6-1-2003

Industrialization and underdevelopment: towards a heavy industrialization drive in Egypt

Mohamed Ismail Sabry
The American University in Cairo AUC

THE AMERICAN UNIVERSITY IN CAIRO

SCHOOL OF HUMANITIES AND SOCIAL SCIENCES

DEPARTMENT OF POLITICAL SCIENCE

INDUSTRIALIZATION AND UNDERDEVELOPMENT:

TOWARDS A HEAVY INDUSTRIALIZATION DRIVE IN EGYPT

MOHAMED ISMAIL SABRY

A THESIS SUBMITTED

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR

THE DEGREE OF MASTER OF ARTS IN

POLITICAL SCIENCE

DECEMBER 2003

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LIST OF ABBREVIATIONS AND ACRONYMS

ANSDK	Alexandria National Iron and Steel Company
ECHEM	Egyptian Holding Company for Petrochemicals
ERSAP	Economic Reform and Structural Adjustment Program
EU	European Union
FDI	Foreign Direct Investment
GATT	General Agreement on Trade and Tariffs
GDP	Gross Domestic Product
GTC	General Trading Companies (in South Korea)
HCI	Heavy and Chemical Industries
IMF	International Monetary Funds
ISI	Import Substitution Industrialization
JIT	Just In Time strategy
LDC	Least Developed Countries
MNC	Multi National Corporation
NBER	National Bureau of Economic Research
NIC	Newly Industrializing Countries
OECD	Organization for Economic Cooperation and Development
PBDAC	Principal Bank for Development and Agricultural Credit (in Egypt)
PCDNP	Permanent Council for the Development of National Product (in Egypt)
PE	Polyethylene

POSCO	Pohang Steel Company (in Korea)
PP	Polypropylene
PVC	Polyvinchloride
R&D	Research and Development
TFP	Total Factor Productivity
UK	United Kingdom (Britain)
UNDP	United Nations Development Program
UNIDO	United Nations Industrial Development Organization
USA	United States of America
USD	United States Dollars
WTO	World Trade Organization

INTRODUCTION

Since the 1980s, Egyptian economic development has faced various obstacles that hindered its economic growth and diminished Egypt's endeavors to those of meeting the existing challenges and crises and their repercussions on the national economy. The increasing indebtness, the fall of revenues coming from oil and oil-related activities, then the structural adjustment policies, the East Asian Stock Market crises of the late 1990s, added to terrorist attacks on tourism, have all denied the Egyptian economy a steady and rapid growth. This critical outcome invites investigation of the reasons for these problems and the possible answers and means to avoid their recurrence for the sake of a more secure developmental future.

The structure of the Egyptian economy seems to have invited such an outcome. Egypt has relied heavily since the 1970s on vulnerable sources of income that have resulted in creating an embedded structural obstacle for a steady and healthy economic development. Revenues from petroleum, either directly through exporting it or indirectly through expatriates' remittances from the Gulf, have moved with world prices for this source of energy, which have declined in the 1980s. Tourism, despite heavy investments in infrastructure directed to this activity and despite the favorable climate resulting from the Peace Process, was still dependant on other international factors that the Egyptian government has little control over. With the terrorist attack in Luxor and the accidents that preceded it, a strong blow was given to all investment that went to this sector. The repercussions of this blow mingled with the crises of the stock market in East Asia. The Egyptian government had not been an actor or a party to these developments, but rather it was a

victim. All these factors have led to a slowing down of the economic recovery that Egypt was witnessing in the mid 1990s. As for Suez Canal, little has been expected concerning the growth of its revenues once it started to operate with its full capacity. This almost steady revenue has not kept pace with the rapid growth of population, which calls for equivalent growth for the major sources of income of the Egyptian economy and revenues from Suez Canal is one of these sources.

The majority of the Egyptian population is still rural, and agriculture is still the major activity. Yet, based on the experience of most of the underdeveloped countries, depending on primary goods means being subject to uncertainties. This fact should be realized even if we do not adopt a Structuralist perspective seeing countries specializing in primary goods as losing in the terms of trade relative to those exporting manufactured goods. The 1980s was a clear witness for the vulnerability of countries specializing in the former activity. On the other hand, industry posts itself as an activity that provides stability for a national economy. As proven by the experience of the Asian Tigers and the Newly Industrializing Countries, an integrated industrial structure that produces various commodities is more likely to provide stability and development for a nation. A comparison between the economies of countries that developed an advanced industrial structure and those that relied on producing and exporting primary goods (notably Sub-Saharan Africa), even without any theoretical analysis, will prove this outcome.

This hints at a possible answer for the problems facing Egyptian development. The answer suggested here is for developing an integrated industrial structure that is capable of absorbing shocks created by the international market and re-orienting production accordingly. In the age of Globalization, a call for an integrated industrial structure is not a call for self-sufficiency in every aspect in the fashion of the Import Substitution Industrialization strategies of the post-colonial era.

I realize that these strategies are outdated and I am not arguing for them although they provide some interesting insights, which will be addressed later in this thesis. A call for an integrated economic structure should rather acknowledge the new world conditions of our present and be formulated according to the logic of free trade and comparative advantage as long as pulling back from the WTO and the GATT Agreement is not foreseeable. Consequently, an integrated industrial structure is meant to make exports or potential exports more competitive both domestically and internationally. Costs and technology are crucial factors in boosting comparative advantage for an export commodity; and an integrated industrial structure should be targeting this. It is not simply a call to produce everything and achieve self-sufficiency in every aspect because even a country as large and well resourced as India cannot realize this objective. It is rather a call for an understanding of the basic industries that can feed competitive industries and trying to develop an integrated economic structure enjoying the linkages effect between the two kinds of industries.

Arguing for this kind of industrial structure leads us to explore the topic of my thesis and its research questions. An integrated industrial structure could not be reached without the presence of a backbone that feeds other industries and creates linkages. What is referred to as heavy industry, especially iron and steel and machinery are the most capable of providing this backbone as will be indicated in my following analysis. Thus, wondering if reinforcing heavy industry in Egypt can provide such a backbone leads us to the first research question: Is there a need for Heavy Industry? Why is it needed for the development of Egypt? What are its advantages as compared to other industries and economic activities? What are the criteria to be used in judging its importance (e.g. economic profitability, linkage effects, strategic need)?

Answering the first research question will lead us to considering the second one, which is: how can heavy industrialization be developed in Egypt? Who would carry the burden of this process, the public or the private sector or a combination of the efforts of the two parties?

In my thesis I will try to explore these two questions, trying to provide an insight for a policy or a drive to be pursued for the sake of Egypt's future development. I am trying to argue for a long run strategy that avoids the shortcomings of seeking short run gains and continuous change of policies, and I am assuming that such a strategy should tackle and give more attention to heavy industry. I hope to succeed in this endeavor through this research.

CHAPTER I:

WHY ESTABLISHING HEAVY INDUSTRY IN EGYPT

1- A Theoretical Overview

A- Heavy Industry

The term "Heavy Industry" comprises a wide range of industries providing strong linkages for the economy and especially for the industrial sector. It includes industries like: Iron and Steel, Aluminum, Petrochemicals, machinery and equipment…etc. Most of these industries are capital intensive ones feeding other industries with intermediate goods (e.g.: Iron rods, Aluminum), or machinery meant for the production process of various industries. For the sake of brevity, in this thesis I am going to stress steel largely due to its various industrial linkages and necessity for the economy, but I will also consider other intermediate goods, especially aluminum and petrochemicals (due to their relevance for the Egyptian economy). The machinery industry would also be very important to my discussion due to its relevance to developing technological capabilities.

B- Specialization Versus ISI Strategies

1- Neoclassical Perspective

I shall start my theoretical analysis with Neoclassicism since it is the dominant paradigm now in development and economics. This dominance has been witnessed since the 1980s, when the world was experiencing supply shocks resulting from the dramatic increase in the price of oil.

Such an increase impacted profoundly on the economies of Third World countries, increasing their indebtedness and causing the failure of those based on Import Substitution. Moreover, the rise of more rightist administrations in the USA and England, and then the failure of the command economies of East Europe and the fall of the Soviet Union, were all political rather than economic reasons that bolstered the dominance of the Neoclassical perspective. This dominance was further reinforced by Neoclassical-oriented international institutions like the WTO, World Bank and the IMF that compelled Third World countries seeking assistance to adopt their sponsored policies.

The basic assumption of the school is that the market mechanism is self-regulating and is always moving towards equilibrium, which is the optimal condition, through the interaction between supply and demand at the micro (i.e.: firm supply and consumer demand) and macro (i.e.: Aggregate Supply and Aggregate Demand for a national economy) levels. Governments should not intervene in the functioning of the economy, and this is a basic cornerstone for the arguments of this school and will be explored more in the second chapter of this thesis.

What is of relevance to this section of my thesis is the school's concepts about trade. The Neoclassical school believes that free trade leads to benefit for all as profit and consumption are expected to be maximized worldwide. Each country should specialize in the product that it has a comparative advantage in and export it, and it is only by this means that a nation, as well as the world, can benefit. It is not a matter of heavy or light Industry, it is a matter of what a country can produce efficiently and better than others and, thus, specialize in it.

The concept of Comparative Advantage stems from the ideas of Ricardo that were modified afterwards by the Neoclassicists.

> According to the law of Comparative Advantage, even if one nation is less efficient than (has an absolute disadvantage with respect to) the other nation in the production of both commodities, there is still a basis for mutually beneficial trade.

> The first nation should specialize in the production of and export the commodity in which its absolute disadvantage is smaller (this is the commodity of its comparative advantage) and import the commodity in which its absolute disadvantage is greater (this is the commodity of its Comparative disadvantage)[1].

This is the crux of the concept of Comparative Advantage. For instance, it can be interpreted as indicating that developing countries can have this advantage in agricultural products even if the developed world can produce them more efficiently. This is attributed to the fact that the inefficiency of developing countries in producing industrial products is even higher than in agricultural goods. Thus, the developed world is likely to specialize in industrial products while the developing world is likely to specialize in agricultural goods.

The cost of the product is crucial for determining the efficiency of a country in producing it. For Ricardo, cost was determined believing in the labor theory of value, which identifies labor as the sole factor of production that influences cost putting some unrealistic assumptions for the sake of simplicity (hence land, capital and management were not given much consideration as factors of production). This theory was renounced, however, and the Neoclassicists adopted the concept of opportunity cost, which calculates cost of a certain product by the "amount of a second commodity that must be given up to release just enough resources to produce one additional unit of the first commodity [product]."[2] Having a lower opportunity cost for a certain product entitles the country in question a comparative advantage in its production and vice versa.

A more developed theory for trade and comparative advantage was provided by the Hecksher-Ohlin theorem. This theorem constructed a model based on certain assumptions and simplifications like having two nations, two factors of production (i.e.: capital and labor) and two commodities (one labor intensive and the other capital intensive). These two countries were

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[1] Dominik Salvatore, *International Economics*, 6th ed., (New York: John Wiley & Sons, Inc., 1999), 31.

assumed to have the same tastes, use the same technology, utilize all their resources, have a constant return to scale in producing the two commodities and operate under a free market system that also does not levy trade barriers. Factors of production mobility across the two nations was not acknowledged and trade between them was assumed to be balanced. With these debatable assumptions the Hechsher-Ohlin theorem states that:

> A nation will export the commodity whose production requires the intensive use of the nation's relatively abundant and cheap factor and import the commodity whose production requires the intensive use of the nation's relatively scarce and expensive factor. In short, the relatively labor-rich nation exports the relatively labor-intensive commodity and imports the relatively capital-intensive commodity[3].

Thus, the theorem is based on the idea that the abundance of a factor of production determines what a country is going to specialize in. Factor abundance could be detected by the number of units of that factor (e.g.: the number of machines), or by the relative prices of these factors of production. The price of capital is interest (r) while the price of labor is wage (w). Hence, the capital abundance in a certain country can be determined either by the capital per labor ratio (K/L) or by the (r/w) ratio. If the two ratios conflicted with each other, the second one (i.e. r/w) is given more credit[4]. It should be noted that technology is not given its due attention and is assumed to be normalized internationally. The concept of developing technological capabilities of developing countries (the concept that would be discussed later in this chapter) is depicting a negation for the mentioned assumption, which is crucial for the theorem. Using the Hechsher-Ohlin concepts, the industrialized world should specialize in capital intensive commodities (for being capital abundant) while developing countries have to specialize in labor intensive goods (for

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[2] Ibid., 37.
[3] Ibid., 119.
[4] Ibid., 115.

being labor abundant and having relatively low wage rates). Specialization is believed to benefit both parties, increase output and result in world's welfare.

The school believes that trade liberalism is benefiting Third World countries, not only by increasing the world's output of various commodities thanks to specialization, but also by facilitating adaptation of learning, technology, and entrepreneurial maturation in these countries. An industrializing latecomer is enabled by trade to acquire the latest available technology and hence it has no need for developing its own technology by developing the relevant Heavy Industrial sector for that purpose. The imported technology might develop a sector that would provide a comparative advantage for a country. The emerging leading sector would become a "center of capital accumulation, backward and forward linkages and ultimately exports."[5] A much deeper analysis for technology in relation to Heavy Industry will be discussed later in this chapter of the thesis.

It should be noted that when the Neoclassical school started to dominate the developmental arena, it was replacing the dominance of the Structuralist school. No wonder that much of the Neoclassicists efforts went to criticizing the Import Substitution Industrialization strategy by which Third World countries tried to close the gap with the developed world through replacing imports by domestic production and industrialization. Their critique of the ISI shows what the Neoclassical school believes in. In 1970, a Neoclassical OECD study for a number of countries criticized ISI policies. This study was reinforced by another research conducted in 1971 by the World Bank and the Inter American Development Bank on trade, which had similar conclusions. The Neoclassicists saw that a major fault was committed by disregarding agriculture for the sake of industry. They argued that Third World countries have comparative advantage in

agriculture and should specialize in it. They regarded industry as wasting too much investment that outstrips resulting output. Industry in these countries does not even create sufficient job opportunities because of its capital-intensive techniques. Moreover, a waste of resources resulted from under-utilization of industrial potentials that was created by Third World countries' industries but not fully utilized for various reasons. A number of governmental policies and practices relevant to ISI policies were also criticized like overvaluation of currency, harming exports and their comparative advantage, the presence of imperfect information in the hands of the bureaucracy, applying restrictions and controls that discourage private initiative, and adopting protectionist measures[6]. For the Neoclassicists, protectionism leads to inefficiency and poor quality besides inappropriate allocation of resources[7]. Bates criticized Import Substitution Industrialization strategies from a similar perspective. He regarded these strategies as discriminating against agriculture, which he regarded as the source of foreign exchange for developing countries. His criticism went on to other policies, which are not directly related to Heavy Industry, like overvaluation of currency[8].

If the above mentioned studies talk about industry generally in relation to agriculture and primary goods, the National Bureau of Economic Research (NBER) study reached conclusions that are more relevant for my study. It criticized policies that made capital intensive techniques much more favorable than labor intensive ones, despite the fact that Third World countries have comparative advantage in labor intensive techniques as the Neoclassicists stress. Socialist policies led to an increase in the price of labor, while currency overvaluation, low interest rates…etc. led

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[5] Stephan Haggard, *Pathways from the Periphery: The politics of growth in the Newly Industrializing Countries*, (Ithaca and London: Cornell University Press, 1990), 10.

[6] John Rapley, *Understanding Development: Theory and practice in the Third World*, (Boulder, Colorado, USA: Lynne Rienner publishers, 1996), 60-61.

to decreasing the cost of capital. This led to adoption of capital intensive techniques that are only relevant for developed countries, creating few jobs and eliminating traditional industries[9]. This argumentation is basically favoring labor-intensive Light Industries seeing that they are more beneficial than Heavy Industries, which tend to be more capital intensive.

Thus, concerning underdeveloped countries, the Neoclassicists call for specializing in primary goods, and more moderately for specializing in labor-intensive industries. Their arguments stand firmly against industries that a country does not have a comparative advantage in, and it is clear that most Third World countries cannot possibly have comparative advantage in Heavy Industries as having such an advantage entails economy of scale and maturity of these industries that is realized with time. According to Auty, in his study on Industrial Policy in the Newly Industrializing Countries (NICs), the Neoclassicists criticizes Heavy and Chemical Industrialization (HCI) due to a number of reasons. Their main criticism is based on the assumption that such a drive will deny the concerned country the opportunity to diversify its portfolio and limit it instead to a number of projects that require large sums of capital. This concentration involves a factor of risk, which underdeveloped economies are less likely to endure its shortcomings. Instead of a HCI drive, the Neoclassicists advocate diversifying the portfolio and investing in small and numerous projects which will together provide higher output, reduce risk and give more flexibility to the industrial sector.

Neoclassicists also criticize HCI due to the long gestation and payback periods for investments directed to HCI projects. The arguments of the school is concerned with short run benefits that would persist on the long run. They are not, however, interested in activities that

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[7] Tom Hewitt, Hazel Johnson & David Wield, *Industrialization and Development*, (Oxford University Press in association with the Open University, 1992), 155-156.

[8] Rapley, 64-65

might have long run benefits after enduring an initial stage of unattractive investment. They point to the assumption that demand changes over time, and thus, by the time a HCI project would finally recover and start to yield profits, demand for the product that it produces might have diminished. Finally, the Neoclassicists argue that HCI requires investments in infrastructure and coordination between these investments and investments in HCI projects so that the needed outcome could be realized. This process they regard as complex, and they suggest another strategy. They rather call for leaving HCI to evolve by itself when the needed environment for such a development exists. Thus, when infrastructure, capital markets, labor skills, technological ability, and entrepreneurial experience are developed, such a HCI evolution could be realized. They asserted also the need for the presence of a growing demand for a certain product that would induce competitive production at home that would substitute for importing the product[10]. They even question the concept of externalities (or linkages) provided by Heavy Industry wondering how it can be measured.

Thus, with their disregard for the importance of externalities that Heavy Industry produces, and with their stress on the risk evolving from concentrating resources on a limited number of projects that do not yield instant returns, the Neoclassicists were against a Heavy Industrialization drive. Yet, externalities and linkages produced by Heavy Industry (which will be discussed in the following subsections) can encourage taking the risk of devoting large investments for Heavy Industrial projects, which yield long run benefits. On the other hand, this risk can be diminished by a wise industrial policy with which governments can guide the economy

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[9] Ibid., 63.

[10] Richard M. Auty, *Economic Development and industrial policy (Korea, Brazil, Mexico, India and China*, (Mansell Publishing Limited, England & USA, 1994), 4, 5& 34.

and foreign capital can help in this process. This will be illustrated more in the case studies in the second chapter of the thesis.

2- Structuralist and Dependency Theories' Perspective

The Neoclassical school fails to explain the surplus that the industrial world extracts from other agricultural economies by trade due to income elasticity of demand. This concept shows that as income increases demand for basic goods decreases, and for manufactured goods increases. On the supply side, the developed world gives higher wages for its labor as compared to those given to underdeveloped labor. This means that the price of products manufactured in developed countries will get higher while the price of primary commodities produced in underdeveloped countries would not rise similarly. Also, there are more suppliers for primary goods than for manufactured goods, a factor that is to the advantage of the developed countries specializing in manufactured goods since prices of goods they acquire from underdeveloped countries will fall. As a result, underdeveloped countries' expenditure on manufactured imported goods coming from developed countries will rise more than the expenditure of the developed world on primary goods produced by the underdeveloped world. To cover this growing gap, underdeveloped countries have to increase their production and, henceforth, specialize more in primary goods. Consequently, they should allocate more resources to get the same quantities that they before used to get of the manufactured imported goods. The result is a loss from trade for underdeveloped countries.

This was pointed out by Raul Prebisch and Hans Singer in their famous thesis which is the cornerstone of Structuralist thought. It concludes that countries specializing in primary goods might be better off, but still their gain is incomparable to the Industrial world. On the long run the gap shall widen more and more. The only way out of this, as can be anticipated, is through

industrialization that would diversify the economies of underdeveloped countries and stop their absolute reliance on exporting primary goods. Such an industrialization and diversification drive invites thinking about Heavy Industry due to its centrality for this drive.

The Dependency School also moved on similar lines and is to a great extent an outgrowth of Structuralism. Their basic concept is the core periphery relationship, where the development of the core results from the underdevelopment of the periphery. Underdevelopment is not an initial phase that countries start at and then develop from, underdevelopment is rather the result of intensification of relations with the core which exploits the primary resources of the periphery and exports manufactured goods back to it using it as a market. Again this points out the dangers inherent in specializing in primary goods and, thus, it holds an embedded call for industrialization of the periphery.

Structuralists strongly stress industrialization. Some of them, such as Baran, point to the fact that industrialization is important even for the development of agriculture. This can be realized through absorbing the surplus of labor and providing agriculture with fertilizers, machinery and equipment, electric power…etc[11]. Needless to say, Heavy Industry provides most of these goods meant for serving agriculture. Hence, these forward linkages would be of much importance for underdeveloped countries, most of which specialize in agricultural products.

The fact that Heavy Industries depend on economies of scale (as with any industrial activity but more even than other industries, and thus should be expected to have high costs in the inception, which diminish as time goes by, yielding profits on the long run) seems not to disturb the Structuralists. They believe that productivity increases with the increase in output and that a process of learning is developed and new and superior technologies are being incorporated. This

industry would then be able to foster the productivity of other sectors of the economy through providing machinery and equipment; and in this regard, it should be understood that this is relevant to Heavy Industry. They refute the logic of Neoclassical argumentation about acquiring industrial inputs from imports neglecting the need for developing linkages through an integrated industrial structure. The Structuralists criticize this view since they regard it as denying other sectors from having productivity gains, and they call for an integrated industrial sector producing machinery, intermediate inputs and consumer goods[12]. This is also attributed to the school's fear that depending on imports will lead to extensive dependence on foreign imported technology that might be expensive and outdated as well as being inappropriate for the domestic economy.

Structuralists argued for creating more linkages in the economy and increasing capital stock, both of which they regarded as fostering the growth of an economy. Industry is regarded as providing many externalities to other industries and to other sectors of the economy. These externalities are manifested in the indirect benefit from a certain industry assisting other industries noting that industrialization is believed generally to provide more linkages than other activities. Forward linkages (in the form of the final product of an industry acting as an intermediate good for other industries) and backward linkages (in the form of inputs demanded) are most likely to be created by industrialization. Thus, Structuralists believed that many externalities benefiting an economy are produced by industrialization. This is reflected in the increase in productivity that happens when output rises and is an outcome of increasing learning and incorporating new technologies. Also, industry produces externalities by providing machinery and equipment to other

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[11] Kenneth P. Jameson & Charles K. Wilber, *The Political Economy of Development and Underdevelopment*, 6th ed. (McGraw-Hill, inc., USA, 1996), 94- 99.

[12] Hewitt, 142& 143.

industries and sectors, reducing the cost of production for these activities[13]. This analysis especially fits Heavy Industry as it is the most capable of producing linkages and the sector that provides most machinery and equipment to other sectors.

As for capital accumulation, the school believes that an increase in the capital stock of a country leads to a faster rate of output growth. An increase in output will cause an increase in capital accumulation through investment in machinery, building and other productive assets. This will lead to a faster increase in capital stock which leads by its turn, as I pointed out before, to higher rates of output growth. Yet, this is not necessarily the case, as the Structuralists admit, and that is why they stress the importance of investing the surplus into productive investments instead of using it for consumption[14]. The emphasis on increasing the capital stock shows the Structuralists' interest in Heavy Industries.

It is clear from this emphasis on linkages and capital accumulation, that the Structuralists favor establishing a Heavy Industry as it is the sector most capable of realizing both objectives. What might be added to this is that some Structuralists call for an integrated economic structure, which cannot escape the necessity of establishing a Heavy Industry. What led a group of Structuralists to think in this way is the critique that they have received together with their ISI policies. This critique pointed out the fact that the idea of linkages seems to be useless as many of the inputs of industries being created for this purpose are being imported from outside. They argued that when industrialization is confined to establishing consumer goods' industries, it is most likely that productivity gains would not be moved among various industrial sectors. This is because this type of industries will tend to import its intermediate and capital goods. It is no wonder that

[13] Ibid., 141&142.
[14] Ibid., 147&148.

some Structuralists argue for establishing an integrated industrial sector producing consumer goods in addition to intermediate goods and machinery[15].

Sutcliffe moved on similar lines criticizing ISI policies:

> The whole concept of import substitution must be rejected. It results from a pre-occupation with existing patterns of demand, which are themselves influenced by the economic and social structure whose reorganization is the objective of industrialization. With the help of import substitution as a criterion of investment, priority would go for example to the vehicle assembly plants rather than to the establishment of an iron and steel industry[16].

Sutcliffe is here pointing out the need to consider what is benefiting the economy (e.g.: Steel industry and the various linkages it creates), rather than what meets domestic demand but may be less valuable for the growth of an economy (in this case vehicle assembly). It should be noted that in many Third World countries, (Egypt is not an exception), assembly industries have not created linkages as they were confined to assembling semi-finished vehicles for the sake of reducing costs and creating more job opportunities. This can be an appealing strategy for an ISI policy, but an Iron and Steel complex should be considered more for the sake of linkages. The point here is one of aiming at an integrated industrial structure with its various sectors feeding each other rather than a structure that simply substitutes local products for imports.

Sutcliffe had still further reservations about ISI policies, notably their tendency to be sequential, starting with consumer goods industries, then moving to intermediate goods and so on. The first stage, targeting consumer goods industries means relying on imported capital and techniques. He claims that there is little opportunity once techniques have been developed for them to change, although these techniques might not be the most efficient given the conditions of the

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[15] Ibid., 142&143.

[16] J. L. L. La Croix, quoted in R. B. Sutcliffe, *Industry and Underdevelopment* (Addison Wesley Publishing Company, 1971), 267.

country in question[17]. This assumption can be reinforced by the historical experience of industrializing countries of the late 1800s. Speaking of the economic downturn of that time that witnessed also the erosion of Britain's advantage of being the first to industrialize, Kemp said:

> The weight of past investment, made at an earlier technological stage, limited the possibility for changing over to new methods. Especially in an uncertain economic climate it appeared safer to continue with obsolescent equipment… Certainly the late comers were not subject to the incubus of an inheritance of a dead weight of obsolescent equipment. Generally speaking, they had a larger proportion of more modern equipment embodying later techniques and giving them certain advantages[18].

Thus, it is clear that a country should be selective in the techniques that it uses even from the start. It is wiser to develop a country's own techniques and capital than to start with imported ones and suffer from the consequences on the long run if they are not appropriate.

C-The Labor/Capital Intensive Debate

Heavy Industries are capital-intensive in nature. Hence, this leads us to a discussion on the relevance of capital-intensive industries to underdeveloped countries. It is argued that underdeveloped countries are labor abundant as compared to the developed industrialized world. W.A. Lewis states that due to traditional family farming, which is a common practice in underdeveloped agricultural societies, wages are set at subsistence levels. That is why Third World countries are endowed by an abundance of cheap labor[19]. It is no wonder that many thinkers, especially those belonging to the Neoclassical school, believe that underdeveloped countries should exploit their comparative advantage in labor-intensive industries. Thus, they argue for specialization in labor-intensive rather than capital-intensive industries.

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[17] Sutcliffe, 268.
[18] Tom Kemp, *Historical Patterns of Industrialization* (London: Longman, 1978), 104.
[19] Rapley, 16.

Yet, Gelenson and Leibenstein had a different view. They refute the arguments that underdeveloped nations, being endowed with labor and where capital is rare, should focus on labor-intensive industries. They believe that the projected outcome from investment is increasing the productivity of workers. This can only be achieved by a high capital per labor ratio and thus the application of modern technology on a large scale[20]. Needless to say, Heavy Industries are examples of such industries needing a high capital per labor ratio, and they also can provide capital to other industries (even for labor intensive industries) increasing their productivity. The two thinkers also point out that the "failure to introduce capital intensive techniques at the outset of the industrialization process may create insurmountable institutional barriers to modernization. If labor intensive techniques are used now, vested interests may set themselves against the adoption of technical improvements in the future."[21]

As for Sutcliffe, he mentioned a number of advantages for capital-intensive industries. These industries are more likely to enjoy availability of spare parts for their machines in the world market, since the developed world specializes in capital intensive industries. Also, many capital-intensive industries (e.g.: iron and steel), are less wasteful of by products, use a small number of workers, and thus provide an opportunity for raising the skill of the labor force involved. Moreover, Hirschman claims that the gap in productivity between the developed and underdeveloped worlds is higher in activities other than capital-intensive ones. Capital-intensive industries produce fewer differentials in productivity between the two worlds due to their reliance on machinery. This makes capital-intensive industries less influenced by the skill and behavior of labor used. Thus, establishment of capital-intensive industries should help to close the gap in

[20] Murray D. Bryce, *Industrial Development: A guide for accelerating economic and growth* (NY-Toronto-London: McGraw- Hill Book Company, INC., 1960), 24.

[21] Sutcliffe, 184.

productivity between the developed and the underdeveloped countries. Also, Sutcliffe argues that competing with foreign industrial production requires efficiency in production which cannot be realized except through using similar techniques to that of the industrialized world which uses capital-intensive ones[22].

The most important point in his analysis points to the linkages that are created by capital-intensive industries, which Sutcliffe regarded as being greater than that provided by other activities. By using machinery, capital intensive techniques can stimulate other industries and services like machine servicing, repairing...etc. They can also provide raw materials like chemicals to other labor intensive industries, which create more job opportunities, and they can stimulate these industries by providing their needed machinery[23]. The discussion here is relevant to Heavy Industry.

Sutcliffe points to the fact that establishing capital intensive goods does not necessarily mean abandoning the opportunity of specializing in labor-intensive goods, a point which is of much relevance to my thesis.

> A country may for example, use the most capital-intensive techniques available to produce everything which is made domestically, and yet it may at the same time specialize in those industries which are in any case more labor intensive than most others[24].

Thus, one can deduce that, capital-intensive industries like Heavy Industries can be complementary industries or a backbone to an economy specializing in labor-intensive industries.

Yet, what seems to discourage establishing a Heavy Industry in underdeveloped countries is what Sutcliffe pointed to as being labor intensive Heavy Industries. These are considered labor intensive in the developed world in the sense that they rely on highly skilled labor producing less standardized production in some of these industries. This poses a problem for underdeveloped

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[22] Ibid., 179,182,183&185.
[23] Ibid., 172.

countries where skilled labor is scarce. Such Heavy Industries include: Structural metal products, roller bearing, iron and steel, steam engines, turbines, machine tools, motors, generators, aircraft production and metal working machinery[25]. I believe that for the case of Egypt, the scarcity of skilled labor is not as profound as elsewhere, since many of these mentioned industries already exist. Yet, this indicates the importance of training workers and creating training centers, with this being a potential role of the government in establishing and reinforcing the existing Heavy Industry in Egypt. We shall explore this issue in the second chapter of this thesis.

D- How to Select a Project

Murray Bryce provided guidance from within a neoclassical perspective for selecting a national project based on a number of criteria. His analysis is based on the soundness of a certain project, and its ability to yield profits, regardless of its nature (Light or Heavy Industry…etc.). He believes that in underdeveloped countries productivity in industry is higher than in the agricultural sector. Industry can lead to diversification of economic activities and exports resulting from them, creation of more job opportunities, increase in national income, and generally it pays more than extraction of raw materials.

In many instances, Bryce adopts a Neoclassical perspective. He believes that small countries cannot progress much in self-sufficiency, and industrialization should not be given a top priority in an early phase of a developmental program. Also, he agrees with intensifying production of primary goods in this early phase and then later moving to large-scale industrialization arguing that the income of the people of underdeveloped countries is mostly coming from agriculture.

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[24] Ibid., 142.
[25] Ibid., 157& 158.

Bryce had no prejudice towards Heavy and light industries. He regards Heavy Industry, like other industries, as being only sound for a large industrial economy with large domestic markets since it needs high technology, scientific skills and auxiliary facilities that are all lacking in a non-industrialized country. His view concerning Heavy Industry is a more global Neoclassical one, and, thus, is one that stands firmly against the logic behind ISI policies. That is why he refutes the arguments that Heavy Industry is needed even with sacrifices, saying that this is true on a global scale but not for a small underdeveloped country. For this country, it is cheaper to import its needed Heavy Industrial commodity.

The only exception he mentioned is when this country is resource-endowed having spectacular reserves of iron ore, coal…etc. However, the weak points of his arguments can be identified as focusing on the short run, while the realization of the benefits from Heavy Industry should be expected mostly on the long run. He also seems to fail to acknowledge the effect of linkages and the strategic need for Heavy Industry.

For Bryce, generally what creates a sound project are: its ability to yield early profits for the economy and for the investor, the presence of a market to absorb its product, and the existence of prospective advantage from producing a good locally as reflected in costs unless it is protected by tariffs for a long time. As for the third factor, cost advantages can be realized through access to cheaper or better raw materials, and similarly low cost or more efficient labor, better accessibility to the market, lower cost financing, a larger scale of operation, better equipment or processes, more capable management, better market arrangements and a more integrated manufacturing operation[26]. In this regard it should be mentioned that the dimension of cost is now acquiring much more relevance due to the application of the GATT agreement, with which tariff protection is to be lifted

[26] Bryce, 15&16.

denying governments the opportunity to intervene and protect a high cost industry leaving only more costly protection and promotion policy options (e.g.: subsidizing inputs to a growing or an important industry).

Among the cost advantages stated by Bryce, Egypt can have an advantage in cheap labor and in some Heavy Industries, like Aluminum, since it has available raw materials as will be discussed later in this thesis. A strategy creating more cost advantages can be targeted to make Heavy Industry more favorable. Nevertheless, I believe that encountering costs in the first stage of implementing a Heavy Industrialization project should not discourage an underdeveloped country from moving in this line due to the long run benefits arousing from such a project.

It should always be expected that Heavy Industries meet high costs in the beginning, which diminish with increasing production. From an economic perspective, this can be attributed to the fixed cost of capital (as compared to variable costs of labor and inputs), given that most of the Heavy Industries are capital intensive relying on sophisticated machinery that should not be expected to be cheap. With economy of scale and with total output of these machines increasing as time goes, average fixed cost (fixed cost per unit of output produced) becomes less, which is not the case for variable costs (labor wages, raw material...etc.) Thus, as time progresses, and provided that depreciation is at low levels, cost will fall for Heavy Industries.

Table 1:Calculation of Costs

Equation	Abbreviations
TC = FC + VC	(TC = Total Cost, FC = Fixed Cost, VC = Variable Cost)
AFC = FC / TP	(AFC = Average Fixed Cost, TP = Total production)
AVC = VC / TP	(AVC = Average Variable Cost)

$AC = AFC + AVC$ | (AC = Average Cost)

Returning back to Bryce, he provides an insight to find new industrialization opportunities. For him finding these would entail:

1. Studying imports
2. Investing existing local resources (e.g.: raw materials and other productive elements)
3. 3-Studying available skills of labor and management
4. Conducting studies on existing industries to give an insight for a new project
5. Considering changes of technology and re-examining existing local resources based on this.
6. Investigating inter-industrial linkages
7. Conducting evaluations for developmental plans seeing how introducing certain new goods have changed the markets.
8. Reviewing old projects that might not have been applicable in the past and might be of relevance now.
9. Studying industrial experiences elsewhere
10. Using industry lists of other countries like the USA or UK that might suggest ideas and opportunities.

For Bryce, these provide a means for screening projects[27]. This methodology is very suggestive and I believe should be carried on when thinking of establishing Heavy industries. The most relevant points in Bryce's analysis are: the 6th point, which is studying linkages, and the 9th about studying experiences elsewhere (that is why I am devoting a section towards the end of this thesis for Heavy Industrialization experiences in newly industrializing countries). The 8th point, about studying old projects, suggests that we should analyze the Heavy Industrialization drive of

the 1960s in Egypt. While the 4th point that deals with analyzing existing industries has led me to discuss the present condition of Heavy Industry in Egypt (this comes later in this chapter). The first and the second points about studying imports and investigating existing local resources, and to some extent the third point on available skills, might provide criteria for giving more attention for developing certain Heavy Industries relative to others.

Furthermore, Bryce discussed a number of criteria for judging the value of industrial projects. He mentioned the factor intensity criterion (labor versus capital intensity), which I have discussed before. Plant size and complexity is a second criterion. As for the second criterion, he referred to the steppingstone theory according to which non-industrial societies should move in their industrialization from small simple industrial operations to larger more complex ones (Heavy Industry can be anticipated as an example). Through this development, this society is gaining skills, experience and capital, which would be helpful for larger industrial operations. Small and simple operations have immediate returns and are not using complicated techniques. This makes these operations, and industries relying on them, more favorable as compared to larger industries needing partnerships and borrowed capital that yield distant returns and which also need developed entrepreneurial skills and attitudes[28].

Moving on the same line, it was argued that large industries should not be carried on in backward countries due to lack of sufficient capital, transportation, technical and executive skills and transportation[29]. Bryce himself criticizes this view. He acknowledges that small and simple industries, being more labor intensive and for various other reasons, are beneficial for underdeveloped countries. Yet, he regards large and small industries as complementary, rather than

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[27] Ibid., 19-20.
[28] Ibid., 26.

being competitive, and thus they are feeding each other. Medium and large industries, which have obvious economic, technical and financial gains for an underdeveloped economy, should not be overlooked. What matters for Bryce is the cost-benefit analysis for a certain project regardless of the nature of the project[30].

Yet, I do not think that the Egyptian economy is too backward to be relevant for the steppingstone theory. Egypt was among the first, if not the first, to attempt to industrialize in the Middle East and this was in the first half of the 1800s during the time of Mohamed Ali's modernization drive. In the 1960s, and even before that, it had established an industrial sector that has become among the leading sectors of the Egyptian economy, as I will discuss later in this chapter. Thus, preconditions to move from small and simple operations to other complex and larger operations and industries are already existing and should be developed further.

Among the other criteria discussed by Bryce were the foreign exchange criterion (how much a project would generate of foreign exchange), commercial profitability criterion, and finally national economic profitability ("The total net measurable rate of return to the economy on an investment.")[31] These last three criteria are not relevant to my analysis because I do not assume that establishing Heavy Industry would provide profits or foreign exchange in the first stages. As Heavy Industries mature on the long run they certainly should be expected to meet these three criteria.

Taken from another perspective, Auty discusses the viability of a Heavy and Chemical Industrial project in a Third World country. His analysis is based on a comparison of constructing a plant in an underdeveloped country and another in a developed country using 1980s standards. According to Auty's analysis:

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[29] The Hoover Commission Report to US Congress in 1955 on overseas economic operations quoted in Bryce, 26&27.

[30] Bryce, 28.

1- In developing countries, construction costs are 20% higher than in a developed country. This results in a 6.5% differential in production costs encountered by a developing country as compared to a developed country. This is due to the need for substantial infrastructural provision and importation of specialized equipment.

2- In the first five years of operation, capacity used in a developing country's plant is about 90% and this is attributed to start-up difficulties. This results in a further 11% increase in costs as compared to developed countries.

3- This means that a developing country encounters about 17.5% more costs than a developed country in the first five years.

4- Yet, if the product is produced domestically, about 10% can be saved as this percentage is relevant to a typical import freight. As for the other 7.5%, it is a percentage that could be covered by an import duty within the limits permitted by the GATT agreement. Thus, even in the first five years the costs of production in a developing country will be equivalent to that of similar imported goods.

5- After the first five years, it is possible to operate at full capacity as there would no longer be start up problems.

6- What makes things even better is paying back debts by the 8th year. This debt is a big burden as it is most likely to be substantial. The presence of entry barriers, resulting from high capital needed for an HCI project, leads to borrowing heavily in the first years of project implementation. Having settled the debts, the project will yield high cash flows by the 9th year.

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[31] Ibid., 32.

7- The minimal outcome that can be expected then is a fall of about 2/5 of the start-up years average costs. If externalities created by this plant are taken into consideration, the benefits out of it would be augmented[32].

Auty is a little skeptical about the presence of such efficient HCI firms in developing countries, and believes in the possibility of the presence of other factors. Yet, his analysis provides a theoretical and empirical justification for constructing an HCI project that would not need much protection and that would yield profits in the long run without burdening developing countries' economies with huge losses even in the initial years. His analysis also takes the GATT agreement into consideration, not assuming a theoretical Autarkic situation, which makes his analysis more appealing.

E- The Concept of Stages

Chenery and Syrquin thought of industrialization as proceeding in stages. They believed that as development proceeds, Light Industries expands at the expense of primary goods. Then, in the next stage Heavy and Chemical Industries (HCI) expand and become dominant. They based this finding on the study they both commissioned on the development of 100 countries between the 1950s and 1980s. Through empirical data they were able to show that the share of output coming from Heavy and Chemical Industries tripled with the rise of per capita GDP. When per capita GDP reaches the level of $1,000 Heavy and Chemical Industries are increasing in importance and they dominate at the expense of light industries[33]. Thus, both thinkers acknowledged the importance of Heavy Industry as its expansion is a characteristic of a developed economy and is a measure of a society's development.

[32] Auty, 37& 38.

Based on a different classification of industries, Hoffmann also thinks of industrialization as developing in stages. In the first stage, consumer goods industries (e.g.: food, textiles, leather and furniture) dominate industrial production. In the second stage, capital goods industries' output starts to reach almost half the output of consumer goods industries. Then, the third stage sees a more balanced position between the two types of industries with a tendency for capital goods industries (e.g.: metal-working, vehicle building, engineering and chemical industries) to expand more rapidly as compared to consumer ones[34]. Thus, the model also acknowledges the proportional relation between capital goods and industrial development.

Yet, this model provokes many criticisms and doubts that question its viability. There is statistical skepticism on Hoffmann's findings since certain industries were hard to classify and, consequently, were excluded from classification. Stages were seen as being set arbitrarily, added to the fact that new technologies can give underdeveloped countries seeking industrialization an opportunity to get higher output at even earlier stages. Moreover, capital/consumer industries' output ratio cannot be a guide to decide the level of development reached by a certain economy. I believe that testifying the maturity of an economy is a far more complicated task than measuring the referred to output ratio. A country might have a mature economy producing various commodities (capital and consumer), but because of a high demand on consumer goods (due to an income boom for instance), more consumer goods would be produced relative to capital goods. In this case, if we measured the capital/consumer output ratio, it would give misleading information about the maturity of the economy being tested. Finally, the analysis also disregards the presence of government dirigisme in certain economies. This intervention might determine this output ratio

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[33] Ibid., 1& 100.
[34] Sutcliffe, 34.

rather than letting the rules of the market move in the prescribed stages[35]. However, despite all this criticism, the model is still suggestive of a pattern of industrial development that should be given its due credit. The progress of capital goods industries is an indication of a progress in industrial development, and this should not be denied even if we acknowledge criticism of this model.

Yet, I believe that capital goods industries should be complementary to consumer goods industries providing the backbone for the latter industries, rather than regarding the process as a matter of stages. I am stressing here the complementary relation between the two types of industries, which I have pointed out previously. Supporting this view is what is stated by the UNIDO. The organization states that establishing Heavy Industry is needed to support and feed basic needs industries for consumer durables, clothing, housing and transportation. It stated three reasons which are:

1. Materials and capital goods provided by Heavy Industry to these industries.
2. Developing rural areas, given that most of the poor population of underdeveloped countries, need irrigation facilities, land improvement, fertilizers, tools and implements, farm tractors and machinery which can all be provided by Heavy Industry.
3. Choice of appropriate technologies for consumer industries and agriculture calls for development of technology which in its turn depends on capital goods producers and suppliers[36].

Thus, rather than thinking in terms of stages and capital industries or Heavy industries taking over the role of consumer industries or light industries, one should think instead of the linkages created between all of these industries and the necessity of developing each of them for the

[35] Ibid., 36-39.

[36] Pradip K. Ghosh, *Industrialization and Development: A Third World perspective* (London: Green Wood Press, 1984), 96.

sake of the whole economy. I believe that these inter-complementarities should be developed from the early stages and this belief is based on the concept of linkages, which I shall discuss in the following sub-section.

F-Linkages

Industrialization, and Heavy Industry in particular, has been stressed by a number of theorists who regarded the industrialization process as fostering the development of underdeveloped societies. One of the old theories in this regard is the Harrod – Domar model of economic growth. It claims that shifting from consumer to Heavy Industries leads to higher rates of economic growth. Their arguments fit more a closed economy endowed with various resources, where savings are converted directly to investment and, consequently, to an output. Others believing in this model suppose that shifting from consumer goods production to other manufacturing activities will lead to this outcome, attributing it to "dynamic linkages, spillover effects and external economies."[37]

Hirschman is one of the prominent thinkers who spoke about the concept of linkages in relation to industrialization. Industrialization is believed by him to create plenty of linkages. Yet, certain conditions should be met in order to achieve this objective and to avoid it being deflected towards causing larger imports of intermediate inputs, unutilized capacity and higher prices...etc. Linkages can only be created when industries being established become the source of demand and supply of intermediate goods and services for each other. He criticized reliance on input-output tables of different countries as a measure to test the development of linkages; rather interdependence between industries is meant to meet final demand, which has something of a

unique character for each country. Final demand depends on tastes, which cannot be assumed to be similar in every country given the cultural varieties and sociological differences present in our world. That is why Hirschman asserts that it would be incorrect to test the efficiency of policies based on inter-industrial linkages with reference only to the growth rates achieved in different countries[38].

Raj argues that potential linkages in certain industries were regarded as inducing greater investment in them. Yet, he added that other factors should also be considered like the availability of various resources such as entrepreneurship, natural resources, foreign exchange, savings, and the presence of favorable governmental policies and clear developmental objectives. Raj concludes that we cannot reach a universal generalization by analyzing the industrial structure of various nations through inter-country comparisons. He points to a study that confirms this conclusion done by Panchamukhi's on the role of linkages in the industrialization of some of developing Asian states[39]. Hence, the arguments of Raj in this regard do not differ much than that of Hirschman.

Staley explained the interdependence between industry and agriculture for achieving development. With reference to the dependence of agriculture on industry, it is clear that he was referring more to Heavy industry saying that industry provides agriculture with machines and other services as well as absorbing surplus manpower and thus helps in the development of agriculture and rural areas[40].

More specifically, Murphy talked about linkages that result from a Heavy and Chemical Industrialization Big Push strategy, like the ones that had been pursued by Brazil and India and

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[37] Robert Mabro, *The industrialization of Egypt (1939-1973): Policy and performance* (Oxford University Press, 1976), 91.

[38] Ghosh, 67.

[39] Ibid., 67.

[40] Bryce, 6.

which will be discussed later. Such a strategy aiming at maximizing economy of scale "through simultaneous entry into several HCI sectors which have complementary demand" has "substantial economy wide benefits."[41] He argues that industrial investment in a sector that seems unprofitable can still have embedded welfare effects as well as other positive effects on income due to the inter-relatedness of industrialization among various sectors. The Big Push strategy can reduce the cost of subsidies and tariffs, meant to assist the rising industries, due to the flow of benefits between sectors[42]. Such a strategy is, thus, very reliant on the concept of linkages and the importance of establishing an integrated economic structure with Heavy Industry playing a central role in this.

G- Debate on Technology

1- The Neoclassical/Structuralist debate

I am devoting to the Neoclassical Structuralist debate on technology (rather than their general debate on Heavy Industry) this sub-section. The debate over technology is relevant to Heavy Industry in many ways (and especially the machinery sector) as will be shown in this sub-section.

The Neoclassical school believes in the applicability of technology everywhere. Thus, they call for relying on foreign technology if it is cheaper than producing it at home. They advocate importing it believing that this imported technology can be used immediately by underdeveloped countries, and also that it contributes to learning and know how. They thought of technology as a cost that the underdeveloped should not suffer much from. This cost avoidance can be realized by

[41] Auty, 103.

using a technology that has been tested before and which is to be acquired from the developed world. Similarly, it is believed that late industrializing countries can take advantage from being late by acquiring the latest available technology[43]. These arguments blow away the logic for a need for establishing a Heavy Industrial backbone, since machinery and equipment to be used in other industries (e.g.: consumer goods industries) and activities (e.g.: agriculture) can be acquired through imports from the far advanced developed world.

Before even moving to the Structuralist criticism of the Neoclassical assumptions supporting this conclusion, Raj pointed out something that questions these assumptions. Raj believed that the technology that evolved in the industrialized world is one that is inappropriate for industrializing underdeveloped countries. This technology is more capital intensive, labor saving as well as being energy intensive and using intensively other resources[44]. A problem might result for underdeveloped countries given their relative scarce factor endowments, except for labor.

Frances Stewart pointed out that an imported technology comes as a package that incorporates many things, which she identified as: nature and specification of the product being produced, scale of production, raw materials and skill requirements, raw material processing and marketing, the characteristics of the labor force (e.g.: education and wage), and often the package also includes marketing arrangements. When a developing country imports a technology from the developed world it actually imports all of the package, which incorporates many factors specific to the country that produced this technology. Thus, by using this assumption, she argues that importing technology will lead to imbedding problems (like capital intensity or excessive scale of production) for the future development of a country involved in this practice. She even claimed that

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[42] Ibid., 103.
[43] Hewitt, 39.
[44] Ghosh, 70.

this would lead to inequality in the distribution of income[45]. This agrees with the view offered by Celso Furtado who believed that imported technology causes structural deformation for the peripheral economies importing it. This technology is not designed for absorbing the labor surplus of peripheral economies. It also targets luxury goods, and, consequently, excludes the masses so that only a small segment of society benefits from the scarce resources of an underdeveloped country[46].

Rather, Stewart argues for establishing capital goods industries in underdeveloped countries considering it to be a great developer of technology in a country. Her arguments are justified by referring to Freeman's arguments on the concentration of research and development in Heavy Industries since new processes and products in various industrial sectors call for new machines[47]. Added to this, Stewart points out that Heavy Industries (as compared to consumer goods industries) stimulate the upgrading of old machines, and are more stimulating to innovation in other industries due to "changed scale of requirements following the innovation, or because of changed technical requirements."[48] In most of this analysis on Heavy Industry, she was specifically pointing to machine making industry. She finally asserts with Rosenburg that "countries which have no capital goods sector also tend to lack the base of skills, knowledge, facilities and organization upon which further technical progress so largely depends."[49]

Returning to the Dependentista (relating to the Dependency school) perspective, which we have discussed with the ideas of Furtado, Evans pointed to the disarticulation of peripheral economies due to their reliance on foreign technology, capital and equipment. For instance, a

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[45] Kurt Martin, *Strategic of Economic Development: Readings in the Political Economy of Industrialization* (New York: St. Martin's Press, 1991), 164&165.

[46] Peter Evans, *Dependent Development: The Alliance of Multinational, State, and Local Capital in Brazil* (Princeton, New Jersey: Princeton University Press, 1979), 29.

[47] Martin, 163.

certain good which is produced in an underdeveloped country is most likely to necessitate importing machinery and various other inputs. Thus, linkages would not be produced locally, but rather the production process is being linked with foreign suppliers and industries. For that reason, the multiplier effect that results from linkages is not being exploited in peripheral economies; the multiplier effect of industrial investment in the periphery is rather moving to the center (i.e.: the developed world).

The Structuralists have dealt with this issue in many instances. They believed that technology should be developed locally to avoid importing inappropriate technologies, that foreign technologies could lead to slowing down or blocking longer-term technological development, and they argued for developing technological capabilities and learning[50]. This capability is reflected in the ability to search for available alternatives, select appropriate technology, adapt technology to meet production conditions, and conduct research and institutionalize Research and Development. In the Third World, developing one's own relevant technology helps in the process of learning. Abandoning the process of developing local technology will only result in lacking technological capabilities. Consequently, this will lead to limiting these countries' negotiation power when trying to acquire technology or trying to adapt it to local conditions. As Jenkins asserts, that is why modern Structuralists stress the importance of developing domestic technological capabilities through learning rather than importing technology. They believe that Third World countries have the capability for developing technology relevant to their conditions even at the first stages of development.

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[48] Ibid., 163,164.
[49] Ibid., 164.
[50] Hewitt, 203.

As for choosing alternatives and adapting technology, the Structuralists state that "significant numbers of innovations are originated by people through learning by doing and learning by using."[51] Hence, user's innovation also influences a country's technological capabilities in certain industries. This is a point that the Structuralists regard as giving hope for underdeveloped countries to develop their technologies without needing to depend much on basic research and science. No wonder that the Structuralists, when speaking of Research and Development (R&D) and acknowledging its high costs that can be an obstacle for poor underdeveloped societies, say that:

> The strength of R&D capabilities in a given country is not a function simply of the existence of formal research institutes and laboratories. Perhaps equally important is the accumulated informal and frequently undocumented knowledge acquired by the indigenous work force through a protracted process of learning by doing and transmitted through formal or informal on the job training[52].

Nevertheless, a gloomy outlook to the concept of developing a local technology is asserted by Raj who said that the selection of a technology is limited for intermediate goods industries, among which is steel[53]. Sutcliffe, furthermore, claims that only a few industries are of a technologically flexible nature (i.e.: various capital intensities are available which can be selected according to relevance). This is because technology, being developed in the West, is mostly capital intensive[54].

Sutcliffe referred to data collected from the USA, noting the technological flexibilities of various industries. The least technologically flexible were: electric machinery, other machinery, products of petroleum and coal, fabricated metal products, non metallic mineral products, furniture and fixtures, printing and publishing and primary metals. Those of intermediate flexibilities were:

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[51] Ibid., 205.
[52] O'Connor 1985 quoted in Hewitt, 324.
[53] Ghosh, 71.

textiles, pulp and paper products, apparel, and transport equipment. For another study, Sutcliffe pointed out that those industries which are highly technologically flexible are iron and steel, cotton yarn and cloth, and textile weaving and spinning[55].

Based on this, it should be assumed that Heavy Industry in Egypt (machinery industry in this case) would be very helpful to the national economy through providing the relevant capital intensity for those industries of high and intermediate flexible technologies. This assumption is asserted by the fact that the textiles industry, which is mentioned as being intermediate in its flexibility, is a very important industry in Egypt and one that Egypt can have a comparative advantage in, in the age of Globalization. The same applies to cotton yarn, cloth and textile weaving and spinning which are highly flexible, according to the studies stated by Sutcliffe. These industries can act as export commodities based on the high quality and availability of the Egyptian cotton crop. More jobs can be created if capital intensity is adjusted. Flexibility does not mean necessarily having labor-intensive alternatives, but costs can be minimized if energy use is adjusted utilizing a locally produced technologically adjusted machinery in the production of these commodities. This local technology should be developed in a way that saves energy without being drastically less efficient than its foreign competitors. Cutting expenses and giving more opportunity for increasing labor intensity would achieve the double goal of increasing job opportunities and increasing the comparative advantage of what can act as excellent export commodities, by this I mean cotton related industries.

2-Fordism and Post-Fordism

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[54] Sutcliffe, 146.
[55] Ibid., 147&148.

A change in production operations has been witnessed in the world since the 1970s, in a way that many writers referred to as a shift from Fordism to Post-Fordism. Fordism meant dividing the production process of a certain good into a number of small tasks that do not require much skill from involved workers whose job is reduced to routine work. The speed of production was based on the speed of the line. Fordism entailed using highly specific machinery, which meant the need for large-scale standardized production to cover large investments in the specialized machinery used in the production process. Inflexibility of production results, and cost is expected to increase as large inventories of spare parts are maintained for a "just in case" basis[56].

Thus, Fordism involved mass production and economies of scale with which productivity increases and consequently wages and mass demand grow. With full utilization of capacity, and as a result of increasing investment in better mass production equipment and techniques, profits increase[57]. This was reflected even on the social conditions of industrialized countries: "Consumption of standardized, mass commodities by nuclear households and provision of standardized, collective goods and services by the bureaucratic state."[58] Thus, technology used in the Fordist age impacted profoundly on society, but what is of relevance to my study is that not every nation was able to adopt such technologies due to the need for huge investments and economy of scale...etc. It can be expected that underdeveloped nations, seeking industrialization, would have met high costs in the inception period due to this.

Yet, due to technical changes in the production processes, the world has witnessed since the 1970s a new age with the rise of what is referred to as Post-Fordism. This age is witnessing more flexibility in production so that many models could be produced by the same assembly line

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[56] Hewitt, 26-28.
[57] Ash Amin, *Post-Fordism: A reader* (Oxford- Cambridge: Blackwell, 1994), 253.
[58] Ibid., 254.

and inventories are kept to a minimum. It is regarded as flexible specialization where relatively small units produce in a decentralized way and where subcontracting arrangements can be arranged[59].

Another dimension of Post-Fordism is the possibility of operating with a relatively smaller plant size than that common in Fordist production methods. With both flexibility and small-scale production that can be adjusted to meet the present demand, the "Just in time" (JIT) strategy became possible. The JIT strategy is a cost effective one and the risk from it is minimal, yet, it necessitates the presence of skilled labor and organizational and innovational skills that might be scarce in an industrializing developing country[60].

Nevertheless, it should be pointed out that the literature on Post-Fordism is more relevant for export commodities and provides hope for industrializing underdeveloped countries in this regard. This is attributable to the concept of flexible specialization which means that these countries are not compelled to operate on a large-scale to cover expenses and to be efficient. Some thinkers even spoke of a return to craft production together with smaller firms production since both no longer have a disadvantage. Smaller batch production would still be efficient.

Even in Heavy Industry, Post-Fordist methods were introduced and provided more opportunities for Newly Industrializing Countries (NICs) to proceed towards Heavy Industrialization. The introduction of mini mills in steel production since the 1980s has contributed to this factor. Mini-mills can operate to 1/10 or 1/7 of the scale of an integrated plant, thus offering the possibility of producing relatively smaller batches than those produced by integrated plants. The production of these mini-mills even competes with that of the integrated plant in certain products (e.g.: flat products as compared to rounded ones). With these developments and their further

[59] Hewitt, 27&28.

progression, more hope is provided for Third World countries to establish a Heavy Industrial sector with less costs and risk. Thus, the high risk and costs that constructing a large integrated plant is encountering can be avoided. An integrated plant experiences three to four stages, the first of which is characterized by unattractive investment due to the high costs resulting from the need for substantial infrastructural investment and for not operating on an optimal scale. In the subsequent stages, the integrated plant should use economy of scale to cover its costs. This requires the presence of demand that can match this substantial production. All of these stages involved a risk that mini mills can avoid. Added to this, the 1970s witnessed the introduction of products that does not require scale production in the way steel and aluminum need. These new products were mainly coming from petrochemicals and an example of these products is engineered polymers[61].

What can be interesting about the literature on Post-Fordism are three points. The first point is that thinking of flexible specialization, I believe, blows away the whole logic behind Neoclassical trade theory. The concept of mass demand that induces mass production of standardized products is the logic that stands behind specialization in a world economy in the manner that the school advocates. If demand is tending to move to less standardized products, and technologies have the capability of shifting production so that flexible specialization results, then a certain country should not necessarily specialize in producing a certain commodity but rather can shift production from one commodity to another. It also does not realize a comparative advantage from large-scale production as it can rather produce in small batches. If this is the case, then establishing Heavy Industries in Third World countries should not require large-scale production to cover expenses. Furthermore, Post-Fordism implies the emergence of a more diversified economy than that called for by the Neoclassicists.

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[60] Auty, 23.

The second point is the belief that producing for specialist and volatile markets necessitates flexible specialization that should rely on skills, flexibility and networking among task specialist units in order to change volumes and combination of goods in order to meet changing demand without meeting productivity losses[62]. Sabel goes further to say that flexible specialization invites the return to locally integrated regional economies based around specialization in a certain product.

> [The] agglomeration of value chain in an industry provides vital support for an industrial paradigm composed of loose confederation of specialist firms responding rapidly to changing market environments.[63]

This imbedded call for linkages to be directed to producing a commodity that a country can specialize in, and shift in producing various models of this commodity according to changes in tastes and demand, invites us to think of reinforcing Heavy Industry. Heavy Industry can provide export commodity industries with machinery and intermediate inputs that meet the changing demand of these industries. If, for instance, the textiles industry in Egypt is to produce less standardized products that necessitate different models of machines, and if the demand for various models of textiles change unpredictably with new models being favored, then it is justifiable to develop a local machinery sector that would help in developing local technological capabilities in a way that permits the local machinery industry to instantly adjust its production to meet new tastes world-wide. If local technological capabilities are not properly developed, or if the textiles industry is to rely on imported machinery, a delay in shifting production according to changing tastes might result. Also, depending on imported machinery denies the textiles industry from any innovational capability, and thus the textiles industry in Egypt would not develop new models for its products but would rather be a follower or imitator of existing models. In a Post-Fordist age, a delay in

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[61] Ibid., 23, 50& 51.
[62] Ash Amin, 21.

catching up with producing new models and the lack of innovational capabilities are great disadvantages. If a machinery sector feeding the textiles industry in Egypt is developed, this industry might escape these disadvantages. This might be accompanied with calling MNCs to participate in joint ventures with local capital in the textiles machinery sector so as to facilitate the process of learning through adopting international models and then moving towards developing local technological capabilities.

Finally, the third point is that Post-Fordism, as a concept, is received by some thinkers with skepticism. For them, Fordism will persist and adapt. Competitiveness is not a question of only efficiency, which can be realized in a supposedly Post-Fordist age without necessarily operating in a large scale. MNCs can dominate markets with other means like their grip over finance, distribution networks, market outlets, advertising...etc[64]. This calls for an institution that can preserve the interests of domestic firms and promote their products. An active role for government can be a possibility, and this active role will be the subject of my discussion later in the second chapter of this thesis.

2-Present Condition of Heavy Industries in Egypt

A- Prologue

Regardless of Egypt's position as an underdeveloped country and the dominance of agriculture in its economic structure, its Heavy Industrial sector is in many regards well established and is varied including Iron and Steel, Aluminum and various other metals as well as petrochemical, machinery and other industries. The Heavy Industrialization drive dates back to the time of the Revolution, which gave more attention to Heavy Industry, than at any time before or after.

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[63] Ibid., 21.

Heavy Industry is still advocated by many Egyptian writers. For instance, Dr. Mamdouh Al-Sharkawi from the Institute of National Planning, in the Egypt Human Development Report 2000/2001, provided a suggested pattern for industrial development in the age of Globalization. He urged focusing on industries with strong backward and forward linkages that help in starting up new industries that use domestic inputs and resources. These suggested industries should be able to compete with imported similar products in quality and price. Added to this, these industries should seek export markets and maximize job opportunities. Al-Sharkawi pointed out industries that he regarded as meeting these conditions which were: "chemicals, cement, garments, shoes and leather products, toys and sport equipment, aluminum, and iron and steel"[65]. Among these industries we can see that many belong to the Heavy Industries that my thesis is arguing for establishing and reinforcing in Egypt.

Gouda Abdel Khalek provided a study on Egyptian industries and their current condition. Away from Heavy Industries and speaking of industries that provide the highest value added for the Egyptian economy, he showed that there was a dramatic decline in the share of value added of the textile industry from 34% in 1975 to 5% in 1995/96, which seems to be striking given the comparative advantage that Egypt can have in this industry if it was provided its due attention. Yet, he pointed out that the private sector shows progress in ready made clothes production and a rise of exports was witnessed from 15 million L.E in 1980s to 322.4 million L.E in 1990/91[66]. Food and other related industries share of value added reached 1/3 in the late1980s before eroding. I should elaborate that the mentioned industries are labor intensive in nature as well as promising for private investment thanks to labor and resource abundance. More job opportunities are further expected to

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[64] Ibid., 16.
[65] UNDP, *Egypt Human Development Report 2000/2001*, 55.

be realized from using the appropriate technology that takes into consideration factor endowments (labor, natural,…etc.) as well as other conditions. This calls again for establishing and reinforcing a Heavy Industrial backbone providing these industries (especially the textiles industry that is expected to expand due to the potential comparative advantage that it has) with the appropriate machinery and equipment (also a cheaper domestic supply of machinery and equipment can be realized when the growing demand for them induce their mass production). Having appropriate and cheaper machinery will encourage more private investment in industries like textiles and food processing. Supporting this view on the appropriate technology to be used, Abdel Khalek talks about the capital deepening happening in some of the naturally labor intensive industries like wood and furniture and paper printing and publishing which have led to lower factor productivity and to raising questions on the right technology to be imported[67].

Moving closer to our research, it should be noted from Abdel Khalek's analysis that the existing Heavy Industry in Egypt is not that of a nation in the first stage of industrial development. A broad category, it incorporates many Heavy Industries, having a share of value added to the public sector of 33% in 1995/96, and it is employing 34% of the public sector labor force. This category included non-metallic and mineral products, metals and metal products and equipment[68]. Yet, in my analysis I will focus on intermediate industries, especially the iron and steel industries, and to a lesser degree the aluminum industry, as well as the petrochemical industry (which is a promising one given the oil and natural gas reserves in Egypt), and finally the machinery industry (due to its centrality for the discussion over building technological capabilities).

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[66] Gouda Abdel Khalek, *Stabilization and Adjustment in Egypt: Reform or De-Industrialization* (Edward Elgar Publishing ltd., UK, 2001), 101-103.

[67] Ibid., 108.

[68] Ibid., 101-103.

B- Iron and Steel Industry

The iron and steel industry is of vital importance for various industrial sectors and to other economic activities. Steel is used in construction, transportation, water and sewage pipes, durables, and machines while other byproducts are used in other industrial activities like the chemical, and cement industries and others[69].

Despite the gloomy picture that might be attached to heavy industries when looking to their profitability, Abdel Khalek provides a different perspective. In his book *Stabilization and Adjustment in Egypt: Reform or De-Industrialization*, he discussed in details two of the main Heavy Industries established in Egypt, which are iron and steel, and aluminum, and the impact of ERSAP and Globalization on them. The iron and steel industry he referred to as being a very important industry for the structure of a nation's economy because of the strong forward linkages that it provides and that I have pointed out before. In Egypt, the Egyptian Iron and Steel Company is the main company involved in producing this product and it is a large complex employing around 23,000 workers. Its activities encompass mining the Pig ore, transporting it and producing steel[70]. The Egyptian Iron and Steel Company has the advantage of being the only Egyptian company having blast furnaces, added to its "wide range of long and flat products."[71]

Abdel Khalek asserts that the Egyptian Iron and Steel Company adjusts its output so as to meet the demand for its final production (reflected in the sales of this product). Consequently, it does not function with its maximum capacity, which is about 1.2 million tones of steel annually.

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[69] *Sanaat Al-Hadid wa Al-Sulb: (The Steel and Iron Industry)* (Cairo: Salsalat Dirasat Al-magalis Al-mutakhasasa, 1980), 15.

[70] Abdel Khalek, 132.

[71] *The Mineral Industry of Egypt-1999*, US Geological Survey Minerals Yearbook 1999; Accessed on 20 October 2003; Available from

This means that the company can be more cost effective if production was expanded using the concept of economy of scale and provided that further demand for it is to be stimulated. I argue that an expansion for the Egyptian industrial sector (especially the machinery sector) will achieve this target. Abdel Khalek clearly stated that this industry is a capital-intensive and even an energy-intensive one that targets the domestic market. Yet, what is surprising is that only 85% of this industry's output is sold in Egypt, and thus that about 15% of its production is being exported[72]. This means that the steel production of the Iron and Steel Company is not only targeting the domestic market but can also act as an export commodity.

Linkages created by this industry are numerous. Various forward linkages are being provided by this industry such as intermediate goods for other industries (e.g.: iron and steel rods). Also, this industry is creating backward linkages. In its industrial process, the Egyptian Iron and Steel Company uses iron ore from Bahraya oases, limestone from BeinKhaled quarries in Minya governorate and dolomite from Adabiya in the Suez governorate. Ferro-Manganese and graphite rods, that used to be imported, are now being supplied from local producers. Generally 85% of the inputs of this industry in the Egyptian Iron and Steel Company are locally produced. Thus, the iron and steel industry has backward linkages (for its needed inputs) with mining added to the stated forward linkages. The value of this industry to the Egyptian economy should be decided putting these facts into consideration.

Yet, it should be known that the steel industry in the Egyptian Iron and Steel Company is facing a number of problems. The first of these problems concerns the inputs and requirements needed for this industry. Iron ore is abundant in Egypt in a way that encourages the establishment of this industry. Nevertheless, the quality of the ore is not the best and the ore needs special

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http://minerals.usgs.gov/minerals/pubs/ country/1999/9210099.pdf; internet.

treatment without which the resulting produced steel will be of higher cost. Studies are being carried out regarding treatment of the iron ore to make the steel industry more competitive. Also transferring the iron ore from the mines to the factory is an expensive process and the same is true in the case of coke. This rising costs has impacted on the price of steel produced by the company in a way that threatened its competitiveness in even the domestic market. Imports of steel from Eastern European countries are the one posing this threat thanks to their cheaper prices and dumping prices practices. The Iron and Steel Company found itself obliged to close two of its four blast furnaces in 1998 in order to reduce cost. In 1999 one of the two furnaces started to operate again while the other was closed temporarily for maintenance[73]. Yet, the government is looking forward to levy antidumping fees on imported steel from Eastern European countries in order to protect the local industry[74].

The second problem is using obsolete machinery together with new ones. When new machinery is obtained for the iron and steel factories, they are not replacing the old ones but rather the old and the new are being used together. The logic of this is not to waste resources by getting rid of old machines while they can still function. However, this eventually leads to deterioration in productivity, efficiency, the use of inputs, energy and fuel and maintenance expenses. Thus, the old machinery should be eliminated completely and be replaced by new technologically advanced machinery in order to foster the productivity and efficiency of the steel produced in Egypt.

A third problem is one that is typical for the public sector, which is the over-staffing of the firms in a way that reduces productivity and raises costs. Finally, the inadequacy in infrastructure,

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[72] Abdel Khalek, 133.

[73] *The Mineral Industry of Egypt-1999*, US Geological Survey Minerals Yearbook 1999; Accessed on 20 October 2003; Available from http://minerals.usgs.gov/minerals/pubs/ country/1999/9210099.pdf; internet.

especially transportation (transportation of coke and iron ore to factories) and electricity provided to factories, results in many production problems[75]. Yet, it should be noted that the infrastructure has recently been much improved in Egypt and costs due to inadequate infrastructure should be expected to be minimized.

As for the effects of the ERSAP, Abdel Khalek said that it has some positive measures benefiting this industry while other measures are negative in their effect. Increasing the prices of energy sources that this industry depend on (e.g.: electricity, coal…etc.), liberalizing interest rates (and thus increasing the value of the company's debts), liberalizing input prices (which might have been previously subsidized), as well as introducing a sales tax on inputs and finished output, are all among the negative impacts of the ERSAP on this industry. Yet, there are some positive implications for the ERSAP on this industry like liberalizing prices for its final product and devaluation. Devaluation has been pointed out by Abdel Khalek, but more emphasis should be put nowadays on this issue due to the present drastic devaluation of the Egyptian pound. This devaluation is providing a sort of protection for this industry. Added to this, this industry depends on inputs, 85% of which are locally produced or provided; thus, devaluation would not raise much the prices of inputs due to the rise in the prices of imports. On the contrary, devaluation will lead to the reduction of the price of inputs, as compared to imported inputs, and to an increased competitiveness for this industry. Added to this, Abdel Khalek suggested a number of measures to reduce energy consumption of this industry and thus reduce the costs and increase profitability.

Added to the Iron and Steel Company, there are a number of other publicly owned firms involved in producing Iron and Steel, like Al-Delta for Steel, the National Company for Metallic

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[74] "Shifting towards the Private Sector," *FORBES Magazine*, 31st May 1998; Accessed on 20 October 2003; Available from http://www.winne.com/egypt/cr07.html; internet.

[75] *Sana'at Al-Hadid wa Al-Sulb*, 43-48.

Industries, The Egyptian Company for Bronze Factories. They are of a lesser value than the Iron and Steel Company.

Yet, more recently the private sector has started to contribute positively to this industry in a way that is promising of expanding production of this commodity. Egypt was witnessing "strong growth in demand for steel, both for long products for the booming construction sector and flat products for industrial equipment and consumer goods. The demand growth has spurred large private investments in the sector but has also led to an influx of inexpensive imports that have hurt the profitability of the domestic producers."[76] Thus, the private sector was attracted to the steel industry opening a new scope for the expansion of this industry. This was possible thanks to the Hadid Ezz Company, which has now outstripped the Iron and Steel Company in production. Hadid Ezz is producing specialized steel and exports almost 1/3 of its products and it can even export all of its production[77]. Towards the end of the last century, the Ezz group was constructing in collaboration with foreign investors a "modern flat steel product facility" near Suez, which was to be accomplished by 2002 with an investment of $620 million and hopes to raise the company's steel production to three million tons per year[78].

The further expansion of the Ezz group was fostered by buying controlling shares of the Alexandria National Iron and Steel Company (ANSDK). Speaking of the ANSDK, it is one of the two major steel producers in Egypt (the other being the Egyptian Iron and Steel Company that I have already talked about). It was established in 1986 and Japanese investors were involved in the company by making it a joint venture. Starting with 750,000 rebars per year, it reached a 1.8

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[76] *The Mineral Industry of Egypt-1999*, US Geological Survey Minerals Yearbook 1999; Accessed on 20 October 2003; Available from http://minerals.usgs.gov/minerals/pubs/ country/1999/9210099.pdf; internet.

[77] "New Sons, old fathers," *The Economist* 350, issue 8111, 20 March 1999; Accessed on 12 October 2003; Available from http://fox.rollins.edu/~tlairson/intbus/egypt3.html; internet 6.

million tons per year in 1998 and realized a $400 million in sales. It exported 20% of its production (especially to Arab countries) and provided the Egyptian market with 35% of its demand of rebars[79]. The ANSDK, however, uses imported iron ore while using Egyptian natural gas in its production processes. The used natural gas is extracted from offshore natural gas fields near Alexandria. In November 1999 it became the "country's second flat products producer" after establishing a one million metric ton per year "DRI-fed hot strip mill with a thin slab caster."[80]

The Ezz group bought 28% of the shares of the ANSDK, and a member of the group became a joint managing director and chairman of both ANSDK and the Al-Ezz Steel Company. Both companies' brands were unified under the name of Ezz-Dekhila. With this merger the Ezz group was entitled to control about 67% of the steel market share in Egypt and the merged company now controls about 60% of the Egyptian market. The production of the company is of a high quality, which is a promising performance[81].

The performance and the expansion of the activities of the Ezz group is not the only indicator that the steel industry is in fact growing as well as promising in Egypt. For instance, the General Lithograph Egypt Company has conducted a feasibility study on constructing an electrolytic tinning line with a capacity of 100,000 tons per year (t/yr) in 6th of October city. The Egyptian American Steel Rolling Company built two mills each of which with the capacity of producing 500,000 tons per year (t/yr), one for bar and wire rod rolling and the other for bar rolling. In the year 2000, a mill with the capacity of 300,000 tons per year (t/yr) bar was being constructed by the El-Attal Steel company, while the Suez Steel Company by then had already a

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[78] "Shifting towards the private sector," *FORBES Magazine*, 31st May 1998; Accessed on 20 October 2003; Available from http://www.winne.com/egypt/cr07.html; internet.

[79] Ibid.

[80] *The Mineral Industry of Egypt-1999*, US Geological Survey Minerals Yearbook 1999; Accessed on 20 October 2003; Available from http://minerals.usgs.gov/minerals/pubs/ country/1999/9210099.pdf; internet.

mini-mill with a starting capacity of 600,000 tons per year (t/yr) at Adabiya[82]. It is clear, thus, that Egypt is starting to make a good use of the technique of the mini-mill.

Furthermore, according to data from the *"US Geological Survey Minerals Yearbook-1999"*, the Arab Company for Special Steel had an expected output in the year 2000 of 60,000 metric tons per year and the company was targeting the realization of full capacity of 160,000 metric tons per year by the year 2003. It was expected that half of the output would be exported. It should be noted that this company "was the only producer of specialty steels, including stainless, in the country."[83] At Port-Saed, The Arab Steel Company was constructing a plant with a projected capacity of 600,000 tons per year, one third of which was meant to be exported. Prospects of foreign capital investment in this industry was witnessed in the plant that was planned near Aswan. The Aswan Development and Mining Company in association with the Aswan Iron and Steel Company "comprised a multinational consortium formed to build an integrated iron and steel mill and mine complex to exploit iron deposits near Aswan. The consortium was awarded a 30 (thirty)-year mining concession that covered the iron deposits in 1998. Tenders went out in 1999 for the development and operational contract for the mine."[84] Unfortunately, the implementation of this ambitious project was suspended due to charges of corruption and stealing public funds.

C- Aluminum Industry

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[81] Ahmed Farouk Ghoneim, *Competition Law and Competition Policy: What does Egypt really needs*, Economic Research FCRUM, ERF working paper series, working paper 0239.

[82] Philip M. Mobbs, *The Mineral Industry of Egypt-2000*, US Geological Survey Minerals Yearbook 2000; Accessed on 20 October 2003; Available from http://minerals.er.usgs.gov/minerals/pubs/country/2000/egmyb00.pdf; internet.

[83] *The Mineral Industry of Egypt-1999*, US Geological Survey Minerals Yearbook 1999; Accessed on 20 October 2003; Available from http://minerals.usgs.gov/minerals/pubs/ country/1999/9210099.pdf; internet.

[84] Ibid.

The usage of Aluminum is growing and its application in various fields is increasing. It is characterized by its lightness, however, its strength can match that of the steel after some treatment and it can resist corrosion effectively. That is why Aluminum is used more now in the transportation industry (e.g.: aircraft, ships, automobile…etc.) Aluminum has been used for a long time in making the bodies of Buses and trucks. Some of these bodies are being exclusively made of it. Also, Aluminum is used in electrical engineering, construction, chemical and food industries. In the field of housing it became a competitor to wood and iron in making doors, stair rails, windows…etc[85].

In Egypt, there are some privately owned companies that produce aluminum of secondary value. Yet, the production of Aluminum in Egypt is based mainly on the Nagaa Hamadi Egyptian Aluminum Company, which its production started in 1975. The industry is dependent on Bauxite ores, and Egypt has not got reserves of these ores. Alumina is being imported from outside, yet, the availability of electricity from the High Dam has made of the Aluminum Industry in Egypt a sound project. It is no wonder that the Aluminum plant is located in Upper Egypt, in Nagaa Hamadi, near the source of electricity in Aswan. The industry is performing well and is exporting a large percentage of its production (about 60% of its production in 1997) mainly to Europe[86]. It is worth mentioning that when it was first produced, the output was of poor quality, but, Aluminum matching "highest international standards" is being produced now in some factories[87]. Signs of an expansion for the production of Aluminum can be witnessed. In the year 2000 the production of the Egyptian Aluminum Company was 195,000 tons per year (t/yr); it was expected then that by 2002

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[85] Mahmoud Farag, *Aluminum Industry in Egypt* (Cairo: The American University of Cairo Press,1980), 24, 38& 56.

[86] Riva Richmond: "Going, going…Is the wait for Egypt Aluminum nearly over," *Cairo Times* 1, issue 20, 27 November 1997; Accessed on 20 October 2003; Available from http://www.cairotimes.com/content/issues/ecref/going20.html; internet.

the production would reach 245,000 tons per year (t/yr) and it was projected that the production in 2008 would reach 300,000 metric tons per year[88].

Late in 1997, the good and promising financial position of the company has made it a good candidate for raising more capital through the stock market, which was something promising of a tremendous expansion for the company:

> Indeed, the demand for stock in Egypt Aluminum is high with both local and international investors because of high profit margins, strong management, and high future earnings prospects that make it a good medium- and long-term investment. Brokers expect the offering to be at least three times oversubscribed. At a share price of LE75, it will have an initial market capitalization of over LE3 billion, making it the fourth largest company on the stock exchange. Just a ten percent rise in the stock value, though, would make it number one -- certainly a possibility[89].

This good financial position has induced foreign investors to try to have majority stakes in the Egyptian Aluminum Company, so that for instance the Alcoa Inc. signed letters with the company for that reason in the late 1990s. The public sector's grip on the company was diluted (despite of its good performance), and in 1998 about 20% of the company's stakes was privatized[90].

The application of Aluminum in the domestic market has benefited the Egyptian economy. Aluminum has substituted wood (which is imported as well as expensive) in industries like door and windows manufacturing as well as other construction applications. Concerning the automotive industry in Egypt (led by Nasr Company), which is producing trucks and buses with a domestic

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[87] Farag, 39.

[88] Philip M. Mobbs, *The Mineral Industry of Egypt-2000*, US Geological Survey Minerals Yearbook 2000; Accessed on 20 October 2003; Available from http://minerals.er.usgs.gov/minerals/pubs/country/2000/egmyb00.pdf; internet.

[89] Riva Richmond: "Going, going…Is the wait for Egypt Aluminum nearly over," *Cairo Times* 1, issue 20, 27 November 1997; Accessed on 20 October 2003; Available from http://www.cairotimes.com/content/issues/ecref/going20.html; internet.

[90] *The Mineral Industry of Egypt-1999*, US Geological Survey Minerals Yearbook 1999; Accessed on 20 October 2003; Available from http://minerals.usgs.gov/minerals/pubs/ country/1999/9210099.pdf; internet.

content of about 70:75%, Aluminum is already now used in many applications in the automotive industry. The availability of domestically efficiently produced Aluminum is suggesting that Aluminum should replace as much as possible the imported steel that is used in the manufacturing of these vehicles[91].

Speaking of the impact of ERSAP on the Aluminum Industry, Abdel Khalek shows that the industry clearly benefits from it. It is negatively affected by liberalizing energy prices, as this industry relies on electricity, and also it is negatively affected by liberalizing input prices. On the other hand, Liberalization of interest rates in the 1990s benefited this industry since it has large deposits in banks and has no debt problems; and also raising the credit ceiling enhanced the possibility of increasing the financial resources at its disposal. Liberalization of prices also has a positive impact on this industry, while again devaluation should give a huge incentive to expand this industry. It should be noted, as Abdel Khalek asserts, that the Aluminum industry is an export industry and thus trade liberalization under Globalization has no direct impact on it. Devaluation would give more competitive advantage for this commodity in export markets, while reducing reliance on energy in producing Aluminum would reduce the cost encountered by this industry, thus increase profitability, as he asserts. This Heavy industry can yield profits, in addition to its role in creating backward and forward linkages for the national economy.

Table 2: some indicators from the Aluminum Company of Egypt. Values are in L.E 1000 [92].

Item	98/99	99/2000	Dev.Rate%
Revenues			
Revenues of current Activity	1131786	1303172	115

[91] Farag, 70.

[92] *Aluminum Company of Egypt*; Accessed on 20 October 2003; Available from Metallurgical Industries Company http://www.micor.com.eg/micor/acomp_homepage.asp; internet.

Subsidies	0	0	
Securities_revenues	17267	14267	83
transfer revenues	422073	330607	78
Total	1571126	1648046	105
Expenses			
Wages	130272	137549	106
Commodity Inputs	833453	867491	104
Non Commodity	26533	33567	127
Purchases	0	0	
Current Transfer Expenses	521107	490224	94
Current Ear Marked	22534	42811	190
Income Tax	0	0	
Total	1533899	1571642	102
Net Profit	37227	76404	205

Table 3: Balance sheet of the Aluminum Company of Egypt. Values are in L.E. 1000[93].

Balance in 30/6/2000					
Assets			**Liabilities**		
Item	30/06/1999	30/06/2000	Item	30/06/1999	30/06/2000

[93] Ibid.

Fixed Assets	2343334	2362771	Capital	400000	400000
Projects in Progress	914610	1000417	Reserves	1124883	1149974
Inventories	521343	504174	Retained Earnings	22500	13651
Long Term Debts	1475	975	Provisions	861442	945980
Financial Investments	154140	54140	Long Term Loans	1226409	1334299
Accounts Receivable	121327	207299	Credit Bank	238929	277164
Misc.Accounts Receivable	116414	159755	Accounts Payable	162250	266688
Cash in hand & Cash at bank	105438	290927	Miscel.Acounts Payable	241668	192702
Defict Carried Over	0	0			
Total	**4278081**	**4580458**	**Total**	**4278081**	**4580458**

Table 4: Some indicators from the Aluminum Company of Egypt[94].

Item	Unit	98/99	99/2000
Production			
Quantity	Ton	189427	202812
Value	1000 L.E	988329	1177567
Sales			
Quantity	Ton	195621	204123
Value	1000 L.E	985093	1174965
Exports			
Quantity	Ton	110823	125105
Value	1000 L.E	518588	685568
Employees	No	10761	10573
Net Profit	1000 L.E	37227	76404
Rate of Return on Investment	%	2.06	3.305
Wages Productivity	L.E	9.905	10.579
Labour Productivity	L.E	123110	139937
Current Ratio	%	1.04	1.37
Acid Test Ratio	%	0.16	0.47

D- Petrochemicals

According to the UNIDO Secretariat:

There is virtually no economic sector of our modern age which does not, in one way or another, use petrochemical products in its development. Moreover, the petrochemical industry has lately become involved in creating new products which not only compete with, but surpass, traditional materials, such as commodity resins, elastomers, and engineering polymers which serve as excellent substitutes for metals, wood, and other construction materials in many applications. Polymers are also being used as glazing materials, panels, parts for transportation hardware, components of computers and other electronic devices, irrigation, and packing materials substituting paper and natural fibers. Synthetic fibers and rubber have

[94] Ibid.

> now surpassed, in many instances, traditional materials in both performance and economy[95].

We are speaking of an industry of tremendous importance that creates various linkages. These characteristics make this industry a big constituent of the industrial backbone for any economy.

Despite the oil and natural gas reserves that Egypt has (which make of this country an exporter of both of them and a major Arab producer), Egypt has a small petrochemical industry. The petrochemical industry is one that provides various linkages and that can benefit the Egyptian economy given Egypt's resource endowments. What seems to be a positive indicator in this regard is that the domestic demand for petrochemical products is growing.

> From the disposable stir sticks and sporks [spoons] used by fast-food restaurant chains to the multicoloured candy packaging on display at the corner kiosk, Egypt's demand for plastics is massive. Some 1.2 mm tons of the raw petrochemicals used to manufacture plastics are consumed by the local market each year -- which amounts to over 18 kilograms for every Egyptian citizen. Local production of these materials stands at around 470,000 tpy [tons per year], which still falls short, by about one-third, of meeting overall domestic demand. The shortfall, meanwhile, is imported from countries with petrochemical sectors developed enough to export their surplus, like Saudi Arabia, South Korea and India[96].

As pointed out by policy planners in Egypt, the country has many assets that helps it in establishing firmly a petrochemical industrial base.

> These assets are available in Egypt through the prevailing elements of political and economic stability, support of the State, advanced systems to attract investments, Egypt's geographical position and the fact that it is near world markets, development of demand in the local market, the reasonable prices,

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[95] The UNIDO Secretariat, *A study on the status and prospects for cooperation in the petrochemical industry in the Arab countries* (CERMAC, Universite Catholique de Louvain Institut des Pays en Developpement, 1992), 1&2.

[96] "Egypt's demand for plastics is massive," *Alexander's Gas & Oil Connections News & Trends: Africa* 8, issue 11, Tuesday, 3 June 2003; Accessed on 20 October 2003; Available from http://www.gasandoil.com/goc/news/nta32328.htm; internet.

> distinguished technical experience in the field of refining and fertilizers, skilled labour and a cost any less than cost (elsewhere) and also the availability of natural gas at competitive prices in Egypt[97].

In the mid 1990s, a project was being prepared to construct a petrochemical complex in Rasshukeir, north of the Suez Gulf, with $2 billion being dedicated for its accomplishment. The project was planned reflecting a form of the Brazilian Triple Alliance that will be discussed later. It involved the Federation of Industries and other private investors as well as the governmental petroleum sector and Egyptian Banks. FDI was called for and Japanese and US firms showed their interest in entering the project as partners in a joint venture. The complex was planned to produce various petrochemical outputs especially ethylene, Poly-ethylene (PE) (used in producing some plastic products), Polypropylene (PP), Polyvinychloride (PVC) (used in Car fibers, water pipelines…etc.) and Polystryrene as well as other products[98]. There was no progress though, although the project was not abandoned.

Also, a new joint stock company was established, which was called the Sidi Krir Petrochemical Company near Alexandria, and it was involved in building what was to be a first Egyptian Petrochemical complex. The target was the Egyptian domestic market, and the project was to be implemented by the Sidi Krir Company together with banks and insurance companies. The complex is now functioning (in the year 2003) and producing petrochemical products.

At the time of establishing the Sidi Krir Petrochemical Company, the Philips Petroleum Company was going to participate as a majority owner in a joint venture with the Egyptian General

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[97] "Petrochemicals industry body set-up," Egypt, Economics, 5/12/2001; Accessed on 23 October 2003; Available from http://www.arabicnews.com/ansub/Daily/Day/010512/2001051228.html; internet.

[98] Natasha Alperowicz, "Dow and Japanese firms consider $2 billion Egyptian project," *Chemical Week* 156, issue 13, 5/4/95, 24.

Petroleum Corporation to construct a poly-ethylene plant[99]. A further Poly-propylene plant was planned by Orient Petrochemicals, which represents the private sector, and the plant successfully started producing this product. By 2003, the company has become able to cover more than 75% of the Egyptian market demand for poly-ethylene which is used in various domestic industries like woven bags, carpets, garden furniture and packing films. Furthermore, the company was able to export 10% of its production with expectations of an increase of this share into 25% in the near future as exportation to the EU intensifies[100].

Thus, it is clear that the petrochemical industry has recently received much attention and that a wise strategy is being pursued in this regard combining the efforts of the government, private sector and MNCs together. It should be noted that most of FDI in Egypt is concentrated in oil and natural gas joint ventures with the Egyptian government. Also, the "Arab petrochemical industry is entirely based on foreign technology both in process know-how and construction"[101]. This is truly a negative point that the UNIDO elaborates calling for developing R&D centers' capabilities in the Arab World (which are still insignificant). Yet, depending on foreign technology until R&D capabilities are developed would not be problematic for this sector, which is now entirely using foreign technology. This provides an indication that petrochemical industry can be the most stimulating Heavy Industry in Egypt for MNC investment and that this industry can be a well established one in the future if special attention is to be devoted to it.

Yet, the petrochemical industry seems to call for government intervention in the fashion of the Developmental State of South Korea (a government that guides the market and furnishes the

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[99] Natasha Alperowicz, "Egypt leads the way in North Africa," *Chemical Week* 159, Issue 19, 14 May 97, 31.

[100] "Egypt's demand for plastics is massive," *Alexander's Gas & Oil Connections News & Trends: Africa* 8, issue 11, Tuesday, 3 June 2003; Accessed on 20 October 2003; Available from http://www.gasandoil.com/goc/news/nta32328.htm; internet.

needed conditions for the rise of certain industries making development its first priority). According to the UNIDO in its study on the Petrochemical industry in the Arab World, a great obstacle for developing this industry can be attributed to the fact that:

> The various economic sectors utilizing petrochemical products are not yet developed; and the available market is too small to absorb the production, particularly in the absence of coordination and cooperation, elements which are considered to be vital to this industry. In addition, there are many other technical obstacles such as the lack of adequate marketing experience, availability of trained personnel, organized and functional R&D, adequate infrastructure and required technology[102].

The government can boost this industry if it can act in such a way as to eradicate these barriers to the expansion of this important industry. Coordination, marketing, training the personnel, establishing R&D centers and providing needed infrastructure can all be carried out by the government so as to promote this industry. This active role for the government in this regard does not necessitate a direct control of the state over the petrochemical industry. Local private capital and MNCs can control the petrochemical industry, with or without government ownership of shares, while the state can help this industry through the above-mentioned policies.

In fact the government has started to think seriously of a long-term plan to boost the petrochemical industry in Egypt. The highlights of this plan are listed in table 5.

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[101] The UNIDO Secretariat, 47.
[102] Ibid., 14.

Table 5: Data from the General Authority For Investment And Free Zones Promotion & External Offices Sector concerning the Ministry of Petroleum's planned Petrochemical Complex Projects (24 Planned Projects)[103].

1- Objective:	Main features of the master plan for the petrochemical sector development comprises the establishment of 14 complexes (24 projects, 50 production units) for import substitution and the generation of export sales over $ 3 billion/ year
2- Location:	North Gulf of Suez – Borg El-Arab – Sidi Krir, Alexandria.
3- Capacity:	15 million tons per year of different petrochemical products worth US $ 7 billion.
4- Products:	The main products are: ▪ Ethane to produce Ethylene and derivatives (vinyl/ polyethylene/ glycol) for the manufacturers of (pipes/ packaging materials/ polyester). ▪ Methane & Propane to produce propylene and derivatives (polypropylene/ acrylic fiber) for the manufacturers of (plastics & textiles). ▪ Condensate to produce olefins and derivatives (butadiene/ synthetic rubber) for tyres industry. ▪ Naphtha to produce aromatics and derivatives (LAB/ PX/ polyester/ styrene) for the manufacturers of (detergents/textiles/packaging)
5- Investments:	US $10 billion over 20 years
6- Advantages of the Projects:	▪ Satisfy the growing local demand for petrochemical products. ▪ Reduce imports and cut foreign currency expenditure. ▪ Achieve optimum utilization of Egypt's natural gas resources and maximize the added value. ▪ Support local industries depending on petrochemicals. Create over 100 thousand jobs (direct/ indirect).
7- Requirement:	Investors

This plan was launched recently and the Egyptian Holding Company for Petrochemicals (Echem) was established in 2002 for helping in implementing the plan. "The company will also establish and possess projects, invest in standing and new Egyptian companies as well as promote

[103] "Ministry of Petroleum Oil& Gas Industrial Projects," General Authority for Investment and Free Zones Promotion & External Offices Sector; Accessed on 23 October 2003; Available from http://www.gafi.gov.eg/docs/downloads/Ministry%20of%20oil%20and%20gas.doc; internet 2.

for investment in the field of petrochemical industry."[104] Providing information for potential investors about the petrochemical sector was one of the objectives of creating Echem. By June 2003, Echem was able to attract investment of about two billion dollars for implementing the first stage of the proposed 20 years plan[105]. Foreign investors are given various generous incentives, such as being able to own 100% of their operations in Egypt, having tax exemption for 20 years, having grantees that their properties would never be nationalized or expropriated and finally by creating two "special economic zones" in which free entry and exit is permitted into the petrochemical industry market[106]. Also, the government is starting to induce attracting bank investment in implementing this plan. The National Investment Bank is expected to invest in constructing two new companies, one with a capacity of 350,000 tons annually of propylene and the other with the capacity of 80,000 tons annually of alkyl benzene[107].

E- Machinery Industry

The machinery industry includes a wide range of industries that provide machinery and equipment for other industries and other economic activities like agriculture. As I have pointed out before, the machinery industry is one that fosters technological progress and builds technological capabilities. In Egypt, it can be argued that the market is stimulating for more expansion of the machinery industry.

> Consistently high levels of private investment in the petroleum, agriculture and manufacturing industries have translated into imports of machinery and

[104] "Chapter Five: Performance of Manufacturing," Egypt Economic Profile, 19 December 2003; Accessed on 21 October 2003; Available from http://www.sis.gov.eg/egyptinf/economy/html/eep/html/text28.htm; internet.

[105] "Egypt's demand for plastics is massive," *Alexander's Gas & Oil Connections News & Trends: Africa* 8, issue 11-Tuesday, 3 June 2003; Accessed on 20 October 2003; Available from http://www.gasandoil.com/goc/news/nta32328.htm; internet.

[106] Ibid.

[107] "Petrochemicals industry activates Egyptian Economy," 19 December 2002; Accessed on 21 October 2003; Available from www.sis.gov.eg/online/html8/o191222j.htm; internet.

> equipment which averaged an annual $2.5 billion in the 1975 to 1985 period, which slowed down in the second half of the 1980s but is now back at more than $2 billion per year since 1990. Egypt's capital goods industry is relatively modest as compared to imports, because of the low level of protection it has enjoyed, with tariffs on imported capital goods as low as 5 to 10 percent. Now that the overall level of tariffs is fast coming down, it can be expected that many investors will find it profitable to enter this production field which is largely labor and skill intensive[108].

It is clear, thus, that the Egyptian market is becoming more stimulating for investment in machinery industry. This view is reinforced after our discussion on the steel, aluminum and petrochemical industries in which it was clear that these stated industries are expanding. Their expansion means further need for machinery. Moreover, the textiles industry, which is one of the most important industries in Egypt and one having a potential comparative advantage for Egypt in the age of Globalization, this industry has been showing signs of expansion in the demand for machinery as clear from table number 5. Most of this machinery is being imported (notably from Italy but from various other countries as well). The textiles industry is facing many problems associated with costs of production and competition in the export market with less expensive textiles production from other countries especially India and Pakistan, and competition in the domestic market with smuggled production from China and East Europe. High taxes on raw materials, especially cotton, and high wages as well as overvaluation of the currency used to hurt the competitiveness of this industry[109]. Thus, the dramatic devaluation of the Egyptian currency that has been going since 2002 should have positive impact on the competitiveness of this industry in Egypt. Yet, this positive impact is altered by the fact that most of the textile industry's machinery is being imported. If the price of the Egyptian textiles is expected to fall due to devaluation of the

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[108] "Chapter Five: Performance of Manufacturing," Egypt Economic Profile, 19 December 2003; Accessed on 21 October 2003; Available from http://www.sis.gov.eg/egyptinf/economy/html/eep/html/text28.htm; internet.

[109] "Textile sector in Egypt"; Accessed on 20 October 2003; Available from www.ice.it/estero2/cairo/Text_sector.pdf; internet, 1.

Egyptian pound, this fall can be offset due to the increasing cost of imported machinery with the rise in the value of the USD and Euro relative to the Egyptian Pound. Hence, this induces more thinking of firmly establishing a local machinery industry to feed this important industry (textiles industry) so as to diminish the cost and boost the competitiveness of the Egyptian textiles production. Moreover, in our discussion on Fordism and Post-Fordism, we have already dealt with the idea of flexible specialization and the need for a mature machinery sector serving important industries (and I pointed to the textiles industry in Egypt as an example) in order to help shifting easily and quickly in the production of models according to the changes of tastes internationally.

It should be noted that there are already three Egyptian companies involved in providing the machinery accessories for the textiles industry, which are the Egyptian Metal Processing, Misr Manufacturing and General Cylinders[110].

As I pointed out before, developing a machinery sector is a complicated task which I suggest should follow an initial stage of Heavy Industrialization in intermediate goods like steel, aluminum and petrochemicals. Yet, by my brief account of the textiles industry machinery I wanted to point the presence of favorable conditions that can later foster stepping into a second stage of Heavy Industrialization strategy. In this proposed second stage, the machinery sector shall be the priority in order to complement the growth of various industrial sectors and boost their production's competitiveness.

Table 6: Imports of textiles' machines in 2000 and 2001[111].

Item	Value $		Quantity	
	2000	**2001**	**2000**	**2001**
Sewing mch. Excp. household type, autom. Unit	736,456	558,112	442	1534
Sewing mch. Excp. Household type not autom.	4,339,826	3,811,219	7481	8327
Mch. For extruding, drawing, texturing	375,611	704,188	4	18
Mch. For prepg. Textile fibers, spinning	6,458,817	7,895,796	224	382
Weaving machines (looms)	8,603,618	8,371,715	543	651
Knitting maching, stitch-bonding machine	7,372,868	8,518,788	1629	1171
Auxiliary mach. For use with mch.	7,211,764	8,219,877	NA	NA
Machinery for the manufacture or finishing	474,570	NA	NA	NA

Yet, a sector that is using less sophisticated machinery and one for which machinery production is promising of being competitive (if wise policies were pursued), is agriculture. Agriculture is still the biggest sector in Egypt, and it should be anticipated that developing a machinery sector to service the agricultural sector would be a great success for the Egyptian economy.

Kerr extensively discussed this industry (agriculture machinery) in Egypt, the problems facing it and prospects for its progress. According to Kerr, until the 1980s the public sector dominated this industry while most agricultural machinery was imported to the extent that some simple machines were also imported. Generally tractors, combines, threshers, harvesters and

[110] Ibid., 12.

reapers were imported, while Egypt manufactured some tractor attachments like plows, scrappers, wagons and trailers. Agricultural machinery production started to be dominated by:

1- The public sector firms, which were involved in producing some machinery and assembling imported semi-finished machines. They were using capital-intensive techniques to produce machinery that could have been produced by simpler techniques in private workshops. Some of their production (e.g.: threshers) was competitive to imported goods.

2- Private dealers who imported machinery and started to be involved in the production process. Their production, however, was of low quality. However, letting them get freely their needed inputs and assuring them of the presence of sufficient demand would give them the chance of producing sophisticated machinery.

3- Finally, those small workshops that were involved in repairing the machinery have started to copy models of the machinery, especially simple ones, without much innovation. These workshops were under-equipped and that is why they relied on big firms to carry out more complex tasks that need sophisticated machinery in the production process. Their production was discriminated against in marketing as dealers preferred to deal with big suppliers to avoid the risk associated with dealing with small suppliers and not being able to sell their product. Also, due to bureaucratic procedures, it was hard for these small workshops to get their production sold through the Principal Bank for Development and Agricultural Credit (PBDAC). Also, it was hard for them to get financial support, unlike the case of large public sector firms. Also, access to sophisticated inputs was restricted and reserved to favored firms both in the private and public sector.

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[111] Ibid., 2.

Thus, Kerr points that what the machinery industry needs is institutional and policy reform. He also calls for giving the chance for small workshops to expand and not to be discriminated against by various governmental policies, which upset the opportunities for this industry to be firmly established. If wise policies were implemented, the agricultural machinery can be a success without burdening the government, since the burden would then be moved to the private sector.

> Domestic manufacturers were quite efficient, but they were hampered by institutional barriers and non price policies. In particular, denial of access to marketing credit limited their sales compared to dealers of the imported machine. For other machines that might be built locally, lack of access to material inputs remained a major impediment[112].

As for the auto industry, I cannot claim that it is possible to target this industry in the first stage of a Heavy Industrialization drive. It can be, however, considered in later stages when other Heavy Industries (e.g.: steel, petrochemicals, machinery …etc.) flourish. It is for that reason that I am not tackling this industry in detail. Yet, I am discussing here how can aggregating industries induce industrialization and how they can even promote the expansion of other Heavy Industries, if this was planned well.

Meier provides a useful insight in this regard. He discussed a growing trend in industrialization of underdeveloped countries that has worked well with newly industrializing countries of the Far East. This is moving backwards in industrialization, starting from producing final goods out from semi manufactured imported industrial commodities. An example for industries in which we can use this strategy is the car assembling industry. The logic is that when demand increases on this now locally produced final commodity, domestic investment will be encouraged to produce the semi-manufactured commodity in a large scale since it will be much

[112] John M. Kerr, "Institutional barriers to policy reform in Egypt: The case of the agricultural machinery industry," *World Development* 22, no. 6 (1994): 884.

cheaper on the long run than importing it. This chain is to continue moving backwards and can achieve industrialization with less risk.

In Egypt, final touches industries (e.g.: Car assembling) have progressed and the demand for them has increased extensively. Unfortunately, there was no backwards development of the type that Meier spoke of. Establishing and reinforcing existing Heavy Industries is a logical step as demand for the locally assembled automobiles increases. Heavy Industries would act as a chain in producing semi-finished commodities, which were previously imported, and might encourage private investment in producing other stages of the chain of the production process of this commodity. It is worth mentioning that the devaluation of the Egyptian pound has saved such industries (final touches industries) from the consequences of the application of the GATT agreement. This devaluation increased the prices of imported final products and provided a sort of protection for the final touches industries in Egypt. Heavy Industry would further this protection by helping in providing cheap intermediary and semi-finished commodities (as production expands and application of economy of scale follows), instead of importing them from outside. This view is supported by Abdel Fadil who pointed out the uselessness of aggregating industries if it is not followed by industrialization. He asserted that these industries can have negative value added when compared to world prices if industrialization does not follow. He elaborated that car aggregation industry needs demand, import protective policies, technical high and intermediate management and also the presence of industries like iron and steel and aluminum that would service the car aggregation industry[113].

[113] Mahmoud Abdel Fadil, *The political Economy of Nasserism: A study in employment and income distribution policies in urban Egypt, 1952-72* (Cambridge University Press, Australia, 1980), 77-78.

3- Why is Heavy Industry Needed for Egypt's Development

Throughout this chapter, I have discussed various theoretical perspectives in order to drive theoretical justifications for Egypt's need for establishing and reinforcing its Heavy Industry. I also discussed the present conditions of Heavy Industry in Egypt in order to show that Egypt has the potential for its evolution. Hence, this section would seem more or less as a conclusion or a summary of interesting points in the first chapter of the thesis.

Creating linkages is the most important motive for establishing Heavy Industries. This kind of industries can act as a backbone for other Egyptian industries (which are most likely to be labor intensive in nature), and thus it can indirectly create more job opportunities and provide more hopes for creating export markets. In this regard, Heavy Industry can act as an infrastructure for other industries, an intermediate or capital good that encounters high costs in the inception period, but which on the long run will prove to be very helpful for other industries. With the progress of time and increase in the demand for domestic Heavy Industrial output, an expansion of Heavy Industries will be expected. This expansion will mean operating with economies of scale and henceforth the costs of production for Heavy Industries will be reduced. Consequently, the price of the Heavy Industrial products (which are at the same time intermediate goods and machinery for other industries) will diminish. Reducing the cost of inputs (intermediate and capital goods provided by Heavy industries) to other industries will give more comparative advantage for these industries. Moreover, in contrary to infrastructure which is not itself a productive activity, Heavy Industry is a productive activity that can generate profits on the long run. This leads us to the second point, which is arguing for diversifying the industrial production of the Egyptian economy.

Heavy Industries provide Egypt with the opportunity of diversifying its industrial production, even if this objective is to be realized on the long run when some of these industries

can have comparative advantage. It should be noted that having a comparative advantage in a certain product is not something that is fixed, but it is changing as conditions change. Technology shifts can alter existing comparative advantages, the same as the emergence of other competitors do. If Egypt is to limit its possibilities to those industries that it now has comparative advantage in, then when conditions change the Egyptian economy would be left vulnerable. Heavy Industries increase the range of goods that Egypt can produce. It can also guarantee the persistence of the existing comparative advantage for certain industries and create comparative advantages for others. This can be reached thanks to building technological capabilities.

That is the third major reason for why Heavy Industry is important for the Egyptian economy. As the Structuralists pointed out (and I regard their arguments as valid), building technological capabilities and the know-how is of great importance for the Egyptian economy. This can only be realized through a national Heavy Industry that can feed other industries and agriculture with machinery and equipment that suit more Egypt's conditions and resource endowments. Learning by doing, and building up local technological capabilities, will guarantee that changing conditions (endangering the comparative advantage of certain Egyptian industries) would be met accordingly. This can only be realized if technological capabilities are built up in Egypt so as to enable local technology to meet new challenges.

Finally, Heavy Industry is needed for strategic reasons, which is a point that I have not mentioned before though. Heavy Industry is a very vital industry for the military. Its expansion can reduce reliance on foreign arms' supplies. This invites investment in Heavy Industry for strategic reasons, so that Egypt can equip its own military and develop with time its own military industrial technology. In this regard, Sullivan pointed out that Egypt is among the most 10 importers of weapons in the Third World.

I understand that military technology has now reached a level of complexity so that it is becoming much harder to catch up with the latest present technology. Yet, this does not deny the importance of building technological capabilities in this field especially that this guarantees secrecy in the information about military capabilities as compared to the alternative of relying on imported weapons and arms. This building up process will take time, but at least it should be given a big push forward.

In my analysis it has also been pointed out that Egypt do have an established Heavy Industrial sector and that some of the Heavy Industries are promising, notably aluminum and petrochemicals. Iron and steel is also performing reasonably well especially if we considered the forward and backward linkages it creates and that it exports part of its production. The machinery industry is more problematic requiring much institutional and policy reform as indicated by the case of agricultural machinery. This suggests that intermediate Heavy Industries should be given more attention or be considered first in an industrialization plan at the same time that institutional and policy reform and technological upgrading proceed, thus permitting the machinery industry to lead a second stage of Heavy Industrialization. The rise of intermediate Heavy Industries of the first stage will in themselves help the establishment of machinery industry in a later stage by providing cheap inputs for this industry (e.g.: steel, aluminum and various polymers can be used in making a machine).

CHAPTER II:

HOW TO REALIZE A HEAVY INDUSTRIALIZATION DRIVE

1- Why the Government?

A- General Theoretical Background

1- A Neoclassical Perspective

Having identified the importance of creating a Heavy Industrial backbone, the question that will arise is how to achieve this objective. This question is a complex one to which I will devote this second chapter. What complicates this question is the high costs encountered by Heavy Industry in the inception period. Another problem is the need for a technology that might be more sophisticated than those used in other industries like labor-intensive industries. This involves an element of risk, since using this kind of technology might mean higher costs without a guarantee of being paid back in a short time.

This invites an active role for the government, as it is the only party that can invest in these kinds of industries without seeking profits, at least in the short run, while trying to develop a long term plan for developing its national economy. This role varies in its character as will be explained later in this chapter. I am going to start discussing why the government should play an active role in a Heavy Industrialization plan.

Starting again with the now dominant Neoclassical paradigm, it has a different perception for government's role. The Neoclassicists do not deny the important role that governments should play, yet they considered this role to be that of a night watchman, protecting the rights of

individuals and their property and seeking to enforce "voluntarily negotiated private contracts"[114]. Neoclassicists deny that the different conditions of the underdeveloped countries and the rigidities that their economies are characterized with, as compared to the developed world, can justify government's intervention in setting price signals. Neoclassicists acknowledge the presence of market failure that necessitates government intervention, attributing this failure to a number of factors like deficiencies in infrastructure, supply of technical expertise and skilled labor, lack of effectiveness of domestic markets for capital and knowledge of foreign markets[115]. Yet, they argue that the price mechanism should be left operating freely giving signals that producers and consumers would respond to. Thus, from a merely economic perspective, Scitovsky and Scott (Neoclassical school), believed in the inefficiency of industrial strategies as they provide unequal incentives for different economic actors[116]. This implies a counterargument to the logic of establishing a Heavy Industrialization plan that should be supported by the government in the early stages. This criticism is based on the idea of providing unequal incentives by which the government could provide incentives for investing in what the Neoclassicists would claim to be unsound projects using a cost-benefit analysis.

From another angle, The Neoclassicists are skeptical about government planning for various reasons. The first is that governments are believed to lack adequate information as reflected in their knowledge about current production techniques, demand for goods, and expectation about how the market for these goods would change. The second is that planners do not have full control on the instruments they are trying to manipulate in order to carry on their plan. Governments, even with a substantial public sector as in Egypt, did not control all sectors of the economy and the private

[114] Peter Evans, *Embedded Autonomy: States and Industrial Transformation* (Princeton, New Jersey: Princeton University Press, 1995), 23& 25.

[115] Auty, 32.

sector still controls certain aspects. What gives credit to this argument in the case of Egypt is that even in the 1960s in Egypt, the private sector was still dominating some industries that depend on small-size enterprises. The third reason for the Neoclassicists criticism is starting planning from a broad national level rather than starting from the project level[117]. It should be noted that the common trend in development nowadays is tackling an issue on a project by project basis. For these reasons the school criticizes the concept of government comprehensive planning in underdeveloped countries and questions reliance on the government in planning a Heavy Industrialization drive, which can only be realized through a broad national level planning rather than on a project by project basis.

It is no wonder that two Neoclassicists (Ranis and Mahmoud) are skeptical about government sectoral targeting seeing it as risky to an economy, if it was guided by an ill-judged industrial policy. They considered Autarky (that means industrializing in a closed economy) as an example of such an industrial policy. They regarded the slow maturation of heavy industry as causing fiscal gaps and regular foreign exchange problems, which might lead to overvaluation of the currency (e.g.: due to printing money to cover the budget deficit). As an industrial policy, they advocated targeting labor-intensive industries in the beginning, then moving to capital intensive followed by skill intensive and finally ending with research-intensive industries. They regarded targeting Heavy and Chemical Industries from the start as being premature[118].

Added to their criticism for providing unequal incentives and for governmental planning, the Neoclassicists look negatively towards governmental investment. They believe that government expenditure discourages private investment, causes large public deficits that have to be financed by

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[116] Jameson & Wilber, 330.
[117] Hewitt, 159.
[118] Auty, 103.

printing money (and thus causes inflation), or by borrowing (and debt results). They even claim that government expenditure goes to unsound investment that costs too much to support it without paying back similarly in the form of revenue[119].

Yet, what seems interesting to know is that the Neoclassicists in fact acknowledge the role of government in supporting certain industries and believe in the concept of Infant Economy rather than the Infant Industry argumentation. The Infant Industry argumentation was first introduced by the German theorist List, who called for government intervention and protection for new industries in a late-industrializing country. He believed that new industries cannot compete immediately with foreign industrial output coming from industrially advanced nations and that is why these new industries should be protected until they are able to compete. As for the Neoclassicists, they believe that the concept of infant economy means leaving firms to operate freely but furnishing the needed environment for them to flourish. As elaborated by Teitel and Thoumi, the Infant Economy strategy should tackle first light industries so that when this succeeds the following stage is to support more complex and large investments like that meant for Heavy Industry. In the third stage various capital and intermediate goods are to be tackled[120].

As for the Infant Industry argumentation, the Neoclassicists are skeptical about government ability to target and support these industries as they regard this process as necessitating knowledge and administrative skills that not many developing countries possess. If an industry is to have Infant Industry status, then it should only receive a time limited subsidy rather than having cheap loans or being protected by tariffs both of which the Neoclassicists regarded as distorting economic signals. For an industry to have this status, it should prove to yield, after maturation, an adequate return to compensate for the initial stages. For this to be realized, the productivity of the industry being

[119] Hewitt, 161.

protected should rise to greater levels more than those of foreign competitors'. Being internationally competitive is not the only requirement for maturation. Moreover, this maturation means "in house improvements in the technology to squeeze ever greater output from the existing plant-specific assets"[121]. Based on this precondition and the concept of opportunity cost, the Neoclassicists believe that Infant Industry stage should not last more than between 5-8 years, although, as Auty elaborates, certain successful HCI industries necessitated more than that like the Japanese automobile industry which took three decades to mature[122].

It should be noted that the ideas of the Neoclassical school have gained much influence since the 1990s and, thus, these concepts have surpassed the status of being only a theoretical framework. Thanks to the GATT agreement and the establishment of the WTO, the Neoclassical perspective has been put into practice and is posing a great challenge to available policy options for governments especially if we are speaking of protectionist policies. The Uruguay Summit set a new stage and conditions under which Third World countries have to adapt their policies. With my focus on industry and trade of industrial commodities in relation to underdeveloped countries, certain measures were agreed on in this regard. According to the Agreement, tariffs were to be reduced to 3% for certain goods while it should be lifted altogether for about 40:45% of traded goods including steel, construction equipment, pharmaceuticals and others. Quotas on textiles were to be replaced by tariffs for ten years, while existing tariffs on this commodity were to be reduced by 25%. Dumping was not prohibited although disputes on it were to be resolved more efficiently and firmly. Subsidies to industry were restricted only in the field of research where governments were permitted to contribute to a maximum of 50% of the cost of applied research in industry.

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[120] Auty,.32.
[121] Ibid., 35.
[122] Ibid., 35.

More freedom was given to foreign investors in relation to government policies so that these investors were to be protected from requirements such as using domestic resources and supplies or export more than or equal to what they import. On the other hand, the Agreement gave the right of temporarily levying tariffs and other measures on an import that severely endangers a domestic industry. The World Trade Organization (WTO) was created to check the implementation of this agreement, and the agreement was signed in 1994 and took effect in 1995[123].

Most of Third World countries (including Egypt) signed this Agreement, which clearly restricts governments' protective policies. On the other hand, Structural Adjustment programs that many underdeveloped countries agreed on (thanks to generous IMF and World Bank assistance), have also restricted governments' grip on their economies. Thus, the dominance of the Neoclassical perspective has created new conditions that should be considered in my analysis about the available policy options left for a government to induce or implement a Heavy Industrialization drive.

2- A non Neoclassical Perspective

Despite this massive Neoclassicist criticism, it should be said that since the developments of the 1920s, it has always been argued for an active governmental role for the sake of development (and industrial development in particular) as well as guaranteeing the well functioning of an economy. Even as early as the time of the origin of economics as a science, Smith admitted that the government has a role to play which he limited to three spheres, among them the defense industry. Yet in the 1920s, the call for a more involved government grew. The Stalinist industrialization process that moved ahead with magnificent success, the Fascist German and to a lesser extent Italian industrial achievements have shown how an active role for government can induce such a

[123] Salvatore, 284& 285.

progress. In these totalitarian regimes the government either controlled the whole economy as in the Soviet case, or guided and actively directed the economy as in the case of German Fascism (Nazism). Germany was able to built up a massive military industrial base in a relatively very short time, while the Soviet Union industrialization enabled it to be the second world power at the conclusion of World War Two. If these were extreme cases, yet, they pointed to the role that can be played by governments in the industrialization of developing countries. The Soviet model specifically was impressive for many Third World countries in the post-colonial era to the extent that many countries adopted Marxism-Leninism and joined the socialist block in the global ideological struggle of the Cold War.

Even in the liberal West, the crises of the Great Depression created an atmosphere more favorable to what Keynes and his macroeconomic theory proposed, which was calling for an active role for the government to intervene in the economy. Other writers moved on the Keynesian perspective, for instance, Jones and Mason regarded the state as a rational decision making entity that through intervention in the economy can adjust market failures which private firms suffer from (e.g.: imperfect market, high entry barriers...etc.). They regarded public enterprises as a tool among various other tools that a government can intervene with[124]. They attributed the presence of an environment encouraging government intervention in Heavy Industry to sectoral characteristics of this industry, added to the vitality of technology and economics of scale for this industry. If state intervention is blamed due to the possibility of organizational failure, the market can equally be blamed for market failure. This is what justifies what they pointed out as "revealed institutional advantage" favoring the state and calls the government to intervene in the economy[125].

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[124] John Waterbury, *Exposed to innumerable delusions: Public Enterprise and state power in Egypt, India, Mexico, and Turkey* (Cambridge University Press, USA, 1993), 18.

[125] Auty, 82 & 93.

Keynesianism was in many ways an answer for economic conditions that still exist nowadays. As pointed by Piore and Sabel, the technology in the age of Fordism called for mass production and mass consumption, which were the driving force for the government to intervene in a Keynesian logic to stabilize demand. The government through this ensures that supply and demand can match and, consequently, mass consumerism be sustained[126]. They argued that the change towards Post-Fordism threatened mass consumerism and mass production. Yet, I would point again to what was mentioned in the previous chapter about the persistence of Fordist relations to the present day and, thus, the need for government. Moving on the same line, Karl Polanyi considered government intervention as an essential factor for developing market relations. Continuous intervention from the government is what led to the realization and preservation of a free market. Bates even went further asserting that private interest is defined by governments; they also help in developing social classes and interest groups[127].

Returning back to our discussion, the Marshal Plan for reconstructing Europe and the emergence of the Soviet Union as a world power pole in a bipolar international system and the subsequent rise of socialist command economies in various places in the globe, all augmented the believe in a more involved government. Even Rostow, who was keen to refer to his famous book, *The stages of economic growth*, as a non-communist manifesto, believed in an active role for the government in developing nations. He stated that in the Pre-conditions for Take-off stage governments are needed to produce "social overhead capital" since there is a need to mobilize large sums of capital. The government also plays a central role in organizing the nation and through various other policies (Health, Education, Tariffs…etc.) that lead to modernization.

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[126] Ash Amin, 15.
[127] Evans, *Embedded Autonomy*, 29& 35.

Gerschenkron in his study on late industrializing countries in the European context elaborated the central role that governments played in their development. Competing with already industrialized countries (e.g.: England was an industrializing pioneer) necessitated access to technology and capital in a way that the private sector could not furnish. That is why governments had to step in, in order to provide the suitable environment for private investment, but also to organize financial markets and induce decision-making. Organizing financial markets meant that governments acted as investment bankers in order to remove the burden of risk from the shoulders of private investment, while provision of incentives was a mechanism by which they were able to guide private decision making and point to investment opportunities which would go undetected otherwise[128].

Bryce, writing in 1960, points out why a governmental role is needed in the industrialization of underdeveloped countries. The government can have an active role when the private sector could not carry the burden of implementing a certain industrial project even if it is sound. This can be due to lack of interest (since private capital is interested more on short run returns and low risk projects), or the unavailability of resources in the hands of the private sector for large projects. The government can also furnish the technical, managerial, marketing and administrative skills that might be lacking. Certain industries (among them Heavy Industries) can only be launched by government initiative. The role of the state in these industries can be permanent or temporary. Moreover, private capital would not be interested or involved in defense industry, the government is the only party willing to invest in it for strategic rather than economic justifications.

More recently, the UNIDO favored an active role for the government in technologically advanced industries in underdeveloped countries saying that:

[128] Ibid., 31.

> The substantial capital needed for the commercial uncertainty of developing new processes and products have made active government encouragement a necessity in the science intensive industries[129].

The government is expected to provide financial, technical, scientific and material support to this kind of industries. Hence, the UNIDO provides a contradictory view to that offered by the Neoclassicists when writing about government's lack of capabilities. Speaking more specifically about Heavy Industry, the UNIDO says:

> In general, the expanded role in the state should encourage the growth of Heavy Industry in the developing countries. Such a trend would lead to the formation of a production structure more closely approximating that currently found in the developed market economies. Changes in the composition of trade between the economic groups and among the developing countries, in the skills needed for the industrial labor force, and in investment requirements for industry are expected to result from an expansion in the share of Heavy Industry[130].

This shows how the UNIDO is calling both for Heavy Industry in underdeveloped countries, and for an active role for the government in this regard.

The Center for Development Planning, commenting on the performance of Underdeveloped countries trying to industrialize, said that:

> [A] marked emphasis on establishing or expanding the public sector's industrial projects in the production of goods that are strategic for investment expansion itself and for meeting the requirements of other industrial branches or sectors of the economy. Prominent examples of these projects are steel, cement, industrial chemicals, fertilizers and petroleum products[131].

This proves the pioneering role that the public sector plays as, one of the tools in the hands of a government, in establishing a Heavy Industrial backbone for an industrializing underdeveloped economy. It should be noted that the specified industries can repay well for government intervention in this regard. According to Spencer, in his analysis on NICs, certain industries meet

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[129] Ghosh, 86.
[130] Ibid., 98.
[131] Ibid., 130.

this criterion. These are: those having domestic cost advantage, "scale economics and/or high capital requirements", and R&D needs[132]. It is clear that Heavy Industry meets the second and third conditions. In the case of Egypt, Aluminum industry meets also the first condition due to the abundance of the aluminum ore and the available cheap energy (e.g.: electricity).

3- An Institutional and Structuralist Perspective

The most enthusiastic about an active role for government are the Structuralists and Institutionalists. Starting with the Structuralists, as I have dealt with their perspective in the previous chapter, they believed in an active role for the government given their suspicion, together with the Dependentistas, regarding local and international private capital. More generally, Structuralists (e.g.: Nurkse), believed that markets in Third World countries are small and that there is a need for government investment in various industries which would create more demand and can stimulate private investment[133]. Based on this, one deduce that public investment in Heavy Industry would lead to an expansion in the demand for these products (e.g.: equipment and machinery) by producers in other industries, as well as increasing the demand of ordinary consumers for these products. This would benefit the economy directly through an increase in the production of these goods and indirectly through providing machinery to other industries. The perspective of this school is going to be incorporated in the subsequent subsections and that is why I am not dealing with it now in much detail.

As for the Institutionalists, they were also enthusiastic about an active role for the government in development and in industrial development. What seems interesting is that this perspective is starting to be acknowledged even by one of the most enthusiastic institutions for the

[132] Auty, 39.

Neoclassical paradigm. The World Bank, in a study on the East Asian industrial miracle, affirmed that some selective government interventions impacted positively on some economies referring to the East Asian countries[134].

In referring to the Comparative Institutional approach which contemporary Institutionalists adopted, Evans defined this approach as being:

> Institutional because it looks for explanations that go beyond the utilitarian calculations of individuals to the enduring pattern of relationships within with such calculations are immersed; comparative because it focuses on concrete variations across historical cases rather than on generic explanations[135].

The basic assumption of this school lies in believing that government intervention can foster comparative advantage for a certain industry. If the Neoclassical school believes that comparative advantage can evolve due to resource endowments, as Ricardo asserted, or due to capital/labor abundance or scarcity as the Hecksher & Ohlin model suggests, the Institutionalists believe in the ability of governments to foster comparative advantage. In this regard, they depend on the literature on late-industrialization and Infant Industry arguments[136]. Cline believes that comparative advantage is realized due to "social and institutional factors" that result from the developmental process, added to those factors stated by the Neoclassicists; Porter elaborates this view by saying that this depends on: "complex evolution of competitive and cooperative ties among local firms, on government policies, and a host of other social and political institutions"[137]. Furthermore, the government can help in acquiring and sustaining comparative advantage for an industry by

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[133] Rapley, 15.
[134] Evans, *Embedded Autonomy*, 39.
[135] Ibid., 18.
[136] Auty, 5.
[137] Evans, *Embedded Autonomy*, 9.

coordinating the accumulation of skills and information that is essential for technological innovation self-sustenance[138].

As for Heavy Industry, the Institutionalists called for government intervention to support this sector. They do not agree with the Neoclassical perspective that criticizes sectoral targeting considering it as risky. For the Institutionalists, this risk is overestimated and they question the basis of such an overestimation. They regard this overestimation as stemming from the standardization of the structural pattern by which the industrial world developed seeing this model as needing modification. Thus, they support protecting certain industries even if the expected comparative advantage is one that is realized in the long-term, as can be indicated from expected rapid increase in domestic demand, or from being resource or cheap labor endowed. The Institutionalists belief that certain sectors should be targeted evolves from their realization of the recurrence of market failures together with their belief in "strategic trade theory". This theory states that extra-profits result from trade and is benefiting developed countries due to the presence of imperfect competitive international markets. If developing countries managed to construct competitive advantage in certain industries, they will be able to have some of these extra-profits[139].

If we considered highly advanced industrial activities as an example for the ideas of the "strategic trade theory", then if Third World countries can enter to these industrial sectors that are now restricted to the industrial world (these industries might need sophisticated technology, skilled labor or large scale of production), the developing world would be able to share in the big profits that the industrial world receives from these technologically advanced industrial activities. Needless to say, states should be active in such a construction of comparative advantages in Third World countries, since entering to these advanced industrial sectors calls for great endeavors and

[138] Auty, 40.

necessitate minimization of risk and cost in the initial stages. States, by various policies and incentives, can minimize this risk and cost and encourage investment in the targeted activities. By this way states would be helping in constructing comparative advantages for their countries in the targeted industries.

Based on studying the industrialization experiences of East Asian NICs, two of the prominent Institutionalists, Amsden and Wade, highlighted methods of sectoral targeting that governments were involved in. For Amsden, what she regarded as the Second Industrial Revolution, that came after the well-known First Industrial Revolution of the 1700s, was characterized by protecting infant industries, unlike the laissez faireism of the First Revolution. Governments acted as entrepreneurs by protecting industries and providing subsidies and financial incentives, imposing performance standards to select those deserving of such treatment. Wade pointed out the role of government in guiding resource allocation in what he referred to as a "governed market" that was a characteristic of Taiwan[140].

Given their advocacy for targeting certain sectors, the Institutionalists call for targeting Heavy Industries. They believe that Heavy and Chemical Industries yield high Total Factor Productivity (TFP)[141]. As an example for these industries, Evans pointed to the great importance of establishing Steel plants, a fact that many Third World countries acknowledged. He discussed how some of these countries were exporting iron ore and importing considerable amounts of steel products. Estimates showed that it would be cost reducing if these steel plants were constructed and Iron and Steel could be produced domestically, and added to the positive effect of linkages that originate from this industry. Neither MNCs nor private capital was interested in investing in Steel

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[139] Ibid., 31& 40.
[140] Evans, *Embedded Autonomy*, 38& 39.
[141] Auty, 37.

production, and governments had to step in. In the countries that I will discuss as models later in this chapter (Korea, Brazil, India) this was the case and they became major world steel producers[142].

B- Lessons from Heavy Industrialization in the 1960s

1- The Three Factors (An Overview)

When discussing Heavy Industrialization and who is to implement this process, one cannot disregard discussing the Egyptian past experience in this regard in order to find out lessons to be taken into consideration in any new trial. This will surely lead us to the 1960s, as this decade witnessed the most serious Heavy Industrialization drive in Egypt.

It is a historically obvious fact that the government was involved considerably, if not exclusively in this drive, starting from nationalizing existing large firms in various industries, and ending by establishing big industrial factories, passing through exploiting the agricultural sector for the sake of industrialization. This might give us an insight that the Egyptian government is the only party that was and is capable to carry on Heavy Industrialization. This insight is reinforced by acknowledging that the Egyptian government is the only party that can be interested in such a drive and willing to bear its costs and risks. Yet, this generalization should not be reached without examining this experience (the industrialization experience of the 1960s) to find out if it succeeded. Also, before testing this experience, one should try to explore what led the Egyptian government to carry alone the burden of this industrialization drive. Discussing this last question, putting certain assumptions in mind and trying to reach conclusions, would prove to be very helpful in finding out how to establish new and reinforce existing Heavy Industries. Identifying a number of factors that

[142] Evans, *Embedded Autonomy*, 86.

induced the government to act this way and testing if these factors have changed is the objective of the next sections.

In this thesis I identify three factors that led to such extensive government control over Heavy Industrialization in the 1960s. These are: the presence of an immature Egyptian bourgeoisie, the inadequacy of infrastructure, and the existence of a developed bureaucracy.

2- The Egyptian Capitalist Class Prior to the 1960s

The Dependency school provides a gloomy outlook for the bourgeoisie in underdeveloped countries, which raises doubts about their potential to carry on Heavy Industrialization. The school thought of indigenous bourgeois classes in Third World countries as being parasitic and interested in the dependency game. They regarded them as hostile to any ISI strategy that might endanger their interests. Thus, the Dependency school called for an active governmental role to bring the ISI strategy forward and to crush the parasitic indigenous bourgeoisie for the sake of an independent national developmental strategy[143].

Paul A. Baran confirms this view. He states that the inherited backwardness of Third World countries (e.g.: Egypt can be thought of as an example) deprived their Middle classes from gathering economic strength or insight or even self-confidence to have a leading role in society. This class was small in size and, as a result, it did not try to upset the existing situation, which it benefited from thanks to its ties with feudal landowners and foreign capital. This led to a system combining the worst in feudalism and capitalism with little potential for economic growth. To avoid feeling inferior to the aristocracy, the underdeveloped countries' middle classes demand for luxurious goods increases. This induces these classes to rely on large-scale agricultural production

[143] Rapley, 20.

to overcome costs of production and acquire more profits. Yet, large-scale production is beyond the potentials of this class, and having distant markets for their products involves risk. Hence, to offset these shortcomings, the middle classes in these societies rely on their relations with foreign capital.

Mahmoud Hussein supports this view by providing a Marxist class analysis for Egyptian society in the 1950s and 1960s. Within the indigenous ruling class there were those from a landowning background who favored industrialization, and who formed thus a rising indigenous Bourgeoisie (by shifting their status from land owning feudalists to industrial firms owners and entrepreneurs). Yet, this Egyptian Bourgeoisie was dependent on foreign banks and companies controlling the market and having almost monopolistic control over the Egyptian market. Hussein considered Nasser's state to be the new bourgeoisie and referred to it as the state bourgeoisie as distinct from the traditional bourgeoisie existing before the 1960s. He attributed the boom of the economy in the first half of the 1960s to the efforts of this new state bourgeoisie to expand. For him this trend stopped in the mid 1960s and this new bourgeoisie grew as conservative as its predecessor[144]. According to Hussein, with the transformation of the state bourgeoisie to an established one, competition among the members of this new bourgeoisie in search for profits drifted this class away from the objectives of the revolution. This profit seeking behavior led to giving more attention to profitable industries and disregarding unprofitable ones, with a mentality that resembles that of the former bourgeoisie. Consequently, few years later, dozens of the newly established factories were functioning with third and even fourth of their capacity and some of these factories stopped functioning altogether due to lack of raw materials. Moreover, lack of coordination among hundreds of public sector's enterprises resulted in the disorganization of their

[144] Hussein, 185.

production process[145]. Thus, industrial projects that the revolution regarded as vital for the rise of the Egyptian economy were disregarded and even denied from having their needed raw material, while competition within the new state bourgeoisie resulted in seeking individualistic interests rather than coordinating for the sake of the public interest and meeting the objectives of the revolution. In other words, the revolution seized to follow its ambitious objectives when its elite were transformed into a bourgeoisie.

This analysis, if taken into consideration, might provide an insight into the incapability of the bourgeoisie, even today, to carry out a developmental role of the type discussed here (i.e.: stressing on Heavy Industrialization). Dessouki affirms this negative view about the bourgeoisie saying that the Nationalization process of the 1960s was attributed to the failure of capitalists to do their share in the 5-year plan and their tendency to invest in quick profit projects such as housing. On the other hand, the state's interest was in creating a powerful national economy[146].

Discussed from another perspective, many thinkers say that colonialism has led to weakening indigenous capitalist classes in underdeveloped countries. The result was the evolution of Capitalist classes in these countries that are only interested in trade and services[147]. That is why those favoring State Capitalism, even in Egypt, were the ones coming from a Petit Bourgeois background having the least interest in the private sector and even disappointed with the performance of this sector.

Yet, discussing more thoroughly the entrepreneurial class of Egypt in the pre 1960s era would be of great importance to reach conclusions. It should be pointed out that there existed an entrepreneurial class in Egypt since the 1920s. Early in that decade Misr Bank was created by

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[145] Ibid., 196.

[146] Dessouki, in *The Political Economy of Income Distribution in Egypt*, by Gouda Abdel Khalek & Robert Tignor (London, England: Holmes and Meier Publishers, 1982), 70.

Tala'at Harb for the purpose of creating a national bank that would furnish economic independence for Egypt. This was followed by creating a number of industries tied to the bank and aiming at diversifying the Egyptian economy and not leaving it solely dependent on the cotton crop. The annual rates of growth for capital and bonds directed to industry increased impressively from 1.25% between 1922 and 1933 to 13.5% between 1933 and 1947 then to 13.7% until the 1952 Revolution. Also, the concentration of capital through mergers was witnessed indicating the rise of big firms and readiness for establishing large-scale industries. This was reflected in the increase of the number of big machinery factories from five in 1917 to seventy-five in 1951[148]. This showed the growing attention directed to industry, which accelerated during the Second World War and was sustained afterwards.

Many of the established industries were cotton related. Other entrepreneurs like Abud Pasha, Ali Yahya, and Farghaly established factories for sugar and cement industries[149]. Generally consumption industries were overwhelmingly dominating Egyptian industry in the 1940s and the 1950s, they reached a peak of 74% of Egyptian industries while intermediate industries were representing 24% and investment capitalist industries only 2%[150]. Textile weaving and spinning was one of the most important industries in Egypt and it persisted in playing this role even in the 1960s due to various reasons. Among these reasons were world demand on long staple cotton, increase in the domestic demand on this product as population increased and the capability of the textiles industry to create more jobs. It is no wonder that Egyptian industry till the end of the 1950s was

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[147] Rapley, 21.

[148] Taha Abdel Aalim, *Mustaqbal al-ra'asmalya al-sana'aya al-masraya (The future of the Egyptian Industrial Captalism)* (Cairo: Marqaz al-Dirasat al-Sayasya wa al-Iqtisadya, 1992), 30,32&33.

[149] Abdel Fadil, 65&66.

[150] Ibid., 69&70.

based mainly on agriculture due to the substantial role of the Food and Spinning and Weaving industries[151].

Thus, it is clear that the Egyptian entrepreneurial class in the pre 1960s era was interested mainly in consumer goods industries the benefits of which come in the short run. This class was not as parasitic as Dependency theory might suggest in the sense of being agents of foreign capital and only interested in producing primary goods. Yet, it should be noted that Egypt was more of an agricultural economy than nowadays, and thus this entrepreneurial class cannot be said to represent the majority of the upper classes. Land Redistribution decrees of the early 1950s were meant, among various other objectives, to lead these classes to invest their money in industry. Yet, the response of these classes was to invest in housing instead despite the efforts of the Revolutionary government in 1956 to limit this trend. This persisted and industrial investment did not increase much[152].

Even for this entrepreneurial class, not much attention was directed to Heavy Industry and there were no indications for a progress in this regard. There was no escape from government intervention. It should be mentioned that even before the nationalizations of the 1960s, government inducement did lead to some progress on the willingness of the private sector to invest in industry. This was witnessed in the case of Misr Bank. The Bank established a number of important industrial companies in the late 1950s like Misr Lil-Alban (Milk products), Misr for Chemicals, Spinning and Weaving in Shibin Al-Kom, and surprisingly it did contribute to establishing the Iron and Steel Company[153]. Thus, an active governmental role was needed, yet whether this could have

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[151] Ibid., 71.

[152] Abdel Salam Sobah, *Al-Raasmalya Al-sana'aya wa Dawraha fi Misr fi Marhalat Al-mashroa'at Al-hora 1916-1957 (Industrial Capitalism and its role in Egypt in the age of liberal projects 1916-1957)* (Cairo: Al-haya'a Al-masraya Al-a'ama lil Kitab 1992), 276.

[153] Abdel Fadil, 77.

developed parallel with the private sector's contribution can be debatable. One should not generalize the attitude of Misr Bank and anticipate it to have been the attitude of the entrepreneurial class of that era.

I shall postpone discussing a contrary view to the possible conflict in objectives between the entrepreneurial class and the government to a later stage in this chapter in the part dedicated for the models and suggestions. This contrary view is offered by the concepts of the Developmental State and Intermediate State.

3- The Need for Infrastructure

As for infrastructure, which is a basic factor for government support for a Heavy Industrialization drive, Rosenstein and Rodan (Structuralist school) believed that industrialization in Third World countries needs a big push, which can only be realized through public investment in infrastructure and planning. They regarded the private sector as incapable of performing this[154]. Baran again asserts that investing in infrastructure, which is needed for industrialization, is beyond the capabilities and interests of the underdeveloped capitalist class.

Meier pointed out to the importance of social overhead capital represented in transportation, electric power, railways, highways…etc. These are infrastructure essential for opening the way for additional productive investment. This infrastructure should exist before anticipating such investment, and the needed objective could only be realized if an expected needed minimum of this infrastructure is present. Moreover, the maintenance that this social overhead

[154] Rapley, 15.

capital requires, when added to the high costs encountered in their construction in the first place, indicates that this infrastructure requires a high initial investment [155].

It should be noted that infrastructure is both costly and in itself is an unproductive activity, and this might deter private investment. If we think of constructing a highway road, railway lines, electric generator plants, we realize how massive investment is needed for such projects that benefit many parties. Private investors can gain their revenue from rent or service of the infrastructural facility they constructed (e.g.: electricity bills, train tickets), but the risk is high. If we are speaking about underdeveloped countries, the issue is more complicated. The capitalist classes in these countries are not developed enough to carry or realize the profit from such activities. The dilemma is that infrastructural investment should precede establishing industrial projects, and sometimes this investment might be meant to encourage industrial projects. So if private capital would invest in infrastructure, they are more likely to wait till industrial projects are being established and factories start to operate and then they can charge these newly established factories with the price of the infrastructural service. It is obvious that this involves a great element of risk especially in the context of underdeveloped countries. The alternative might be the collaboration of various parties concerned about constructing industrial projects in a certain area and their agreement on establishing infrastructural facilities for the benefit of them all. This again necessitates the presence of a mature capitalist class that can invest these huge sums of money and that can coordinate among its private investors the establishment of these infrastructural facilities.

It is clear that Heavy Industry, like any industry, needs such social overhead capital. And it is clear that, especially in Egypt, only the government can provide this since it is the only institution that is not concerned only with profits, and that can endure the risk from and the cost of

[155] Gerald M. Meier, *Leading Issues in Economic Development*, 5th ed. (NY-Oxford: Oxford University

infrastructural investment. This was a main reason for government intervention to achieve Heavy Industrialization in the 1960s.

4- The Capabilities of the 1960s Egyptian Bureaucracy

A number of writers have asserted the relative development of Third World's bureaucracies as compared to other institutions in a way that justifies relying on them in these countries' development in general and in their industrialization in particular. Max Weber was among the first thinkers who thought positively of the role of bureaucracy in development. He pointed generally to the efficiency of the bureaucracy as a rational and modern apparatus that could be relied on in the Modernization process, and consequently on its aspects (e.g.: industrialization)[156]. His ideas were followed by many who advocated the indispensability of the role of bureaucracy in development.

For another writer, Riggs, the concept of unbalanced systems means the shift of power to bureaucracy given the weakness of other political institutions. For him this is the outcome of the colonial era as the administrative apparatus was adopted from the West and aided by advancement of technology which transitional societies (societies moving towards Modernization) were keen to acquire for their military, agricultural or educational objectives. This was happening while the rest of these societies were living traditional ways of life[157]. As a result, bureaucracies of these societies became far more advanced than other social groups and institutions. It is no wonder that La Palombara states that bureaucracy in developing societies can match the professional, technical and entrepreneurial available resources and utilize this in developmental efforts. The creation of what

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Press, 1989), 282.

[156] Joseph La Palombara, in *Bureaucracy and Political Development* (Princeton, New Jersey: Princeton University Press, 1963), 10.

[157] Mohamed F. El-Rawi, *The political Role of Bureaucracy in Contemporary Egypt* (Southern Illinois University, 1974), 13.

La Palombara refers to as a "social overhead capital" requires the application of various available resources for the political and bureaucratic capacity. Hence, the bureaucracy together with head of the executive are expected to have a critical role in setting up, determining and implementing clear objectives and directives of a developing political system[158].

Moving on the same line of arguments, Fritz Marx believes that bureaucracy has a tremendous capacity to gather facts through administrative activities. It can survey public needs and sentiments, interest groups' pressure, as well as government responses and its technical procedures to meet these needs and to reach its objectives. Bureaucracy is also an apparatus that is suggestive of various ideas meeting different conditions. They are able to convert abstract or broad understandings about objectives, to be reached, into "the detailed language of regulatory measures."[159] Fritz Marx asserts the importance of civil servants he regarded as knowing everything in certain fields. He said that they should not be overlooked when formulating reform objectives. He considers higher civil service bureaucracy as a "magnifying glass" or "intelligence center" for society providing it with observation and evaluation[160]. Using the thinker's perspective, we realize that bureaucracy should be relied on in any Heavy Industrialization plan, as its capabilities would help formulate such a plan. This formulation would be aided by its practical knowledge to implement policies stemming from abstract ideas as well as being an intermediary between people's needs and government's goals.

Joseph Spengler still realizes the importance of bureaucracy, but he thinks that the rise of a private sector is essential also. For him bureaucracy can facilitate the rise of this private economic system by setting a framework of law, order and security for evolving private initiatives. It can also

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[158] La Palombara, 112.

[159] Fritz Morstein Marx, in *Bureaucracy and Political Development*, by Joseph La Palombara (Princeton, New Jersey: Princeton University Press, 1963), 78.

secure credit and resources and provide other things encouraging economic growth in a dual economy where the private sector is left to expand while the bureaucracy is involved in limited planning at the national level[161]. These suggestions would prove to be very helpful when discussing the possible role that the government can play, given the new settings, in a future Heavy Industrialization plan; and how it can provide a ground for private capitalists to take over its responsibility gradually when this industrialization plan starts to yield its profits.

Another perspective for the role bureaucracy can play for a developing country was offered by Mancur Olson. He considered institutional arrangements linking state and society as critical to economic development, pointing out that various social groups would exert pressures to transform any developmental endeavor into a distributive mechanism and will organize to achieve that purpose. This will restrict government possible actions and options and society itself will lose the opportunity of long run gains. Thus, for an economic development strategy to be successful, institutions should be created that would restrain and control the independent organizational strength of these social groups for the purpose of "insulating decision makers from group pressure and expand the range of their directive powers."[162] It is clear that one of these institutions is bureaucracy, and that weakening of other societal pressure groups in a certain stage of development points to another important function for bureaucracy in underdeveloped countries seeking industrialization even with sacrifices especially if we are talking about establishing Heavy Industry.

Given all these qualifications for bureaucracy in developing countries, it was not surprising that Egypt relied heavily on it in the 1960s. According to Waterbury, the Public Sector had to:

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[160] Ibid., 90.

[161] Joseph La Palombara, in *Bureaucracy and Political Development* (Princeton, New Jersey: Princeton University Press, 1963): 60.

1- Promote industrialization

2- Increase living standards of backward areas

3- Develop infrastructure

4- Generate employment

5- Yield financial surpluses for the Treasury

6- Develop and absorb new technology

7- Supply goods with cheap prices for the poor

8- Compete with foreign suppliers of goods and services that are similar to that produced domestically[163].

These conflicting objectives (e.g.: supply goods with cheap prices and generate employment) points to the substantial role played by the public sector bureaucracy and the realization that only this institution is capable of performing these functions. It turned out to be a heavy burden on it, one that was beyond its capacities, as will be discussed later. Yet, there was not any party capable of performing in a better or an equal way.

Yet, Olson (a Neoclassicist) provides a different outlook to bureaucracy. His basic assumption is that people are self-interested. He believed that people are better organized in small groups, due to free rider and bargaining costs. In big organizations (i.e.: State apparatuses), these self interested individuals would act to maximize and preserve their interests by distributing income between themselves rather than to increase efficiency and output. There would not be any motive for seeking technical innovation[164]. This questions the efficiency of the bureaucracy in carrying the burdens of Heavy Industrialization on its shoulders.

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[162] Haggard, 44.
[163] Waterbury, *Exposed to innumerable delusions*, 107.
[164] Jameson & Wilber, 331.

Added to this, the Neoclassicists are skeptical about planning which is supposed to be carried out by government bureaucracies. They regard planners as lacking needed detailed information about current production techniques and consumers' demand as well as foresight for their evolution. They thought of private entrepreneurs and the price mechanism as being much more helpful in this regard[165]. They believe also that the public sector yields lower financial rates of return as compared to the private sector. Thus, public sector's firms constitute a burden on the public budget given that they are in some cases receiving subsidies. Hence, the school calls for limiting the fields that government controls so that it would intervene only in the fields it is better equipped in. Governments should provide the needed infrastructure without necessarily controlling it directly[166].

Bryce criticized reliance on the bureaucracy of public sector's firms. He pointed out that this bureaucracy consists of civil servants experienced in public administration and who have little to do with commercial business, which needs willingness to take risks, awareness of cost-benefit analysis and the enthusiasm to innovate. Moreover, he said that:

> Usually they will gain nothing personally if, by great effort, they succeed in increasing production or reducing costs. To do so generally will involve risks, and they know they will face censure and perhaps dismissal if many failures or mistakes are listed against them. Therefore, [they prefer] to take it easy and play safe, even though this kind of half-hearted management is bound to give only mediocre results without even the possibility of spectacular achievements[167].

Yet, I have to point out that the Neoclassicists do not consider the fact of the relative development of underdeveloped countries bureaucracies as compared to the private sector as I previously pointed out. This condition might have changed as compared to the 1960s, but this change could not be expected to offset completely the need for a sort of planning.

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[165] Hewitt, 159.
[166] Ibid., 161&164.

5-The 1960s Heavy Industrialization Experience

It was clear from the beginning that the Revolutionary government was intending to intervene in the economy in order to achieve high levels of economic development, yet, the shape and intensity of this intervention was not clear. Government's commitment to establishing Heavy Industry to support other industries was also obvious. As early as 1954, the government constructed the Iron and Steel Company in Helwan and contributed to constructing a factory for producing railway wagons. Yet, the escalation of government intervention in this regard was witnessed throughout the 1950s until it reached its peak in the early 1960s with the Nationalization Decrees.

The Pre-1952 Egyptian government did not invest directly in industry except for military related industries especially after the 1948 War. Yet, this was changed drastically with the 1952 Revolution so that in its first year, a Permanent Council for the Development of National Production (PCDNP) was created and asked to study various developmental projects, recommend policies and to even implement projects directly or in association with ministries or private capital. The purpose was to transform manufacturing into the main activity in the Egyptian economy[168]. It is worth mentioning that since the mid 1950s industry received the largest share of investment. Also, the PCDNP was meant to explore national resources and use them efficiently[169]. It is this organization that established the aforementioned Iron and Steel Company and factory for railways wagons. It also recommended construction of two oil refineries, a hydroelectric power station on the Aswan Dam, two thermal power stations in Cairo, besides recommending construction of the

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[167] Bryce, 49.
[168] Mabro, 65.
[169] Abdel Fadil, 85.

Kima Fertilizer Plant in Aswan, and the Rakta Paper Mill near Alexandria, both of which were constructed in the second half of the 1950s[170]. The PCDNP was helped also by the Permanent Council for Services established in 1953 and meant to upgrade social development projects[171].

With the 1956 War and the nationalization of many foreign firms after which these companies were directed by the government, State's involvement in the economy and in industry increased so that it reached between 1957-1960 a considerable percentage ranging between 30: 40 % or more[172]. It was the period that witnessed the dissolving of the PCDNP and the creation of the National Planning Committee and the Economic Organism instead, with the latter organization administering nationalized foreign firms and other companies established by PCDNP. The National Planning Committee was entrusted with drafting 2 five-year plans, a plan for agriculture and another for industry. By then, a more active role for the Egyptian government was realized in industrialization, and the interest in Heavy Industry was reflected in a growing tendency to favor big industrial units as compared to small and intermediate ones. As acknowledged in a newsletter of the General Union of Trade Chamber in 1957, Heavy Industrial projects (and more generally grand projects) cannot be left to individual activities due to their higher risk and their profitability that is realized only on the long run[173]. The profit seeking behavior of the capitalist class trying to realize short run benefits together with low household savings ratios pointed out the need for comprehensive planning and a much more active role for the government. The government was not hostile to private investment, but rather it was the conditions that led it to act in the way it did in the early 1960s. It is worth mentioning that the government encouraged private foreign and

[170] Mabro, 65&66.
[171] Abdel Fadil, 85.
[172] Mabro, 68.
[173] Abdel Fadil, 87.
The General Union of Trade Chamber is my own translation to the Arabic name of the organization

national investment in ventures for producing electric cables and in contracts for Nasr Company for Rubber tiers, and it has successfully attracted foreign investment in pharmaceuticals and petroleum exploration[174].

Yet, the ambitious objectives of the government and especially establishing Heavy Industry had led it, in the existing socioeconomic circumstances, to step towards a much tighter grip on industrialization in order to implement its 5 years plan. A Ministry of Industry and another for Planning were created, and an ambitious objective was set which was to double national income in ten years. The government till then did not lose faith in possible contributions by the private sector although it did not let it participate in drafting the 5 years plan. The private sector, however, failed to finance the industrial objectives of the plan and nationalization took place in the early 1960s[175]. The state almost controlled everything in big industrial establishments leaving the private sector to operate only in small factories and industries. The government nationalized:

1. All banks and insurance companies
2. Foreign trade
3. Strategic and big industries (e.g.: all large textile, food processing and sugar refining plants added to all medium and Heavy Industries)
4. Air and Maritime transport
5. Public utilities and mass transit
6. Major department stores, cinemas, hotels and theaters
7. Newspapers, as well as importation and distribution of newsprint
8. Reclaimed lands and infrastructure for surface irrigation.
9. Agriculture credit and supply of fertilizers, seeds…etc.

[174] Mabro, 66,68&69.

10. Construction companies
11. Infrastructural assets (e.g.: High Dam, Suez Canal, Power Stations, Ports, airports, railroads…etc.
12. A small proportion of urban retail trade[176].

The private sector was left to dominate only five minor industries which were: leather, furniture, wood, wearing apparel, and printing as it was understood that the private sector could perform better than the state in these industries due to their nature and because of the low cost of labor used in them[177]. According to Abdel Fadil, the private sector persisted in the form of small sized enterprises and were centered mainly in 4 industries which were respectively: spinning and weaving, engineering industries, the food processing industry, and the chemical industry[178]. The government chose the alternative of full control over the economy in order to achieve its ambitious industrialization plan, a plan that Heavy Industry was an integral part of. But, did this work out efficiently?

If we look to GDP real economic growth as an indication, it was between 1952/1953 to 1959/1960 about 4.4%, then it rose between 1959/1960 and 1964/1965 to 6.4/6.6 %, and finally it deteriorated afterwards between 1964/1965 and 1971/1972 to 3.5%[179]. The last period can be referred to as one in which the development plan was suspended due to military activities, either with the intensification of the Yemen Civil War (1962-1967) and Egypt's involvement in it, or the military conflict with Israel that culminated with the 1967 War and persisted to drain Egypt of resources that could have been directed to developmental efforts in industrial development. Yet,

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[175] Waterbury, *Exposed to innumerable delusions*, 62.
[176] Ibid., 62.
[177] Mabro, 98.
[178] Abdel Fadil, 101.
[179] Mabro, 43.

Mabro even attributes the high growth rates of the first half of the 1960s to the increasing capacity that was created in the second half of the 1950s. He claims that this is due to the lag that exists between investment and production. If we agreed with this assumption, we will reach the conclusion that the policies of the second half of the 1950s that witnessed a lesser intensity of government's intervention, the involvement of the private sector and the encouragement that it received to contribute in industrial development, were behind the industrial boom of the 1960s that was thought to be resulting from the five-year plan. Mabro did not deny that active state intervention starting from 1954 played a positive role in accelerating growth. He rather implies that tightening the grip of the state, in the way that was witnessed after the 1961 Nationalization Decrees, did harm this accelerating growth. Consequently, growth rates started to fall after 1963-1964 until it reached levels below zero in 1966/1967- 1967/1968[180].

The government was capable of moving considerable investment for Egypt's development, and its ability increased after 1961 due to its tighter control over the economy. The investment ratio in the 1950s ranged between 13.5 and 14% on average while between 1956/1960 and 1963/1964 it reached 19.7% to fall again (due to the 1967 War) to 11.8% in 1968/1969. This deficit was partly financed by a budget deficit due to the fact that the savings ratio remained the same and did in fact fall after 1967 War. Being deprived of US aid worsened things and compelled the government to curtail imports and to pull back the investment ratio to the level that was indicated in 1968/1969, something that led to the deterioration of GDP growth[181]. This rate of investment was, however, still high and proved how tighter control by government over an economy can be beneficial for investment and industrial investment in particular, since the Egyptian government was committed more to industrialization to the extent of exploiting agriculture for that purpose. One can argue that

[180] Ibid., 87&88.

if private capital was left to dominate the Egyptian economy, the result would be directing much of this investment to short run benefit activities. In a basically rural country like Egypt, private investment will be more likely directed to agriculture, and in a rapidly demographically growing country like Egypt private investment might be more interested in construction activities. It is less likely that private investment would be interested in industry in the way that the government is.

It is true also that the structure of the Egyptian economy became more diversified with the rising share of industry and the multiple linkages that it produces to various other sectors and within this sector itself. Industry's share of national output increased between 1955/1956 and 1973 from 17.4% to 21.3% using 1964/1965 constant prices[182]. In another estimate, industry's share of national output rose from 21% in 1950 to 38% in 1970[183].

Within the industrial sector itself the small shares of various intermediate and other industries were increased and this was reflected in exports as the basket of exported goods became more diversified, with a growing share for manufacturing goods. Engineering industries and durables' (e.g.: refrigerators, cars) share of value added also increased[184]. This created more opportunities for Heavy Industry to feed these industries although at this time they relied on aggregating imported parts. Yet, this did not mean that Egypt fail to recognize the importance of concentrating on goods having a comparative advantage for Egypt like textiles. As an indication of a healthy growth of industry, the share of the textiles industry within the industrial sector increased and its share of exports rose from 2:4 % to 17: 20% between 1952/1953 and 1969/1970[185]. Thus, the government acted wisely in its endeavor to industrialize by launching an integrated industrial structure with

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[181] Ibid., 46.
[182] Ibid., 44.
[183] Raymond William Baker, *Egypt's uncertain Revolution under Nasser and Sadat* (Harvard University Press, England, 1978), 175.
[184] Abdel Fadil, 74.

Heavy Industry feeding other industries without neglecting the comparative advantage that Egypt has, as in the case of the cotton crop and using its abundance and high quality in industries based on this crop (e.g.: textiles). Almost full government control over major industrial activities seemed to function well in creating this balanced structure and avoiding, as much as possible, reliance on export led industries that depend on imported intermediate and capital goods that deny the opportunity for creating more inter-industrial linkages.

Nevertheless, a number of embedded problems were present and led to inefficiency, as many critics pointed out.

> The problem of Egyptian industry after 1962 is one of increasing labor costs arising from organizational defects, inefficiencies, redistributional policies, supply bottlenecks, a deterioration of relationships with firms, and a host of other factors[186].

Most of these deficiencies resulted from the intensely centralized way that the Egyptian industry was directed by the government. The non-profit seeking behavior of the public sector (as compared to that of the private sector), mingled with tying the system to a number of hierarchies and entrusting decision-making process exclusively to a senior level. These impacted negatively on the performance and possibilities of growth of Egyptian industries.

The public sector was organized as follows: managers of public firms were reporting to public organizations each of which controlled various firms in the same branch of activity; then these organizations were attached to their relevant ministries from which directives, guidelines and various other instruments of control were transferred down the ladder from the ministry to the organization then to the firm. Investment decisions were centralized in the ministries, and firms could neither use profits to expand or invest, nor could they set their prices to attain profits, since

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[185] Mabro, 219.
[186] Ibid., 150.

prices were administered[187]. Also, the public organizations included those industries having homogenous products or services. Consequently, this denied any possibility for competition, unlike the situation under the holding companies of the 1950s[188]. As asserted by Waterbury, these organizations started even to intervene in all aspects of management and managers had to wait for orders in most decisions[189]. Import quotas dedicated to each ministry gave these ministries more power since they redistributed these quotas as they saw appropriate. This had its impacts as firms were not able to take advantage of low price opportunities and to choose the proper time to import raw materials at a lower price. What resulted was foreign exchange costs[190]. Barter deals that the Egyptian government engaged in for its exports and imports aggravated the situation, as imports might not have been appropriate when compared to needed specifications. Also, these deals were subject to delays due to negotiations, ratification…etc. which were more common[191]. Yet, on another level coordination was lacking between various industries. The Ministry of Planning did not have much independent power, and planning services were performed in individual ministries[192].

C- Changes in the Three Factors

1- The Private Sector

We will start to examine now the present condition of the three factors (immature capitalist class, inadequate infrastructure and the relatively developed position of the Egyptian bureaucracy as compared to other organizations and groups) that justified an active role and almost full management of the Egyptian government over the Heavy Industrialization drive of the 1960s. We

[187] Ibid., 74.
[188] Waterbury, *Exposed to innumerable delusions*, 139.
[189] Ibid., 140.
[190] Mabro, 73.
[191] Ibid., 73.

will try to investigate if any of these factors has changed. This would prove to be important to reach a conclusion on the role that the government should play in launching a new Heavy Industrialization program.

It should be known that the remnants of the private sector that were left to operate in the 1960s, received growing attention in the second half of that decade. Small-scale manufacturers were encouraged to increase exporting to the Socialist bloc and the state helped by guaranteeing a market for their production by annual negotiations with the Soviet Union. Subcontracting between the private and public sector started to take place after 1967. Then when the Open Door policy was launched, the private sector started to expand again away from the limitations that it encountered in the 1960s.

The UNDP Egypt Human Development Report 2000/2001 shows that the private sector has a growing share of manufacturing industries and that has reached to 2/3 by 1996/1997. The leading position of the sector in exporting is clear also if we realized that it contributes by 80% of manufactured exports, if we set aside highly resource based industries[193]. Moreover, According to Sullivan, in 1999 private investment constituted about 60% of total investment in Egypt. It is clear then that the size of this sector and the resulting bourgeoisie makes the private sector play a far different role than the one it used to play decades ago. The behavior of this class even should be expected to be different from that of the bourgeoisie of the 1950s due to time and social change factors.

Yet, Eberhard noted of unemployment that:

> Indirectly, the increase in unemployment is corroborated by an analysis of the creation and destruction of jobs during the 1990s, which not only questions the ability of the private sector to create jobs, but illustrates the weakness, even

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[192] Baker, 177.
[193] UNDP, *Egypt Human Development Report 2000/2001*, 56.

> absence, of job creation in agriculture, manufacturing industries, construction and transport[194].

He asserts this view by showing that unemployment increased between 1990-1995 from 8.6% to 11.3% and other sources claimed this to reach from 12:17%; real growth rate of the GDP, however, increased and was in steady rise so that it rose from 0.3% in 1991/1992 to 5% in 1996/1997[195]. This was before the crises in the stock market in East Asia and its effects on Egypt. Yet, we should note that this increase in GDP is the outcome of many factors, not only the booming of the private sector. One of these factors includes reduction of the debt burden after cancellation of a large proportion of Egyptian debt in the aftermath of the 1991 Gulf War.

It should be pointed out that the structure of the Egyptian bourgeoisie has changed and it is not as it used to be in the pre 1952 Revolution era. It is true that some remnants of the old Aristocracy and the old Bourgeoisie linked with it have retained their power, but new groups have climbed within the class structure, especially in the aftermath of the Open Door Policy of the 1970s. Galal Amin points out that the Noveau Riche were able to acquire their wealth through intermediating activities such as contracting, speculation, commission taking activities, and sub-contracting with foreign firms in addition to high salaried professions[196]. Mahmoud Gad agrees with this view saying that the upper bourgeoisie is made up of people involved in trade, contracting, industry, agriculture and intermediating activities[197]. He also claims that this class resulted from the Open Door Policy era. Furthermore, as elaborated in a study conducted by the National Center for Social and Criminal Studies in 1985, the Capitalist class consisted of owners of

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[194] Kienle Eberhard, *A Grand Delusion: Democracy and Economic Reform in Egypt* (London-NY: I.B. Tauris Publishers, 2001), 149.

[195] Eberhard, 149.

[196] Galal Amin, *Maza hadath lil Misreyeen: Tatawor al-mogtama'a al-misri fi nasf qarn 1945-1995 (What has happened to Egyptians: The Egyptian society's development in half a century 1945-1995)* (Cairo: Dar Al-Hilal, 1997), 76.

big firms, hotels, restaurants added to others involved in profitable business. What needs highlighting in this study is its acknowledgement that people having higher positions in the government, bureaucracy, army and police are among this capitalist class[198].

Thus, it is clear that this new capitalist class (bourgeoisie) is one that is greatly different from that of the royal age. This new class incorporates the remnants of the pre-1952 feudal-capitalist class who escaped the grip of various socialist laws, former lower bourgeois officers who had moved upwards in the social status thanks to their position in the government and the bureaucracy, and finally the group that benefited from the Open Door Policy and who were primarily involved in intermediating activities and trade. In fact, intermediating activities and trade necessitate strong relations with the bureaucracy for getting approvals and licenses especially if we are discussing the post-1952 Revolution era in which the bureaucracy is overwhelmingly dominant. Those new bourgeois elements who were army officers and higher officials can be expected to also have strong relations with the bureaucracy since this was the apparatus through which they gained their new status. Despite all the negative consequences of the mentioned facts, it suggests the presence of stronger relations between the bureaucracy and the new bourgeoisie. If policies would be adjusted so as to make good use of such a relationship, the blessings would be realized and could prove to be very helpful in a Heavy Industrialization drive involving the efforts of the private sector and the government. With various government policies and incentives, this new capitalist class' investment can be channeled to industry. This outcome can be reached and encouraged

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[197] Mahmoud Gad, *Al-tarkeeb Al-tabaqi lil madina Al-misraya fi Al-a'asr Al-hadees (The class structure of Egyptian cities in the modern age)* (Cairo: Maktabit Al-nahda Al-misraya, 1994), 124.

[198] Abdel Basit Mohamed Abdel Al-Ma'aty, *Darasat Al-takwin Al-agtama'aee wa Al-banya Al-tabaqaya la Misr: Al-dirasat Al-mahalya (Studies of the Egyptian social and class structure: local studies)* (Cairo: Al-markaz al-qawmi lil boohoos al-agtama'aya wa al-gina'aya, 1988), 112.

thanks to the mutual trust that has been developing since the time of the Open Door Policy between this class and the bureaucracy.

2- Infrastructure

The first half of the 1980s witnessed a large boom for industrial infrastructure in Egypt. Added to the enhancement of electricity and communications facilities, this period witnessed conclusion of the construction of many industrial cities like the 10th of Ramdan, 6th of October, Sadat…etc. Establishing factories with reasonable prices was guaranteed, and the needed facilities were provided. This infrastructural boom added to other policies (such as protectionism and legal measures to encourage industrial investment), have led to the establishment of a considerable number of factories in the above-mentioned new industrial cities. This shifted private capital interest to industry in the expense of trade that was an attractive field for private investment during the Open Door policy years[199]. Thus, the improvements in infrastructure contributed much in directing private capital to invest in industry.

3- The Bureaucracy

Concerning bureaucracy, as years passed the performance of this apparatus showed signs of inefficiency. If the Neoclassicists had their body of theory on the concept of rent seeking behavior, which I have discussed before, I will argue now that this inefficiency was to a great extent the result of over-burdening the bureaucracy in Egypt with various roles.

[199] Abdel A'alim, 78.

Bureaucracy has been blamed for not having the absorptive capacity to carry on developmental objectives due to weak managerial and technical capacities[200]. Yet, I believe that most of the blame should be rather on the over-burdening of the Egyptian bureaucracy, added to its lack of autonomy in the context of public sector firms. I will focus here on the over-burdening of the bureaucracy pointing out that it was both responsible for development and for social welfare. The developmental role was distracted by the latter role:

> The government must choose between a bureaucracy capable of playing a reasonably efficient and dynamic role in the development process and a bureaucracy designed to augment social welfare by absorbing successive generations of graduates. They cannot have it both ways[201].

Instead of establishing a bureaucracy (referring here to public sector employees) that is efficient, productive and profit-oriented to meet the objectives of the industrialization drive, the government committed itself to employing university graduates regardless to the need of public firms to employees. The result was the overstaffing of bureaus without much consideration to match between skills and functions, together with overlapping functions between sections. This affected negatively the developmental role of the bureaucracy added to other factors like the red tape, rigidity and inadequacy of processing equipment. On the side of the developmental role for the bureaucracy, Samir Youssef asserted that rapid industrialization in Egypt exhausted the existing pool of managers so that there was no other option but to use military officers and mainline bureaucrats to meet this expansion[202]. This shows that it was not possible to meet the over-demand over bureaucracy with an expansion in recruiting efficient and productive employees. Hence, the malfunctioning of the bureaucracy was not a manifestation of its failure as an apparatus, but rather

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[200] Malcolm Wallis, *Bureaucracy: Its role in Third World Development* (London and Basingstoke: The Macmillian Press LTD, 1993), 16.

[201] Monte Palmer, Ali Leila, and El-Sayed Yassin, *The Egyptian Bureaucracy* (New York: Syracuse University Press, 1988), 25.

it was the result of policies disregarding developing the administrative capacities to meet new demands and realize a more active role for the government.

Eberhard shows that the public sector is still in command of the Egyptian economy. The Public Business Sector, which was created after the 1991 agreement with the IMF, was meant to lead to the privatization of 314 public sector companies. Yet, till early 2000 controlling stakes were sold for 114 out of them and minority stakes for another 20 companies, thus less than half of these 314 companies has been privatized. It is worth mentioning that the book value of these 314 companies represent only 15% of estimated book value of publicly owned production and service unit[203]. Siddiqi points out that as late as 2000, the state still owned about 170 companies in various sectors while holding substantial stakes in another 400 companies[204].

This shows that bureaucracy, represented in the public sector, is still controlling a large segment of the Egyptian economy and can not be simply overlooked in any Heavy Industrialization plan, but rather should be relied on. Nevertheless, the bureaucracy should not be over-burdened by many responsibilities that outstrip its capacity and this calls for a more active role for private capital.

2- Models and Suggestions

I am devoting this final part of my thesis to models from other industrializing countries and suggestions for how Heavy Industrialization could be realized. I will start my discussion by analyzing models of underdeveloped countries which have proceeded successfully in

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[202] Ibid., 22&40.
[203] Eberhard, 148.
[204] Moin A. Siddiqi, "Economic Report: Egypt," *Middle East*, Issue 315 (Sep. 2001): 35-36.

industrialization, how Heavy Industry contributed to this outcome and how this industry was established in these countries.

A- Models

1- South Korea

South Korea is one of the economic miracles that the world is speaking of and about how it achieved such a progress in a relatively short time. Understanding how things worked out with this newly industrializing country (and a former underdeveloped country) would prove to give helpful insights for any developing country.

South Korea's economic development is always attributed to export-led industrialization, helped by having small internal markets and being favored by generous US and Japanese aid. In fact South Korea's small internal markets had led it to renounce ISI policies quite early and adopt an outward looking industrialization strategy aided by the abundance of light industries' production. It is also true that the USA contributed much in the form of financial and technical aid to the economic growth of South Korea thanks to the environment of the Cold War and the threats posed by Communist North Korea and China, and the need to establish a model for a liberal capitalist economy in South East Asia. Direct aid was not the only mechanism of US support, which reached the level of even coordinating planning development strategies as in the case of creating the US-Korean Economic Cooperation Committee established in 1963[205]. Also Japan, to compensate for its colonial legacy in pre 1945 Korea and to normalize relations with South Korea, it started to

[205] Haggard, 70.

provide grants for the South Koreans. Yet, it was not only due to this that South Korea achieved development. It was rather because of a wise industrialization strategy that this country followed.

South Korea did not rely only on light industries and exporting light industries' commodities. South Korea, starting from the early 1970s, engaged in a Heavy Industrialization plan that guaranteed this industrial progress. As industrialization proceeded in South Korea, the economy became more and more dependant on imports of machinery, transport equipment and chemicals. Also, the growing military tensions in South East Asia at this time (as the Vietnamese defeated US troops and the USA started to talk about pulling back their military presence in South Korea) provided the incentive to develop an independent military industrial complex with which the South Korean army could enjoy self-sufficiency in a number of weapons systems. These two factors led to calls for establishing a strong Heavy and Chemical Industrial base, which received great care since 1973[206]. The investment in HCI between 1978 and 1980 reached a level of 80% of all manufacturing investment, and in 1978 it received 93% of the loans meant for manufacturing[207]. South Korea was able to launch Heavy Industrial projects thanks to its cheap labor. With this Korea was able to offset costs arising from operation with low capacity and in a sub-optimal size for an HCI plant.

By this means South Korea was moving towards achieving an integrated economy with exports paying for Heavy Industry and Heavy Industry providing export-led industries with the appropriate capital that they needed, with the process of know-how and building technological capabilities proceeding ahead. This is what Ohno and Imako were pointing to when they identified Korean industrialization as a dualistic policy, where export led promotion mingled with Import Substitution Industrialization (ISI). In this way, the Koreans were able to make use of existing

[206] Ibid., 131.

comparative advantage in certain sectors, as they were developing other comparative advantages in other sectors. For the two writers this was an elaboration of the "Secondary Import Substitution" phase that was to be followed by a "Secondary Export Promotion" phase, according to Weiss model[208].

The role of the government in this was substantial. As Evans points out, the Korean capitalist class was weakened due to a number of historical factors like Japanese Colonialism and the Korean War (1950-1953). He attributes to this factor the growth of a Developmental State in Korea[209]. The concept of a Developmental State will be explored later in this chapter, but what I will point to now is that such a state is an active one but it is not in conflict with private initiative. Rather it supports and guides private investment.

Thus, even before the Heavy Industrialization drive of the early 1970s, the South Korean government supported the private sector by many ways one of which was the banking system (through banking institutions controlled by the government). These institutions provided export firms with various generous facilities. Another mean of support was through giving import rights based on the export performance of a firm. A third way was through protective policy, by imposing tariffs and quotas on competing goods' imports, so that liberalization did not take place before 1967[210]. Also, the government utilized the tax system to provide various incentives. Finally, the government reduced uncertainty by "procurement of information and coordination of planning."[211] By this and through other methods the government guided or participated directly to promote these

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[207] Auty, 88.

[208] Ibid., 41.

Weiss model is pointing to four stages of development: 1- Primary ISI, which corresponds to infant economy; 2- Primary export promotion; 3- Secondary ISI (Which takes place due to emerging labor shortages that opens the way for more capital and skill intensive industries like the HCI); 4-Secondary Export Promotion.

[209] Evans, *Embedded Autonomy*, 232.

[210] Haggard, 65,66&67.

[211] Auty, 41.

industries bearing in mind the development of self reliance so that exports could be used to "finance self reliance through the development of infrastructure and basic industries."[212]

Thus, the motive for self-reliance existed from the beginning and it induced the Heavy Industrialization plan that started in the 1970s. Again the government played a major role in this drive. This drive was referred to as an HCI Big Push, as it targeted intensively a number of HCI projects incorporating petrochemicals, steel, shipbuilding, engines and automobiles. Diversification of investment between various sectors was targeted in order to avoid the risk of HCI projects[213].

The main guidelines of the government's policy were to participate, and even directly control, Heavy Industries and to provide favorable conditions for private sector investment in export led industries. The government, for instance, directly owned petrochemicals and steel industries, while "Industrial estates were created to house private sector ventures" in electronics and machinery sectors, and negotiations were conducted with large industrial groups for conducting projects entailing some foreign equity[214]. The government negotiated with MNCs to acquire the best available technology. Yet, it should be pointed out that Foreign Direct Investment did not contribute much, as a proportion of total investment, to the Big Push. Between 1972 and 1983. It represented hardly 5% of total capital inflow; yet, "equity participation by reputable MNCs was secured in order to facilitate rapid technology transfer, but that participation was kept to a minimum."[215]

The new industries were protected from foreign competition and given fiscal incentives while letting them dominate the domestic market through localization requirements for firms forcing them to buy Korean capital goods. Production was meant for domestic markets, but when

[212] Haggard, 68.
[213] Auty, 124.
[214] Haggard, 131&132.

domestic demand failed, the government adjusted the exchange rate to induce export of HCI products. Moreover, the government used the banking system to provide preferential loans.

Finally, the government helped in establishing big firms through establishing the General Trading Companies (GTC) to act as an exporting agency. Also, the government, through setting capital and export requirements, forced the creation of large firms (Chaebols) instead of medium and small sized firms. Moreover, as Haggard pointed out, this was done by giving priority for investment in larger and more technologically sophisticated firms[216]. Foreign investment was even discriminated against for the sake of developing large domestic firms. The government provided incentives for these Chaebols in exchange for export performance and growth targets[217]. As an example of these Chaebols, Evans referred to the automobile industry pointing to Hyundai and Daewoo as two examples. The state induced the formation of these Chaebols agreeing with its strategy of forming big firms. Then when the industry was established, it helped the existing firms by limiting the number of competing firms as well as the number of models (e.g.: car models) produced added to providing them with inputs with preferable prices. The government also guided private investment by encouraging investment in this industry, and by entering as an equity holder in these chaebols. Negotiations with MNCs were being conducted to transfer technology. This was possible thanks to the preferable international conditions at this time which facilitated the acceptance of MNCs to transfer their technology. These favorable international conditions were not existing in the case of Brazil when it started earlier its Heavy Industrialization drive[218].

Needless to say, the automobile industry is a success story for Korea. The HCI Big Push was also successful in many other fields, iron and steel being a clear example. Korea became one of

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[215] Auty, 128.
[216] Haggard, 131&132.
[217] Auty, 87.

the major Steel exporters in the world despite the fact that Korea neither had iron ore nor coke. It is no wonder that establishing the Pohang Steel (POSCO) was met in the beginning with much criticism. The government solely invested in constructing it using Japanese technical and financial assistance. Yet, this investment proved to be of considerable importance as the Steel industry soon paid back for this investment and became a major export after a period of protection. The POSCO surpassed all US steel firms production and its production was more competitive due to the low costs it encounters. It proved to provide linkages of vital importance for the Korean economy as it fed the automobile industry and played a great role in its competitiveness and other industries competitiveness. It also provided forward linkages for the shipbuilding industry and was an "important source of innovative technological knowledge."[219]

Thus, Heavy Industrialization has benefited the Korean economy. Auty attributes this success in the HCI drive to a number of things. The first is setting global competitiveness as a target from the beginning. The second is using economies of scale and acquiring the best available technology. The third is the rapid GDP growth and early involvement in exportation, which have led to dwindling market constraints on scale production. The fourth is providing local firms with high autonomy and ownership that facilitated the maximization of skill attainment. The fifth is the presence of cheap labor, which reduced costs and helped in the competitiveness of the Korean HCI industries. Finally, the success was due to a macro policy that "sustained rapid domestic demand and export competitiveness."[220]

Yet, many writers, notably the Neoclassicists, criticize the HCI Big Push attributing the difficulties of the Korean economy in the 1970s to this drive. The Big Push was accused of causing

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[218] Evans, *Embedded Autonomy*, 92.
[219] Ibid., 74,75&87.
[220] Auty, 72.

inflation, increasing foreign debt, decreasing economic growth, deteriorating trade balance and causing the economic downturn that toke place between 1979 and 1981. This was blamed on "misallocation of subsidized credit to create excess HCI capacity which gave a low financial return."[221]

Nevertheless, it should be noted that the Big Push coincided with the world supply crises that happened due to oil shocks of the 1970s. These crises troubled the world economy as well as Korea. Korea in the late 1970s started a liberalization of the economy and minimization of state's involvement, and the Korean economy expanded. Auty points out that this expansion was not only because of this liberalization but also due to more favorable international conditions, after the oil shocks, as well as due to the HCI rebound[222]. When the HCI projects constructed in the Big Push started to stand on their feet, they were able to provide the economy with comparative advantages in new sectors and to provide more linkages and it is this point that should be considered for a fair judgment on the Heavy Industrialization drive in South Korea.

2- India

As for India, one of the countries that is rapidly developing nowadays, the realization of the importance of constructing a Heavy Industrial backbone was realized shortly after independence in the late 1940s. The Indian manufacturing sector was weak, despite the huge size and population of the country. This had implications for the need for infrastructure and long construction periods as well as inducing an active role for the Indian government. The size and population of the country pointed to the possibility of developing self-sufficiency, in contrast to South Korea, and this meant a lot for the industrial policy that India pursued. It is no wonder that India followed an Autarkic

[221] Ibid., 123.

economic policy aiming at Import Substitution and not targeting export markets in the early phases. The large markets and resources that India is endowed with encouraged such a policy. Thus, Heavy Industrialization was receiving a great attention from the start, and there was a realization that investing in capital goods will encourage savings unlike investment in consumer goods (as less money will be directed to consumption and thus more money will be saved). These savings can be used then in further investment causing high growth rates for the Indian economy[223].

With these assumptions, India launched the Mahalanobis Big Push between 1956 and 1961. In this Big Push, Heavy and Chemical Industries played a central role and received tremendous care that persisted even to the late 1980s. The Indian Industrialization strategy that followed this Big Push was one of a wise division of roles. Heavy Industrialization was still a priority. As Raj points out, long run growth was regarded as depending on increasing production of coal, electricity, iron and steel, heavy chemicals, heavy machinery and Heavy Industries more generally with more emphasis on heavy machine building industry. Increasing the production of these goods was anticipated to achieve quicker rates of industrialization in a fairly short time. The government was to own these industries referred to as Department I industries, using the Marxist Soviet term, (e.g.: steel, heavy engineering, power generation and machine making). This was led by the assumption that the private sector is neither capable nor willing to invest properly in these kinds of industries[224]. Returning back to Raj, he said that still an important role was assigned for the private sector, which was to be involved in important industries like cement, chemicals,…etc. While consumer goods were to be provided by household or hand production, making use of labor

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[222] Ibid., 111&123.
[223] Ibid., 184&185.
[224] Tom Kemp, *Historical patterns of industrialization* (London: Longman, 1978), 168.

abundance and trying to meet the need for creating more job opportunities, although what happened in practice was an increase in factory produced consumer goods[225].

As Auty points out, this was a sort of guided capitalism where the economy was divided between state public firms, big private firms, and informal-sector micro firms. Yet, the state was still dominant despite this division of roles. The government controlled the behavior of private capital by various means. There were restrictions on new products, technology access, locational choice, plant size selection and work force reduction. The state also discouraged private capital from investing in large size plants and seemed not interested in inducing this capital to look for export markets in the way the Korean government did. On the other hand, the government encouraged the expansion of the small industries, and more industries were shifted to them. Yet, as Auty points out this sector was not able to expand as they were not equipped "to supply larger firms efficiently" and also they had less "resources to finance R&D."[226]

As for the performance of the Heavy Industrialization drive of the Indian economy, it should be pointed out that Heavy and Chemical industries surpassed the size of light industries in the 1960s, and, thus, dominated the Indian industrial sector. India witnessed high growth rates for its industrial production. This growth rate accelerated from an average of 4.7% between 1947 and 1951, to 5.6% in the First Five Years Plan, then to 7% in the Second and finally to 9% in the Third[227]. These growth rates did not persist, however, as Heavy and Chemical Industries did not rebound, as Auty asserts. Investment rates continued to grow, but GDP growth decelerated giving serious indications as to the inefficiency of Indian economic performance. The deceleration can be attributed to the war with Pakistan in the mid 1960s added to the agriculture crop failure at that

[225] Ghosh, 73.
[226] Auty, 190.
[227] Ibid., 196.

time. This consequently meant a cut in public spending that should have implicated negatively on industrial growth.

Yet, Auty still refers to a number of policy and performance mistakes that led to the problems faced by Indian industry. The most clear of these mistakes is ignoring light industries and textiles, which could have acted as export goods for the Indian economy but were growing slowly. As for Heavy and Chemical Industries that were controlled by the government, they were encountering high capital costs due to long construction periods, poor management of HCI projects and infrastructure meant to support them, and low profitability as compared to private sector investment. As for government involvement in the economy in general and its ownership of a substantial proportion of the Indian industrial sector, by the late 1970s problems emerged for the public sector due to lack of autonomy among the firms and inflexible price controls. Evans adds to this lack of autonomy for public firms bureaucracy another factor, which is "lack of effective embeddedness" so that the Indian bureaucracy was "too removed from day to day operations."[228] The Indian bureaucracy did not establish proper ties with its local capitalist class and this was the reason for its lack of embeddedness as compared to the South Korean model.

The result was that the public sector, which was contributing by about ¾ of industrial investment, gained almost no profits. The steel industry, which was the most favored Heavy Industry in India and a major contributor to Indian Industrial expansion as pointed out by Evans, was an example that manifested these defects. Thus, the steel industry regressed in performance in the 1970s. This was due to a number of factors that were elaborated above and added to it other factors specific to the Steel industry like: not operating in the required capacity (even when mini-

[228] Evans, *Embedded Autonomy*, 88.

mills were introduced), inadequate infrastructure and excessive protection from foreign competition[229].

Hence, the reform that India had undergone in the 1980s, by giving more autonomy to public firms, easing price controls, decreasing subsidies, encouraging private contribution in joint ventures in some sectors like petrochemicals, and finally increasing private sector's presence in public firms' boards. All these measures resulted in an improvement in the efficiency of the Public Sector and Heavy Industries' firms under its control[230].

Speaking of another dimension of Heavy Industrialization in India, Raj states that high-level income groups influenced industrial production and deflected it from what was planned. He pointed out an example which was the increase in the production of hot and cold rolled sheets which are used in producing consumer durables and to a similar trend in producing stainless steel[231]. This points to the role played by the bourgeoisie, which can exert considerable pressures that can direct the industrialization path of an underdeveloped country. We are here considering the demand side of the economic equation (demand for certain goods that induce their production), while all my previous analysis was based on the effect of the bourgeoisie on the supply side (e.g.: investing in short run profitable activities). Confirming this view is what Evans pointed out about the erosion of the cohesiveness and cohesion of India saying that:

> Declines in the state's ability to perform as a coherent corporate actor and erosion of effective state-society ties went hand in hand, demonstrating once again that capacity depends on putting autonomy and embeddedness together[232].

The Indian government's erosion of power has made it less autonomous towards interest groups, especially the bourgeoisie. Thus, the government's role as a corporate actor developing effective

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[229] Auty, 193& 194.
[230] Ibid., 190&191.
[231] Ghosh, 75.

state-society ties was affected and the Indian government became rather subject to interest groups' pressures. Yet, from another perspective, Raj's analysis points out an asset for Heavy Industries, which is their flexibility that permits shifting their production according to conditions and changes in demand and tastes.

Despite its initial encouragement for MNCs investment during the Big Push, the Indian government thereafter refrained from this due to concerns over deterioration of foreign exchange and for the sake of developing "a high level of indigenization of technology," which India was able to achieve as Bruton points out[233]. Thus, India did not rely on MNCs in its industrial development, it rather adopted the idea of building up technological capabilities. This strategy was referred to as being the reason behind providing the Indian labor with upgraded skills. Yet, this was at the expense of trying to acquire the latest available technology, a factor that was pointed to as a major defect that might hinder an economy seeking a more outward looking export led industrialization strategy[234]. Auty asserted that this strategy affected the steel industry in India.

Yet, there are supporters to the claim of the appropriateness of using old technologies in Third World countries.

> From the point of view of technological requirements there are obvious differences between LDCs and advanced countries some at earlier stages of development. These include the land/labor ratio, the rate of growth of the labor force, the availability of different types of materials, and the world technological system in which the LDCs must operate. Thus, it is sometimes too readily assumed that old technology from advanced countries is likely to be appropriate to their needs[235].

Pack and Todaro develop this to argue for developing local technologies in Third World countries based on old designs from industrialized countries. These designs are the most appropriate for

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[232] Evans, *Embedded Autonomy*, 73.
[233] Auty, 196.
[234] Martin, 105.

underdeveloped countries, but as they are obsolete they would not be imported from the advanced industrialized world in the best shape (e.g.: they might be using second hand machinery or lack spare parts as they are not using the most up-to-date technology,…etc.) Thus, it would be justifiable to argue for Third World countries to develop their own technological capacity based on old designs from the industrialized world[236]. This is the logic that made the Indian strategy understandable.

Yet, it should be pointed out that the Indian government started to renounce this strategy and to acknowledge the vitality of relaying on MNCs and acquiring the latest technology without renouncing the need for developing its Heavy Industrial sector. Together with the reform measures that have been mentioned regarding the public sector and encouragement of the private sector, MNCs were encouraged to invest. These new reforms were reflected in high growth rates[237].

Thus, the Indian experience points out to the necessity of involving MNCs in developing Heavy Industry for the sake of technology transfer. It also points out the central role of the government in this industry (Heavy Industry). The role of the government in this regard should not, however, be exclusive and should involve other parties like the private sector and MNCs (especially MNCs to upgrade the used technology as evident from the Indian case). Building technological capabilities was an achievement in the Indian case, but still there was a need for contacting foreign technology to update these capabilities. This is the formula that India seems to have recognized recently.

3- Brazil

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[235] Ibid., 165.
[236] Ibid., 165.
[237] Auty, 192.

Brazil was another economic industrializing miracle especially in the 1970s. It also realized the importance of establishing a Heavy Industrial backbone, yet the strategy that it pursued for creating an integrated industrial structure was somewhat different from the other two models that have been discussed.

What was pursued in Brazil was a strategy that was referred to as the Triple Alliance, an alliance that combined the efforts of the state, local private capital and Foreign Direct Investment. The government also was the one investing in infrastructure, human capital, and heavy capital and intermediate goods industries, but what is novel is that it relied on MNCs in its industrial development and in transferring technology[238]. As the UNIDO pointed out, the public industrial sector had a substantial presence in those areas that the private sector was unable, due to organizational and financial reasons, to invest in. This included steel, due to high capital needed in it, petroleum, (acting as a partner with MNCs and indigenous private sector), and chemicals[239]. We have to point out that concerning petroleum, the Brazilian government was involved in both its refining and extraction as well as in petrochemical industries. The local private sector was left to operate freely in other industrial activities but it shared also in Heavy Industries. As for foreign capital, MNCs were active in industries of great need for access to "universally applicable, rapidly changing technology that cannot be obtained on an open market." This is added to their marketing advantage and to the fact that certain industries were initiated in Brazil by the MNCs[240]. The Petrochemical industry in Brazil was a clear example of a Heavy Industry under the Triple Alliance where the three forms of capital coexisted.

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[238] Ghosh, 75&76.
[239] Ibid., 261.
[240] Evans, *Dependent Development*, 284&285.

Heavy Industrialization in Brazil was pursued as a part of an Import Substitution Industrialization strategy that Brazil aimed at in an autarkic economic policy. Heavy Industrialization took the form of two Big Pushes, one between 1956 and 1960, followed by the Economic Miracle, then the second Big Push between 1974 and 1979.

The first Big Push, the Kubitschek Big Push 1956-1960, entailed more emphasis on the steel industry that received around two thirds of total investment. Yet, the petrochemical industry was also targeted to some extent together with special targets for automobiles, heavy machinery and shipbuilding. Considerable foreign and domestic resources have been devoted to this Big Push, and this investment repaid well. High growth rates were witnessed during this period so that GDP average annual growth increased from 6.7% between 1951 and 1955 to 8.1% during the Big Push. In the manufacturing sector growth rates were 10.2% as compared to 7.9% in the early 1950s and this achievement mingled with considerable enhancement in self sufficiency and reduction of imports demanded by various sectors (consumer, intermediate and capital goods) by 1960[241]. Yet, the Big Push resulted in an increase in Brazilian debt due to the need for tremendous investment while export commodities were not receiving much attention, a trend that persisted even after the end of the first Big Push.

The period that witnessed unprecedented growth rates for the Brazilian economy and in which the country was referred to as an economic miracle (late 1960s and early 1970s) corresponded with the time in which the government increased its share of total invested capital from 37 to 45%, and from 60 to 75% of total net worth of Brazil's largest 100 firms (1968:1974). This growing governmental contribution became a trend that persisted and accelerated with the 2nd National Development Plan starting in 1976 (in the context of the second Big Push) that called for

[241] Auty, 147& 148.

substantial new investments in pulp and paper, energy, petrochemicals, fertilizers, non ferrous metals, and steel[242]. As for the period of the "economic Miracle", it should be noted that despite the central role that Heavy and Chemical Industries continued to play (capital goods annual growth rate was 18%, and for intermediate goods around 13%) some liberalization measures were introduced like exchange rate easing while the Brazilian government started to acknowledge the importance of export promotion. Yet, this is not the only factor for the high growth rates that reached annually 11% for the economy and 13% for the industrial sector. Investment increased to 25% by 1973 from a level of 18% in the mid 1960s and this was possible due to an increase in savings. Another factor was the rebound of the Heavy and Chemical industrial projects of the first Big Push, so that full utilization of capacity was achieved[243].

The Economic Miracle had however some embedded problems that had developed serious implications for the Brazilian economy afterwards. If exports increased fairly, imports as a share of GDP surpassed it. This resulted in augmentation of Brazilian debts since the inflow of foreign capital was not matched by an equivalent increase in trade surplus. In 1973, foreign debt reached a level of $12.9 billion from a level of $5.1 billion in 1970. Manufactured exports were mostly agriculture-based industrial output as HCI projects' maturation was slow, and this meant a great loss given the substantial investments that went to Heavy and Chemical Industries. These were all mingled with a dramatic increase in inflation due to the Oil Shock of 1973.

The government then launched another HCI Big Push plan that was referred to as the Geisel Big Push (1974-1979). The hard economic conditions under which this plan was implemented called for an active role for the Brazilian government. Public investment increased about three times as private investment, and the state controlled about half of the net assets of the

[242] Haggard, 182&183.

biggest industrial firms in 1981. This increase in the involvement of the state, however, was matched by an increase in the inefficiency of state firms (attributable partly to low autonomy of these firms) and an ill-designed macroeconomic policy confronting the souring inflation and foreign debt by import controls instead of tackling exchange rates and export promotion[244]. Yet, the problems faced by the Heavy Industrialization of the Second Big Push can be attributed to the international economic conditions of the 1970s and the subsequent oil shocks characteristic for this decade. Nevertheless, the role of MNCs, which will be discussed below, and government macroeconomic policies should also be blamed for this outcome.

MNCs played a major role in the Brazilian industry as indicated from a figure stated in 1970 saying that a considerable proportion (about 75%) of "net fixed assets" owned by US manufacturers was concentrated in chemicals, transportation and machinery showing how MNCs participated even in Heavy Industry[245]. Andre Gunder Frank spoke of the Brazilian experience with MNCs pointing to how their involvement in the industrial sector led to considerable problems for the Brazilian economy. He pointed out that in Brazil MNCs controlled almost 90% of motor vehicle, 70% of machinery industries together with substantial percentages of textiles, electrical equipment, rubber, food, and mineral non-metallic industries, although this was through joint firms with government and private capital[246]. This strong dominance of MNCs over industries of that considerable importance has led to a deterioration in the trade balance so that even though Brazilian exports increased impressively, a trade deficit of –$4 billion was witnessed in 1975 as compared to a positive trade surplus in 1964. Frank attributed this to the massive importation of capital and intermediary goods and services by MNCs. To offset this trade deficit, Brazil started to

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[243] Auty, 150.
[244] Ibid., 153.
[245] Haggard, 216.

rely heavily on foreign borrowing, which has led, together with other international economic factors of the late 1970s, to ruin the industrial Brazilian miracle. In highlighting the defects of the Brazilian model, Frank said:

> The model, moreover, shows three contradictions that have political explosive power: firstly, the de-Brazilianization of the economy is increasingly getting the upper hand, so that the power of decision is being transferred to the center of international capital. Secondly, the need for imported goods, foreign technology and foreign capital increases all the more the stronger the presence of the multinational becomes, which leads to an alarming increase in the Brazilian external debt[247].

The third contradiction for Frank was increasing the polarization of Brazilian society by targeting special groups in the developmental process, a point that is not relevant to my analysis. Evans referred to this simply as the internalization of imperialism through Foreign Direct Investment, and referred to the Brazilian developmental trend as "Dependent Development" indicating another form for Imperialist Core-Periphery relations involving some industrialization for the periphery and a Triple Alliance as in the case of Brazil[248].

As for Heavy Industries, the Steel industry was performing well in Brazil and contributed much for its industrial expansion. Brazil became a major exporter of steel to the extent that their exports surpassed that of the USA[249]. Yet, the Brazilian performance encountered many problems. Construction costs were high as compared to the Korean case in which cheap labor minimized this cost. In fact, in Brazil these costs were higher then the industrial average. Maturation periods were long, and exchange rates kept the Brazilian currency overvalued providing a price disadvantage for exporting Steel. Another problem originated from the social structure of Brazil, where equality between various regions constituting a big country like Brazil induced a strategy of multi-plant

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[246] Andre Gunder Frank, *Crisis in the Third World* (NY- London: Holmes and Meier Publishers, 1981), 8.
[247] Ibid., 11.
[248] Evans, *Dependent Development*, 32.

expansion for steel to avoid favoring a region more than others. This was something that led to the augmentation of costs as well as dilution of technical and managerial skills. Consequently, this led to the inefficiency that was attributed to the performance of state firms[250]. Another social dimension has harmed the steel industry in Brazil. This was the fragmented nature of the Brazilian government and its low autonomy from private capital. Thus, the government found it proper to sacrifice its agenda for the sake of its private collaborators, so that indecision resulted and delays concerning investment implementation was the outcome[251].

The petrochemical industry proved to be a promising Heavy Industry for Brazil. This was due to the low scale requirements of this industry (unlike steel), lower technical barriers and lower cost for its establishments[252]. In fact, the petrochemical industry has received much attention since the time of the first Big Push. About 1/9 of total investment in the first Big Push (1956-1960) was directed to the petrochemical industry, while steel received 2/3 of total investment[253]. This shows that the petrochemical industry took a big share of the total investment that was not being directed to the steel industry (which was a major industry and contributor for Brazil's industrial expansion as I pointed out before). Given this considerable investment in the petrochemical industry and knowing that Brazilian GDP growth rate and manufacturing sector growth rate expanded in this period, indicates that the petrochemical industry has contributed much to Brazil's industrial expansion. GDP growth rate reached a level of 8.1% annually in this period (1956-1960 as compared to 6.7% between 1951 and 1955), and the Brazilian manufacturing sector growth rate

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[249] Evans, *Embedded Autonomy*, 87&88.
[250] Auty, 55&56.
[251] Evans, *Embedded Autonomy*, 88.
[252] Auty, 58& 59.
[253] Ibid., 147.

was 10.2% (between 1956 and 1960) as compared to 7.9% in the early 1950s [254]. In the years that followed and in the second Big Push, the petrochemical industry still received an important share of investment and has contributed to Brazil's industrial expansion.

As for the automobile Heavy Industry, it performed well and opened export markets for Brazil. It was exclusively owned by MNCs while being protected by the government from competition. As Evans points out, it contributed much to the "Economic Miracle", "spawning a large local parts industry with a substantial proportion of local ownership."[255] Thus, although this industry was in the full grip of MNCs, the Brazilian economy benefited from the linkages it created together with the fact that automobiles became a major export for the country.

B- Suggestions

1- Lessons from the Models

In this subsection we are going to discuss suggestions regarding the anticipated role of the Egyptian government in the proposed program, which should be expected to be different from that of the 1960s in intensity and strategies, putting the new global and internal settings in consideration. Suggesting various ways by which the Egyptian government can foster or direct this plan and how this can be in coordination with or guidance for the private sector, will conclude my thesis. I will start with deducing lessons out from the models that was discussed in the previous section.

[254] Ibid., 147&148.

a- Pros and Cons of a Big Push

In his discussion about the Heavy Industrialization strategies of the NICs, Auty discussed the idea of establishing this industry in the form of a Big Push. As for those advocating this strategy, they point out that:

> The cost savings anticipated from the capture of both the internal and external economies of scale encourage the pursuit of HCI as a Big Push: that is, via the simultaneous start-up of complementary upstream and downstream sectors (say, steel and auto assembly) which thereby provide each other with markets that are larger than would be the case, and so capture the scale economics earlier[256].

Yet, Auty points out that such a strategy, despite its advantages, can be a substantial burden on the resources of a developing country added to its reliance on the increase of demand to justify operating on a large scale. Thus, a Big Push is a more feasible option for a big country, with various resources and big markets, than for a small country. Referring to empirical evidence from countries that pursued this strategy, Auty asserted that a Big Push "strains domestic implementation capacity and lowers economic growth"; this passes through three stages:

1- The HCI Big Push: this stage is characterized by inflation, microeconomic imbalances and exchange rate appreciation.

2- The second stage starts after four or five years and is characterized by GDP slow down due to stabilization measures meant to support HCI projects. These measures, however, cause low capacity (and, thus, problems for servicing debts) and minimize domestic demand.

3- The third stage is the HCI rebound, which is dependent on the success of stabilization measures. In this stage demand increase and HCI projects can work to excess capacity[257].

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[255] Evans, *Embedded Autonomy*, 92.
[256] Auty, 2.
[257] Ibid., 104.

Thus, a Big Push might be a successful strategy for a big country provided that stabilization measures in the second stage succeed and Heavy Industrial projects can rebound. I anticipate that Egypt cannot sustain a Heavy Industrial Big Push despite the fact that it has a big market. A rather milder strategy should be adopted in stages. For a highlight of such a proposed strategy, I anticipate that intermediate goods Heavy Industries should be developed and given more attention first, especially Steel and Aluminum in the Egyptian context. Also, the petrochemical industry should be developed in this stage since Egypt has many cost advantages in such a strategy given its oil and gas production and the low cost and scale of operation needed for this industry. Then at a later stage, Egypt then should develop the machinery and equipment sector industry and other industries that develop local technological capabilities. This will be a strategy that is reasonable and less pressuring on the country's resources.

I have shown in my analysis in the first chapter how three of the most important intermediate Heavy Industries in Egypt (aluminum, steel and petrochemicals) are in fact promising and one can anticipate their further expansion based on their performance and to wise government strategies (especially the twenty years plan for the petrochemical industry). I have also shown in my analysis how there is a growing demand for machinery (especially in the textiles industry and agriculture) that is being imported despite the rising costs emerging from the appreciation of foreign currencies in comparison to the Egyptian Pound. This points to the possibility of implementing the strategy that I am calling for, starting with intermediate Heavy Industries and then moving to the machinery sector.

b- Size of the Market and Heavy Industry

On his comment on why Heavy Industrialization proceeded in South Korea and Taiwan and has been the reason for their further growth and how this was achieved, Haggard stated that:

> Korea and Taiwan could entertain a deepening of the industrial base through integration into intermediate and capital goods, whereas the city-states (e.g.: Singapore) could not. Sectoral choices, in turn, influenced the mode of state intervention. In capital-intensive industries or in natural monopolies Korea, Taiwan and Singapore formed or expanded state-owned enterprises. In other sectors where private investors were capable of organizing production, the state's role was to reduce risk by subsidizing credit, extending infrastructural and technical support, and providing market information[258].

Hence, one can infer that industrial deepening through creating a much-integrated industrial structure depends on the size of the market. This can be a positive point in campaigning for such a development in Egypt. Egypt is having a growing market with its population of almost seventy million, the second largest in Africa and one of the largest populations in the Middle East. The growth of the Egyptian industrial sector that has been witnessed since the 1952 Revolution, and the increasing demand of the growing population for industrial goods, which has been reflected in a growing share of imports and big trade deficits, all show how big is the Egyptian market. Galal Amin, for instance, in his book "*what has happened to Egyptians*", points to social mobility that have resulted from the 1952 Revolution and then free education and labor remittances from the Gulf. The newly enriched classes have been trying to show that they are better off by consuming more, with consumption becoming the hallmark of social status. Expansion in consumption means the expansion for the Egyptian market, which has unfortunately met this growing consumption with more imports. Creating an integrated industrial structure will make better use of this consumption behavior and convert it to an engine stimulating more industrialization. Heavy Industry will benefit from these developments, since it will provide the backbone for this integrated industrial structure.

If we can think further of a kind of a future Arab economic integration then this calls much for taking such a step and reinforcing Heavy Industry in Egypt. Yet, another point that should be elaborated is that tackling Heavy Industries will mean also a more active role for the Egyptian government.

c- Institutional History and the Role of the Government

Haggard added that the institutional history and patterns of interaction between society and the government determined the way in which governments intervened in their economies so that it differed between the South Korean and Taiwanese cases. Moreover, these strong governments were able to avoid the influence of pressure groups on economic decision-making process. They seemed to manifest Mancur Olson's discussion on containing social groups' influence on economic policy as being critical to development[259]. This development was a characteristic of Korea and was made possible due to its conditions. Auty, in his analysis on the industrial policies in the NICs stated that:

> The differences in industrial policy choice among the larger NICs are rooted in the greater ability of the resource base of the larger Latin American countries to sustain an autarkic policy for longer than the resource-deficient Korea. This permitted the emergence of powerful urban pressure groups in Brazil and Mexico, which benefited from an inward-oriented trade policy, an overvalued exchange rate and generous state assistance. In Korea, however, the deficient resource base forced the early abandonment of autarky before such groups became consolidated. In fact, the competitive industrial policy which Korea then adopted created urban-based groups with an interest in the maintenance of competitive exports, and they were prepared to subsidize the lagging rural sector[260].

It is striking that resource deficiency can be a positive factor for acknowledging a more active role for the government and for preventing the pressure of interest groups from influencing

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[258] Haggard, 157&158.
[259] Ibid., 158&159.

government's formulation of policies. Consequently, a wise industrial policy was realized in the Korean case as the government was able to play a more autonomous and active role than that played by the Brazilian government. Thus, a more active and autonomous government intervention is crucial for the proliferation of Heavy Industries.

The third point that is worth commenting on is that institutional relations between society and government determine the nature of government intervention. It should be obvious that the sociological perception of the state by society in general in the Egyptian context is one of almost absolute reliance and dependency. It can always be seen in the comments of most of the common people when a problem happens and they start to blame the government and government agencies. What aggravates things is the historical mistrust between the state and the private sector due to the remnants of the memories of the nationalizations of the 1960s and the everlasting changing government regulations and laws governing private investment. If all these factors are taken into consideration, one might anticipate that the only possible kind of government intervention is at least full ownership of Heavy Industries and a sort of government guidance and Dirigisme to other industrial sectors, if an industrial strategy is to achieve success. The need for avoiding the influence of interest groups on economic decision-making gives another negative impulse to move against political liberalization.

It seems that a lot must to be done to furnish the way for the private sector to play an active role in the Egyptian economy generally and in the sector we are focusing on in this thesis (Heavy Industry). Developing the capabilities of the people and teaching them to organize and try to solve their problems and giving more guarantees and incentives to the private sector, will all help in changing the sociological perception of the Egyptians and will prove to be very helpful in diluting

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[260] Auty, 118.

reliance on government's control. This will be reflected in the increasing contribution of private capital in the Heavy Industrialization plan and will possibly dilute the role of the government to one of partnership, protectionist or supervisory.

d- Specificity of Industrial Experiences

The concept of institutional history and the relative role of the government leads us to the idea of the specificity of industrial experiences that should be acknowledged when studying various models of underdeveloped countries' industrialization experiences.

In this regard Raj said:

> Intersectoral linkages, as also the industrial structures that have developed in different countries, are likely to have been influenced to a considerable degree by institutional factors; that, if this is correct there is more scope for choice and flexibility than if one were to interpret them mechanistically in terms of some kind of a standard industrial structure or reference technology; and that, from the point of view of future policy, it is perhaps more important for the developing countries to be aware of the nature and implication of such choice than to proceed in terms of what are believed to be inescapable technological compulsions[261].

This invites a much deeper analytical understanding for various models, an analysis that should explain the unique conditions of the country in question. I tried to consider this point in my discussion on the different experiences of South Korea, Brazil and India.

e- ISI Policies and Industrialization

When Haggard wrote of the experience of Latin America (I have discussed Brazil as an example), he mentioned how these economies moved from trading and specializing in primary goods into adopting ISI policies. Primary goods together with foreign borrowing were still financing ISI policies that started with producing consumer goods. As compared to the case of

Korea, ISI persisted for a longer time as a result of the existence of large markets. These large markets also encouraged investing in intermediate and capital goods and, thus, permitted a movement to a more developed stage of ISI. Yet, exporting primary goods and foreign borrowing continued, while the ISI increased importing capital and intermediate goods (a point that was criticized by Structuralists as I pointed out before calling for an integrated industrial structure). Protectionism paved the way for intensifying FDI investment in the form of MNCs operating in Latin American countries so that they became a contributing factor for these countries' development. At a later stage ISI policies moved towards producing manufactured goods to compensate for the balance of payments losses that were the expected outcome of the previous stage of ISI policies (consumer goods sufficiency stage)[262].

I have went through this analysis in my previous discussions (e.g.: big markets and Heavy Industries, ISI policies…etc.). It suggests an industrialization strategy relying on MNCs and financed by income coming from exporting primary goods. Evans regarded this as "Dependent Development," while many Structuralists (e.g.: Sutcliffe) criticized reliance on MNCs as well as other ISI policies that were common in Latin America. They thought that these policies failed to produce many linkages within the economy, and that countries which applied ISI policies imported, in the first stages, much of their needed intermediate and capital goods. They suggest that ISI policies can only be useful if they target establishing an integrated economy. If a country can successfully manage to establish such a structure with a Heavy Industrial backbone, then its ISI is a great accomplishment. Nevertheless, ISI policies are an invalid option in our contemporary world where a great majority of world's nations have signed the GATT agreement and became members of the WTO. It is illogical to call for producing everything locally; it is beyond the capacities of a

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[261] Ghosh, 78.

developing country and is not possible in the age of Globalization and fierce competition. A call for an integrated economy or a Heavy Industrial backbone in the age of Globalization is rather a call for establishing those very important and strategic industries that can feed other competitive industries and promote their comparative advantage. Also, such a call is for the sake of developing technological capabilities of an underdeveloped country and equipping it with tools with which it can shift production and meet changing market conditions as well as helping in developing a technology that is relevant for resource endowments of this country.

2- Proposed Scenarios

a- Full Government Ownership

Given the size of the public sector and the institutional relations between society and the Egyptian government that was pointed out previously in this thesis, added to other factors as private sector's disinterest in Heavy Industry in the inception period, all of these invite a full government direction to any future Heavy Industrialization in Egypt. This suggests a full government ownership of Heavy Industries' establishments especially that most of the countries stated as models show similar trends of behavior. The radical proposition of a more direct control of the public sector over, not only Heavy Industry, but also on major industries (e.g.: textiles, sugar…etc.) should be discredited since the conditions are not at all favorable for this. All the discussion on the burden that was on the public sector since the 1960s provides a great disincentive for such an option. What is meant from this scenario is rather confining government ownership to Heavy Industrial establishments and leaving the private sector to operate in other sectors proposing some sort of assistance and guidance for the private sector in this regard.

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[262] Haggard, 24,26&27.

Among the various advantages of such an alternative, as stated by Bryce, are: the capability of governments to raise more capital as compared to other parties, and the credibility that they enjoy which invites foreign capital to invest in joint ventures with governments and assure foreign investors and bankers that their loans would be repaid. It should be noted that this was the case in the years of the Open Door Policy when the overwhelmingly dominant public sector invited foreign investment without giving much incentives for the indigenous private capital to share in big industrial establishments.

I have to note that governments can be bankrupt; however, the risk of that outcome is much less than in the case of a private firm. Moreover, the private sector is discouraged to invest in certain projects due to their high risks; the government is the only institution that can be willing to do this as the Structuralists points out[263]. It can be argued that foreign capital is more interested in collaborating with private capital as they both seem to understand the same language and logic, and both are guided by market laws and mechanisms. Yet, it should not be denied that collaborating with the public sector has the above-mentioned advantages for foreign capital.

Public firms can also enjoy many advantages once they are established. Governments can provide them with import licenses for needed inputs (not a valid advantage now in the age of free trade and Globalization), necessary infrastructure, free foreign technical assistance (that can only be channeled through the government), government purchases (expanding the market for public firms' goods) and finally governments provide loans or equity to these firms when need arises[264]. Using these advantages efficiently would improve the performance of public firms as compared to private enterprises, which do not have access to many of the above-mentioned facilities.

What argues more for a government monopoly over Heavy Industrial establishments is that:

[263] Hewitt, 149&150.

> The truth is that in the absence of monopoly situations and high tariff protection, profits in manufacturing are not likely to be that high, and can easily be non existent if high efficiency and effective cost controls are not established through good management[265].

Only the government can provide such a monopoly due to the substantial resources needed for realizing such a monopoly in Heavy Industry. Also, through government monopoly, prices can be set so as to target expanding the market for certain commodities even if this meant selling these products at their cost price or near it.

As for the Egyptian experience with Heavy Industry, Waterbury said that protection and oligopoly mingled with state intervention have benefited this industry leading to high rates of growth. Nevertheless, high protective costs, soft budget constraints and being in oligopoly or even monopoly have led to deteriorating performance for these industries[266]. This suggests that monopoly might be good for only the inception period after which the market mechanism and competition should replace it. It should be noted that many Heavy Industries must be oligopolized or monopolized due to the large size of firms and the extensive need for capital. What I am suggesting is the minimization of market imperfections (e.g.: Monopoly) in this regard as much as possible.

To improve the performance of government firms, Bryce suggested a number of measures, which I find very suggestive if we are to pursue a government monopoly on Heavy Industry. He suggests defining clearly the objectives of the project and how to measure its progress, using an incentive mechanism, and providing autonomy for the management away from political pressures that they normally encounter. The last point means that Public firms' management should not be compelled to employ more labor for social objectives or wait for decisions from the Ministry. It

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[264] Bryce, 45.
[265] Ibid., 47.

also means that they should be given freedom to set their budget and to sell their products commercially. The management itself should be effectively selected[267]. In this context it should be noted that the ideological orientation of the 1952 Revolution had possibly harmed the public sector by choosing mangers that agreed with the political affiliations of the government rather than basing their selection on their efficiency. It was common then that army officers with little administrative experience were selected for the finest positions in the bureaucracy and public firms only for the sake of their loyalty to the revolutionary regime. Now that conditions have changed and revolutionary sentiments have subsided, it should be expected that the selection of management for public firms would be based only on experience and efficiency.

Thus, arguing for government dominance and ownership for Heavy Industrial establishments is justifiable on the grounds that the market for Heavy Industries requires some form of monopoly for the sake of economy of scale. Due to the high costs and risk in the inception period, the government can be the only possible candidate to monopolize these industries. This assumption is also reinforced by the fact that the Egyptian public sector is still dominating industrial production and other utility services in the country. A government monopoly over Heavy Industry seems to be promising even for the inception period after which private capital can be involved. Yet, in a political economic climate that calls for economic liberalization and relying more on the private sector, state monopoly over Heavy Industry might not likely be considered as a best option. The high burden of costs and risk (originating from investing in Heavy Industry) represents a big burden over the government budget especially that the state has been trying since the early 1990s to reduce the budget deficit. This leads us to discussing the second scenario, which is a government / private sector partnership on Heavy Industry.

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[266] Waterbury, *Exposed to innumerable delusions*, 107.

b- Government / Private Partnership

The burden of managing the whole Heavy Industrialization plan as well as the realization, from my side, that many of the Heavy Industrial establishments should be entrusted to the private sector after the inception period and when prospects of profits are present, invite us to think of a joint governmental / private sector effort to carry on this plan. It is worth mentioning that this did happen in the 1950s when the Misr Bank group contributed in establishing the Iron and Steel Company in Egypt. Such a strategy would help in the maturity of the Egyptian entrepreneurial class and getting it involved in Heavy Industrialization from the beginning so that when conditions are ripe and the government withdraws its presence, this private sector would be able to carry on maintaining and expanding Heavy Industrial output effectively. Also, the profit seeking behavior of the private sector can limit, to a great extent, costs that could be encountered if the private sector is to be excluded from the Heavy Industrial sector. The incentive of having more profits can be anticipated as pushing forward the innovational skills of private management leading to more technological upgrading and realization of resource endowments in selecting the appropriate technology.

Yet, the mentioned profit should not be expected to be always a real one in the first stages. Rather, the government can assist the private sector by subsidizing inputs and liberalizing Heavy Industrial output so that a profit results, not in market terms, but a profit that will act as an incentive for further private investment in Heavy Industry. With the progress of time, gaining of experience and diminishing average fixed cost, the government can withdraw its assistance and things shall operate smoothly.

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[267] Bryce, 47,48,69&70.

Bryce again spoke about what government can do in this regard. For him the government can establish an agency specialized in conducting research on industrial development problems and provide policy guidance to direct investment in needed areas even if this meant providing this guidance to the private sector leaving it to operate freely. The government can also invest in social overhead capital and invest in human capital. He thinks that the government should create favorable conditions for creating a strong and capable private sector and also set favorable conditions for having foreign assistance (e.g.: hiring consultants, training…etc.) in order to accelerate industrial development[268]. What confirms this view is the experience of the two Asian miracles South Korea and Taiwan. In these countries the government trained their labor using scientific and technical education to promote their skills and feed various industries with these skilled labor contributing to the upgrading of these industries[269].

Speaking of the developmental state, Leftwich identified six components for these states which are: having an elite that is determined to develop its own country, the presence of a bureaucracy that is capable and powerful as well as insulated, the "effective management of non state economic interests" (as in the case of forming chaebols and managing the presence of MNCs in the way benefiting South Korea), the presence of relative autonomy (no class or interest groups control over the state), the existence of a "weak an subordinated civil society", and the use of repression while the regime is identified as legitimate thanks to its economic performance[270]. The last two points seem to be discouraging about the Developmental State. They were not pointed out in Evans' discussion, suggesting that they should not be taken as requirements for realizing this model of active fruitful state involvement.

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[268] Ibid., 63-67.
[269] Hewitt, 219.

Evans elaborated the concept of "Embedded Autonomy" that he identified as the major attribute of the Developmental State. It is Autonomous in the sense that it can formulate its goals independently from interest groups' pressures, while Embeddedness "implies a concrete set of connections that link the state intimately and aggressively to particular social groups with whom the state shares a joint project of transformation."[271] This is the role that the South Korean government played in the development of this country where decision making was independent from political pressures of interest groups, while the links that the government developed with private investment were able to guide government's policy to what benefits the Korean economy. Evans asserted that private individuals did not regard a powerful state as an enemy or deterring factor for their investment. At least such a state was protecting and promoting their interests (e.g.: against labor riots) for the sake of national welfare.

Rapley identified various characteristics of a Developmental State. Such a government should make development its first priority, commit itself to private property, give autonomy to a highly skilled bureaucracy, and invest heavily in human capital with a special focus on the technical and engineering corps. Also, this government should guide the market through various measures, among which are changing the incentive structure, playing with prices to benefit an emerging sector, protecting some selected infant industries, sponsoring technological change and opening the rest of the economy to foreign competition so that firms performing poorly would wither away[272]. This is very suggestive for a kind of government / private sector partnership and these are the possible means by which governments can intervene given that we are now entering the age of free trade where import restrictions and protectionism through tariffs are invalid. Protecting a certain

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[270] David Potter, David Goldblatt, Margaret Kiloh & Paul Lewis, *Democratization* (Polity Press& Open University, 1997), 225-226.

[271] Evans, *Embedded Autonomy*, 59.

industry can be realized now through subsidization and can also be realized through increasing government purchases of that industry's goods.

As for Intermediate States, which are also suggestive, the form of embeddedness and autonomy were rather mild. Different forms of autonomy and embeddedness are existing which "can play themselves out against disparate societal backgrounds."[273] Brazil was an example of such a regime where pressure groups were much stronger than in the case of Korea and, consequently, the government could not enjoy similar forms of autonomy like that entertained by South Korea. Still there is no conflict between the state and private sector; there is recognition that the state is much more farsighted than the private sector. Yet, the government should disengage from its involvement in the economy when conditions are ripe for the rise of an indigenous capital, which is also true for the case of South Korea[274]. I anticipate that the concerned government should have the willingness to do and the capability of planning such a transfer so that the process would take place safely and easily.

In a study conducted by Baer and Salehi on the ideas of Evans and taking Egypt as a case study, it was stated that the Egyptian bureaucracy needs the embeddedness that could make a considerable improvement in Egyptian industrial and economic policy given the relatively moderate administrative capabilities of the Egyptian bureaucracy. According to their analysis, the efficiency of government intervention depends on two things, which are administrative capability (meaning organizational capacity and expertise enabling the implementation of a certain job with low costs) and embeddedness. For the two writers, if administrative capability is very high, this will be sufficient to induce government intervention, and thus embeddedness in this case is irrelevant. If,

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[272] Rapley, 125.
[273] Evans, 72.
[274] Waterbury, *Exposed to innumerable delusions*, 11.

however, administrative capability is very low, then embeddedness would not help much either. It is at reasonable levels of administrative capability that embeddedness is crucial. Egypt is considered by them to have this reasonable administrative capability and, hence, they think that increasing embeddedness will much benefit Egypt. The extreme autonomy of the state was attributed to the background of the governing elite since the 1952 Revolution, as this military elite came from the Egyptian middle class without a political power base other than the army. The policies pursued, since the time of the revolutionary regime, made of the government and its establishments a form of political control and education rather than being involved with the public and communicating with them through effective participation. This form persisted in a way or another and the result was the lack of embeddedness that should be tackled for a much wiser industrial policy.

In this context, I should refer to what I have discussed before when I was talking about the change of the structure of the Egyptian bourgeoisie. It is true that during Nasser's era the state was patrimonial rather than embedded and that can be attributed to the class origins of the emerging bureaucratic elite, which came from the lower bourgeoisie (especially if we are referring to army officers and Nasser's associates) and thus was distinct from the pre-1952 capitalist class. What aggravated the situation between the bureaucratic elite and the indigenous capitalist class is the mutual mistrust that led first to the extermination of the land power base of the feudal-bourgeois class through various land reforms and then by the Nationalization decrees of 1961. Yet, as I have said before, the structure of today's bourgeoisie is much different and it incorporates people who were from the bureaucracy (e.g.: former army officers and higher officials) or involved in active relations with the bureaucracy (e.g.: businessmen involved in intermediating activities). This structure suggests a deeper possible relationship between the bureaucracy and the private sector and this relationship can be used effectively. Embeddedness in the South Korean fashion can result

if relevant policies can be identified and implemented. Yet, this should not be at the expense of the autonomy of the Egyptian bureaucracy, which is still high.

In fact, some indications of a growing embeddedness can be seen in Egypt, business associations that became very active since the 1980s being an example.

> They [business associations] are frequently consulted before the enactment of a new law or changing an existing one. Owing to the liberalizing tendencies of government economic policies, representatives of these associations and various business groups are often invited to voice their opinions or to be part of committees assigned to certain issues. Businessmen who choose this strategy are usually powerful and have contacts in high places[275].

Ayubi also refers to this trend in his discussion on the Association of Egyptian Entrepreneurs:

> New interest groups are emerging to represent and defend the evolving constellation of interests within the country. Particularly influential is the Association of Egyptian Entrepreneurs (Jam'iyyat rijal al-a'mal al-misriyyin), where the interests of segments of the state bourgeoisie, domestic investors, and international capital coincide. In addition to ex-ministers and officials, the Association includes a large number of members of the Boards of banks and public sector companies (in industry and trade), as well as private import-export "big shots" and commercial agents (28% of all members in 1984) and investors in the fields of foodstuffs, textiles, furniture and, of course, tourism, and consultancy. Foreign capital is represented through contributions from affiliate committees…. and from a number of international finance agencies[276].

Moreover, Samir Youssef points out that businessmen hire some former officials as consultants or in other high positions so as to facilitate communication with the bureaucracy and help in acquiring various needed approvals or resources[277].

Thus, business associations should receive more attention and on the long run they can act as a mean of increasing the embeddedness of the Egyptian government. They can also lead to the intensification of relations between the government and the private sector. This will help in guiding

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[275] Samir M. Youssef, "The Egyptian private sector and the bureaucracy," *Middle Eastern Studies* 30, no. 2, (April 1994): 372.

[276] Nazih N. Ayubi, "Bureaucracy and development in Egypt today," *Journal of Asian and African Studies* 24, no. 1-2, (January/April 1989): 71-72.

[277] Youssef, 372.

the policies of the government and assist it in formulating plans that are more feasible and that will mutually benefit both parties (the government and the private sector). Through these associations the government would have a better understanding for what fields the private sector is interested in investing in and what kind of assistance the private sector needs. On the other hand, the private sector will more clearly understand the objectives of government policies and will act more as a partner in implementing and formulating plans.

Also, hiring ex-bureaucrats in higher positions in private firms helps in increasing the embeddedness of the government and in developing stronger relations between the bureaucracy and the private sector. Ex-bureaucrats can be expected to still have connections with officials and bureaucrats that are still at office. This will help in the intensification of relations between private firms and the bureaucracy and will help in increasing communication and mutual understanding between both parties. The ex-bureaucrat or ex-official, now serving in a private firm, will help in better communicating the interests and needs of private capital (e.g.: infrastructure and other utilities) thanks to his ties with the bureaucracy and his knowledge of how things operate within the bureaucracy. He will also be more helpful and capable of coordinating a joint activity or a partnership as well as building mutual trust between the government and a private firm. What should be avoided, however, is that stronger relations might lead to more corruption rather than embeddedness. Business associations seem to be more favorable in this regard as they are more reflective for the collective interest of private firms and the government, while employing ex-officials can involve an element of corruption for favoring the individual interest of a certain firm or a big industrial group rather than the collective interest of private capital.

Another possible model for a suggestive state-private sector interaction is what was referred to by Waterbury as Property Regimes. These regimes allow economic actors to develop

interdependencies while these regimes (governments) would ensure that rules for this interaction are observed. Thus, their role is one of monitoring and enforcing these laws, but if the costs of this process are prohibitive then governments should develop a self-enforcement mechanism[278]. As I anticipate it, such a regime can be appropriate once the government pulls back from its involvement in the Heavy Industrial sector (when this sector starts to yield profits) and when the government decides to entrust the private sector with further expansions in this sector. Yet, I do not think that such a regime will be effective for the inception period meant for establishing a Heavy Industrial backbone. In the inception period I anticipate a more direct involvement of the state which will be needed to face the high risks and costs encountered in this stage. These risks and costs might deter private investment in Heavy Industry. This anticipated involvement should include a form of government ownership (this can be a partnership with private capital) for Heavy Industrial establishments.

Speaking again about the Post-Fordist debate, there are writers who spoke about Neo-Statism in this Post-Fordist era. What they meant by this is that Post-Fordism is "promoting a state guided approach to economic reorganization through intervention from outside and above the market mechanism."[279] The government is one among various economic actors, but one that has an important coordination role in a Post-Fordist era. This is added to: "structural policy in which the state sets strategic targets for flexible accumulation, continuous innovation and promotion of overall structural competitiveness of the national economy."[280] States can help in training their labor force so as to foster flexibility of labor's skills. They can also assist in restructuring poor performing industries and promote well functioning ones. This is how the government can promote

[278] Waterbury, *Exposed to innumerable delusions*, 13.
[279] Ash Amin, 268.
[280] Ibid., 268.

a flexible specialization strategy targeting specific high technological sectors[281]. Again I would like to point out that in addition to this the role of the state should go beyond this dimension. The above-mentioned strategy should be adopted towards industry in general while pursuing a much more active governmental role in Heavy Industry in the inception period.

The UNDP Human Development Report of 2000/2001 agrees with this analysis. The report affirms that developing industrial capabilities needs time and in order to speed things up there is a need for government intervention even in the age of Globalization.

> Government actions are indispensable to implementing a national innovation system, to guide firms in how to acquire technology, and to support scientific bodies and educational organizations to provide firms with a continuous stream of technology, information, and knowledge[282].

What supports this view is modern Structuralists' belief in an active role for government in protecting certain industries for certain period of time that might stretch to a decade to help in learning and acquiring technological capability. They believe that only governments are able to establish certain industries due to their high risk and their need for huge capital investment that refrain local and foreign capitalists from investing in them.

Another perspective is implied from Chakravarty who, speaking of technological adaptability, said that: "While technological primitivism cannot constitute an answer for developing countries, the problems of adaptation of technology in directions more appropriate to the factor endowments of developing countries deserve very close consideration. It would be most inappropriate to leave questions of adaptation to technologists alone. In many cases, the overall macro-economic framework must also be made conducive to the process of adaptation."[283] Speaking of making the overall macro-economic framework more conducive for technological adaptation invites the

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[281] Ibid., 268.
[282] UNDP, *Egypt Human Development Report 2000/2001*, 57.

government to play this role. If governments can guarantee that such a framework exists while leaving the private sector to achieve such adaptation, a new form of government/ private collaboration can exist. The Japanese experience provides an insight for how this could be done; the government encouraged technological innovation through providing guidelines and also by protectionism, while substantial investments were directed to Research and Development and companies sponsored scientific education[284].

Hence, involving the private sector in Heavy Industrial projects will prove to be valuable thanks to its profit seeking behavior which will help in reducing costs, developing innovational skills and using the most efficient available technology. This involvement will also help in the maturity of the Egyptian private sector so that after the inception period it can be relied on to operate Heavy Industrial establishments. Partnership between the state and private sector in Heavy Industry and adjusting the role of the government to a developmental one can be expected to yield a better outcome than a government monopoly even if this monopoly is limited to the inception period. I have shown that the embeddedness of the Egyptian economy has in fact been enhanced and that it might improve more in the future. This makes a partnership between the private sector and the state in Heavy Industry more possible. Nevertheless, the need for using an advanced technology that is essential for the competitiveness of Heavy Industrial products calls for involving another party, which is MNCs. As evident from the experience of India, MNCs should be incorporated to the formula besides the government and the indigenous private sector. This is what I will try to investigate in the following subsection.

c- Government / Private / MNCs Coordination

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[283] Martin, 106.

The last scenario is one in which a possible interaction in the efforts of the government, public sector and MNCs would achieve Heavy Industrialization. The petrochemical industry in Egypt is showing some signs of such a collaboration.

Auty points to the vitality of the role of MNCs in developing Heavy Industries in a developing country. He considers the technology and capital needed for Heavy Industries as an entry barrier that can deter local private investment and rather invites Foreign Direct Investment in the form of MNCs. He points to a strategy in which states encourage the establishment of joint ventures between local capital and MNCs so that entry risk can be reduced. The state can induce such an action by playing an active role so that it "collates information, synchronizes complementary investments via sectoral plans, negotiates technology transfers and provides a time-constraint package of incentives."[285] Sabin and Kato assert that these arrangements can provide tremendous economic net benefits, regardless to the financial return of the project concerned.

Yet, the Structuralist view in this regard is worth discussing. The Structuralists and the Dependentistas criticized industrialization through reliance on foreign capital. They believed that free flow of capital will lead to the direction of most of this capital to the developed world as they have the needed infrastructure, extensive markets and political stability which ensure profitability for foreign firms. Even when foreign firms are interested in investing in underdeveloped countries, the result was that these Multi National Corporations (MNCs) dominated most of the dynamic sectors of these countries' economies. This led to the dominance of international capital and its agenda, rather than creating a national bourgeoisie that has an interest in promoting its future country's development. Added to this is the resulting profit outflow. MNCs are entitled to much of the profits that they gain in their operation, and this leads to draining Third World countries from

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[284] Ibid., 106& 107.

possibilities of growth. The more foreign capital is being invested, the more the resulting outflow[286].

The Dependentistas assert the irrelevance of the techniques used by MNCs, which are mostly capital-intensive creating less jobs and trying to exploit the existence of cheap labor in underdeveloped countries. MNCs do not create a research or a development capacity, and rather they use second-generation technology, as the Dependentists accuse them of doing. What supports this claim is a report on MNCs prepared by the US. Tariff Commission in 1966. It stated that only 6% of R&D expenditure of American MNCs is done outside the US. In fact affiliates contribute more than benefit from R&D, since they pay fees and royalties[287]. Thus, MNCs use techniques that are more relevant to their home countries.

Furthermore, these firms, being owned by foreigners, rely on imported inputs. Consequently, it is not expected that they would care for national well being and establishing linkages. By relying on imports, MNCs worsen the balance of trade, and, thus, compel underdeveloped countries to export more primary goods to offset this outcome. This will lead on the long run to a further specialization in primary goods[288]. Thus, rather than industrialization, an underdeveloped country will find itself moving in the opposite direction and specializing in primary and agricultural goods.

No wonder that Sutcliffe calls for economic independence by which he meant directing production primarily to the underdeveloped countries' domestic market and raising investment

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[285] Auty, 38&39.
[286] Hewitt, 133&140.
[287] Evans, *Dependent Development*, 177.
[288] Rapley, 19&20.

funds locally or under local control. This independence shall also include establishing an independent technology and a diversified economy that is less dependent on foreign imports[289].

Yet, this pessimism towards achieving an industrialization strategy through MNCs can be minimized by thinking about alternatives to limit the power of MNCs and direct them to what achieves our objectives. The Structuralists call for government control over the activities of these multinationals; governments, for instance, can provide protection to local private firms in their bargaining with MNCs for the transfer of technology. They believed also that governments can do unpacking of technology, which is a process meant to importing only those needed parts that are not produced locally. By this governments can help in developing a local technology that is relevant to the conditions of their countries[290]. This provides us with the possible role that the Egyptian government can play to launch a Heavy Industrialization plan.

Another interesting option is what is referred to as "Turnkey Agreements." According to the terms of these agreements a complete factory is being constructed and operated by foreign capital. However, after some time, the factory together with its expertise of building and operating it is being handed to either the government or the indigenous private sector. By this way a transfer of technology can be realized[291]. Certainly, the Structuralists would criticize this as not leading to building indigenous technological capabilities. Yet, I argue that this can be a possible mean of implementing an effective Heavy Industrialization plan if it was accompanied by a learning process. This will help in building technological capabilities with time and minimize the need for foreign technology on the long run. Till then, however, MNCs can provide such a technology through the above-mentioned Turnkey Agreements. MNCs will be encouraged to do this since they can benefit

[289] Anthony Brewer, *Marxist Theories of Imperialism: A Critical Survey*, 2nd ed. (London- NY: Routledge, 1990), 274&275.

[290] Hewitt, 150.

for some time from the establishment that they created before handing it over to the private or the public sector. I believe that the government would prove to be very helpful in conducting negotiations with MNCs for reaching these agreements with favorable terms for the public or the indigenous private sector .

It should be noted that the Egyptian government has been eager to attract foreign investment since the days of the Open Door Policy. This was happening at a time that the private sector was not given its due attention. The government was trying then to make partnerships between public firms and foreign capital so as to upgrade these firms[292]. Yet, the government should do a lot to stimulate Foreign Direct Investment to Egypt in Heavy Industry and to the industrial sector generally.

> The World Bank reached some conclusions from a survey they made of Egyptian businesspersons about why FDI might be slow in moving into Egypt. The reasons include the following: unclear information about liberalization causing uncertainty among investors; complex and restrictive labor laws, weak protection of intellectual property rights, consumer rights (or rights in general one might add to the list); inadequate antitrust and trade legislation; complex and prohibitive regulations on corporate approval and licensing, both at the national and local levels; inefficient and inadequate public institutions responsible for policy administration and enforcement; time consuming and expensive litigation procedures that harkens back to the days of a socialist planned economy. Add to this a weak legal system that is manipulated, if not controlled, by the powerful and corrupt; inadequate credit mechanisms for small and medium sized businesses, a limited securities market and virtually non-existent derivatives market; a lack of adequately educated workers and managers; and cumbersome and time consuming tax administration procedures[293].

Again as was indicated in the Machinery industry sector, Egypt is in great need of institutional changes for inducing more FDI and for encouraging private investment generally and this shall reflect positively on Heavy Industry in Egypt.

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[291] Ibid., 214.

[292] Ayubi, 67.

[293] Paul Sullivan, "Globalization: Trade and investment in Egypt, Jordan and Syria since 1980," *Arab Studies Quarterly* 21, Issue 3 (Summer 99): 33- 35.

Finally, What Waterbury has pointed to should be considered also in my analysis. He asserts that Egypt's freedom of action is limited by its socioeconomic makeup and dependency on external sources of finance capital, technology, markets and arms. For Waterbury this meant that Egypt was always in need for a patronage to proceed in its development projects, but it also meant that the government is obliged every now and then to meet short term obligations by policies that may limit future options and place the country always in a transition phase[294].

These two points (needing patronage- meeting short term obligations) should be considered as parameters both for the industrialization of the 1960s and for any future industrialization plan especially if it is a Heavy Industrialization plan, which needs large investment, expertise, and technology. The government can secure a more stable environment for the plan by trying not to be distracted by other short-term obligations as much as it can. On the other hand, in an age where international non-state actors are becoming more active, MNCs can replace the role of the traditional form of patronage (as the role of the Soviet Union in the 1960s and that of the USA afterwards). MNCs can act as transferors of technology, as providers of technical expertise (if they are employing Egyptian technocrats in their firms) and can generally help in Egypt's industrialization through investment. Their activities however should not go unchecked; and the government again should ensure this and help domestic private sector to learn from and work and compete with MNCs.

To conclude, it seems that the best formula is one that involves the three parts: the government, the indigenous private sector and MNCs. I have pointed before in the previous subsection to the advantages of a collaboration between the government and the indigenous private sector. In this subsection I have also shown how it is important to involve MNCs but without

[294] Waterbury, *The Egypt of Nasser and Sadat*, 4& 5.

letting their power go unchecked. The government plays a central role in this, both in attracting MNCs through institutional changes, and in checking their power through various means. The presence of an active role for the state will give a strong support for the indigenous private sector when negotiating partnerships with MNCs. So even when the state pulls back from directly operating Heavy Industrial establishments after the inception period, the government can still help private capital to reach better terms from collaborating with MNCs. This is added to other roles that a developmental state plays and that were stated in the previous subsection. With the collaboration of the three parties (the government, the private sector, and MNCs) a Heavy Industrialization drive can be a success and can help Egypt in its industrial development which will reflect on every aspect in the Egyptian economy. Yet, a wise industrial policy is also needed so as to make the collaboration of the three parties one that promotes industry and avoid a rent seeking behavior.

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