

(iii) prohibit any transfers of credit or payments between financial institutions or by, through, or to any financial institution, to the extent that such transfers or payments are subject to the jurisdiction of the United States and involve any interest of the sanctioned person;

(iv) block all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the sanctioned person, and provide that such property and interests in property may not be transferred, paid, exported, withdrawn, or otherwise dealt in;

(v) prohibit any United States person from investing in or purchasing significant amounts of equity or debt instruments of a sanctioned person;

(vi) restrict or prohibit imports of goods, technology, or services, directly or indirectly, into the United States from the sanctioned person; or

(vii) impose on the principal executive officer or officers, or persons performing similar functions and with similar authorities, of a sanctioned person the sanctions described in subsections (a)(i)–(a)(vi) of this section, as selected by the President or Secretary of State or the Secretary of the Treasury, as appropriate.

(b) The prohibitions in subsection (a) of this section apply except to the extent provided by statutes, or in regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order or, where specifically provided, the effective date of the prohibition.

**Sec. 6**. *Sanctions Relating to the Iranian Rial.* (a) The Secretary of the Treasury, in consultation with the Secretary of State, is hereby authorized to impose on a foreign financial institution the sanctions described in subsection (b) of this section upon determining that the foreign financial institution has, on or after August 7, 2018:

(i) knowingly conducted or facilitated any significant transaction related to the purchase or sale of Iranian rials or a derivative, swap, future, forward, or other similar contract whose value is based on the exchange rate of the Iranian rial; or

(ii) maintained significant funds or accounts outside the territory of Iran denominated in the Iranian rial.

(b) With respect to any foreign financial institution determined by the Secretary of the Treasury in accordance with this section to meet the criteria set forth in subsection (a)(i) or (a)(ii) of this section, the Secretary of the Treasury may:

(i) prohibit the opening, and prohibit or impose strict conditions on the maintaining, in the United States of a correspondent account or a payable-through account by such foreign financial institution; or

(ii) block all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of such foreign financial institution, and provide that such property and interests in property may not be transferred, paid, exported, withdrawn, or otherwise dealt in.

(c) The prohibitions in subsection (b) of this section apply except to the extent provided by statutes, or in regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order or, where specifically provided, the effective date of the prohibition.

**Sec. 7**. *Sanctions with Respect to the Diversion of Goods Intended for the People of Iran, the Transfer of Goods or Technologies to Iran that are Likely to be Used to Commit Human Rights Abuses, and Censorship.* (a) The Secretary of the Treasury, in consultation with or at the recommendation of the Secretary of State, is hereby authorized to impose on a person the measures described in subsection (b) of this section upon determining that the person:

(i) has engaged, on or after January 2, 2013, in corruption or other activities relating to the diversion of goods, including agricultural commodities, food, medicine, and medical devices, intended for the people of Iran;

(ii) has engaged, on or after January 2, 2013, in corruption or other activities relating to the misappropriation of proceeds from the sale or resale of goods described in subsection (a)(i) of this section;

(iii) has knowingly, on or after August 10, 2012, transferred, or facilitated the transfer of, goods or technologies to Iran, any entity organized under the laws of Iran or otherwise subject to the jurisdiction of the Government of Iran, or any national of Iran, for use in or with respect to Iran, that are likely to be used by the Government of Iran or any of its agencies or instrumentalities, or by any other person on behalf of the Government of Iran or any of such agencies or instrumentalities, to commit serious human rights abuses against the people of Iran;

(iv) has knowingly, on or after August 10, 2012, provided services, including services relating to hardware, software, or specialized information or professional consulting, engineering, or support services, with respect to goods or technologies that have been transferred to Iran and that are likely to be used by the Government of Iran or any of its agencies or instrumentalities, or by any other person on behalf of the Government of Iran or any of such agencies or instrumentalities, to commit serious human rights abuses against the people of Iran;

(v) has engaged in censorship or other activities with respect to Iran on or after June 12, 2009, that prohibit, limit, or penalize the exercise of freedom of expression or assembly by citizens of Iran, or that limit access to print or broadcast media, including the facilitation or support of intentional frequency manipulation by the Government of Iran or an entity owned or controlled by the Government of Iran that would jam or restrict an international signal;

(vi) has materially assisted, sponsored, or provided financial, material, or technological support for, or goods or services to or in support of, the activities described in subsections (a)(i)–(a)(v) of this section or any person whose property and interests in property are blocked pursuant to this section; or

(vii) is owned or controlled by, or has acted or purported to act for or on behalf of, directly or indirectly, any person whose property and interests in property are blocked pursuant to this section.

(b) With respect to any person determined by the Secretary of the Treasury in accordance with this section to meet any of the criteria set forth in subsections (a)(i)–(a)(vii) of this section, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of such person are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in.

(c) The prohibitions in subsection (b) of this section apply except to the extent provided by statutes, or in regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order or, where specifically provided, the effective date of the prohibition.

**Sec. 8**. *Entities Owned or Controlled by a United States Person and Established or Maintained Outside the United States.* (a) No entity owned or controlled by a United States person and established or maintained outside the United States may knowingly engage in any transaction, directly or indirectly, with the Government of Iran or any person subject to the jurisdiction of the Government of Iran, if that transaction would be prohibited by Executive Order 12957, Executive Order 12959 of May 6, 1995, Executive Order 13059 of August 19, 1997, Executive Order 13599, or sections 1 or 15 of this order, or any regulation issued pursuant to the foregoing, if the transaction were engaged in by a United States person or in the United States.

(b) Penalties assessed for violations of the prohibition in subsection (a) of this section, and any related violations of section 15 of this order may be assessed against the United States person that owns or controls the entity that engaged in the prohibited transaction.

(c) The prohibitions in subsection (a) of this section apply, except to the extent provided by statutes, or in regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order or, where specifically provided, the effective date of the prohibition, except to the extent provided in subsection 20(c) of this order.

**Sec. 9**. *Revoking and Superseding Prior Executive Orders.* The following Executive Orders are revoked and superseded:

(a) Executive Order 13628 of October 9, 2012 (Authorizing the Implementation of Certain Sanctions Set Forth in the Iran Threat Reduction and Syria Human Rights Act of 2012 and Additional Sanctions With Respect to Iran); and

(b) Executive Order 13716 of January 16, 2016 (Revocation of Executive Orders 13574, 13590, 13622, and 13645 With Respect to Iran, Amendment

of Executive Order 13628 With Respect to Iran, and Provision of Implementation Authorities for Aspects of Certain Statutory Sanctions Outside the Scope of U.S. Commitments Under the Joint Comprehensive Plan of Action of July 14, 2015).

**Sec. 10**. *Natural Gas Project Exception.* Subsections 1(a), 2(a)(ii)–(a)(v), 3(a)(ii)–(a)(iii), and, with respect to a person determined by the Secretary of State in accordance with section 3 to meet the criteria of 3(a)(ii)–(iii), 3(a)(iv)–(vi) of this order shall not apply with respect to any person for conducting or facilitating a transaction involving a project described in subsection (a) of section 603 of TRA to which the exception under that section applies.

**Sec. 11**. *Donations.* I hereby determine that, to the extent section 203(b)(2) of IEEPA (50 U.S.C. 1702(b)(2)) may apply, the making of donations of the types of articles specified in such section by, to, or for the benefit of any person whose property and interests in property are blocked pursuant to this order would seriously impair my ability to deal with the national emergency declared in Executive Order 12957, and I hereby prohibit such donations as provided by subsections 1(b), 5(a)(iv), 6(b)(ii), and 7(b) of this order.

**Sec. 12**. *Prohibitions.* The prohibitions in subsections 1(b), 5(a)(iv), 6(b)(ii), and 7(b) of this order include:

(a) the making of any contribution or provision of funds, goods, or services by, to, or for the benefit of any person whose property and interests in property are blocked pursuant to this order; and

(b) the receipt of any contribution or provision of funds, goods, or services from any such person.

**Sec. 13**. *Entry into the United States.* The unrestricted immigrant and nonimmigrant entry into the United States of aliens determined to meet one or more of the criteria in subsections 1(a), 3(a), and 7(a) of this order would be detrimental to the interests of the United States, and the entry of such persons into the United States, as immigrants or nonimmigrants, is hereby suspended. Such persons shall be treated as persons covered by section 1 of Proclamation 8693 of July 24, 2011 (Suspension of Entry of Aliens Subject to United Nations Security Council Travel Bans and International Emergency Economic Powers Act Sanctions).

**Sec. 14**. *General Authorities.* The Secretary of the Treasury, in consultation with the Secretary of State, is hereby authorized to take such actions, including adopting rules and regulations, to employ all powers granted to me by IEEPA and sections 6(a)(6), 6(a)(7), 6(a)(8), 6(a)(9), 6(a)(11), and 6(a)(12) of ISA, and to employ all powers granted to the United States Government by section 6(a)(3) of ISA, as may be necessary to carry out the purposes of this order, other than the purposes described in sections 3, 4, and 13 of this order. The Secretary of the Treasury may, consistent with applicable law, redelegate any of these functions within the Department of the Treasury. All agencies of the United States shall take all appropriate measures within their authority to implement this order.

**Sec. 15**. *Evasion and Conspiracy.* (a) Any transaction that evades or avoids, has the purpose of evading or avoiding, causes a violation of, or attempts to violate any of the prohibitions set forth in this order or in Executive Order 12957, Executive Order 12959, Executive Order 13059, or Executive Order 13599 is prohibited.

(b) Any conspiracy formed to violate any of the prohibitions set forth in this order or in Executive Order 12957, Executive Order 12959, Executive Order 13059, or Executive Order 13599 is prohibited.

**Sec. 16**. *Definitions.* For the purposes of this order:

(a) the term ''automotive sector of Iran'' means the manufacturing or assembling in Iran of light and heavy vehicles including passenger cars, trucks, buses, minibuses, pick-up trucks, and motorcycles, as well as original

equipment manufacturing and after-market parts manufacturing relating to such vehicles;

(b) the term ''entity'' means a partnership, association, trust, joint venture, corporation, group, subgroup, or other organization;

(c) the term ''financial institution'' includes (i) a depository institution (as defined in section 3(c)(1) of the Federal Deposit Insurance Act) (12 U.S.C. 1813(c)(1)), including a branch or agency of a foreign bank (as defined in section 1(b)(7) of the International Banking Act of 1978) (12 U.S.C. 3101(7)); (ii) a credit union; (iii) a securities firm, including a broker or dealer; (iv) an insurance company, including an agency or underwriter; and (v) any other company that provides financial services;

(d) the term ''foreign financial institution'' means any foreign entity that is engaged in the business of accepting deposits, making, granting, transferring, holding, or brokering loans or credits, or purchasing or selling foreign exchange, securities, commodity futures or options, or procuring purchasers and sellers thereof, as principal or agent. It includes, but is not limited to, depository institutions, banks, savings banks, money service businesses, trust companies, securities brokers and dealers, commodity futures and options brokers and dealers, forward contract and foreign exchange merchants, securities and commodities exchanges, clearing corporations, investment companies, employee benefit plans, dealers in precious metals, stones, or jewels, and holding companies, affiliates, or subsidiaries of any of the foregoing. The term does not include the international financial institutions identified in 22 U.S.C. 262r(c)(2), the International Fund for Agricultural Development, the North American Development Bank, or any other international financial institution so notified by the Secretary of the Treasury;

(e) the term ''Government of Iran'' includes the Government of Iran, any political subdivision, agency, or instrumentality thereof, including the Central Bank of Iran, and any person owned or controlled by, or acting for or on behalf of, the Government of Iran;

(f) the term ''Iran'' means the Government of Iran and the territory of Iran and any other territory or marine area, including the exclusive economic zone and continental shelf, over which the Government of Iran claims sovereignty, sovereign rights, or jurisdiction, provided that the Government of Iran exercises partial or total de facto control over the area or derives a benefit from economic activity in the area pursuant to international arrangements;

(g) the term ''Iranian depository institution'' means any entity (including foreign branches), wherever located, organized under the laws of Iran or any jurisdiction within Iran, or owned or controlled by the Government of Iran, or in Iran, or owned or controlled by any of the foregoing, that is engaged primarily in the business of banking (for example, banks, savings banks, savings associations, credit unions, trust companies, and bank holding companies);

(h) the term ''Iranian person'' means an individual who is a citizen or national of Iran or an entity organized under the laws of Iran or otherwise subject to the jurisdiction of the Government of Iran;

(i) the terms ''knowledge'' and ''knowingly,'' with respect to conduct, a circumstance, or a result, mean that a person has actual knowledge, or should have known, of the conduct, the circumstance, or the result;

(j) the terms ''Naftiran Intertrade Company'' and ''NICO'' mean the Naftiran Intertrade Company Ltd. and any entity owned or controlled by, or operating for or on behalf of, the Naftiran Intertrade Company Ltd.;

(k) the terms ''National Iranian Oil Company'' and ''NIOC'' mean the National Iranian Oil Company and any entity owned or controlled by, or operating for or on behalf of, the National Iranian Oil Company;

(l) the term ''person'' means an individual or entity;

(m) the term ''petrochemical products'' includes any aromatic, olefin, and synthesis gas, and any of their derivatives, including ethylene, propylene, butadiene, benzene, toluene, xylene, ammonia, methanol, and urea;

(n) the term ''petroleum'' (also known as crude oil) means a mixture of hydrocarbons that exists in liquid phase in natural underground reservoirs and remains liquid at atmospheric pressure after passing through surface separating facilities;

(o) the term ''petroleum products'' includes unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas, and miscellaneous products obtained from the processing of: crude oil (including lease condensate), natural gas, and other hydrocarbon compounds. The term does not include natural gas, liquefied natural gas, biofuels, methanol, and other non-petroleum fuels;

(p) the term ''sanctioned person'' means a person that the President, or the Secretary of State or the Secretary of the Treasury pursuant to authority delegated by the President and in accordance with the terms of such delegation, has determined is a person on whom sanctions described in section 6(a) of ISA shall be imposed pursuant to ISA, CISADA, TRA, or IFCA, and on whom the President, the Secretary of State, or the Secretary of the Treasury has imposed any of the sanctions in section 6(a) of ISA or a person on whom the Secretary of State, in accordance with the terms of section 3 of this order, has decided to impose sanctions pursuant to section 3 of this order;

(q) the term ''subject to the jurisdiction of the Government of Iran'' means a person organized under the laws of Iran or any jurisdiction within Iran, ordinarily resident in Iran, or in Iran, or owned or controlled by any of the foregoing;

(r) the term ''United States financial institution'' means a financial institution as defined in subsection (c) of this section (including its foreign branches) organized under the laws of the United States or any jurisdiction within the United States or located in the United States; and

(s) the term ''United States person'' means any United States citizen, permanent resident alien, entity organized under the laws of the United States or any jurisdiction within the United States (including foreign branches), or any person in the United States.

**Sec. 17**. *Notice.* For those persons whose property and interests in property are blocked pursuant to this order who might have a constitutional presence in the United States, I find that because of the ability to transfer funds or other assets instantaneously, prior notice to such persons of measures to be taken pursuant to this order would render those measures ineffectual. I therefore determine that for these measures to be effective in addressing the national emergency declared in Executive Order 12957, there need be no prior notice of a listing or determination made pursuant to subsections 1(b), 5(a)(iv), 6(b)(ii), and 7(b) of this order.

**Sec. 18**. *Delegation to Implement Section 104A of CISADA.* The Secretary of the Treasury, in consultation with the Secretary of State, is hereby authorized to take such actions, including adopting rules and regulations, and to employ all powers granted to me by IEEPA, as may be necessary to carry out section 104A of CISADA (22 U.S.C. 8513b). The Secretary of the Treasury may, consistent with applicable law, redelegate any of these functions within the Department of the Treasury.

**Sec. 19**. *Rights.* This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

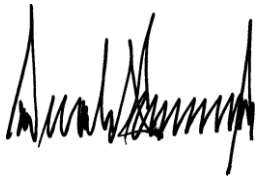
**Sec. 20**. *Effect on Actions or Proceedings, Blocked Property, and Regulations, Orders, Directives, and Licenses.* (a) Pursuant to section 202 of the NEA (50 U.S.C. 1622), the revocation of Executive Orders 13716 and 13628 as set forth in section 9 of this order, shall not affect any action taken or proceeding pending not finally concluded or determined as of the effective date of this order, or any action or proceeding based on any act committed prior to the effective date of this order, or any rights or duties that matured or penalties that were incurred prior to the effective date of this order.

(b) Except to the extent provided in statutes or regulations, orders, directives, or licenses that may be issued pursuant to this order, and notwithstanding any contract entered into or any license or permit granted prior to the effective date of this order, the following are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: all property and interests in property that were blocked pursuant to Executive Order 13628 and remained blocked immediately prior to the effective date of this order.

(c) Except to the extent provided in regulations, orders, directives, or licenses that may be issued pursuant to this order, all regulations, orders, directives, or licenses that were issued pursuant to Executive Order 13628 and remained in effect immediately prior to the effective date of this order are hereby authorized to remain in effect—subject to their existing terms and conditions—pursuant to this order, which continues in effect certain sanctions set forth in Executive Order 13628.

**Sec. 21**. *Relationship to Algiers Accords.* The measures taken pursuant to this order are in response to actions of the Government of Iran occurring after the conclusion of the 1981 Algiers Accords, and are intended solely as a response to those later actions.

**Sec. 22**. *Effective Date.* This order is effective 12:01 a.m. eastern daylight time on August 7, 2018.



THE WHITE HOUSE,
*August 6, 2018.*

[FR Doc. 2018–17068
Filed 8–6–18; 2:00 pm]
Billing code 3295–F8–P

## APPENDIX- V

## The Human Capital Index (HCI): Methodology

### The Human Capital Index: Context

The Human Capital Project (HCP) includes an international metric to benchmark the key components of human capital across countries. The Human Capital Index (HCI) measures the amount of human capital that a child born today can expect to attain by age 18, given the risks of poor health and poor education that prevail in the country where she lives. The HCI is designed to highlight how improvements in current health and education outcomes shape the productivity of the next generation of workers, assuming that children born today experience over the next 18 years the educational opportunities and health risks that children in this age range currently face.

The HCI measures key points along the trajectory from birth to adulthood of a child born today. In the poorest countries in the world, there is a significant risk that the child does not even survive to her fifth birthday. Even if she does reach school age, there is a further risk that she does not start school, let alone complete the full cycle of 14 years of school from pre-school to Grade 12 that is the norm in rich countries. The time she does spend in school may translate unevenly into learning, depending on the quality of teachers and schools she experiences. When she reaches age 18, she carries with her lasting effects of poor health and nutrition in childhood that limit her physical and cognitive abilities as an adult.

### Components of Human Capital Index

The HCI quantifies the key stages in this trajectory and their consequences for the productivity of the next generation of workers, with these three components:

Component 1: Survival from birth to school age, measured using under-5 mortality rates.

Component 2: Expected Years of Learning-Adjusted School, combining information on the quantity and quality of education. The quantity of education is measured as the expected

number of years of school a child can expect to attain by age 18 given the prevailing pattern of enrollment rates across grades. The quality of education reflects ongoing work at the World Bank to harmonize test scores from major international student achievement testing programs. These are combined into a measure of learning-adjusted school years using the "learning-adjusted years of school" conversion metric proposed in the 2018 World Development Report.

Component 3: Health. In the absence of a single broadly-accepted, directly-measured, and widely-available metric, the overall health environment is captured by two proxies: (i) adult survival rates, defined as the fraction of 15-year olds that survive until age 60, and (ii) the rate of stunting for children under age 5. Adult survival rates are calculated by the UN Population Division for all countries, and can be interpreted as a proxy for the range of fatal and non-fatal health outcomes that a child born today would experience as an adult if current conditions prevail into the future. Stunting is broadly accepted as a proxy for the pre-natal, infant and early childhood health environment, and so summarizes the risks to good health that children born today are likely to experience in their early years – with important consequences for health and well-being in adulthood. Data on the prevalence of stunting is reported in the WHO-UNICEF-World Bank Joint Malnutrition Estimates.

**Unit of Measurement of the Human Capital Index**

The HCI is measured in terms of the productivity of the next generation of workers, relative to the benchmark of complete education and full health. This gives the units of the index a natural interpretation: a value of X for a particular country means that the productivity as a future worker of a child born in a given year in that country is only a fraction X of what it could be under the benchmark of complete education and full health. This can be decomposed into the contributions of the three components of the HCI, each of which is also expressed in terms of productivity relative to the benchmark. Multiplied together they arrive at the overall HCI. Differences in the human capital have large implications for the productivity of the next generation of workers. In a country around the 25th percentile of the distribution of the HCI, a child born today will be only 43 percent as productive as she would be in the benchmark of complete education and full health.

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