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Productivity performance in developing countries

Country case studies

Egypt

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Executive summary

Egypt's productivity performance has been uneven. The focus of this study is the period 1962-2000. This period exhibited frequent fluctuations in the annual growth rate of total factor productivity (TFP) and of real gross domestic product (GDP). The mean rate of TFP growth was modest, averaging 0.93 percent per annum, with a moderately high mean rate of GDP growth exceeding 5 percent annually.

In this paper, the traditional TFP methodology is used to analyze sources of economic growth. In Section 1, two sources of growth in GDP are identified: changes in physical inputs and disembodied technology innovations measured by growth in TFP. The analysis focuses on growth at the aggregate level, with occasional reference to manufacturing. In Section 2, the major determinants of Egypt's productivity developments are identified with reference to five broad groups: creation, transmission and absorption of knowledge; factor supply and allocation; institutions, integration and invariants; competition, social dimension and environment; and country specific issues. Section 3 discusses and analyzes policies that have an explicit or implicit impact on productivity developments.

Section 1: The Role of Physical Inputs and Productivity in Output Growth: Stylized Facts

Two sources for growth in output are considered: growth of physical inputs (capital and labor) and growth of total factor productivity (TFP). The dataset used comes from the Penn World Tables (6.1) provided by UNIDO.

Changes in total factor productivity are decomposed into two components: the change in technical efficiency, and technical change. The sum of the two components must add up to the overall productivity growth. However, discrepancies in 1971, 1974, 1976, and 1998 are considerable, which makes the reliability of the data employed questionable.

1.1 Characterization of Output Growth

The mean rate of growth was consistently high with an average of about 5 percent per annum. However, the annual growth rate of real output exhibited recurrent fluctuations with values ranging between a minimum of -9.02 percent (1974) and a maximum of 18.57 percent (1964), with a standard deviation of 4.54 percent.

Cautious periodization that permits identification of broadly homogeneous sub-periods during which the main drivers of growth are rather stable is necessary. Three main sub-periods: 1962-76, 1977-89 and 1990-2000 are distinguished.

A big nationalization wave, in the early 1960s, brought the public sector into control of around 90 percent of total investment. Significant expansion was observed in the provision of free education and health services and in securing guaranteed jobs for all secondary technical schools and university graduates. The main lines of the socialist

economic policy orientation persisted, even after the next major political turning point with the *Infitah* (or 'opening up) in 1974. The rate of economic growth during the first sub-period 1962-76 is relatively low, averaging only 3.81 percent. Radical political changes resulted in sharp and rapid fluctuations in output growth, which, exhibited the highest and lowest growth rates of output relative to the entire period in 1964 and 1974 respectively.

Under *Infitah*, new policies to encourage private sector initiatives, to develop and upgrade the infrastructure, to expand new urban and industrial clusters in the desert, and to control population expansion were applied. These measures, coupled with foreign resources inflows, raised the average growth rate, which increased to about 6.69 percent over the period 1977-89. Despite these reform policies, Egypt's institutional and management set-up remained unchanged. A number of these policies proved to be too costly and required revision. The resulting macroeconomic imbalances threatened the stability of the economy.

The year 1991 witnessed a key turning point with the initiation of an economic reform and structural adjustment program (ERSAP) aimed at removing macroeconomic imbalances, promoting economic efficiency, and improving Egypt's potential for foreign trade. While the program was successful in reducing internal and external imbalances, its impact on economic growth during 1991-2000 was disappointing. The average growth rate remained below the pre-1991 levels. The pivotal factor in this recovery was the increase in the domestic supply of scarce foreign currency, due to external debt forgiveness. Average output growth barely exceeded 4.80 percent during the third sub-period, falling from 6.61 percent in 1997.This decline was attributed to exogenous factors: the terrorist attack on tourists in Luxor, the East Asian crisis, and the decline in oil prices. Shorter sub-periods have also been selected to highlight growth patterns driven by specific transient policy changes.

1.2 The Role of Physical Inputs

There was an almost one-to-one correspondence between the behavior of the *output growth and labor growth* series (with a correlation coefficient of 99.69 percent).

The capital per worker series shows, during the first sub-period, a marked change in capital deepening, with a high average capital growth per worker of about 5.33 percent. Growth of capital deepening accelerated from 1962 to 1965, reflecting the rise in investment during the First Five-Year Plan. This trend was quickly reversed from the mid-1960s until 1973, due to the foreign exchange drain that accompanied the Yemen war, the withdrawal of US foreign aid, and the looming 1967 war with Israel.

In the last few years of the first sub-period, the level of investment started to rise, and this continued until the mid-1980s. Investment growth stimulated new production opportunities, reflecting the implementation of a number of pro-investment laws as well as an increase in the country's hard currency resources. Capital per worker grew between 1974 and 1985. Towards the end of the second sub-period (mid-1980s to 1990), investment started to fall sharply because of domestic market distortions that overburdened the government budget and discouraged the efficient allocation of

investment, and because of the collapse of international petroleum prices. The growth rate of capital deepening, on average, fell considerably.

Despite this sharp dip, capital deepening growth averages in the first two sub-periods were nearly equal. Although capital deepening increased from 1994 to 1999, its average decreased significantly in the third sub-period, reflecting a lingering effect of the decrease in investment in the second sub-period.

1.3 The Role of Technical Progress

During the first and second sub-periods, productivity growth was exceptionally low with averages of -0.75 percent and 0.75 percent respectively. The implementation of ERSAP in 1991 stimulated a rise of technical productivity growth, which reached an average of 3.42 percent during the third sub-period. There was a relatively strong correlation between the pattern of output growth and changes in TFP, especially in the first two sub-periods.

During the entire period under investigation, changes in TFP were sensitive not only to variation in the level of output growth but also to changes in the economic and political environment. Some dips in TFP coincided with political disturbances.
Moreover, the general decline in technical productivity growth during 1977-89 was amplified by the slowdown of the 1980s, which was instigated by the decline in petroleum and tourism revenues and Arab aid, and by the resulting investment cuts. Recovery with *Infitah* and then the ERSAP, accompanied by an increase in foreign currency availability because of debt forgiveness, caused TFP growth to rise significantly in the third sub-period.

There is a significant negative correlation between TFP growth and the growth of capital deepening, particularly starting in 1967. The increase in capital growth per worker is not conducive to technical progress. In contrast, TFP change is correlated with growth of labor productivity. This result emphasizes the key role of education and human capital development.

Decomposing change in TFP into two components, change in technical efficiency and technical change, shows that changes in total factor productivity have been differently influenced by technical change and by the growth of technical efficiency over the sub-periods considered. The results suggest the importance of encouraging both technical change and growth in technical efficiency in order to raise TFP.

Section 2: Assessment of Major Determinants of Productivity

Determinants of productivity growth, categorized in five main groups, are examined. Some of the determinants might be more effective during certain sub-periods, while insignificant during others.

2.1 Creation, Transmission and Absorption of Knowledge

During the 1960s the government adopted an import substitution state-led growth strategy. It engaged in an ambitious industrialization program undertaken by the public sector. One million jobs were created and manufacturing output increased by 10 percent annually during the period 1960–1965. Imports were restricted and domestic production highly sheltered. This led to an incentive system biased against the production of tradable goods. The public sector grew to dominate all industries, while the private sector was concentrated in minor industries with export potential.

Public sector firms introduced simple technological techniques. The share of heavy industry in manufacturing value-added was relatively low. R&D activities were undertaken in national research centers and in centers related to military industries in an effort to develop Egypt's own technological capacities. Their focus was on developing new technologies for defense purposes. These activities received a severe blow after the 1967 war.

In 1974, Egypt adopted an open door policy in an attempt to attract western technology and to promote economic growth. The government was replaced in the leading role by the private sector. During this period, FDI was concentrated mainly in banking and tourism and, to a much lesser extent, in manufacturing.

Large private sector firms enjoyed fairly free access to modern equipment and know-how from developed countries. In collaboration with foreign firms, they were able to master simple technologies, but were not capable of developing their own advanced technology. Egyptian manufacturing remained dominated by small and medium enterprises which used low levels of technologies. They produced mainly low quality products for the local market.

Most R&D activities were (and continue to be) undertaken by government research centers or in research centers affiliated with public universities. R&D activities conducted by these institutes had little market relevance.

By the mid-1970s, Egypt was experiencing large-scale temporary labor migration**,** which increased the brain drain and had negative repercussions on productivity and growth.

By the mid-1990s, Egypt succeeded in attracting FDI inflows as a result of the reform effort exerted. The average annual FDI inflows reached US$1 billion, peaking in 1999/2000, yet they did not exceed 1 percent of GDP. As well as the moderate levels of FDI inflows, industrial technology transfer was very modest. In general, Egypt lacked competitiveness in high value-added, high-skill products, indicating technological weakness.

During the period 1980-2000, Egypt was doing well relative to other Arab countries in terms of the number of specialized research centers and the number of workers engaging in R&D activities. However, by international standards, it lagged behind in terms of number of patents registered in the U.S. The government budget allocated to R&D activities increased, but did not exceed 1 percent of GDP in the 2000s. The private sector

did not show much interest in these activities. Egypt achieved distinct progress in the competitiveness index in 1998, reaching the rank of 57; it is the only Arab country to achieve this ranking.

In general, more efforts are required to develop and use new technology among the different stakeholders: individuals, business and government.

2.2 Factor Supply and Allocation

Physical Capital.
During the early 1960s, there was an ideological shift in economic policy. Nationalization eroded most of the national private sector. Trade was diverted towards the Eastern bloc and there was no potential for any private investment. Important industries, such as iron and steel, fertilizers and pharmaceuticals, were established.

The period was characterized by persistent capital deepening. The private sector was concentrated in minor light industries.
Industrial public sector firms were complying with planned output, profits and productivity objectives, while at the same time employment and price control policies negatively affected efficiency and productivity. From the mid-1960s to the early 1970s, agriculture, transportation, communications and infrastructure were neglected, and suffered from lack of investments. The relatively high rates of growth of industrial output in the early 1960s (33 percent in 1960/1961) were not sustained and gradually decreased to 5 percent, before turning negative after 1967.

After the 1967 war, the industrial sector suffered from a lack of adequate financing and a shortage of foreign exchange. However, public sector firms continued to supply the domestic economy with its basic needs. Small and medium private sector firms were encouraged to create linkages with large public sector enterprises. They absorbed 50 percent of the industrial labor force in the early 1970s; yet their share in value added and output remained very modest. After the 1973 war, the government declared its commitment to liberalizing the economy and supporting the private sector. Private sector firms were encouraged to engage in all import activities. FDI inflows increased and were mainly concentrated in the banking and tourism sectors. Capital deepening accelerated, encouraged by a cheap-credit monetary policy.

Investments in the public sector concentrated on replacement and renewal operations. The industrial public sector continued to suffer from drawbacks and weaknesses, and was unable to compete with the more advanced technology adopted by private sector industries. It suffered mainly from price distortions, overstaffing, lack of autonomy, and competition from private sector firms.

During the period 1981-1990, investment declined, mainly because of the overburdened government budget. However, this period continued to witness remarkable improvements in infrastructure.

In 1991/92, the adjustment program to correct macroeconomic imbalances was a major step towards a market-oriented economy. The elimination of price distortions and the

reduction in consumption subsidies increased economic efficiency. By the mid-1990s, private investment started to pick up. The second half of the 1990s witnessed a decline in external resources, unemployment rates remained high, and vulnerability to external shocks increased.

Physical capital accumulation explained about two thirds of economic growth, while human capital-adjusted labor explained one third. The contribution of TFP was insignificant, while capital deepening tended to be the main contributing factor to growth. In general, extensive growth, triggered by an accumulation of physical capital, was observed rather than intensive growth, which evolves from technological developments or TFP growth.

Human Capital.
During the 1950s and 1960s, the government made an extensive effort to expand access to education, focusing mainly on increasing secondary and tertiary education instead of basic education. The education and public employment policies negatively affected human capital and contributed little to raising productivity. Even after the guaranteed employment policies were abandoned in the 1990s, the same education policies were adopted, and labor productivity continued to be low.

The principal role of the Egyptian government as the main employer of university and secondary schools graduates negatively affected the structure and functioning of the labor market from the 1960s onwards. The market for skilled labor suffered from a serious shortage of workers, especially in the construction and manufacturing sectors. There was an increasing scarcity of agricultural workers as a result of pull factors from migration, government-guaranteed employment schemes and military conscription.

As to the wage structure, during the second half of the 1960s and early1970s, agricultural and government wages were static, and declining in real terms. Wages in construction were much higher due to the scarcity of labor. In general, employment and wage policies during this period did not reflect the contribution of labor to GDP growth and negatively affected the growth of TFP.

During the inter-war period (1966–1973), the government did not change its employment policies, continuing to absorb the new entrants to the labor market in public administration and public sector firms.
Under the open door policy, while public sector firms suffered from over-staffing, private sector firms attracted skilled and qualified technical labor, leaving behind the unskilled workers and new entrants into the job market to take up employment in the public sector. With the beginning of the oil boom in the mid-1970s, there was an increasing wave of temporary labor migrations. The educational attainment of labor migrants was about one year higher than non-migrants in the mid-1980s, resulting in a reduction in human capital stock due to the brain drain.

The enrollment rates achieved at various levels of schooling and higher education reveals that Egypt is well endowed with human capital. It ranks higher than other newly industrialized countries (NICs) at the secondary level and is ahead at the tertiary level. However, it falls behind in terms of enrollment in technical fields. The content and quality of technical education are not consistent with modern industrial needs.

Vocational training lags far behind. Private sector firms do not invest much in long-term training programs to raise workers skills. The government does not provide an alternative and was never involved in training programs tailored to the direct needs of industry.

Despite low labor cost, Egypt suffers from an uncompetitive position in manufacturing in terms of value added per worker.

2.3 Institutions, Integration and Invariants

For decades, Egypt adopted inward-looking strategies and did not take significant comprehensive measures to liberalize its trade regime until the beginning of the 1990s. It established several free trade agreements with its major trading partners. However, there is still room for improvement in terms of openness. Egypt's exports are concentrated in a limited number of products: petroleum and petroleum related products, food and agricultural products, industrial supply and raw materials.

Other factors that negatively affect productivity include customs procedures, administrative controls, and quality controls. These regulations reduce market contestability and add to the barriers faced by domestic and foreign investors more than they protect consumers.

2.4 Competition, Social Dimension and Environment

Several measures were taken to achieve the objective of social justice, including the implementation of the Agricultural Reform Law and providing free schooling at all levels of education. By the end of the 1960s, Egypt was committed to a welfare state and was responsible for providing a minimum standard of living for its citizens. The government introduced severe price controls in order to ensure a more equitable income distribution and efficient resource mobilization. However, price controls and subsidies created market distortions and negatively affected allocative efficiency.

The stabilization program, starting in 1991/92, concentrated mainly on the fiscal deficit, the exchange rate, and the interest rate. During the period 1990/91–1997/98, the budget deficit was reduced, revenues increased and government expenses declined. These contractionary measures resulted in short term adverse effects. To reduce these effects, Egypt established the Social Fund for Development (SFD) in 1991 with the objective of protecting and improving the status of vulnerable groups. The government remained committed throughout the 1990s to a generous social expenditure program, despite strict fiscal austerity. However, there was room to increase the efficiency of social sector spending, especially on education and health, by improving the distribution of these expenditures through better targeting.

Another aspect is domestic market contestability. Domestic firms do not have sufficient incentives to integrate in the world market and still lack fair competition from imports in their domestic markets. Although improved, the business environment is still restrictive and the cost and time needed to establish and run a business in Egypt are discouraging.

Income inequality, as measured by the Gini coefficient, declined in rural areas but increased in urban regions. However, poverty in Egypt is shallow, as reflected by the low poverty gap. Marginal changes in income would have great effects on poverty. The poor in Egypt are characterized by being less educated, with higher illiteracy rates, have very few assets and need to work hard just to survive.

2.5 Issues Specific to Egypt

The issues specific to Egypt relate mainly to the effects of the 1967 and the 1973 wars, and the Gulf wars, the impact of foreign aid, and the lack of entrepreneurship of its educated class.

The Egyptian economy faced many difficult challenges after the 1967 war. It suffered the cost of the defeat and the military expenses needed to prepare for the next war to recuperate the occupied territories. Growth rates declined tremendously. However, a large expansion of manufacturing output compared to agriculture and mining was observed. The economy recovered during the last few years of the 1960s and the early 1970s, supported by the increase in foreign aid, particularly from Gulf countries.

During the inter-war period, public sector firms were able to survive and to secure Egypt's basic needs with very little support from the government. The public sector was considered an indispensable backbone of the Egyptian economy. However, by the late 1960s, the government began to question its efficiency and its ability to promote economic development, and in May 1971 new policies were adopted to attract foreign capital to invest in Egypt and to ensure the free movement of domestic capital.

Connections with the private sector were established through subcontracts in order to benefit from the efficiency gains of small-scale factories. Small and medium enterprises (SMEs) were encouraged to establish linkages with the public sector.

The victory in the 1973 war was a turning point. After a long period of war culture dominance, it was time to concentrate on promoting economic growth. Oil prices rose, the remittances of Egyptians working abroad increased, as did foreign aid flows, and Suez Canal earnings and tourism revenues boomed (these were known as ‘the big four’). FDI inflows received since the mid-1970s exceeded expectations, due to the large market size and to benefits from the relatively friendly business environment.

The period 1980–1990, however, witnessed heavy macroeconomic imbalances, due to the decline in foreign resource inflows along with the government’s continued generous infrastructural, social and subsidization spending.

Despite extensive efforts by the government to encourage the private sector, the government share in investment is still almost 60 percent. This could be explained by the lack of entrepreneurial spirit.

In sum, the inward looking strategy, price controls, limited and irregular inflows of foreign direct investment, and the education and public employment systems hindered the creation, transmission and absorption of knowledge, and were the main reasons for the decline in TFP growth. FDI did not create the expected spillover effects of technological

development. Despite ongoing efforts to liberalize trade and to integrate the Egyptian economy into the world economy, more reform measures are needed to promote exports. More attention should be given to training and to demand-driven education policies that take market needs into consideration.

Section 3: Policies Affecting Productivity

Easy access to skilled labor, appropriate technology, finance, quality telecommunications and transport services at world prices, reliable infrastructure, and a transparent and supportive institutional framework are all required to achieve productivity growth and sustainable development.

Although it has been persistently repeated, since the adoption of the open door policy in 1973, that Egypt's economic policy is focused on promoting exports and attracting foreign direct investment (FDI), none of these objectives has been achieved to any significant degree. The main factor behind this lagging performance is the absence of a coherent industrial policy. The main elements of industrial policy would include increasing local technological efforts, skills development, SME support, and institutional reform, all aimed at enhancing productivity.

3.1 Raising Local Technological Effort

The main problems in scientific research and technological development are reported to be the absence of a clearly announced statement of national policy on scientific and technological research; the lack of coordination between research centers and institutes and production sectors; complex organizational structures and bureaucratic procedures; managing research institutes and centers as academic units which set their research agenda without consultation with prospective users of their output; lack of incentives to researchers; and a modest domestic private sector contribution to funding research, product development and brand name creation .

Acquiring, controlling, adapting and generating knowledge through national capacities is becoming the key to scientific and technological sustainable development. The implementation of such development requires the mobilization, organization and utilization of all available scientific research and innovative capabilities. A plan of action would include the following pillars.

- **Planning for technological policy,** carefully linked to industrial policy and other developmental objectives.
- **Restructuring and modernizing the current research and technological infrastructure.**
- **Financing scientific research and technological development.** The government should provide the majority of the funds. International institutions could help in this endeavour. A national fund should be created to diversify the sources of finance for scientific and technological development.
- **Supporting reverse engineering within the TRIPs requirements.**
- Focusing on the **level of technological capabilities within firms,** rather than just R&D, by using benchmarking tools.

3.2 Education and Skills Development

Important strides have been made in providing access to formal education. Enrollment has risen significantly. The strength of the government's commitment is further reflected in the proportion of its budget allocated to education. The share of public spending on education in GDP rose from 2.9 percent to 4.2 percent in 1999. Although this share is still lower than the 5.1 percent of GDP spent on education by lower middle-income countries, it represents a substantial effort by the government during a period of general fiscal austerity.

There is, however, a considerable skills gap in new entrants to the labor force. The quality and relevance to industry of the education system has to be addressed. This would mainly require:

- **Changing the orientation and structure of the university and higher education system** from one based on liberal arts and social sciences to a technically oriented one.
- **Development of a strong industrial training system.**
- **Reforming secondary and higher technical schools** and upgrading their facilities.
- **Imposing a training levy on large and medium firms:** this may be considered to supplement available public funds.

3.3 SME Support and Development

Over 98.1 percent of private establishments engaged in industry employed less than 10 workers, 1.1 percent employed between 10 and less than 50, 0.7 percent were of a medium size employing between 50 and less than 500 employees, and 0.1 percent had five hundred employees or over. An integrated plan to promote SMEs in manufacturing activity is thus required. Priority areas of action include:

Developing human resources in SMEs.

Improving access to finance.

Providing appropriate technology to support and develop the competitiveness of SMEs, to enhance the interconnections between various manufacturing activities, and to maximize backward and forward linkages.

Developing a directory of appropriate technologies for SMEs, **establishing a technological park for industrial SMEs**, and establishing a specialized administration under the Ministry of Foreign Trade and Industry to provide technological support to industrial SMEs.

Improving market access for the output of SMEs through disseminating knowledge about export markets and domestic outlets, and improving access to such markets. Proposed measures would include: **improving the quality of output** through setting specifications and supporting acquiring certification for quality; **encouraging integrated marketing contracts** to benefit from the experience of large chain stores; encouraging the establishment of small industrial projects through **franchising; simplifying bidding procedures** to allow industrial SMEs to obtain a share of government purchases; **securing electronic data bases** giving the availability of marketing channels

domestically, regionally and internationally; **coordinating collective efforts** to support self-financed marketing boards; providing incentives to SMEs to participate in **trade exhibitions; providing support** to SMEs in manufacturing to access export markets; **preparing a manual,** to be periodically revised and updated, to disseminate information on various products required in external markets; **developing networks among SMEs** to upgrade marketing efficiency; **developing electronic trade** and promoting its adoption by **industrial SMEs**.

Relaxing procedural constraints. It is necessary to entrust the responsibility of supporting **industrial SMEs** to **one central administration** under the Ministry of Foreign Trade and Industry in order to improve government bureaucracy in dealing with them; to reinforce the one-stop shops referred to under the law in order to facilitate and expedite licensing requirements; to draw up a geographic map of the distribution of industrial SMEs and of their classification and of the major constraints they face; **to support the clustering of SMEs** to enhance their performance through competition and developing complementarities among them and, **to secure effective business incubators.**

3.4 Institutional Reform for Productivity Enhancement

Significant steps towards reform have been undertaken but they are not sufficient unless supported by the reform of the administration of policy. A comprehensive reform of all institutions that impact the behavior of agents in the domestic market is needed to ensure competition and to minimize transactions costs. This includes **simplifying regulations for the incorporation of enterprises**; **simplifying exit procedures,** particularly for small firms; **relieving various financial levies on economic activities** which are detrimental to the competitiveness of domestic production; **reducing land costs; reducing the prices of non-traded services,** including the costs of freight and transportation services; and reducing the costs of financial services, litigation procedures and telecommunications.

The network industries and services have experienced serious attempts at modernization and liberalization, but further continuous improvement is required.

- Despite the prevalence of unemployment, **unit labor cost in Egypt is high.** The wage rate is amongst the lowest in the region, yet compared to labor productivity the labor cost per unit of manufacturing output in Egypt is still high. Shortage of skilled workers and a lack of discipline contribute to rising labor costs.

Egypt is currently witnessing serious attempts at addressing market inefficiencies. The reforms address different challenging areas: tariffs, tax, corporate regulations, SMEs, competition, labor relations, and the banking sector. Egypt has, further, signed a number of regional trade agreements, including a partnership agreement with the EU, the Great Arab Free Trade Area (GAFTA), and qualified industrial zones (QIZs) with the U.S., and is currently negotiating a free trade agreement. These commitments attest to Egypt's willingness to open up its economy, to streamline its markets to enhance efficiency and to become integrated in the global economy.

Introduction

Egypt's productivity performance was uneven from the early 1950s until the beginning of the 2000s. At the beginning of the 1950s the economy suffered from the uncertainties of a decadent political regime and of a major political change following the 1952 revolution. In the early days of the revolution, between 1954 and the early 1960s, the transition gradually took place from a free private enterprise system, with the government role restricted to reinforcement of law and order and implementation of public works, to a sectorally planned economy and later to a centrally planned economy, with a dominant public sector. Due to data unavailability up until 1959, the focus of this study is the period 1962-2000. This period exhibited frequent fluctuations in the annual growth rate of total factor productivity (TFP) and of real GDP. Nevertheless, the mean rate of growth of TFP was modest, averaging 0.93 percent per annum, with a moderately high mean rate of growth of GDP slightly exceeding 5 percent annually.

Early in 1960, and further in 1961, in what became known as the "Socialist Revolution", a big nationalization wave brought the public sector control of around 90 percent of total investment. In the First Five-Year Comprehensive Plan, the public sector dominated all non-agricultural activities. A significant expansion of free education and health services was implemented, and guaranteed jobs for all secondary technical schools and university graduates were secured. The main "socialist" lines of economic structure and policy direction prevailed until the next major political turning point, the *Infitah* (or opening up) in 1974.

Under this new policy, private sector initiatives were encouraged. However, the institutional and management set-up remained unchanged. Subsidies were meant to be an essential tool for providing a comprehensive safety net. An expansion of new urban and industrial clusters in the desert was attempted, and new "urban communities" were established. Measures for expanding and upgrading the country's infrastructure were undertaken, starting in the late 1970s through the 1980s. In the meantime, an attempt was made to control population expansion. However, a number of these policies proved to be too costly and required revision. Macroeconomic imbalances threatened the stability of the economy.

The year 1991 witnessed another turning point in Egypt's economic development with the initiation of a stabilization and structural adjustment program (ERSAP) aimed at improving economic management, raising productive efficiency and competitiveness, and accelerating integration of the foreign trade sector in the world economy. While the program was successful in reducing both internal and external imbalances, its impact on economic growth during the period 1991-2000 was disappointing for the government and for the Egyptian people, as the average real rate of growth remained below the average for the whole period, at about 4.6 percent per year, supported by a moderate increase in TFP growth of 2.9 percent per annum over the whole 1991-2000 period. However, TFP growth turned negative in 1998.

The disappointment arose because it was anticipated that success of the reform measures and the apparent stability of the macroeconomic framework would be sufficient to generate high sustainable levels of growth. Recent years witnessed extensive endeavours to find ways to salvage the reform program and revive the previous high rates of growth.

Various attempts focused on identifying different aggregate variables and policy instruments conducive to creating an enabling macroeconomic environment, which in turn would stimulate growth. However, we believe that most studies were preoccupied with addressing financial and institutional aspects of macroeconomic policy management to the extent of neglecting real-side aspects of the growth process (Kheir-El-Din and Moursi, forthcoming).

In this paper, the traditional TFP methodology is used to analyze sources of economic growth in Egypt during the period 1962-2000. In Section 1, two sources of growth in GDP are identified: changes in physical inputs (capital and labor) and disembodied technology innovations measured by growth in TFP. Changes in total factor productivity (DTFP) are further decomposed into changes in technical efficiency and technical change. The analysis focuses on TFP growth and GDP growth at the aggregate level, with occasional reference to manufacturing. The data provided by UNIDO is used for this purpose. In Section 2, the major determinants of Egypt's productivity developments are identified with regard to five broad groups of determinants: creation, transmission and absorption of knowledge; factor supply and allocation; institutions, integration and invariants; competition, social dimension and environment; and country specific issues. Egypt's strengths and weaknesses in each of the five groups of determinants will be highlighted. Section 3 describes, discusses and analyzes policies adopted in Egypt and having an explicit or implicit impact on productivity developments both in the economy at large and in the manufacturing sector.

I. The role of physical inputs and productivity in output growth

Following mainstream literature, we assume two sources of growth in output; the first is associated with growth in physical inputs and the second with the growth of total factor productivity (TFP). In this section we examine the stylized facts related to the contribution of physical inputs and TFP growth to the process of economic growth in Egypt from 1960-2000 within an aggregate growth accounting framework.

The dataset used in this study comes from the Penn World Tables (6.1) and is provided by UNIDO. Table 1 portrays the different variables in the dataset. They include output (GDP), growth (*DY*), labor productivity growth (*DLP*), TFP growth (*DTFP*) and capital deepening (*DKL*). In addition, *DTFP* is decomposed into two components, namely, the change in technical efficiency (*DEFFCH*), which shows movement towards (+) or away from (-) the production possibility frontier, and technical change (*TECCH*) which measures shifts in the frontier. Obviously, the sum of *DEFFCH* and *TECCH* must add up to the overall productivity growth. Table 1 reports the discrepancy between *DTFP* and that sum (labeled Diff). As the table shows, the discrepancies in 1971, 1974, 1976, and 1998 are considerable. In general, as we shall see later in this section, the reliability of the data employed in the formulation of the stylized facts is quite questionable. Nevertheless, we use the data as it is, without any attempts at modification or adjustment.

1.1 Characterization of Output Growth

Before examining the relationship between output growth and both physical inputs and productivity growth, we examine the pattern of output growth from 1962-2000.

During that period, Egypt's economic growth record was uneven. While the mean rate of growth was consistently high, with an average of about 5 percent per annum, the period exhibited recurrent fluctuations in the annual growth rate of real output because of frequent changes in the political environment and in socio-economic conditions. It is discernable from Table 1 that the growth of output was characterized by substantial volatility and frequent fluctuations around its average, with values ranging between a minimum of -9.02 percent (1974) and a maximum of 18.57 percent (1964), with a standard deviation of 4.54 percent.

Detailed analysis of the structure of output growth and of the impact of changes in TFP and in physical inputs on output growth over a relatively long time horizon requires cautious periodization that permits identification of broadly homogeneous sub-periods during which the main drivers of growth are rather stable. Hence, it may be convenient to dichotomize the period under investigation into several homogeneous sub-periods, guided primarily by the behavioral growth dynamics of one or more of the variables in our dataset, and also by extraneous information about the policy environment that prevailed in Egypt in different economic eras.

This, however, is a formidable task using the dataset at hand, because of rapid and abrupt changes in the growth rates of the different variables and to some extent in the policy environment, especially prior to the mid-1980s. For instance, while output growth might seem to be the most likely key variable for periodization, it turns out that the high frequency and volatility of changes in GDP generate extreme unevenness in the pattern of economic performance that precludes the possibility of relying on it for dichotomizing the entire period, 1962-2000, meaningfully into homogeneous sub-periods.

Consequently, at the outset we adopt Kheir-El-Din and Moursi's (forthcoming) periodization for dichotomizing the period 1962-2000 into three main sub-periods: 1962-76, 1977-89 and 1990-2000[1]. Figure 1 portrays the output growth during that period. Two gridlines are sketched in order to identify the three selected sub-periods.

Table 1

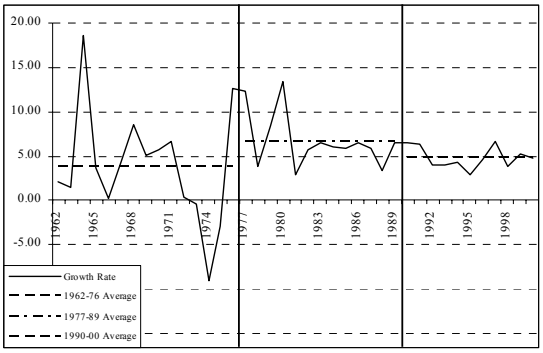
[1] Although Kheir -El -Din and Moursi's study covers a slightly different period (from 1960 to 98) and their periodization is based on their own TFP estimates, which differ from those used in this study, we do not believe that their periodization is inappropriate to provide a broad, yet reasonably good, description of the behavior of output growth and of the other variables in this study.

Annual Growth Rates Dataset 1962-2000*

Year	DY	DKL	DLP	DTFP	DEFF	DTECH	Diff(1)
1962	2.07	7.41	-0.23	-1.80	-3.90	2.20	-0.10
1963	1.52	9.64	-0.96	-3.10	-4.30	1.20	0.00
1964	18.57	9.14	15.64	13.20	13.80	-0.50	-0.10
1965	3.68	8.23	1.11	-1.00	2.30	-3.20	-0.10
1966	0.17	4.95	-2.26	-3.60	-4.50	0.90	0.00
1967	4.38	0.24	1.99	1.90	0.10	1.80	0.00
1968	8.53	-1.95	6.15	6.80	7.50	-0.70	0.00
1969	5.06	-0.87	2.93	3.20	2.90	0.30	0.00
1970	5.74	-0.10	3.70	3.80	8.10	-4.00	-0.30
1971	6.66	-2.81	4.81	7.20	18.30	-9.40	-1.70
1972	0.43	-2.67	-1.32	0.60	2.00	-1.40	0.00
1973	-0.41	1.66	-2.16	-3.20	-4.90	1.70	0.00
1974	-9.02	10.16	-10.72	-16.80	-21.50	6.10	-1.40
1975	-2.90	22.19	-4.82	-18.70	-7.80	-11.70	0.80
1976	12.70	14.78	10.32	0.30	18.00	-15.00	-2.70
1977	12.35	14.26	9.82	1.80	-1.20	3.10	-0.10
1978	3.81	13.24	1.39	-5.70	5.00	-10.20	-0.50
1979	8.34	12.10	5.71	-1.70	2.70	-4.30	-0.10
1980	13.39	8.00	10.59	5.40	12.30	-6.20	-0.70
1981	2.92	7.75	0.34	-4.10	-0.50	-3.50	-0.10
1982	5.68	8.31	3.01	-1.70	-0.90	-0.80	0.00
1983	6.52	6.44	3.82	-0.10	-2.60	2.50	0.00
1984	6.01	6.19	3.32	-0.80	-6.30	5.90	-0.40
1985	5.82	5.08	3.16	0.60	-3.00	3.60	0.00
1986	6.46	0.95	3.88	3.40	2.60	0.80	0.00
1987	5.83	-3.15	3.29	4.90	0.80	4.10	0.00
1988	3.32	-2.07	0.90	1.90	0.80	1.00	0.10
1989	6.57	-3.53	4.13	5.80	7.60	-1.60	-0.20
1990	6.52	-2.91	4.14	5.60	3.60	1.90	0.10
1991	6.28	-7.02	3.15	7.70	7.00	0.70	0.00
1992	3.94	-7.53	0.99	7.00	8.50	-1.40	-0.10
1993	3.98	-7.93	1.07	7.00	0.00	7.00	0.00
1994	4.32	-6.53	1.51	6.20	0.00	6.20	0.00
1995	2.88	-4.88	0.15	4.00	0.00	4.00	0.00
1996	4.55	-2.37	1.56	3.60	0.00	3.60	0.00
1997	6.61	0.45	3.52	3.10	-3.00	6.30	-0.20
1998	3.91	4.10	0.93	-2.80	-12.00	10.50	-1.30
1999	5.20	4.66	2.17	-2.20	-9.90	8.60	-0.90
2000	4.74	3.54	1.74	-1.60	-6.70	5.50	-0.40

* All data are in constant 1996 PPP.

Figure 1
GDP Growth 1962-2000



The early 1960s witnessed a big nationalization wave, which brought the public sector into control of around 90 percent of total investment, in what became known as the "Socialist Revolution". In the First Five-Year Comprehensive Plan (1960-65), the public sector dominated all non-agricultural activities. There was also significant expansion in the provision of free education and health services and in securing guaranteed jobs for all graduates of secondary technical schools and universities.

The main lines of the socialist economic policy orientation prevailed, even after the next major political turning point of initiation of the *Infitah* (or opening up) by President Sadat in 1974. It is discernable from Figure 1 that the rate of economic growth during the first sub-period is relatively low, averaging only 3.81 percent.

Moreover, according to the data at hand, it seems that the radical political changes in that sub-period resulted in sharp and rapid fluctuations in output growth. Besides the low average growth, the period 1962-76 exhibited, in 1964 and 1974 respectively, the highest and lowest growth rates of output relative to the entire period under investigation.

Under *Infitah*, starting in the late 1970s through the 1980s, there were new policies that attempted to encourage private sector initiatives, to develop and upgrade the infrastructure, to expand new urban and industrial clusters in the desert, and to control population expansion. These policies dampened the fluctuations of *DY*, especially from 1981 until the end of the second sub-period in 1989. On the other had, the *Infitah* measures, coupled with foreign resources inflows associated with the first oil boom, were successful in raising the average growth rate, which increased over the period 1977-89 to about 6.69 percent.

Despite the *Infitah* reform policies, Egypt's institutional and management set-up remained unchanged. However, a number of these policies proved to be too costly and required revision. The macroeconomic imbalances, which were partly brought about by the high costs of implementing these policies, threatened the stability of the economy. The year 1991 witnessed a key turning point in Egypt's modern economic history, with initiation of an economic reform and structural adjustment program (ERSAP). The

program aimed at removing macroeconomic imbalances and promoting economic efficiency. This was envisaged through market-oriented strategies based on the elimination of price distortions, on relieving the government budget of hefty consumption

subsidies, on foreign trade deregulation, on intensifying the role of the private sector in economic activity, on financial and capital market reform, and on encouraging foreign trade openness and improving Egypt's potential for more solid foreign trade relations, especially with the West.

While the program was successful in reducing both internal and external imbalances, its impact on economic growth during 1991/2000 was disappointing for the government and for the Egyptian people, as it could not raise the average growth rate back to the pre-1991 levels. The pivotal factor underlying this recovery appears to have hinged on increasing the domestic supply of typically scarce foreign currency through external debt forgiveness in return for Egypt's political role in the Gulf war. That is, the success of the reform measures and apparent stability of the macroeconomic framework were not sufficient to generate high sustainable levels of growth. Figure 1 and Table 1 reveal that the average output growth barely exceeded 4.80 percent during the third sub-period, falling from 6.61 percent in 1997 to only 4.74 in the year 2000. This decline after 1997 was further reinforced by exogenous factors, such as the unfortunate terrorist attack on tourists in Luxor and the East Asian crisis.

Kheir-El-Din and Moursi (forthcoming) present a general periodization scheme for productivity and output growth. Selecting shorter sub-periods, however, may be useful for highlighting growth patterns that were driven by specific transient policy changes. Again, we use Figure 1 for demonstration.

During the socialist period, 1962-66, the quality of data notwithstanding, the average growth rate was about 5.20 percent[2]. The Egyptian-Israeli war exigencies and the war of attrition from 1967 to 73 resulted in a noticeable fall in the rate of output growth to 4.34 percent, an all time low during the period 1962-2000. The periods 1974-1980 and 1981-90 were times of relatively high growth, averaging about 5.53 percent and 5.56 percent respectively. For reasons mentioned earlier, the high growth rates could not be maintained, and average *DY* fell to 4.65 percent and then to 4.62 percent from 1991 to 97 and 1998 to 2000 respectively. We also notice from the diagram that, starting from 1983 through 2000, the output growth exhibited significantly low fluctuations with a small standard deviation of 1.25 percent. The growth rate during that period averaged 5.19 percent.

1.2 The Role of Physical Inputs

We identify two sources of growth in output: one that is attributed to changes in physical inputs (capital and labor) and one that is due to disembodied technical innovations

measured by growth in TFP. We focus in this section on the role of physical inputs, using the same periodization suggested by Kheir -El- Din and Moursi (forthcoming).

[2] We are rather skeptical about the 18.57 percent growth rate that is recorded in 1964. Alternative sources of data from national (e.g. Ministry of Planning) and international (e.g. World Bank, World Development Indicators) sources do not substantiate such an increase of GDP growth in that specific year. The Ministry of Planning reports 9.8 percent in 1963/64.

Figure 2
Labor Productivity Growth 1962-2000

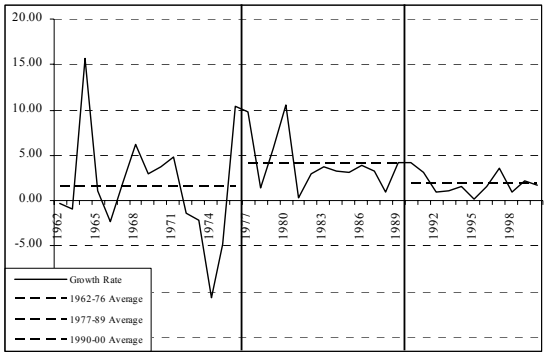
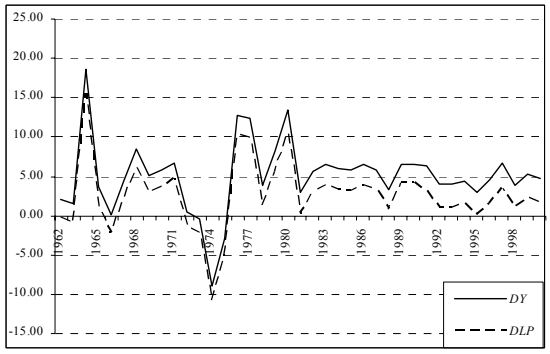


Table 1 and Figure 2 display the behavioral dynamics of labor productivity growth in the three selected sub-periods. We notice that, in the first sub-period, the employment growth rate fluctuates significantly, reaching a maximum of 15.64 percent in 1964 and a minimum of -10.72 percent in the aftermath of the October 1973 war, with a large standard deviation of 6.49 percent. The growth rate of labor productivity averaged about 1.61 percent in that sub-period. That average, however, more than doubled in the second sub-period (1977-89), reaching more than 4.01 percent with relatively less fluctuations, as indicated by a lower standard deviation of 3.06 percent. Finally, in the third sub-period, the growth of labor productivity fell again to an average of 1.90 percent, which is comparable with the analogous level of *DLP* in the first sub-period. As shown in Figure 2, the variation in *DLP* from 1991 to 2000 appears to be rather limited, with virtually no signs of pronounced peaks or troughs in the labor productivity growth series.

Figure 3
The Behavior of Output and Labor Productivity Growth 1962-2000

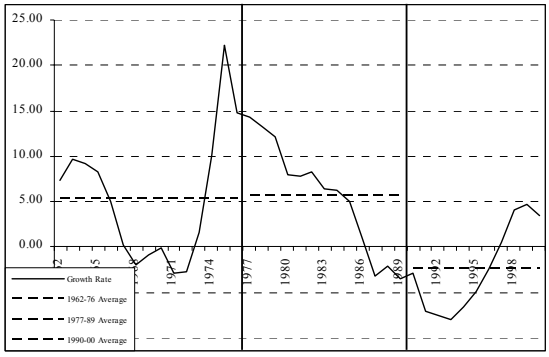


As we have done before with *DY*, we could have gone on to examine the specific behavior of labor productivity growth in shorter sub-periods than those proposed by Kheir- El- Din and Moursi but for the fact that we have noticed a striking similarity between the behavior of *DLP* and that of output growth. To facilitate the exposition, we have plotted the *DY* and the *DLP* series (displayed in Figures 1 and 2) together in Figure

3. Obviously, the diagram suggests either that both labor and output growth have been driven by the same forces throughout the period 1962-2000 or that output growth during

that period was completely caused and dominated by the changes in labor productivity. It may be rather difficult to justify the almost one-to-one correspondence between the behavior of the *DY* and the *DLP* series on economic grounds related to the development of the Egyptian economy during the period under examination. Hence, we are tempted to believe that the strong relation (with a correlation coefficient of 99.69 percent) between the two series is an artifact of the statistical procedure used in their calculation.

Figure 4
Capital Deepening Growth 1962-2000



Alternatively, Figure 4 portrays the capital per worker series for the period 1962-2000; the two vertical grids show the three selected sub-periods. During the first sub-period, there is a marked change in capital deepening, which varies between a minimum of -1.95 percent in 1968 and a peak of 22.19 percent in 1975. Despite the fluctuations, average capital growth per worker is high, reaching about 5.33 percent.

During the early years of this first sub-period, there was a rise in the level of investment that accompanied the First Five-Year Plan. Consequently, growth of capital deepening accelerated from 1962-65. This trend was quickly reversed in the mid-1960s when the share of imports in GDP increased without being matched by a rise in the export share, mainly because of the cotton crop failure that occurred at the time and the poor export performance of newly nationalized companies. In addition, the foreign exchange drain that accompanied the Yemen war, the withdrawal of US foreign aid and the looming (1967) war with Israel amplified the downward pressure on domestic investment, which reached very low levels from the mid-1960s until 1973, thereby leading to a slowdown in the growth rate of capital per worker.

In the last few years of the first sub-period, the level of investment started to rise and remained comparatively high on average until the mid-1980s. Investment growth stimulated new production opportunities. The reasons for the increase in investment primarily included the implementation of a number of pro-investment laws within the context of *Infitah,* as well as an increase in the country's hard currency resources because of rising world petroleum prices, a regional boom that encouraged an inflow of worker remittances from abroad, reopening the Suez Canal, and expansion in tourism. The rise in the inflow of Arab aid and capital also permitted a large increase in investment. The investment surge was translated into a rise in the growth rate of capital per worker, which averaged about 10.71 percent between 1974 and 1985.

However, towards the end of the second sub-period (mid-1980s to 1990), investment started to fall sharply because of domestic market distortions that overburdened the government budget and, at the same time, discouraged the efficient allocation of investment across sectors and activities, and because of the collapse of international petroleum prices. The fall in investment is reflected in the decline in the growth rate of capital deepening, which on average fell considerably, to -1.95 percent. Despite this sharp dip, Figure 4 discloses that the capital deepening growth averages in the first two sub-periods are nearly equal (5.33 percent and 5.66 percent, respectively). In contrast, although *DKL* increased from 1994-1999, its average decreased significantly to -2.40 percent in the third sub-period (Figure 4). It seems that the effects of the decrease in investment in the second sub-period had a lingering effect on capital deepening in the last sub-period.

Two remarks seem in order regarding the behavior of the *DKL* series during 1962-2000. First, Table 1 and Figures 1 and 4 reveal that, during the entire period 1962-2000, capital-deepening growth was pro-cyclical during the years 1962-67, 1976-86 and 1997-2000, and countercyclical in the remaining years (1968-75 and 1987-96). The data used in this study, therefore, fail to establish a consistent relation between the growth rates of output and capital per worker during the entire selected period.

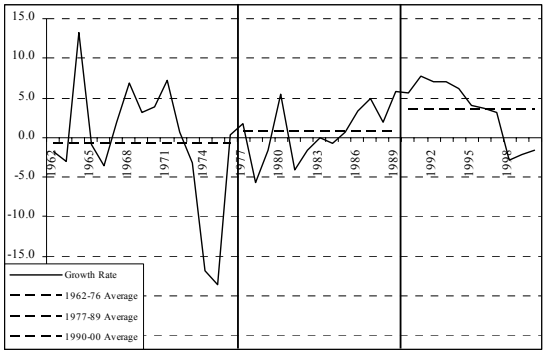
Second, the high correlation between output and labor productivity growth has two important implications. On the one hand, it implies that the growth rate of output per worker was rather stable during the selected period. Accordingly, during that period technical innovations and education programs may have had limited impact on raising the growth rate of the average productivity of labor. On the other hand, it implies that the growth rates of the capital / labor and the capital / output ratios were also highly correlated. Assuming a fixed level of capital, the adoption of more labor-intensive modes of production would result in lower growth of the average product of capital. Hence, lower labor productivity growth, due to a relative increase in the labor force, would also have adverse consequences on the growth of capital productivity.

1.3 The Role of Technical Progress

Figure 5 displays the TFP growth series during 1962-2000 and illustrates its average growth rate during each of the three selected sub-periods. The diagram suggests that *DTFP* is now playing an increasingly vital role as a major source of development in the Egyptian economy. During the first and second sub-periods, productivity growth is exceptionally low with averages of -0.75 percent and 0.75 percent, respectively. The implementation of ERSAP in 1991 stimulated a rise of technical productivity growth, which reached an average of 3.42 percent during the third sub-period, 1990-2000.

Figures 1 and 5 disclose that there was a relatively strong correlation between the pattern of output growth and *DTFP*, especially in the first two sub-periods. Actually, the correlation coefficients between the two variables were about 70.13 percent and 78.71 during the periods 1962-2000 and 1962-1989 respectively.

Figure 5
Total Factor Productivity Growth 1962-2000



During the entire period under investigation, *DTFP* was sensitive not only to variation in the level of output growth but also to changes that occurred in the economic and political environment. Some dips in *DTFP* coincide with political disturbances. These include repercussions of military involvement in Yemen (1966), the effects of the 1973 war (1974), the cold shoulder treatment and withdrawal of investment inflows from Arab countries to Egypt, and the assassination of President Sadat by fundamentalist militants in the aftermath of the Camp David Peace Treaty with Israel (1978 and 1981). Moreover, the general decline in technical productivity growth during 1977-89 was amplified by the slowdown of the 1980s, which was instigated by the decline in petroleum and tourism revenues and Arab aid and by the resulting investment cuts. Alternatively, recovery with *Infitah* and then the ERSAP reform program, accompanied by an increase in foreign currency availability, because of debt forgiveness, caused *DTFP* to rise significantly in the third sub-period as indicated above.

We indicated above that there is a positive association between output growth and *DTFP*. We notice, however, that there is a significant negative correlation between TFP growth and the growth of capital deepening, particularly starting in 1967; the *negative* correlation coefficient between those two growth series during the period 1967-2000 is relatively high, exceeding 75 percent in absolute terms. Hence, the increase in capital growth per worker is not conducive to technical progress. In contrast, DTFP is correlated with the growth of labor productivity. This result emphasizes the key role of education and human capital development in raising the rate of growth of technical productivity.

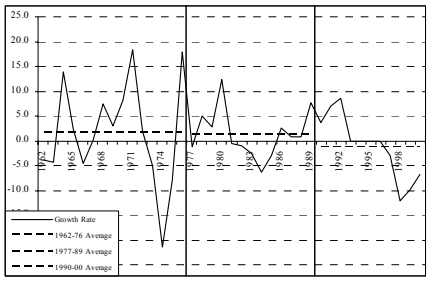
Table 1 reports the decomposition of *DTFP* into two components: change in technical efficiency (*DEFF*) and technical change (*DTECH*). The two series are plotted in Figure 6, Panels A and B, respectively.

Figures 5 and 6 (Panels A and B) suggest that the *DTFP* averages in the first and the third sub-periods were primarily influenced by technical change rather than by the growth of technical efficiency. As the diagrams illustrate, the negative average *DTECH* (-2.11 percent) during 1962-76 outweighed the positive average *DEFF* in the same period, which led to negative average growth of TFP. On the contrary, the high average *DTECH* in the third sub-period (4.81 percent) exceeded the average decline in *DEFF* (-1.14), resulting in a strong increase in average TFP growth from 1990-2000. In the second sub-

period, the three diagrams show that *DEFF* had a relatively more influential effect on *DTFP*.

Figure 6

Change in Technical Efficiency
A



Technical Change
B

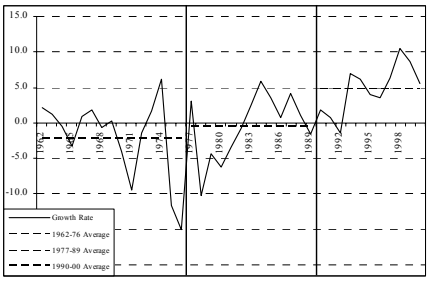


Figure 6-B shows that the *Infitah* had a positive impact on technical change, which started increasing, albeit with noticeable fluctuations from the early 1980s through 1998. During that period, however, the stabilization program dampened the escalating trend of *DTECH* in the early 1990s, as shown in Figure 6-B. On the contrary, the reform measures of ERSAP led to a rise in DEFF at the beginning of the 1990s, which helped raise DTFP from 1991-93. It is worth mentioning that, although *DTECH* had a significant effect on TFP growth (on average) in the 1990s, the sharp decrease in *DEFF* in the second half of the 1990s (1997) appears to have been instrumental in the fall of *DTFP* starting 1997-2000, despite relatively high levels of technical change in that period. The result suggests the importance of encouraging both *DTECH* and *DEFF* in order to raise total factor productivity.

II. Assessment of Major Determinants of Productivity

Several factors determine productivity growth. These factors include the improved use of available inputs, such as labor, physical capital and materials. Productivity is also affected by human capital, research and development, and technological catch-up. More specifically, the ability of the country to innovate in the high-tech sector and to acquire new and highly productive equipment positively affects productivity.

Moreover, innovation and new technologies are affected by market conditions. Macroeconomic imbalances, market structure, social and environmental conditions, and institutional set-up affect productivity.

Table 2 presents the rate of growth of total factor productivity (DTFP) over a long period of time. We can easily depict the tremendous fluctuations of DTFP, which reflect the changes in factors determining DTFP, in terms of intensity and direction. In the following section we analyze the main determinants of DTFP categorized in five main groups. It is worth mentioning that these factors will be examined over a long period of time; some of the determinants might, therefore, be more effective during certain periods, while their effects might be insignificant during other periods.

Table 2. Productivity Indicators

Year	GDP Growth	Capital Deepening	Labor Productivity Growth	TFP Growth	Change in Technical Efficiency	Technical Change
1962 – 1966*	1.86	7.56	-0.58	-2.38	-2.60	0.27
1967 - 1973	4.34	-0.93	2.30	2.90	4.86	-1.67
1974 - 1980	5.53	13.53	3.18	-5.06	1.07	-5.46
1981 - 1990	5.56	2.31	3.00	1.55	0.21	1.39
1991 - 1997	4.65	-5.11	1.71	5.51	1.79	3.77
1998 - 2000	4.62	4.10	1.62	-2.20	-9.53	8.20
1962-2000	**5.05**	**3.26**	**2.52**	**0.93**	**0.79**	**0.40**

Source: UNIDO, 2005
Data for 1964 were not used because they represented an outlier

2.1 Creation, Transmission and Absorption of Knowledge

During the 1960s, the government adopted an import substitution, state-led growth strategy. It also engaged in an ambitious industrialization program undertaken by the public sector. The industrialization program promoted a combination of traditional sectors such as food processing and textiles in addition to more sophisticated industries such as steel, chemicals, and heavy engineering. These efforts created one million jobs, and manufacturing output increased by 10 percent annually during the period 1960-1965 (Said, et al. 1995). In order to provide sufficient protection for its infant industries, Egypt relied heavily on non-tariff barriers (NTBs) to restrict imports and to shelter its domestic production[3]. This inward looking strategy led to an incentive system biased against production of tradable goods (World Bank, 1991). Consequently, the average share of trade[4] in GDP during the period 1960-1969 reached 37 percent (World Bank, 2003).

The public sector grew to dominate the capital, the intermediate and, less important, the consumer goods industries. This period witnessed the establishment of important industries such as the Egyptian Iron and Steel Company (production started in 1958), the Aluminum industry, the Al Nasr for Cars factory, and other industries such as the Fertilizers Factory in Aswan, and pharmaceuticals. The private sector was concentrated in minor industries that possessed export potential such as leather, wood, garments and paper products (Mabro and Radwan, 1976).

[3] NTBs included import bans, suspensions of letters of credit for the import of certain products, prior import approvals from specific government agencies and ministries and quality control standards. (World Bank, 1991)
[4] The sum of exports and imports of goods and services.

Public sector firms established throughout the 1960s, and even before, introduced simple technological techniques. The overall structure of manufacturing remained relatively primitive. The share of heavy industry in manufacturing value-added was relatively low compared to similar newly industrialized countries. Meanwhile, the private sector engaged in technologically simple activities with a very large resource base (Lall, 1996). During the second half of the 1960s, inflows of foreign direct investment (FDI) were very limited as a result of the nationalization wave that the government implemented, and of political instability that the Arab-Israeli conflict created in the region. However, R&D activities were undertaken in some national research centers and in centers related to military industries in an effort to develop Egypt's own technological capacities. Their focus was on developing new technologies for defense purposes. These activities received a severe blow after the 1967 war. They continued, however, on a limited scale during the interwar years and till the end of the 1970s.

In 1974, Egypt adopted an open door policy during which the government was replaced in the leading role in the economy by the private sector. The era of the open door policy started with the "October Paper", where the government was committed to new liberalization policies. The necessary legislations were considered and prepared, and at the same time there was a political shift from the East to the West. This new era started with the promulgation of Law 43 of 1974 for investment of Arab and foreign capital and the free zones, and its amendment by Law 32 of 1977. During this period, FDI was concentrated mainly in banking and tourism and, to a much leer extent, in the manufacturing sector.

One of the main purposes of adopting the open door policy was to attract western technology in order to promote economic growth. The projects established under Law 43 and its amendments were dominated by foreign capital and were engaged in investing in more capital-intensive technologies (Hansen and Radwan, 1982). During the early 1970s, large private sector firms enjoyed fairly free access to modern equipment and know-how from the developed countries. In collaboration with foreign firms, they were able to master the simple technologies they adopted, but they were not capable of developing their own advanced technology beyond what they acquired from their foreign partners. However, it was claimed that limiting access to foreign technology to private enterprises discriminated unfavorably against public sector firms that could not compete with new advanced technologies (Ayubi, 1991).

In general, the Egyptian manufacturing industry was dominated by small and medium enterprises which used low levels of technology and lagged behind the worldwide production frontiers. They produced low quality products, mainly for the local market. Nor did they participate in any training activities, nor invest in upgrading their processes to achieve more advanced technologies. They lacked finances and contacts with foreign advanced firms which could supply them with up-to-date technologies that could help them improve their production techniques, reduce the costs of production, raise skills and help them to penetrate foreign markets.

Most R&D activities were (and continue to be) undertaken by government research centers, such as the National Research Center, or in research centers affiliated with public universities. These institutes showed modest success in exerting any technological effort

related to the industrial sector. Moreover, R&D activities conducted by these institutes had little market relevance. For a long time, R&D efforts stagnated and, as a result, lagged behind the levels achieved by newly industrialized countries in East Asia, and were about the same level as that achieved in Thailand or Indonesia (Table 3). Evidence showed that practically no significant real R&D was conducted by private sector firms and that Egyptian industries depended mainly on imported technologies. Nor did these firms appreciate the impact that could result from R & D efforts. From the mid-1970s, Egypt experienced large-scale temporary labor migration**,** which helped to increase the brain drain phenomenon, and had very negative repercussions on productivity and economic growth (Lall, 1996).

Table 3. R&D Expenditure and Personnel

Country	Total R&D (% in GNP)	R&D by productive firms (% in GNP)	Scientists, engineers in R&D (per 10,000 employees)	Scientists, engineers in R&D (per million pop)
Egypt	0.2	0.04 (est)	15	439
Korea	2.3	1.9	32	1346
Taiwan	1.8	0.6	42	1987
Singapore	0.9	0.2	27	1297
Malaysia	0.8	0.1	Na	181
Thailand	0.2	0.03	Na	103
Indonesia	0.2	0.02 (est)	4	183
India	0.9	0.1	4	111
Turkey	0.7	0.5	12	224
Mexico	0.3	0.03	8	217
Argentina	0.6	0.09	16	336
Brazil	0.7	0.1	9	256

Source: UNESCO, 1996

By the mid-1990s, Egypt succeeded in attracting FDI inflows as a result of the privatization program that the government adopted, as well as the reform effort that was exerted at that time. During this period, the average annual FDI inflows reached US$1 billion, peaking at US$ 1.7 billion in 1999-2000. However, FDI inflows did not exceed 1 percent of GDP (Table 4), and were moderate compared to those received by economies in phases of transition and by some MENA countries.

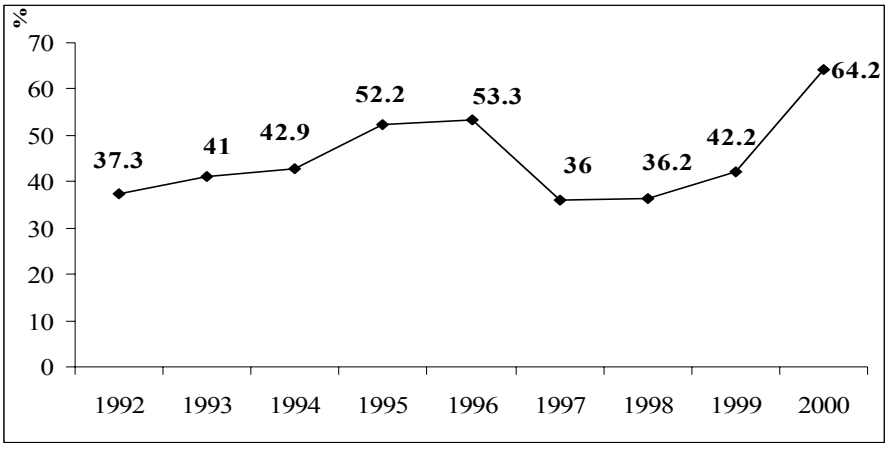
Table 4. Foreign Direct Investment Inflows to Egypt

Period	FDI (US$ million)	FDI as a percent in GDP	FDI as a percent in GDI
1988/89	124	0.18	0.57
1989/90	136	0.28	0.96
1990/91	141	0.42	1.76
1991/92	359	0.86	4.36
1992/93	453	0.97	5.99
1993/94	520	1.00	6.02
1994/95	783	1.30	8.03
1995/96	627	0.93	5.60
1996/97	770	1.02	5.80
1997/98	1150	1.39	6.47
1998/99	716	0.80	3.70
1999/2000	1691	1.71	8.72
2000/01	510	0.52	2.84
2001/02	532	0.61	3.37

Source: Sakr, 2003.

In general, foreign investors were engaged in joint ventures with low equity investment and relied mainly on domestic financing from the banking sector. Only non-Arab investors provided access to technology and training services. The main bulk of FDI was concentrated in the manufacturing sector (Figure 7). However, foreign investors showed interest only in low-tech, resource based industries, with a heavy reliance on brand names and a commercial presence in the domestic market. High-tech and export-oriented products did not receive any priority from foreign investors. Transnational corporations contributed mainly in the manufacturing sector but their investment contribution was insignificant (Sakr, 2003).

Figure 7. Share of Manufacturing in FDI Investment



Source: GAFI, 2003

In addition to the modest levels of FDI inflows, the extent of industrial technology transfer was also very modest. The World Bank reported that "the involvement of Egyptian firms in enterprise set-up and operations has been limited to facilitating start-up procedures, securing access to local credit, and mediation with the government; almost all of the R&D, training or transfer of know-how has been executed by the foreign partners in their headquarters or limited to boundaries of their production facilities in Egypt, with

insignificant diffusion to the local market. Moreover, multinationals in Egypt have little incentive to use local research centers because of their weak capacity, while their investing in locally owned labs has proved hard to justify in the absence of economies of scale" (World Bank, 1994).

A country's technological capability could be reflected in its exports of engineering products, as an index of the more complex technologies adopted in manufacturing. In 1991/92, Egypt's exports of these products reached US$181 million and declined by 24 percent in 1992/93 (Table 5), while a country like Thailand exported US$7 billion of machinery and equipment in 1992, and Malaysia exported US$16 billion. In general, Egypt lacked competitiveness in high value added, high-skill products such as machinery and equipment, which is an indicator of technological weakness (Lall, 1996).

Table 5. Non-Oil Manufactured Egyptian Exports (in US$ million)

Industry	1991/92	1992/93	1993/94	Growth Rate (1991 – 1994) %
Textiles	575.4	450.9	495.5	-7
Garments	204.9	182.0	217.7	3
Yarn	283.1	203.8	211.5	-14
Other textiles	87.4	65.1	66.3	-13
Food products	144.5	100.4	88.2	-22
Chemicals	237.4	111.1	110.2	-32
Engineering and metals	380.6	379.0	328.6	-7
Other	123.2	126.0	104.9	-8
Total	**1461.1**	**1167.4**	**1127.4**	**-12**

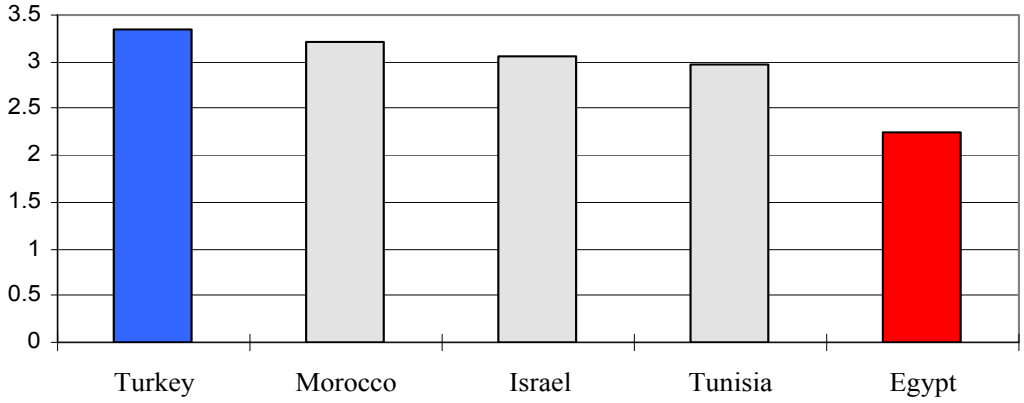
Source: World Bank, 1994

The Arab Human Development Report revealed that during the period 1980-2000 Egypt was doing well relative to other countries in the Arab world in terms of the number of specialized research centers and the number of workers engaging in R&D activities. However, compared to international standards, Egypt lagged behind in terms of the number of patents registered in the US. During the period 1980-2000, Egypt had only 77 patents, while Korea had 16,328. The number of patent applications from non-residents reached 706 while that of patent applications from residents was only 504 (Handoussa, 2004.)

The government budget allocated for R&D increased from LE371 million in 2001/02 to LE414 million in 2002/03; however, it did not exceed 1 percent of GDP during the same period (Figure 8). The R&D activities were mainly undertaken by research centers affiliated either with the Ministry of Scientific Research or with public universities. The private sector did not show much interest in these activities. This could be explained by the lack of an efficient incentive system that would create an enabling environment for R&D activities in Egypt. Moreover, Egypt's efforts to link FDI to technological transfer were ineffective because of the lack of a friendly business environment. The following figure shows a cross-country comparison based on an index that measures the extent to which the business environment is conducive to private sector activity. The index includes political stability, pro-business policies, regulations, national treatment,

investment incentives, taxation, remittance freedom, exchange rate stability, trade liberalization, and market size/growth. It is obvious that Egypt does not enjoy a very friendly business environment (Nathan Associates Inc., 1997).

Figures 8. Cross Country Comparison of Business Environment (1997)



Source: Egypt: Comparative Study of FDI Climates, Nathan Associates Inc., 1997

Note: Ranking: 5 Best, 1 Worst

The Egyptian government is responsible for financing R&D activities. Government spending on tangible assets such as equipment and machines should be reduced to the benefit of more intangible assets like knowledge, information and human resources.

According to the Industrial Development Report 2002/2003, issued by UNIDO, Egypt achieved distinct progress in terms of the competitiveness index in 1998. It achieved a rank of 57, the only Arab country to do so. Manufactured value added increased by 10 percent between 1985 and 1998. Despite a moderate level of manufacturing exports, their growth rate was 13 percent. The import substitution policies created a divergence between manufactured exports and value added. Although Egypt altered its import substitution strategy and engaged in a market-oriented strategy, it had a long way to go in order to increase the contribution of the manufacturing sector in growth. The R&D activities financed by the private sector were insignificant. Egypt also suffered from education problems; the number of tertiary students enrolled in technical disciplines declined from 75,000 in 1985 to 70,000 in 1995 (UNIDO, 2004).

Annex 1 shows Egypt's ranking with respect to selected technology indicators compared to other countries such as Brazil, the Philippines, Tunisia and Morocco.[5]

On the environment component index[6], Egypt is in a similar position to Morocco, and better than the Philippines but worse than Brazil and Tunisia. The same comparison applies to the readiness component index[7]; however it is in a worse position on the usage component index[8]. In general, one can conclude that more efforts are required to develop

[5] These countries are selected because they belong to the same lower middle income group as Egypt (World Bank classification).
[6] Measures the degree of conduciveness of the environment for the development and use of ICT.
[7] Measures the capability of different stakeholders to leverage the potential ICT.
[8] Measures the degree of usage of ICT.

and use new technology among different stakeholders such as individuals, businesses and governments (World Economic Forum, 2004).

2.2 Factor Supply and Allocation

Physical Capital.
As was previously mentioned, the main component of the import substitution, state-led growth strategy adopted during the 1960s was industrialization, with special emphasis on heavy industries undertaken by the public sector. Consequently, the share of investment allocated to the industrial sector amounted to 27 percent of total investment (Soliman, 1997). The industrialization strategy was complemented by extensive waves of nationalization, which resulted in increased dominance by the public sector in Egyptian industries. In 1960, the Bank Misr Group, which owned the largest industrial firms, was nationalized. The two holding companies that the government established at that time took over the core of the nationalized firms. During this time, government interference in those firms was minimal and the role of the holding companies concentrated mainly on securing financial resources for these firms. Moreover, the Egyptian government approved the establishment of three foreign subsidiaries of multinational pharmaceutical firms. Three joint venture firms were established with Egyptian private sector participation.

In general, during the early 1950s, the nationalization policy aimed at promoting industrial production. At the time, the government believed that this role could not be left to the private sector, in light of its weak performance. However, the confiscation of foreign ownerships after the 1956 war triggered a lack of confidence between the government and the private sector. During the early 1960s, there was an ideological shift in the government's economic policy away from the private sector enterprises. By the mid-1960s, nationalization had eroded most of the national private sector.

Moreover, trade was diverted towards the Eastern bloc and there was no potential for any private investment (World Bank, 1983).

As mentioned earlier, the public sector grew to dominate the capital, the intermediate and the consumer goods industries. This period witnessed the establishment of important industries such as iron and steel, fertilizers and pharmaceuticals. The period was characterized by persistent capital deepening. The private sector was concentrated in minor light industries that possessed export potential, such as leather, wood, garments and paper products (Mabro and Radwan, 1976).

Public sector firms were supposed to comply with the planning objectives relating to output, profits and productivity, while at the same time employment and price control policies negatively affected efficiency and productivity. However, there was a strong feeling of enthusiasm during the first half of the 1960s which promoted higher growth rates. From the mid-1960s to the early 1970s, the agriculture, transportation, communications and infrastructure sectors were neglected, and suffered from a lack of investments (Hansen and Radwan, 1982). The relatively high rates of growth of industrial output in the early 1960s (33 percent in 1960-61) were not sustained. During the period

1962-66, the growth rate of industrial output gradually decreased to 5 percent (UN, several issues), before turning negative after the 1967 war (Mabro and Radwan, 1976).

After the 1967 war, the industrial sector suffered from a lack of adequate financing and foreign exchange due to the increase in defense spending. However, public sector firms continued to supply the domestic economy with its basic needs. During this time, small and medium private sector firms were encouraged by the creation of linkages between these firms and large public sector enterprises. These private sector firms absorbed 50 percent of the industrial labor force during the early 1970s. Their share in value added and output remained very modest. After the 1973 war, the government adopted the open door policy and declared its commitment to liberalize the economy and support the private sector (World Bank, 1983).

The new market-oriented strategy adopted by the Egyptian government emphasized the role of private sector firms in all economic activities. Accordingly, a new investment law (Law 43 of 1974 amended by Law 32 of 1977) was issued to regulate private sector activities and to encourage foreign direct investment. In addition, there were several attempts to liberalize trade and the exchange rate regime. In 1974, the private sector was permitted to provide its own sources of foreign exchange to finance its imports. Moreover, Law 118 of 1975 encouraged private sector firms to engage in all import activities in order to secure their needs of imported intermediates and capital goods. These imports were mainly financed by workers' remittances converted at a free and fluctuating exchange rate. During the second half of the 1970s, more commodities were imported through parallel market resources made available since 1975. During the period 1979-1981, the pound was devalued several times. In response to the new liberalization strategy, FDI inflows increased and were mainly concentrated in the banking and tourism sectors (World Bank, 1983).

As a result of an expanding private sector, bank credit grew around 32 percent per annum over the period 1973 - 1980. The private sector's share in domestic credit increased from 18 percent in 1974 to 30 percent in 1980/81. Moreover, the government depended heavily on the banking sector to finance the public sector deficits. The availability of funds and the increase in private sector investment increased the productivity of the private sector after many years of public sector domination (Al Mashat, 2002). Capital deepening accelerated, encouraged by a cheap-credit monetary policy.

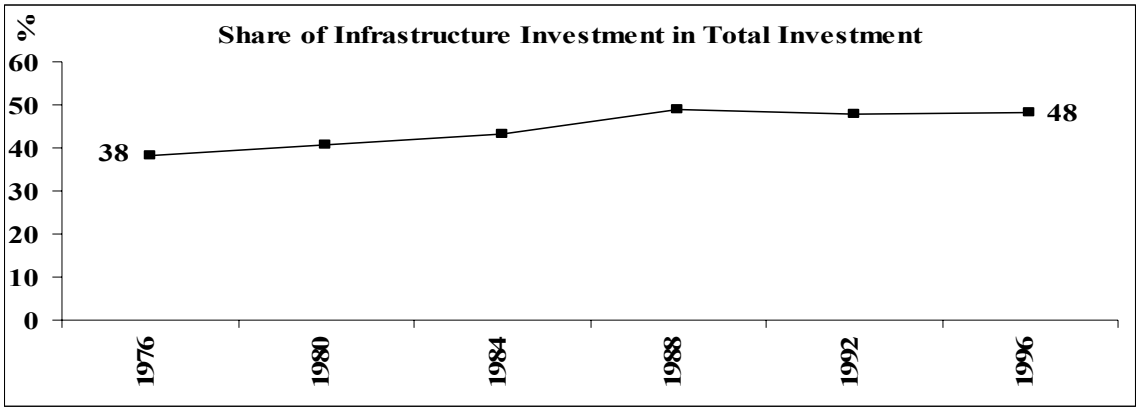
In 1981, a new company law (Law no. 159) replaced the old one to support the establishment of new enterprises under the open door policy. Law 230 of 1989 replaced Law 43 of 1974 and its amendments. The new laws allowed foreign ownership of land, repatriation of capital and profit, and income tax holidays for 10 to 15 years, in addition to removing price controls (Handoussa, 1990). Meanwhile, investments in the public sector concentrated on replacement and renewal operations, and the industrial public sector continued to suffer from drawbacks and weaknesses, and was unable to compete with the more advanced technology adopted by the private sector industries (Ayubi, 1991). This could be explained by the dualism that characterized the Egyptian economy during this period. The government attempted to complement the open door policy with a new strategy for public sector enterprises, giving them more autonomy. Nevertheless, industrial public sector firms continued to supply the economy with its basic needs at

subsidized prices. Moreover, public sector industries suffered from a large labor surplus as a result of the guaranteed employment strategy adopted since the 1960s.

Public sector firms suffered mainly from price distortions, overstaffing, lack of autonomy and fierce competition from private sector firms. During the second half of the 1970s, most goods produced by the public sector were subject to price controls. These goods included "building materials, fertilizers, food and textile products, cigarettes and beverages." In addition, intermediate inputs were provided at subsidized prices, which resulted in misleading signals to public sector enterprises. Furthermore, the majority of public sector firms claimed that they could perform better with a 30 percent reduction in the labor force. These firms were not able to compete with more productive, efficient and flexible private sector firms (Ayubi, 1991).

During the period 1981–1990, investment declined, mainly because of the overburdened government budget caused by the adopted expansionary fiscal policy prevailing in the second half of the 1970s. However, this period continued to witness remarkable improvements in infrastructure (Figure 9). The share of infrastructure investment to total investment rose from around 40 percent by the end of the 1970s to exceed 48 percent in 1990. "The available electricity generated, increased by 470 percent, enabling all villages in the country to receive electricity, the length of railway lines nearly doubled, the length of paved roads increased by 137 percent, the capacity of sea ports more than tripled, the number of telephone lines increased almost ten-fold, and the number of fax and telex lines went up by almost the same rate. Central and public hospitals increased from 169 to 236, village hospitals from 39 to 375. The availability of drinking water and of sewerage capacity increased tremendously" (World Bank, 1999).

Figure 9. Development of Infrastructure Investment



Source: NPI, 2000

In 1991/92, the government adopted the Economic Reform and Structural Program (ERSAP) to correct the macroeconomic imbalances which resulted in fiscal and current account deficits. The program was a major step towards a market-oriented economy. It concentrated on commodity price liberalization, privatization of public sector firms, promoting FDI and restructuring the banking system.

As a result of ERSAP, there was a remarkable improvement in all the financial sector indicators in response to the financial and capital market reform. Moreover, Egypt was

granted external debt forgiveness. The elimination of price distortions and the reduction in consumption subsidies increased economic efficiency. By the mid-1990s, private investment started to pick up. Investment was higher in industry than in agriculture and services. These positive developments were reflected in the high DTFP witnessed then.

During this period, Egypt's economic growth was mainly driven by the domestic market, which reflected a substantial demand for domestic goods and services. The share of external demand in total demand declined from 49 percent to 9 percent during the first half of the 1990s. This was mainly due to the poor performance of exports, which went down from 28 percent of GDP in 1990/91 to 16 percent in 1999/2000 (World Bank, 2001).

Egyptian exports comprised mainly depleting resources such as fuel, minerals and metals, while exports of manufactured goods did not exceed 30 percent of total Egyptian exports. In addition, the share of Egypt's merchandise exports of total world exports in 1990 declined from 0.15 percent in 1980 to 0.11. They also reflected abundant natural resources and low-skilled labor intensity. Furthermore, the share of exports of unskilled-labor intensive goods declined from 31 percent to 24 percent of Egypt's exports, while the share of exports of capital-intensive products increased from 3 percent to 7 percent of total exports during the same period (Sakr, 2003), reflecting, once more, the cheap capital policy adopted by the government.

Table 6 shows that physical capital accumulation (in terms of acquisition of machinery, equipment, and buildings) explained about two thirds of economic growth, while human capital-adjusted labor explained one third. The contribution of TFP is insignificant, while capital deepening tends to be the main contributing factor to growth. In general, extensive growth, triggered by accumulation of factors of production, mainly physical capital, is observed rather than intensive growth, which evolves from technological developments or TFP growth. This result has been confirmed by a previous study (Kheir-El-Din and Moursi, forthcoming).

Table 6. Factors Contribution to GDP Growth in Egypt (1965-2000)

Period	Growth Rate (%)			Contribution to GDP Growth (%)		
	GDP	Human Capital Adjusted Labor	Physical Capital	Human Capital Adjusted Labor	Physical Capital	TFP
1965 – 1970	3.33	3.29	3.80	1.74	1.79	-0.2
1970 – 1975	3.48	3.04	6.24	1.61	2.93	-1.06
1975 – 1980	9.80	4.07	13.54	2.16	6.36	1.28
1980 – 1985	6.73	2.42	11.89	1.28	5.59	-0.14
1985 – 1990	4.22	3.37	6.45	1.78	3.03	-0.59
1990 – 1995	3.39	3.64	3.73	1.93	1.75	-0.29
1995 – 2000	5.72	4.65	6.88	2.47	3.23	0.02
1965 - 2000	**5.22**	**3.50**	**7.45**	**1.85**	**3.5**	**-0.13**

Source: World Bank. 2001. Egypt: Social and Structural Review, Middle East and North Africa Region, June 20, 2001.

During the second half of the 1990s, the share of investment to GDP increased by 5 percent and reached an average of 22 percent of GDP in 1998; however, this share did not

reach the high levels attained during the second half of the 1980s, which amounted to 30 percent of GDP. At the same time, the share of savings to GDP declined and reached 12 percent by the end of the 1990s (World Bank, 2003). This modest rate of savings was mainly attributable to the decline in public savings affected by the growing budget deficit and the slow pace of privatization. Moreover, the private corporate sector savings declined due to the recession and to discouraging policies that inhibited savings for re-investment purposes. Household savings declined in response to inflationary pressures and meager interest rates on deposits and banks certificates. The government depended mainly on exogenous resources to finance the savings-investment gap throughout the 1990s. However, from 1996/97 these resources shrank, constraining investment growth (Sakr, 2003).

This period witnessed a decline in external resources due to a lower inflow of workers' remittances, the poor performance of the export sector, and restricted external borrowing. Unemployment rates remained high and Egypt continued to rely heavily on exogenous resources to finance domestic expenditures, which increased the vulnerability to external shocks. This period was characterized by a low level of domestic savings and investment and a slow accumulation of human and physical factors of production. For these reasons DTFP declined sharply.

Table 7. Saving – Investment Gap

Period	Share of Gross National Savings in GDP (%)	Share of Gross Domestic Investment in GDP (%)	Savings-Investment Gap (%)
1993/94	24.0	16.6	7.4
1994/95	20.1	6.2	3.9
1995/96	16.9	16.6	0.3
1996/97	16.9	17.6	-0.7
1997/98	16.7	21.5	-4.8
1998/99	17.2	21.6	-4.4
1999/2000	16.3	19.6	-3.3
2000/01	16.3	18.3	-2.0
2001/02	14.9	18.1	-3.2

Source: Sakr, 2003

Human Capital.

During the 1950s and 1960s, the government made an extensive effort to expand access to education, focusing mainly on increasing secondary and tertiary education.

This policy was in line with the guaranteed employment strategy that the government had adopted. These policies were geared to fulfilling the requirements of an inward-market oriented economy. The education and public employment policies negatively affected human capital and consequently contributed little to raising productivity (Table 8). The main target of education policies in this period was to ensure a supply of government employees; they therefore concentrated on secondary and tertiary education, instead of increasing basic education, like most countries at the same level of development. Consequently, the educated labor force was trapped in public sector and government jobs since they received training geared to these positions. These employees were not suitable

for fulfilling private sector requirements. Even after the guaranteed employment policies were abandoned in the 1990s, the same education policies were adopted and labor productivity continued to be low. In addition, rates of return on vocational secondary schools and post-secondary higher institutes were low in the private sector, because the government failed to absorb the increase in the supply of graduates at this educational level, while the private sector refused to hire them due to their low level of skills (Assaad, 2002).

The principal role of the Egyptian government as the main employer of university and secondary schools graduates negatively affected the structure and the functioning of the labor market from the 1960s onwards. These policies resulted in expansion and overstaffing in the public sector. Public sector firms were obliged to hire labor, even if it was in excess of their requirements. Moreover, they were forced to hire all university graduates and those who fulfilled their military service. Consequently, the public sector suffered from a large proportion of its workers being illiterate and unskilled, while the rest of its labor force consisted of university graduates with few technical skills. These policies resulted in a negative marginal productivity of labor, since these overstaffed public firms did not contribute to an increase of output. "The ILO estimated that between 1960 and 1976, 750,000 jobs were created in excess of employment requirements" (World Bank, 1983).

Table 8. Labor Share in Gross Domestic Income, Wage Rate per Hour and Marginal Product of Labor

Year	Labor's Share in GDI	Wage Rate per Hour (LE)	Marginal Product of Labor*
1960	0.346	0.060	0.027
1961	0.275	0.052	0.028
1962	0.291	0.058	0.029
1963	0.356	0.080	0.031
1964	0.520	0.078	0.031
1965	0.353	0.067	0.027
1966	0.334	0.069	0.028
1967	0.325	0.072	0.030
1968	0.348	0.070	0.029
1969	0.330	0.071	0.029
1970	0.324	0.063	0.028
1971	0.427	0.086	0.028
1972	0.474	0.086	0.028
1973	0.481	0.086	0.028
Average for the entire period	0.358	0.071	0.029

Source: Hadely, 1979

* Marginal product of labor (MPL) is derived by differentiating the Cobb-Douglas production function $Q = A K^{\alpha} H^{(1-\alpha)}$ with respect to labor (Q = aggregate output measured in terms of national income at factor cost, K is capital stock in value terms, and H is labor input measured in man-hours). $MPL = dQ/dH = A (1-\alpha)(K/H)^{\alpha}$ (Data sources and coefficients' estimates are explained in details in *Hadely, 1979)*

At the same time, the market for skilled labor suffered from a serious shortage of workers, especially in the construction and manufacturing sectors (Table 9). There was an increasing scarcity of agricultural workers as a result of pull factors from external migration, government guaranteed employment schemes and military conscription.

Table 9. Distribution of Labor by Industry, 1960 - 1976

Industry	Number of Persons (000)		Annual Growth Rate, Compound (%)	Shares in Total Employment	
	1960	1976		1960	1976
Agriculture, fishery	4,406	4,881	0.6	56.3	43.9
Mining, quarries	21	34	3.0	0.3	0.3
Manufacturing	647	1,369	4.7	8.3	12.3
Electricity, gas	17	62	8.3	0.2	0.6
Construction	159	425	6.3	2.0	3.8
Trade	691	861	1.4	8.8	7.7
Transportation and communication	260	482	3.9	3.3	4.3
Financing	72	88	1.2	0.9	0.8
Services	1,333	1,868	2.1	17.0	16.8
Not adequately described[/1]	225	1,060	10.1	2.9	9.5
Total[/2]	**7,831**	**11,130**	**2.2**	**100.0**	**100.0**

Source: ILO Report, 1982.
[/1] Including unemployed.
[/2] Including military conscripts.

Another aspect that reveals the distortion and imbalances in the labor market relates to the wage structure of workers in different sectors (Table 10). During the second half of the 1960s and early 1970s, agricultural and government wages were static and were declining in real terms. Wages in the construction sector were much higher, due to the scarcity of labor. In general, employment and wage policies during this period did not reflect the contribution of labor in GDP growth and negatively affected DTFP.

Table 10. Sectoral Wages, 1966 and 1975

Sector	Average Daily Wages			
	1966		1975	
	PT	Index	PT	Index
Agriculture, men	25	100	46.5	100
Construction, excavators, men	25	100	100.0	215
Manufacturing industry				
Public	70.5	282	105.1	226
Private	46.5	186	85.9	185
Government	103.3	413	127.9	275

Source: ILO, 1982.
NB. It is assumed that employees in the manufacturing industry work 6 days per week and government employees 300 days per year.

During the inter-war period (1966-1973), the government did not change its employment policies and continued to absorb the new entrants to the labor market in public administration and public sector firms (Table 11). From 1966 to 1973, the annual growth rate of government employment was almost 7 percent.

Table 11. Distribution of Labor by Industry, 1971 – 1979 (Age 12 to 65)

Industry	Number of Persons (000)		Annual Growth Rate, Compound (%)	Shares in Total Employment	
	1971	1979		1971	1979
Agriculture, fishery	4,469	4,002	-1.4	54.2	41.8
Mining, quarries	7	23	15.5	0.1	0.3
Manufacturing	1,030	1,532	5.0	12.5	16.0
Electricity, gas	26	66	12.4	0.3	0.7
Construction	193	448	11.1	2.3	4.7
Trade	797	918	1.8	9.7	9.6
Transportation and communication	323	488	5.3	3.9	5.1
Financing	83	117	4.3	1.0	1.2
Services	1,269	1,820	4.6	15.4	19.0
Not adequately described	54	150	13.6	0.7	1.6
Total[/1]	**8,252**	**9,565**	**1.8**	**100.0**	**100.0**

Source: ILO Report, 1982.
[/1] Not including military conscripts.

During the open door era, private sector firms enjoyed many privileges which public sector firms were deprived of. While public sector firms suffered from over-staffing, private sector firms attracted skilled and qualified technical labor, leaving behind the unskilled workers and new entrants into the job market for employment in the public sector. In 1978, only 11 percent of middle management, 9 percent of lower management and 7 percent of clerical and minor administrative personnel moved from public to private sector firms (Ayubi, 1991).

With the beginning of the oil boom in the mid-1970s there was an increasing wave of temporary labor migration[9]. The number of temporary migrant Egyptians to the Gulf countries increased from 0.25 million in 1970, to 0.5 million in 1975. The educational attainment of labor migrants was estimated to be about one year higher than non-migrants in the mid-1980s. The reduction in the human capital stock due to the brain drain is higher than that of temporary labor migration, since the vast majority of the brain drain consisted of highly qualified persons. "In response to increasing educational attainment in the population at large, the reduction in human capital stock due to the brain drain declined in years of educational attainment per capita, from 16.5 in 1960 to 15 in 1975, 14 in 1985 and 13 in 1995. However, the quality of the human capital stock lost due to the brain drain is likely to be much higher than average." The number of temporary migrants reached 1.75 million in 1990, 0.75 in 1991 and 1.25 in 1995 (Fergany, 1998).

[9] Growth slowed down in the late 1980s and the second Gulf war caused a massive wave of returned migrants in the late 1990s1990s.

The enrollment rates achieved at various levels of schooling and higher education reveal that Egypt is well endowed with human capital. It ranks higher than other newly industrialized countries (NICs) at the secondary level and is ahead also at the tertiary level. However, it falls behind these countries in terms of enrollment in technical fields. The most interesting observation relates to the fact that Egypt did not suffer from a shortage of high-level technical manpower, since it enjoyed a high level of enrollment rates in engineering schools. Nevertheless, as was mentioned before, Egypt's exports of engineering machines and equipment were very modest. However, the enrollment figures might be misleading as they represent only one side of the story. The other side seems to be more important as it relates to the content and quality of technical education, which was not consistent with modern industrial needs. It seems that foreign firms suffered from a lack of middle-level managerial personnel and skilled technical workers. They depended mainly on expensive expatriates to fulfill the more sophisticated jobs.

Moreover, vocational training lagged far behind. In general, Egyptian industry suffered from a lack of skilled and experienced workers, which led to the increase in turnover rates. This could explain why private sector firms did not invest much in long-term training programs that could raise workers skills. At the same time, the government did not provide an alternative and was never involved in training programs tailored to the direct needs of different industries nor flexible enough to adapt to the speedy technological changes (Lall, 1996).

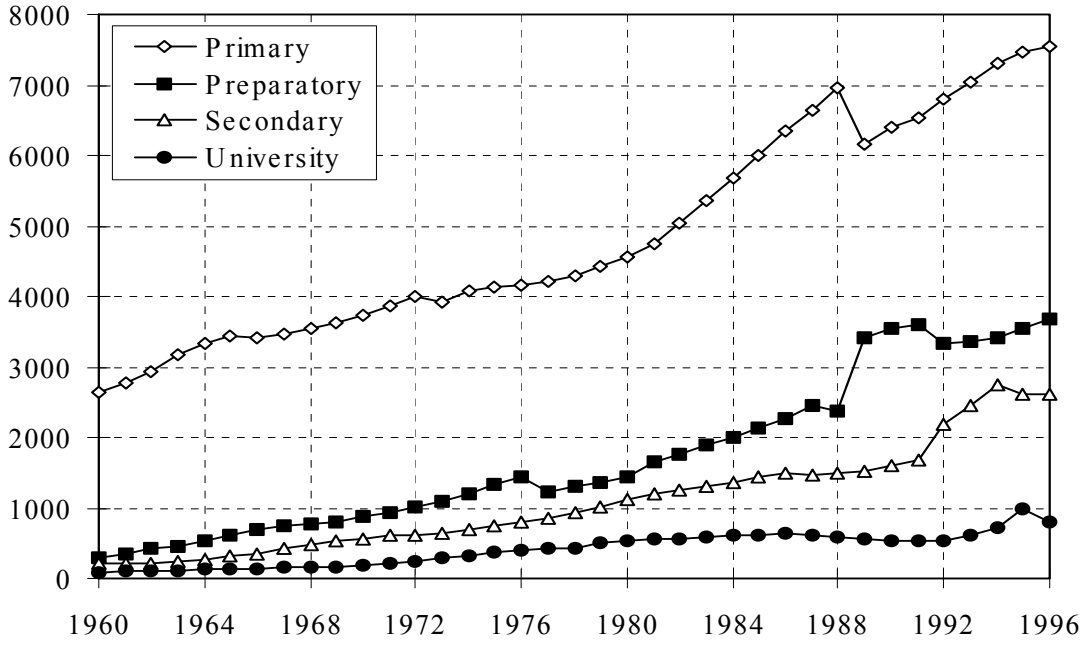
Table 12. Skills for Technology Development

Country	Numbers enrolled as % of age group						Enrolments in tertiary technical education			
	Primary		Secondary		Tertiary		All technical fields		Engineering only	
	1970	1990	1970	1990	1970	1990	Number	% of population	Number	% of population
Egypt	72	98	35	82	18	19	66610	0.12	42354	0.08
Turkey	110	110	27	54	6	14	142446	0.26	96633	0.17
Morocco	52	68	13	36	6	10	70933	0.28	2275	0.01
Tunisia	100	116	23	45	5	9	13939	0.17	4792	0.06
Indonesia	72	117	12	45	1	10	137324	0.08	109472	0.06
Malaysia	90	93	28	56	2	7	26026	0.15	12693	0.07
Korea	101	108	35	87	6	39	410929	0.96	249919	0.58

Source: Lall, 1996

Egypt suffered from low enrollment rates in basic sciences, engineering, medicine, and other scientific subjects. There was also a shortage of graduates of intermediate technical institutes. Despite a low labor cost, Egypt suffered from an uncompetitive position with respect to value added per worker in the manufacturing sector (Handoussa, 2004).

Figure 10. Enrolment by stage of education, 1960-1996



Source: Fergany, 1998

2.3 Institutions, Integration and Invariants

This factor is more relevant to explaining DTFP in the 1990s. It is also irrelevant to talk about integration in the world economy before this time. For decades, Egypt adopted import substitution and inward-looking strategies and did not take significant comprehensive measures to liberalize its trade regime until the beginning of the 1990s. Tariff rates were lowered and several quantitative restrictions were removed.

In addition, it established several free trade agreements with its major trading partners. However, Table 13 reveals that there was room for more improvement in terms of openness. Egypt lagged behind many developing countries, and neighboring MENA countries such as Tunisia, Morocco and Turkey. Moreover, its share of international trade declined sharply: its share of world exports fell from an average of 0.14 percent over 1980 – 1989 to only 0.08 percent on average during 1990-1999, while its share of world imports, although higher than its share in exports, declined from 0.45 percent in 1980-1989 to 0.25 in1990-1999 (World Bank, 2001).

Table 13. Trade Openness Indicators in Egypt Compared to Other Developing Countries in 2001

Country	Total exports (% of GDP)	Manufactured exports (as % of merchandise exports)	Manufactured imports (as % of merchandise imports)
Egypt	**17.6**	**32.7**	**55.3**
Morocco	30.4	64.1	62.9
Tunisia	47.6	77.0 (2000)	75.6 (2000)
Jordan	44.2	66.0 (2000)	62.3 (2000)
Indonesia	41.1	56.4	61.1
Malaysia	116.3	80.1	83.1
Brazil	13.4	54.3	75.3
Estonia	90.6	75.2	77.8
Croatia	46.7	73.2	74.2

Source: World Bank, 2003.

Table 14 depicts the evolution of trade performance during the period 1990-2000. Despite the increase in petroleum exports in 2000, the decline in imports negatively affected the total trade turnover.

Table 14. Evolution of Trade Indicators (1990 – 2000)

	1990	1994	1995	1996	1997	1998	1999	2000
Exports of goods (in US$ billions)	2.6	3.5	3.5	3.6	3.9	3.5	3.6	4.8
Petroleum Exports (in US$ billions)	0.8	1.4	1.3	1.8	1.8	1.3	1.3	2.1
Imports of goods (in US$ billions)	9.2	9.6	11.8	13	13.2	16.5	16	14.1
Ratio of exports to imports (%)	28.1	36.7	30	27.8	29.7	21.3	22.4	34.4
Openness (%)	13.7	12.6	12.7	12.3	11.3	12.1	10.6	9.6

Source: World Bank, 2001

Openness is defined as the percent of trade turnover divided by GDP.

Moreover, the composition of Egypt's exports reveals it was not diversified, but concentrated in a very limited number of products, namely, petroleum and petroleum related products, food and agricultural products, industrial supply and raw materials. Although, the level of processing of exports might reveal the progress in industrialization

of a country,[10] a close look at Egypt's basket of exports during the 1990s shows that the level of processing was very moderate and that it did not improve.

Other factors that negatively affect productivity include customs procedures, administrative controls and quality controls. Customs procedures are cumbersome and despite many reform measures undertaken to ease these procedures, they are still very complicated and time consuming. Moreover, it is estimated that these procedures impose additional cost equal to a 15 percent tariff and take about 11 days, on average, to be implemented. In addition, these procedures include several inspections and reviews (World Bank, 2001).

Egypt is applying very elaborate quality control standards that do not have an equivalent in international standardization. These complicated rules cover over 400 product categories. In addition, the estimated cost added by these barriers amounts to 5 – 50 percent of the cost of imports. These regulations reduce market contestability and add to the business barriers faced by domestic and foreign investors more than protecting consumers from hazardous products (Kheir-El-Din, 2000).

The following table indicates the ranking of public institutions performance according to the World Competitiveness Survey in 2003 – 2004,

Table 15. Public Institutions Indicators (2003 – 2004)

Indicator	Rank of Egypt in 102 countries
Irregular payments in public utilities	84
Irregular payments in tax collection	66
Judicial independence	59
Property rights	58
Irregular payments in exports and imports	54

Source: WEF, 2004.

2.4 Competition, Social Dimension and Environment

One of the main objectives of the 1952 Revolution was to establish social justice among different classes. In order to achieve this objective several measures were undertaken; including the implementation of the Agricultural Reform Law, which aimed at redistributing Egypt's agricultural land more equitably, and providing free schooling at all levels of education. By the end of the 1960s, Egypt was committed to a welfare state and consequently was responsible for providing a minimum standard of living, which entailed applying large price reductions for several goods and services. In addition, the government was committed to employment policies and to the enforcement of a higher minimum wage rate and better working conditions (World Bank, 1983).

The government exerted severe price control in order to realize more equitable income distribution and efficient resource mobilization. However, price controls and subsidies

[10] In some cases it does not, if the domestic market is more attractive than exporting.

created market distortions, which harmed all sectors and negatively affected allocative efficiency. Moreover, energy prices were highly subsidized and petroleum prices were below world prices. These large subsidies encouraged widespread resource misallocation and directed investments to energy-intensive economic activities (World Bank, 1991) (e.g. large investments in the production of fertilizers and aluminium).

As mentioned before, Egypt adopted a comprehensive stabilization program, starting in 1991/92, which concentrated mainly on the fiscal deficit, the exchange rate, and the interest rate. In fact, during the period 1990/91 – 1997/98, the budget deficit was reduced from 18.5 percent of GDP to only 1.0 percent. This decline was the outcome of an increase in revenues and a decline in expenses. Revenues increased mainly through higher valuation of imports associated with a severe devaluation of the Egyptian pound, the increase in Suez Canal revenues, and the introduction of a sales tax in 1991/92. Government expenses declined by 11 percent of GDP during the same period. The cut in expenses was mainly attributed to a sharp decline in government investment, which was compensated for by the encouragement of private participation in infrastructure investment. In addition, subsidies were reduced from 5.2 percent to 1.6 percent of GDP, and were limited to only four food items. A major reduction of expenditure was the debt service forgiveness that Egypt received (World Bank, 1999).

In order to reduce the short run adverse effects of ERSAP, Egypt established the Social Fund for Development (SFD) in 1991, which started functioning in 1993. The main objectives of SFD were to protect and improve the status of vulnerable groups, such as the poor and the unemployed, during the transition period. SFD promoted income and employment generating activities, provided basic social services and increased local participation and awareness. During its first phase (until 1996), SFD succeeded in achieving its goals, such as establishing 35 thousand illiteracy classes with almost 700 thousand pupils enrolled, and created 35 thousand temporary jobs for youths teaching in these classes. It also extended credit to 37 thousand borrowers, offered vocational training to 11 thousand persons, and trained 5 thousand unemployed to meet market demand. SFD's achievements in local and, particularly, rural infrastructure were commendable. The same thing can be said about phase two of SFD (1996-2000), as it extended the line of credits it offered to borrowers. Vocational training was increased and important developments achieved in local infrastructure.

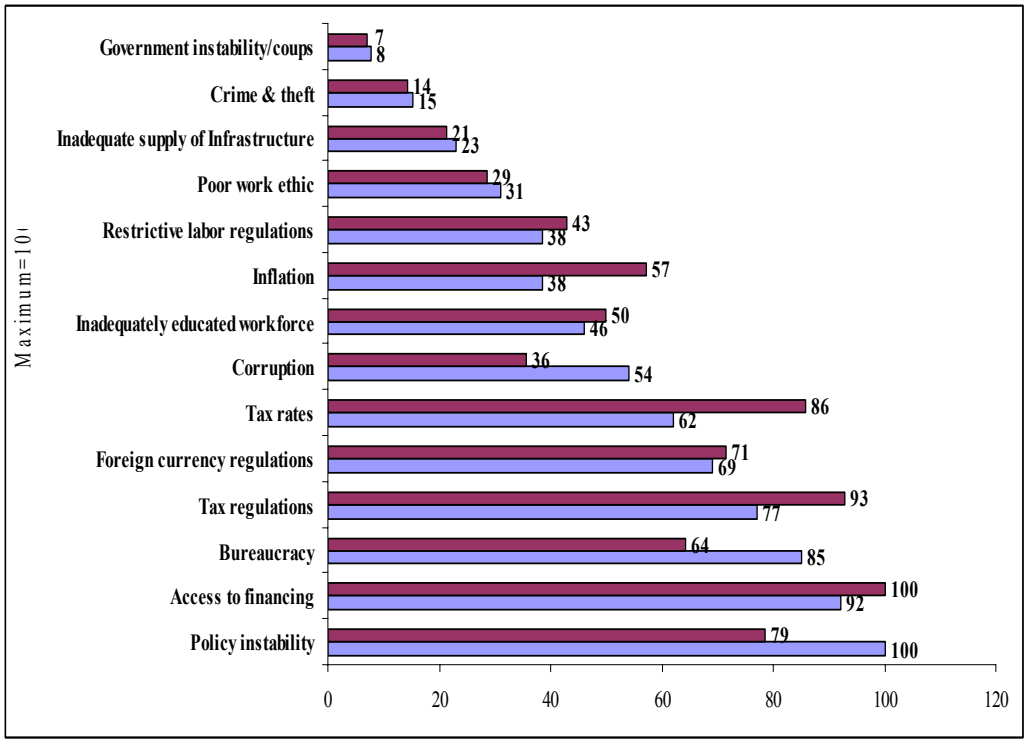
In general, the government remained committed throughout the 1990s to a generous social expenditure program, despite strict fiscal austerity. However, the efficiency of social sector spending left room for improvement, especially in education and health.

These social services were not restricted to the poor; high income groups also benefited from them, which left a lot of scope for improving the distribution of these expenditures through better targeting (World Bank, 2001).

Another aspect that relates to the institutional setup that affects DTFP is domestic market contestability. In fact, domestic demand was the main stimulus for growth during the last decade and is expected to continue for the coming decade or so. Domestic firms do not have sufficient incentives to integrate in the world market and are still lacking fair competition from imports in their domestic markets. Although improved, the business environment is still restraining, and the cost and the time needed to establish and run a business in Egypt are discouraging. Figure 11 shows the ranking that private sector firms gave to business constraints hindering their performance in the Egyptian market.

The delay in ratifying important laws such as the Competition Law, which took seven years of discussions before being approved in 2005, reduces the contestability of the Egyptian market.

Figure 11. Ranking of Business Constraints in Egypt (2003 – 2004)



Source: WEF, 2004 and 2005.

According to the latest data available on poverty estimates, it appears that the ultra poor was estimated at 19.4 percent of the population in 1995/96. This fell to 16.7 percent in 1999/2000. Income inequality, measured by the Gini coefficient, declined in rural areas but increased in urban regions (Table 16). However, poverty in Egypt is shallow, as reflected by the low poverty gap. This implies that marginal changes in income would have great effects on poverty. More specifically, the moderate growth in income in rural areas during the period under investigation moved a large proportion of the poor above the poverty line.

Table 16. Development of Poverty Indices (1995/96 and 1999/2000)

	1995/96			1999/2000		
	Urban	**Rural**	**All**	**Urban**	**Rural**	**All**
Headcount (in % of sector's population.)	11.02	24.8	19.41	9.21	22.07	16.74
Poverty Gap (in %)	2.00	4.29	3.39	1.72	3.86	2.97
Poverty Severity Index	0.55	1.14	0.91	0.50	1.01	0.8
Gini Index	0.34	0.24		0.37	0.23	

Source: World Bank, 2002.

Several studies indicated that the poor are characterized by being less educated, with much higher illiteracy rates and have very few assets. In 1997, it was estimated that the unemployment rate among the poor was 14 percent, while it was 12 percent among the non-poor.

In order to avoid the complication of using monetary indicators to compare Egypt's level of poverty with other countries, we used non-monetary indicators such as health and nutrition. These indicators show that Egypt compared poorly with similar lower middle-income countries (Table 17). For instance, 6 percent of children under the age of 5 years died each year, 25 percent were undersized and 12 percent suffered from malnutrition. In addition, the illiteracy rate remained very high. In 1999, more than 45 percent of adults were illiterate as were 31 percent of the young (15 – 24 years old). The public sector had, for a very long time, played a crucial role in providing the poor with their basic needs. Even after the adoption of ERSAP, Egypt's commitment to these socially vulnerable groups did not cease. However, there is still room for improving the life conditions of these groups through public expenditure on health and education.

Table 17. Comparison of Selected Social Indicators

Country	**Mortality Rate (Under 5 years)**	**Life Expectancy at Birth (in years)**		**Young Adult Illiteracy Rate**	
		Male	**Female**	**Male (% males 15-24)**	**Female (% females 15-24)**
Egypt	61	65	68	24	38
MENA	56	67	69	13	24
World	78	65	69	--	--

Source: World Bank. 1991.

It is worth noting that, despite all government efforts to liberalize the economy and to stimulate the private sector, the government was still committed to the goals of the welfare state and tried hard to control prices, wages and employment. As a result of the open door policy and the inherited policies of the 1960s, the government continued to provide basic commodities at subsidized prices. This created a kind of dualism; part of the economy was functioning according to market rules, while the other part wad

dominated by socialist norms. At the same time, part of the economy enjoyed higher flexible prices, high profits and productivity, while the other part continued to suffer from low and rigid pricing and low productivity and incomes. These two economies enjoyed different levels of factor productivities and incomes (World Bank, 1983).

2.5 Issues Specific to Egypt

The issues specific to Egypt relate mainly to the effects of the 1967, the 1973 and the Gulf wars, the impact of foreign aid, and the lack of entrepreneurship of its educated class.

The Egyptian economy faced many difficult challenges after the 1967 war. The defense budget absorbed a large share of funds that were supposed to be used to increase productive investment. During this period, the government failed to provide the basic requirements of the industrial sector, especially their requirements of foreign exchange. The eagerness and enthusiasm that characterized the first half of the 1960s was replaced by feelings of despair.

Moreover, the government failed to achieve the goals of the 1965-1970 five-year plan, due to lack of finances, as the US withdrew all financial aid and the Soviet Union refused to open new credit lines; moreover, the Sinai occupation and the closure of the Suez Canal after the 1967 war led to a period of recession. The five-year plan was replaced by annual development plans (EIU, 1994).

After the 1967 war, the Egyptian economy suffered from the cost of the defeat and also from the cost of military expenses undertaken to prepare for the next war to recuperate its occupied territories. Suez Canal revenues had ceased, and domestic savings declined, reaching 8 percent in 1967/68. In the following years, savings increased moderately to 10.6 percent in 1969/70 while gross investment reached 12 percent of GDP in 1969/70. The priority was to recover the occupied land at the expense of deepening industrialization. As a result, the growth rate declined tremendously and reached unprecedented levels of 0.6 percent and 0.7 percent in 1966 and 1967 respectively (Mabro, 1974).

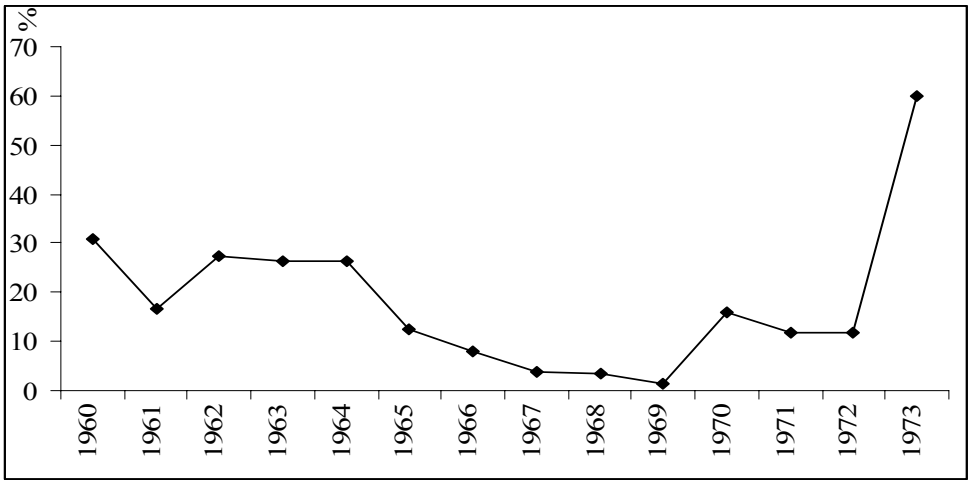
A comparison between the index numbers of production in manufacturing, mining and agriculture during the 1960s reveals a large expansion of output of manufacturing relative to the two other sectors. In addition, the index number of manufacturing production increased from 62 in 1960 to 211 in 1968, while that of agriculture decreased from 127 to 114 during the same period. The index number of employment in manufacturing increased from 100 in 1960 to 132 in 1963, emphasizing the increase in the relative importance of industry during this decade. (UN, several issues). The relative share of industry in GDP amounted to 18 percent on average, while the shares of construction and trade were 5 percent and 7 percent respectively (NPI, 2000). The manufacturing sector growth rate reached 9 percent, and the share of exported manufactured goods came to 23 percent of exported consumption goods (Soliman, 1997).

The economy recovered during the last few years of the 1960s and the early 1970s. This recovery could be attributed to the increase in foreign aid, particularly from Gulf

countries. Figure 8 shows that foreign aid increased from 4 percent of capital formation in 1967 to almost 60 percent in 1973. In addition, the government allowed the private sector to use foreign exchange resources provided outside the banking sector to finance imports[11]. This concession was granted to allow private sector firms to use the foreign exchange resources that they got from their exporting activities to finance imports of intermediate inputs, especially those that the government could not finance through official banking resources (Al-Sayyid, 2004).

During the period 1967-70, the average growth rate of GDP, at constant prices, was 3 percent for agriculture, 11 percent for construction, 9 percent for transportation and communication, and 9 percent for the industrial sector. This shows, however, that despite the decline, the level of industrial growth was relatively high compared with other sectors (UN, several issues). During the inter-war period, public sector firms were able to survive and to secure Egypt's basic needs with very little support from the government. For this reason, the public sector was considered the main stimulus for economic growth and was appreciated as the indispensable backbone of the Egyptian economy. However, by the late 1960s, the government began to question the efficiency of the public sector and its ability to promote economic development, and in May 1971 new policies were adopted to attract foreign capital to invest in Egypt, and to ensure the free movement of domestic capital. Meanwhile, the public sector established connections with the private sector through subcontracts in order to benefit from the efficiency gains of small-scale factories. Moreover, SMEs were encouraged to survive through establishing linkages with the public sector and creating marketing cooperatives and training centers for different skills (Ayubi, 1991).

Figure 12. Share of Foreign Aid to Capital Formation (1960 – 1973)



Source: World Bank, 2003

The first law for Arab and foreign investment was issued in September 1971 (Handoussa, 1990). Following the October war oil boom, prospects of Arab investments encouraged the state to adopt more liberal economic strategies. Egypt also reoriented its foreign policy towards increasing political and economic relations with the West in view of deteriorating economic relations with, and confidence in the Eastern bloc (Ayubi, 1991).

[11] This concession resulted in the expansion of a parallel market for foreign exchange and was a direct cause of the loss of huge amounts of these scarce resources during the 1970s and early 1980s.

The victory that Egypt achieved in the 1973 war was a turning point not only on the international front but also domestically. After a long period of war culture dominance, it was time to concentrate on promoting economic growth (Ayubi, 1991).

During the early 1970s, oil prices increased as a result of the 1973 war, worker remittances and foreign aid flows increased, and Suez Canal earnings and tourism revenues boomed (these were known as the big four). Egypt made good use of the opportunity provided by large increases in oil surpluses in Arab countries. The FDI inflows received since the mid-1970s as a result of adopting the open door policy exceeded what was expected for a highly protected economy, due to its large market size and to benefits from the relatively friendly business environment that was created at the time.

The period 1980-1990, however, witnessed heavy macroeconomic imbalances. These may be attributed mainly to the decline in foreign resource inflows along with the government's continued generous spending to finance infrastructure development and upgrading, and to provide for social spending and subsidization to ensure higher living standards for the population. The fiscal deficit widened to exceed 20 percent of GDP; the current account deficit reached 10 percent of GDP; inflation accelerated to over 20 percent; and foreign debts increased tremendously. The financial sector suffered from segmentation, lack of competition, subsidized credit allocations, negative real interest rates, and overvalued exchange rates. In addition, external resources declined sharply following two oil crises. In 1982, the government initiated a new five-year plan to promote exports and reduce private consumption and imports in order to address the large trade deficit. This plan was followed by another five-year plan for the period 1987-1992, which aimed at achieving economic stability, debt reduction, and the promotion of exports and the role of private sector firms in raising economic growth. New roles were assumed by the private sector, namely, encouraging tourism, exploiting gas, enlarging the Suez Canal and expanding electrical power generation. This plan was unrealistically ambitious because of reduced sources of finances even before the Gulf Crisis in 1990 (World Bank, 1997).

Despite extensive efforts by the government to encourage the private sector in Egypt, its share in investment was only 60 percent. This could be explained by the lack of entrepreneurial spirit, particularly among the new entrants to the labor force who were still hoping for a government secured job opportunity. In addition, businessmen were often not well perceived by society, due to the incidental misconduct of some of them. More importantly, new projects found it more difficult to get banking finance than did existing projects.

In conclusion, the inward looking strategy, price controls, limited and irregular inflows of foreign direct investment, and the education and public employment systems hindered the creation, transmission and absorption of knowledge and were the main reasons for the decline in DTFP. It is understood that DTFP is positively affected by flows of aid, inflows of FDI and trade liberalization. However, FDI did not create the expected spillover effects of technological development. Despite ongoing efforts to liberalize trade and to integrate Egypt into the world economy, more reform measures are needed to promote exports. Human capital represents a major determinant of DTFP. More attention

should be given to training and to demand-driven education policies that take the market needs of the labor force into consideration.

III. Policies affecting productivity

Based on the previous analysis of determinants of productivity, and in light of successful countries' experiences in promoting productivity and enhancing competitiveness, discussion of relevant policies will be undertaken. The implications of such government policies for the aggregate economy in general and the manufacturing sector in particular will also be considered.

Egypt's economy has been shown to have been traditionally highly protected. The government has supported activities and firms that are not necessarily the most productive, efficient and viable. Support has been given to various entities based on criteria such as past performance, expected externalities, strategic importance and potential social contribution. Such criteria are not necessarily a good indication of future efficient performance in a liberalized and globalized environment. The structure of incentives has to be revised to support activities and firms according to their contribution to a set of new criteria related to desired targets such as growth, and the generation of exports and employment in the new environment. Efficiency has to be encouraged in a competitive environment and within a sound macro economic framework. Easy access to skilled labor, appropriate technology, finance, quality telecommunications and transport services at world prices, reliable infrastructure, and a transparent and supportive institutional framework are all required to achieve productivity growth and sustainable development.

A prerequisite for productivity enhancement is to provide a stable macroeconomic environment and a trade regime that favor exports and attract private investments. Just as important are the stability and credibility of the policy framework. Egypt's economy, after suffering from a recession which extended from 1997 to the beginning of 2004, is starting to show signs of improvement. After a series of minor devaluations followed by a major one associated with an announced flotation of the exchange rate in January 2003, the exchange rate started to stabilize, improving export profitability. Egypt has finally started to implement structural reforms including attempts at institutional reform, a proposed tax reform, and an actual revision of the tariff structure aimed at reducing its dispersion and level. It seems that the recently appointed cabinet has finally realized that the most important export incentive is to provide inputs at world market prices to exporters, so long as they sell their outputs at such prices.

Although it has been persistently repeated, since the adoption of the open door policy in 1973, that Egypt's economic policy is focused on promoting exports and attracting foreign direct investment (FDI), none of these objectives has been significantly achieved. Exports have shown signs of improved diversification (Kheir-El-Din, 2001) but their level remains modest. FDI is far below expectations and remains concentrated in petroleum and telecommunications. The main factor behind this lagging performance is the absence of a coherent industrial policy which would enhance productivity by enlarging supply capacity in exportables and by improving the investment climate. Based on the experience of Asian countries, and considering Egypt's specificity, the main elements of industrial policy would include raising local technological effort, skills development, SME support, and institutional reform for productivity enhancement.

3.1 Raising Local Technological Effort

The largest share of Egypt's domestic investment in technology research and development (R&D) is made by the government through state-owned research institutes and academic centers. The Academy of Scientific Research, under the Ministry of Higher Education and Scientific Research, the Ministry of Foreign Trade and Industry, the Ministry of Agriculture, the Ministry of Housing, Utilities and New Communities, the Ministry of Irrigation and Water Resource all have centers that offer R&D services. In the area of industrial design and technology development, specialized organizations under the Ministry of Foreign Trade and Industry, such as the Industrial Design Development Center, the Organization of Standardization and Measurements, and the Industrial Monitoring Authority, receive state funding to invest in laboratories, quality control research and testing. In 2004, spending on scientific research and technological development was reported to have reached 0.9 percent of GDP, compared to 2.5 to 3.5 percent in advanced industrial countries (statement of the Minister of Higher Education and Scientific Research in the Shura Council Committee on Education, Scientific Research and Youth, November 7, 2004).

The quality of research and training provided by these public entities in Egypt is reported to be of little use to production units, the facilities being outdated and lacking financial resources and appropriate incentives.

The main problems encountered in the area of scientific research and technological development are reported (Shura Council, 2005) to be:

1. The absence of a clearly announced statement of a national policy of scientific and technological research associated with the national development plan and particularly with a clear vision of industrial policy.

2. Lack of coordination between research centers and institutes on the one hand and production sectors on the other. This leads to duplication of activities in certain areas and gaps in others, resulting in wasteful utilization of the scarce resources available.

3. The complex organizational structures and procedures of these research entities. This subjects research activities to bureaucratic hindrances, resulting in unnecessary delays in implementation.

4. The management of most research institutes and centers as academic units which set their research agenda without consultation with prospective users of their output. This results in irrelevant research outcomes, low return on scientific research, and lack of confidence on the part of investors and producers in the necessity and relevance of research.[12]

5. Lack of incentives for researchers. They follow the government employees' modest payment scales and are subject to promotion requirements unrelated to innovative

[12] This however does not apply to research institutes and centers directly related to some ministries such as the Agricultural Research Center and its affiliated institutes, the National Center for Water Research, the Center for Housing and Building Research and the Center for Research and Development of Metals.

performance. Furthermore, insufficient attention is given to evaluating their output in terms of quality and relevance.

6. A very modest contribution by the domestic private sector to research funding, product development and brand name creation. Firms operating in manufacturing tend to invest in turn-key projects and have little participation in adapting or developing technology.

An important factor explaining the lagging and irrelevant performance of these institutes and centers is that they were mostly created as central entities, funded and managed by the government independently of the production units which were to provide their main clientele. The creation of such research units was unaccompanied by other activities necessary to support the technology push, particularly engineering design and industrialization technology. They were further dependent on university academic staff who did not differentiate between academic and applied research.

The gap between Egyptian research and development entities and those in newly industrialized countries has been increasingly widening. Concerted action to address this gap is urgently required, and. the need to emulate other successful countries is compelling. International institutions such as UNIDO and UNCTAD could be supportive in this area. Acquiring, controlling, adapting and generating knowledge through national capacities is becoming the key to scientific and technological sustainable development. Egypt's objective should thus be to mobilize, organize and utilize all available scientific, research and innovative capabilities to implement such development. A plan of action to implement an overall strategy for scientific and technological development would include the following pillars (Shura Council, 2005):

1) **Planning for technological policy.** Based on successful experiences of other countries, the national plan should include a long-term vision of national technological development within which medium and short-term plans should be designed and implemented. The objective should be to fill the prevailing technological gaps, to catch up with world technological developments and to avoid such gaps arising in the future

.

The planned policy would not only regulate the relationship between producers and importers of technology; it should also regulate the relationship between prospective domestic developers of technology and potential users through promoting the need for such technology, providing incentives to use it, and supporting its potential returns.

Marketing of such technology is also necessary– Malaysia's Multimedia Super Corridor is a successful project that is worth looking at (Lall, 1999). The technological plan would be carefully linked to industrial policy and other developmental objectives.

2) **Restructuring and modernizing the current research and technological infrastructure in Egypt,** through appraising various centers and institutes in light of international standards, and upgrading their capabilities and organizational structure. Training researchers and administrators, and the provision of databases and information systems are also warranted. Egyptian scientists and experts abroad could significantly contribute to this effort, given appropriate incentives and the

establishment of linkages between them and national research centers. The technology infrastructure comprises the previously mentioned metrology, standards, testing and quality institutions, particularly those under the Ministry of Industry and Foreign Trade, the public research laboratories, the university system and the technical extension service for small and medium enterprises under the Social Fund for Development and others.

3) **Financing scientific research and technological development.** The major beneficiaries of improving the R&D infrastructure are producers of various goods and services. However, in the early stages of the drive for technological development, they are not expected to be willing to bear or even to contribute to funding the cost of this effort. The government should, therefore, provide the majority of the funds.

   UNIDO and WAITRO[13] could help in this endeavor as they have already put forward several proposals to streamline the management of R&D centers in developing countries and to increase their financial resources through private sector participation. The Egyptian government is currently considering creating a national fund to diversify the sources of finance of scientific and technological development. This fund – in addition to receiving government finance – would seek national private and international resources. It would target financing projects that enhance productivity through the technological development of products and processes, in addition to supporting the transfer and domestic adaptation of advanced technologies.

4) **Supporting reverse engineering within the TRIPs requirements.** Reverse engineering involves learning from prevailing technologies while preserving the intellectual property rights of the original owner of the innovation. It further allows innovative practices based on mastering prevailing technologies and then improving, developing and adapting them to current circumstances.

5) What productivity enhancement needs to focus on is the **level of technological capabilities within firms,** rather than just R&D. It is possible to evaluate and compare technological capabilities across firms by using benchmarking tools which combine quantitative and qualitative information to develop a technology index. The Appendix illustrates one way of doing this. It shows a series of indicators of technological competence that can be developed from relatively brief firm-level interviews.

An index could be constructed for each industry to appraise levels of technological activity and productivity. This would help in the analysis of required productivity support.

3.2 Education and Skills Development

Important strides have been made in providing access to formal education in recent years. Enrollment has risen significantly, from 61.3 percent in 1960/61 to 91.7 percent in 2000/01 at the primary level, and from 17.1 percent to 71.1 percent at the secondary level. The strength of the government's commitment is further reflected in the proportion of its

[13] The World Association of Industrial and Technological Research Organizations, an international non-governmental organization.

budget allocated to education. Whereas overall budget spending fell from 32 percent to 28 percent of GDP between 1994 and 1999, the share of education in GDP rose from 2.9 percent to 4.2 percent over the same period, with current expenditure increasing somewhat faster than investment expenditure. Even though this share is still lower than the 5.1 percent of GDP spent on education by the lower middle-income countries, it represents a substantial fiscal effort during a period of stabilization and general fiscal austerity (Egypt Country Profile 2004).

Nevertheless, the illiteracy rate, although declining from 47.7 percent of the labor force in 1988 to 32.8 percent in 1998, remains high compared to newly industrialized countries and a sustained effort is required to address this persistent problem.

The growth rate in secondary enrollment has fluctuated over the past three decades, rising by 6.6 percent p.a. in the 1990s. Furthermore, changes have been observed in the composition of secondary education between general and technical disciplines and among the branches of the latter, which showed several reversals over the 1990s and the early 2000s. These changes reveal great instability in education policy. Technical secondary graduates tend to enter the labor market at high rates but they fare very poorly in terms of employment and wages. It has been shown that the rate of return on technical education in the private sector is in fact negative, even without taking into account the high unemployment rates of technical secondary graduates[14].

The evolution of the number of graduates from the higher education system shows similar tendencies towards policy instability. The 1990s saw a rapid growth in the number of university graduates, which grew at a rate of 8.3 percent per annum. This rapid growth was biased towards the humanities and social sciences (9.0 percent per annum from 1990/91 to 2000/01) compared to all science disciplines (5.7 percent) (Egypt Country Profile 2004). The number of graduates from higher technical institutes, however, declined at a slow rate of -1.5 percent, with a high regression of -4.9 percent in commercial disciplines unmatched by a modest increase of 2.4 percent in industrial specializations. These developments resulted in these graduates having significant difficulties finding suitable placement in the labor market, particularly in that their skills composition did not match the private sector demand requirements.

Although ERSAP aimed at reducing public spending, the fastest growing sector (4.8 percent per annum) and the largest contributor to employment growth (41.8 percent of net job creation) in Egypt continued to be the government sector. The share of government employment increased from 22 percent in 1990 to 28 percent in 2001. These employees were trapped in low productivity but secure jobs, showing distinct underemployment. During the same period, the share of state owned enterprises (SOEs) in total employment fell from 9.7 percent to 5.9 percent, showing an average annual decline of 2.6 percent and reflecting the freeze on hiring, attrition and early retirement associated with ERSAP. Private sector employment grew modestly at 2.0 percent annually. However, the share of the private sector in total employment declined from 68 percent in 1990 to 66 percent in

[14] In 1998, vocational secondary industrial and agricultural schools graduates represented 11.7 percent of the total labor force and those of vocational secondary commercial schools represented 10.7 percent compared to 28.8 and 24.5 percent respectively of total unemployment.

2001. The share of both agriculture and manufacturing in total employment also fell. The activities of the private sector that grew most rapidly in the 1990s were finance, insurance and real estate, trade, restaurants and hotels, and construction, all of which are non-tradable activities constrained by the domestic size of the market and unable alone to create sustainable sources of income growth. Another distinctive feature of the Egyptian labor market in the 1990s was the significant informalization of employment. Employment in the informal sector was either made up of individuals working in small and micro enterprises and outside establishments or workers employed in the formal private sector without the protection of legal employment contracts and of social insurance coverage. Sixty-five percent of jobs taken up by new entrants to the labor market in the late 1990s were reported to be informal (Egypt Country Profile 2004). This increased informalization may be attributed partly to the high financial burden of rules and regulations of incorporation and partly to the high financial burden of social insurance on employers as well as the near impossibility of labor contract termination. Some of these issues will be addressed in the next two sub-sections.

It appears, therefore, that there is a considerable skills gap in new entrants to the labor force that has to be filled. Furthermore, the quality and relevance to industry of the education system has to be addressed. A massive improvement in skills is required if growth is to be sustained in the face of acute competition from cheaper countries (China and other countries in Asia). This would mainly require:

1) **Changing the orientation and structure of the university and higher education system** from a liberal arts and social science based one to a technically oriented one. This is a medium to long-term process that could be achieved through cooperation with well-established economies in this area (Germany, Japan and possibly Korea).

2) **Development of a strong industrial training system** is also warranted. In the short run, skills gaps could be addressed through providing firms with incentives to train their employees, particularly in basic operational skills. Upgrading of industrial training centers in major export areas (such as garments, textiles and weaving, food processing, and chemicals) has to be urgently addressed.

3) **Reforming secondary and higher technical schools** and upgrading their facilities is of the utmost importance. The active involvement of industrialists in deciding the curricula is essential to ensure its relevance to, and satisfaction of, labor requirements.

4) **A training levy on large and medium firms** may be considered to supplement the available public funds for this purpose.

3.3 SME Support and Development

The 1996 census of private establishments indicated that over 98.1 percent of those engaged in industry employed less than 10 workers, 1.1 percent employed between 10 and less than 50, 0.7 percent were of a medium size, employing between 50 and less than 500 employees, and 0.1 percent had over five hundred employees. The private sector in industry is thus primarily composed of micro and small enterprises (99.2 percent), while the large private sector accounts for a small share of employment within the category of large enterprises, which primarily includes large public enterprises (Shura Council internal report 2002).

A new law (141/2004) was issued in mid-2004 to support and develop SMEs, and making the Social Fund for Development (SFD) the coordinating body responsible for this task. However, the SFD lacks the necessary managerial and technical skills to enhance SMEs' development and to upgrade their productivity, particularly in manufacturing. An integrated plan to promote SMEs in manufacturing activity is warranted. Priority areas of action include:

1) **Developing human resources in SMEs.** In addition to the necessity of improving the relevance of the Egyptian education system and of enhancing training and skills development in general, specific training is required in the area of SME management. This would necessitate continuous training in technical, professional, administrative and organizational areas. Training in the management of financial risks - particularly those associated with foreign exchange fluctuations - is also necessary. Training should be required for start-up entrepreneurs as well as for newly engaged employees in such firms. Trainees should be required to pay modest fees to supplement the available public funds, and to ensure that they take the training seriously.

2) **Improving access to finance.** The main problems faced by SMEs in this area are related to the availability of appropriate collateral to secure access to the official credit market and to the provision of suitable terms of payments, including a grace period and repayment schedule. Successful schemes for providing finance to SMEs though NGOs, such as the Alexandria Businessmen's Association (ABA), or through banks, such as the National Bank for Development (El-Watany), should be expanded and emulated. Government support of such schemes is required, whether through the direct provision of public funds to the Industrial Development Bank (IDB), in addition to upgrading and modernizing its capabilities, or indirectly through the SFD. These funds should be preferentially directed to modernizing the machinery and equipment used by SMEs.

3) **Providing appropriate technology.** To support and develop the competitiveness of SMEs, it is necessary to provide them with appropriate technology, to enhance the interconnections between various manufacturing activities, and to maximize backward and forward linkages between such activities. It is also necessary to support dissemination of industrial designs and specifications to incorporate SMEs into the production chain of multinational firms as well as that of medium and large-scale domestic establishments, particularly in the electronic and engineering industries.

Developing a directory of appropriate technologies for SMEs and disseminating it among such enterprises would be very useful. **Establishing a technological park for industrial SMEs** under the supervision of one of the modernized scientific and technical institutes referred to previously would provide a useful pilot project to start this endeavor.

A specialized administration under the Ministry of Foreign Trade and Industry needs to be established to provide technological support to industrial SMEs. This administration would aim at:

- Disseminating and transferring modern industrial processes and technologies in various industrial clusters
- Disseminating modern methods of maintaining and repairing machinery and equipment

4) **Improving market access for output of SMEs.** Private sector SMEs have been traditionally concentrated in minor light industries that possess export potential, such as leather, wood and furniture, garments and paper products. They were mostly involved in the production of final consumption goods with little involvement in the production chain of intermediate inputs required by medium and large domestic and multinational firms. Improving market access would thus require disseminating knowledge about export markets and domestic outlets, and improving access to such markets through developing large marketing firms. Proposed measures would include:

- **Improving the quality of output** through setting specifications and supporting the acquiring of certification for quality (ISO 9000 etc.). Financial incentives through the partial (or total) recovery of costs incurred to obtain such certification may be required.
- **Encouraging integrated marketing contracts** in order to benefit from the experience of large chain stores and their extensive marketing capacities, both domestically and internationally.
- Encouraging the establishment of small industrial projects through **franchising,** in order to achieve maximum benefit from marketing the services of the mother company.
- **Simplifying bidding procedures** to allow industrial SMEs to obtain a share of government purchases, and to actually benefit from government decisions that have been previously taken in this matter.
- **Securing electronic data bases** on the availability of marketing channels domestically, regionally and internationally. Commercial representations of the Ministry of Foreign Trade and Industry may play a decisive role in providing information on regional and international marketing channels, whereas local governments may help to provide information on local domestic markets.
- **Coordinating collective efforts** to support self-financed marketing boards.
- Providing incentives to SMEs to participate in **trade exhibitions** through partial or total government funding of such costs.
- **Providing support** to SMEs in manufacturing to access export markets through investment promotion and trade missions.
- **Implementing a previous decision** to prepare a **manual,** to be periodically revised and updated, to disseminate information on various products required in external markets, giving priority to the most important markets for industrial products of Egyptian SMEs – Arab, European and US markets. This manual is to be jointly prepared by the Ministries of Foreign Trade and Industry and of Military Production.
- **Developing networks among SMEs** to upgrade marketing efficiency and ensure cooperation among firms in the areas of purchases, production, product development, distribution, sales, and after sales services. This would allow SMEs to benefit from increasing returns to scale and would reduce procedural costs.
- **To develop electronic trade** and promote its adoption by **industrial SMEs** by developing an information infrastructure, identifying and resolving obstacles to the development of such trade in Egypt, and encouraging joint efforts between the government and the business sector to support the design of training programs targeted at preparing SMEs to engage in e-commerce (Shura Council 2002).

5) **Relaxing procedural constraints.** Various efforts have been made to relax bureaucratic constraints and to upgrade the efficacy of government agencies dealing with investors and exporters. However, aside from the issuance of law 141/2004, called the SMEs law, little has been specifically done to address the constraints hindering SMEs in manufacturing. It is proposed that the following be considered:

- The necessity of entrusting the responsibility of supporting **industrial SMEs** to **one central administration** under the Ministry of Foreign Trade and Industry**.** A prospective candidate could be the General Authority for Industrialization (GAFI), after it is reformed, and its capabilities upgraded with appropriate technical skills so that it can assume this responsibility. This administration will be primarily responsible for planning the activities of SMEs in industry, and identifying and supporting their role in Egypt's industrial structure.

- Improving government bureaucracy's way of dealing with SMEs in the areas of monitoring, control and supervision; restricting dealings with SMEs to the minimum necessary; simplifying and streamlining procedures; and clearly specifying that the government role should be that of a facilitator rather than a controller.

- Reinforcing the one-stop shops referred to under law 141/2004 to facilitate and expedite licensing requirements, and ensure their wide regional dissemination by the governorate.

- Setting a geographic map of the distribution of industrial SMEs, of their classification and of major constraints they face, this to be done in coordination by the Ministries of Foreign Trade and Industry, and of Local Development and the Information Decision Support Center (IDSC) of the Cabinet and other localities.

- **Supporting clustering of SMEs.** This would considerably facilitate the removal of the constraints they face, in addition to enhancing their performance through competition and by developing complementarities among them.

- **Securing effective business incubators** by encouraging the business community, universities and research centers, federations and business organizations, international and national donors, in investing in the establishment and management of such incubators.

3.4 Institutional Reform for Productivity Enhancement

The announced major economic objectives of the Egyptian government – increasing private investment and promoting Egyptian exports – are still far from being fulfilled. The reasons for this have been identified as structural and institutional. The most frequently cited constraints requiring institutional reform are an inadequate legal structure; inefficient and unfair systems and administration of tax and tariffs; weak marketing facilities that fail to attract investments and to find new markets for Egyptian exports; and a cumbersome and often corrupt bureaucracy (El-Mikary and Handoussa, 2001).

The 1990s witnessed significant governmental efforts to reorient statist, protectionist economic policies towards an open free market, but this positive record has been hindered by the lack of institutional reform. The past few months have seen a flow of new legislations aimed at streamlining domestic market performance, alleviating tax and tariff burdens and improving tax administration. In September 2004 the tariff structure was revised, the number of tariff bands reduced to six, the rates lowered and their dispersion reduced. A law averting monopolistic practices was finally approved after more than

seven years of discussion. A new tax code and administration law is being issued, and a consumer protection law is being finalized by the government but has not yet been sent to parliament.

These are all promising necessary steps towards reform, but they are not sufficient, unless supported by the reform of the administration of policy. There is no means by which any policy reform or law enactment can reach the end beneficiaries (investors, exporters, consumers) without the implementation of administrative and bureaucratic reform. The persistence of a low performing institutional framework – although significantly improved – continues to be perceived as a major obstacle to activating a private sector contribution to investment, employment creation and exporting.

A comprehensive reform of all institutions that impact on the behavior of agents in the domestic market is warranted to ensure competition and minimize transaction costs. The legacy of government domination and centralization continues to constrain the functioning of markets in spite of the dismantling of state monopolies, the elimination of price controls, and successive measures to alleviate the burden of these interventions and reduce their costs.

- Simplifying regulations for the incorporation of enterprises is of the utmost necessity. Significant steps have been taken in this direction by the instauration of one-stop shops under the umbrella of the General Authority for Investment and Free Zones, and in some governorates (e.g. Dakahlia). This has reduced the time for incorporation, but the costs are still high. Egypt still ranks in the top 25 percent of countries in terms of cost of registration (World Bank, 2004). Complementary information for micro-enterprises reports from local case studies declares that "the incorporation of a single person business could take up to 91 steps, dealing with 43 entities and 232 days"! (Galal, 2004).

- Simplifying procedures to exit, particularly for small firms, is also required. As in the case of business failure, the firm is faced with a lengthy and costly process to obtain the necessary legal and regulatory clearances from the tax, labor and social insurance agencies needed to enable the failed entrepreneur to close down one firm and start another one. Galal (2004) further reports that "bankruptcy procedures could take up to 53 steps, dealing with 41 entities and 635 days, costing entrepreneurs about L.E.9000 in cash and L.E.19000 in opportunity cost".

- Various financial levies on economic activities are detrimental to the competitiveness of domestic production. On the import side, a large number of administrative controls, although considerably streamlined, still burden the import process. These procedures relate to customs clearance, quality control, and testing for specification and product standards. Fees charged for inspection activities and associated delays, and stamp duties add to the cost of imported inputs. Firms producing and exporting are subject to certification by a number of official bodies.

These requirements are particularly stringent for the production of foodstuffs and textile exporting. The varieties of fees imposed, however, have been streamlined, particularly for exporters. Although there has been a marked effort to alleviate these burdens on producers and exporters, these charges require consolidation in a low flat fee, unless they are a payment for a service actually provided. In this case, they should be based on a rationalized cost-recovery basis (Egypt Country Profile, 2004).

- Despite the prevalence of unemployment, **unit labor cost in Egypt is high,** due to labor market rigidities and distortions. The wage rate in Egypt is amongst the lowest in the region, yet, compared to labor productivity, it appears that the labor cost per unit of manufacturing output in Egypt is higher than in other competing countries. Shortage of skilled workers and a lack of discipline, supported by restrictive labor regulations that restrain firing, all contribute to raising labor costs. Although the labor law has been changed (Law 12/2003), to introduce some flexibility in labor relations, its effect on the labor market in the immediate future is likely to be small, as the new law only applies to new employment contracts rather than existing ones, so that existing job protection remains.

Land costs are also high compared to other competing countries of the region.

Prices of non-traded services relative to those of traded goods tend to be high in Egypt. High costs of freight and transportation services, of financial services, of litigation procedures, and of telecommunications, all raise the costs of exportables.

The network industries and services have experienced serious attempts at modernization in Egypt. Additionally, there has been a great deal of liberalization in these sectors. Egypt has made commitments in the transportation and financial sectors in the GATS agreement. This was followed by its joining the Basic Telecommunications Agreement in 2002 and the Information Technology Agreement in 2003. Moreover, domestic laws and regulations impose little restrictions on foreign participation. It has further liberalized and privatized a large number of activities in network industries (Egypt Country Profile, 2004).

Egypt is currently witnessing serious attempts at addressing market inefficiencies. The reforms address different challenging areas such as tariffs, tax, corporate regulations, SMEs, competition, labor relations, and the banking sector. Egypt has further signed a partnership agreement with the EU that will come into force. it has liberalized trade with Arab neighbors within the context of the Great Arab Free Trade Area (GAFTA); and it has implemented qualified industrial zones (QIZs) with the US, and is currently negotiating a free trade agreement. These commitments attest Egypt's willingness to open up its economy, to streamline its markets, to enhance efficiency and to become integrated in the global economy.

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Annex 1. Some Technology Indicators

	Rank/102				
	Egypt	**Brazil**	**Philippines**	**Morocco**	**Tunisia**
Environment Component Index*	**60**	**35**	**82**	**61**	**36**
Market Environment	49	34	78	60	29
Political and Regulatory Environment	66	43	63	69	34
Infrastructure Environment	65	34	94	61	52
State of Cluster Development	26	25	43	40	63
Venture Capital Availability	44	54	71	53	25
Subsidies for Firm Level R&D	45	35	78	36	7
Quality of Scientific Research Institutions	60	49	89	66	45
Availability of Scientists and Engineers	57	46	72	53	13
Brain Drain	54	22	87	90	41
Utility Patents granted	64	48	58	72	62
ICT Manufactured Exports	91	46	28	54	58
ICT Service Exports	56	59	85	66	52
Overall Administrative Burden	49	53	98	36	10
Quality of Legal System	59	52	73	71	33
Laws Relating to ICT	63	37	52	57	19
Competition in ISP Sectors	33	26	41	74	60
Foreign Ownership Restrictions	70	42	83	31	40
Efficiency of the Tax System	57	101	62	31	18
Freedom of the Press	90	17	16	91	87
Overall Infrastructure quality	43	47	89	65	33
Waiting Time for Telephone Lines	70	44	88	32	58
Telephone Mainlines	64	50	77	78	62
Public Pay Telephones	83	5	90	47	40
Internet Servers	81	49	68	80	75
Readiness Component Index**	**71**	**40**	**72**	**70**	**42**
Individual Readiness	72	59	65	78	56
Business Readiness	60	39	80	46	35
Government Readiness	77	26	56	82	37
Public Expenditure on Education	70	53	73	66	49
Adult Illiteracy	92	66	43	94	83
Tertiary Enrollment	37	62	43	73	57
Radios	62	47	88	74	90
Television Sets	59	41	69	70	64
Households Online	99	87	97	43	60

Quality of Math and Science Education	66	75	89	50	10
Affordability of Local Fixed Line Calls	35	42	76	78	37
Affordability of Internet Telephone Access	25	56	43	70	19
Affordability of Internet Service Provider Fees	52	59	80	78	61
Ease of Obtaining Telephone Lines	64	34	71	33	49
Cost of Business Telephone Monthly Subscription	38	58	101	80	25
Extent of Staff Training	66	27	41	51	26
Quality of Business Schools	75	34	32	42	24
Scientists and Engineers in R&D	55	65	81	45	64
Government Prioritization of ICT	42	66	61	63	5
Government Online Presence	89	11	49	83	85
Government Procurement	48	53	84	58	5
Usage Component Index* **	**63**	**47**	**50**	**59**	**45**
Individual Usage	77	58	72	76	56
Business Usage	72	31	59	64	46
Government Usage	44	51	29	47	36
Personal Computers	74	48	68	76	65
ISDN Subscribers	80	42	88	62	78
\Cable Television Subscribers	n/a	69	72	67	48
Internet Users	80	51	64	72	53
Computers Installed in Businesses	70	38	63	79	68
Firm-Level Technology Absorption	71	40	72	43	23
Prevalence of Foreign Technology Licensing	64	7	23	69	29
Government Success in ICT Promotion	35	38	68	32	3
Government Online Services	44	58	20	54	81

Source: World Economic Forum, 2004.

Notes:

* The environment component index is designed to measure the degree of conduciveness of the environment that a country provides for the development and use of ICT. This index comprises three sub-indices: market, political/regulatory, and infrastructure indices.

** The readiness of a nation measures the capability of the principal agents of an economy (citizens, business and governments) to leverage the potential of ICT. This capability depends on a combination of factors like the presence of relevant skills for using ICT in individuals, access to and affordability of ICT for corporations, and government use of ICT for its own services and processes. This index also includes three sub-indices: individual, business and government readiness.

*** The usage component index: This index aims to measure the degree of usage of ICT by the principal stakeholders of individuals, business, and governments. It consists of three sub-indices for the usage of each the three groups of stakeholders.