EMPLOYMENT INTENSITY OF GROWTH IN EGYPT WITH A FOCUS ON MANUFACTURING INDUSTRIES

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Abstract

The employment intensity of growth is an important issue that merits in-depth study and analysis in the case of the Egyptian economy as it directly impacts economic policymaking. With that in mind, the study sets out to identify the sectors and sub-sectors in which output growth generates more jobs. It also sheds light on the extent and significance of the structural change in the pattern of generating value-added and employment in the Egyptian economy since the 1980s; the aim is to find out whether it was a positive change similar to that which accompanied growth in developed economies. Finally—given that the manufacturing sector is the backbone of sustainable development, and that the service sector is capable of generating enough jobs—the paper seeks to identify the sub-sectors that generate permanent and decent jobs, and hence deserve support. To achieve these objectives, the study reviews the conceptual framework and application of the employment intensity of growth and employment elasticities of output. It also analyzes the link between employment growth with output, and productivity growth. The study then moves on to measure employment elasticities of overall economic growth during 1980/81-2004/05 as well as in six major sectors over the same period to analyze both the job-creation capability of these sectors, and the significance of structural change. Finally, the study estimates the employment elasticities of output growth in nine manufacturing sub-sectors to identify their job-creation capability compared to their relative share in investments, and the relationship thereof with economic policymaking.

ملخص

تعد قضية كثافة التشغيل في النمو الاقتصادي من أكثر القضايا التي تستحق الدراسة والتحليل في حالة الاقتصاد المصري، وذلك لما لها من تأثير مباشر على توجهات السياسة الاقتصادية. وفي هذا الإطار، تحاول هذه الدراسة تحديد القطاعات الكلية والفرعية التي يولد نمو الناتج فيها فرص عمل أكثر من غيرها من ناحية، كما تهتم من ناحية أخرى بقياس وتفسير مدى ودلالة التحول الهيكلي الذي حدث في نمط توليد القيمة المضافة والتشغيل في الاقتصاد المصري منذ عقد الثمانينيات، وهل هو تحول إيجابي على غرار التحول الهيكلي الذي صاحب نمو الكثير من الاقتصادات المتقدمة. وأخيرا، إذا كان قطاع الصناعة التحويلية هو عصب التنمية المستدامة، وإذا كانت قطاعات الخدمات قادرة على توفير فرص عمل كثيرة، فإن الدراسة تسعى لتحديد أي الفروع في هذه القطاعات جميعا هي التي تولد بالفعل فرص عمل دائمة ولائقة ومن ثم تستحق المساندة والرعاية. ولتحقيق هذه الأهداف، تقوم الدراسة أولا بعرض إطار نظري لمضمون مفاهيم كثافة التشغيل في النمو ومرونات التشغيل بالنسبة للناتج، كما تعرض استخدامات هذه المفاهيم، وتحلل العلاقة بين نمو التشغيل مع الناتج ونمو الإنتاجية. بعدها تقيس الدراسة مرونات التشغيل بالنسبة للنمو الاقتصادي الكلي خلال الفترة ١٩٨١/٨٠-٢٠٠٥/٠٤، وكذلك مرونات التشغيل بالنسبة لستة قطاعات رئيسية لذات الفترة الزمنية في محاولة لتحليل قدرة هذه القطاعات على خلق فرص العمل من جانب، ولتحليل مدلول التحول الهيكلي، من جانب آخر. وأخيرا، تقوم الدراسة بتقدير مرونات التشغيل بالنسبة لنمو الناتج في تسعة قطاعات فرعية من الصناعة التحويلية، وذلك للوقوف على قدرة هذه الصناعات على خلق فرص عمل مقارنة بنصيبها النسبي في الاستثمارات، وعلاقة ذلك بتوجهات السياسة الاقتصادية.

1. INTRODUCTION

The employment intensity of overall and sectoral economic growth is an issue that merits in-depth study and analysis due to its direct impact on economic policies in Egypt. Previous studies addressing employment problems in the Egyptian labor market agreed that these problems are structural in nature with their roots going back to the sixties, but did not become evident until the mid-eighties, and aggravated over the last two decades. These studies also agreed that the employment problem in Egypt—and its associated poverty—would only be solved by adopting an employment strategy as an integral part of macroeconomic policies. This strategy should be based on three main pillars: high and sustainable economic growth; high employment content of growth; and integration of the poor into the growth and employment process. Despite this consensus, these studies did not explore in depth the employment content of growth and merely indicated that the source of growth should be the employment-intensive sectors, without addressing which sectors and sub-sectors are capable of generating productive and decent jobs.

In fact, there is a need to answer several important questions when examining the issue of employment intensity of growth, most importantly: (i) What are the sectors and sub-sectors in which output growth generates more jobs, and are the investments directed to these sectors sufficient to meet the employment objective? (ii) What is the extent and significance of the structural change that took place in the pattern of generating value added and employment in the Egyptian economy since the 1980s? And has it been a healthy and positive change similar to the structural change associated with growth in many developed economies? (iii) Considering that the manufacturing sector is the backbone of sustainable development, and that service sectors are capable of providing numerous job opportunities, which sub-sectors actually generate permanent and decent jobs and, therefore, merit support?

This paper attempts to answer these questions. Organizationally, it comprises five sections. Following the introduction, Section 2 presents a theoretical framework of the concepts of employment intensity of growth and employment elasticities with respect to output. It also presents the various uses of these concepts and analyzes the relation between employment growth with GDP, and productivity growth. Section 3 measures employment elasticities with respect to overall economic growth during a quarter century (1980/81-2004/2005). In addition, employment elasticities are estimated in six major sectors over the same period in an attempt to analyze the significance of structural change as well as the

ability of these sectors to create jobs. Given the importance of the manufacturing sector to the Egyptian economy, Section 4 estimates employment elasticities with respect to output growth in nine manufacturing sub-sectors with a view to identifying the ability of these industries to create jobs, and the link thereof to economic policies. The conclusion offers a summary of the main messages of this paper.

2. CONCEPTUAL FRAMEWORK

Economists and policy makers use a set of indicators to measure the ability of the national economy in general or of some of its sectors in particular, to create sufficient jobs to absorb new entrants to the labor market. These indicators include unemployment rates, rates of participation in economic activity, ratios of employed persons to the population, and employment elasticity with respect to output, which reflects the employment intensity of growth.

In what follows, the paper sheds light on the concept of employment intensity of growth, its definition, uses as well as the different types of elasticity. It also addresses the theoretical relation between employment growth—with GDP growth—and productivity growth. Moreover, this section addresses the criticism directed at using the employment elasticity to output index, and how to counter such criticism.

2.1. Concept of Employment Intensity of Growth and its Uses

It is widely known in theory that labor markets worldwide are either negatively or positively affected by macroeconomic performance, especially GDP growth. This impact takes place through two mechanisms. First, GDP growth and the extent of its stability and sustainability, and the resulting job expansion in the national economy. The second mechanism is the composition of growth, i.e., whether growth takes place in the sectors that apply labor intensive production techniques, and the resulting ability of this growth to increase the rate of employment in the national economy. Therefore, it is important to measure the employment content of growth or what is called "employment intensity of growth" in order to find out whether the growth of the national economy is of the type that creates adequate and decent jobs, or it is "jobless growth" exacerbating the problems of unemployment and informal labor.

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To measure the employment intensity of growth, economists use the "employment elasticity to GDP" index, which measures how employment tends to change with the change in output. Specifically, it measures the percentage point change in jobs associated with an economic growth of one percentage point.

This indicates that the concept of employment intensity of growth—and hence, employment elasticity—is mainly used in analyzing how economic growth and employment growth develop jointly, and the extent of labor market sensitivity to changes in overall economic conditions (represented by GDP growth). However, there are other uses of employment elasticities, which depend on data availability on one hand, and on the various methods used to estimate elasticities—ranging from a simple descriptive method to one based on mathematical models—on the other hand.[1]

These uses include identifying the differentials in the change of employment opportunities with the change of economic growth for different categories of the population, particularly for youth and females. Moreover, sectoral elasticities are used to identify whether a structural change has occurred in employment over time in a given economy, i.e., whether employment intensity has changed in the three major sectors (agriculture, industry and services) at different points in time.

Additionally, building mathematical models to measure employment elasticities with respect to GDP helps in understanding the primary determinants that affect elasticities themselves (such as the degree of impact of labor supply, economic stability, openness to the outside world, the tax system, and the degree of rigidity/flexibility of the labor market). Furthermore, using employment elasticity with respect to GDP sheds light on an important aspect of growth strategies worldwide, and particularly in developing countries, namely, the tradeoff—or conversely the compatibility—between employment growth and productivity growth; and whether growth is largely attributed to either of them or to both equally, and the impact thereof on achieving various objectives, particularly poverty reduction.

As previously mentioned, the basic definition of employment elasticity is that elasticity is the relative change in the number of the employed in a given economy—or region, sector,

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[1] Kapsos, S. (2005), The Employment Intensity of Growth: Trends and Macroeconomic Determinants. ILO, Employment Strategy Papers, Paper no. 12, pp. 1-2.

or population segment—associated with the relative change in GDP (or value added). In this context, there are two different methods to calculate elasticties:[2]

1. Calculating the arc elasticity of employment. In case of calculating it for the national economy as a whole, this elasticity is expressed as follows:

$$\varepsilon = \frac{\Delta E / E}{\Delta Y / Y} \tag{1}$$

where E refers to employment and Y denotes GDP for the economy as a whole. In this case, elasticity ε is the percentage change in the number of employed persons to every percentage change in GDP. While calculating elasticity this way is simple, the value of elasticities in this case is highly fluctuating and does not represent stable trends, thus it is not appropriate for conducting comparisons across periods.

2. Calculating the point elasticity of employment. This elasticity is expressed by a log-linear equation that links employment to GDP and takes the following basic form:

$$LnE = \beta_0 + \beta_1 LnY \tag{2}$$

where Ln denotes the natural logarithm of the relevant variable, and the regression coefficient β_1 is employment elasticity with respect to GDP. In other words, elasticity equals the percentage change in employment associated with the percentage change in GDP by one percentage point:

$$\beta_1 = \frac{dLnE}{dLnY} = \frac{dE/E}{dY/Y} \tag{3}$$

While the arc elasticity measures the percentage change of employment with respect to GDP between two different periods, the point elasticity measures the percentage change in the number of the employed if GDP changes by values nearing zero, hence more stable values of elasticities can be obtained. This is important from the economic policy perspective, since human resources are primarily planned in the medium- and long runs. Therefore, reliance on arc elasticities renders the planning process unfeasible and inefficient because such measurement neither produces stable trends for employment growth with respect to output growth in the various sectors, nor allows for assessing the impact of previous economic

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[2] Islam, I. and S. Nazara, (2000), Estimating Employment Elasticity for the Indonesian Economy, ILO-Jakarta.

policies on employment. Thus, from the perspective of sound planning, it is preferable to use the linear regression technique.

One of the advantages of using the regression technique in calculating elasticities is that it allows linking " β coefficients" to other variables, i.e., equation (2) above would take the following form:

$$LnE = f\,(LnY,Z) \tag{4}$$

where Z refers to all other variables affecting the relation between employment and GDP, which were assumed to be absent in equation (2). These variables may take the form of dummy variables (e.g., different degree of urbanization among various regions in a given country, or different degree of industrialization or technological progress), all of which may affect the employment coefficient.

The above refers to employment elasticity with respect to overall GDP or output. However, if we are to examine elasticity at the sectoral level, equation (4) would take the following form:

$$LnE_i = f\,(LnY_i\,,Z) \tag{5}$$

This means that both sectoral output Y_i, and other variables Z affect employment in sector i. Since elasticity is calculated here at the sectoral level, there is a possibility that the variable Z would include—among other factors—the impact of overall GDP (Y) on employment in sector i. Hence, the change in employment in this sector is linked to the change in the output of the sector Y_i, in addition to the change in overall GDP (Y) as well as other variables.

This last addition is very important and should be analyzed, due to its significance when explaining the values of elasticities. When measuring the relationship between the change in GDP and the associated change in employment in the various sectors, a distinction should be made between the impact of sectoral output and that of overall GDP. The concept of employment elasticity with respect to output has two meanings: The first refers to the change in employment in one sector as a result of the change in the output of the same sector. The second refers to the change in employment in a given sector resulting from the change in overall GDP. The change in the two types of GDP simultaneously determines the value of employment elasticity and whether it is positive or negative. The growth of one sector's

output—such as agriculture—may lead to substantial growth of employment in the sector; hence, the elasticity value is positive and high. But the growth of overall GDP may reduce employment in the sector, as large numbers of the employed would leave the sector to work in another sector such as construction and building. Thus, the final value of elasticity and its sign depend on how strong the two impacts are, and which of them would outweigh the other. The experiences of some countries—such as Indonesia—showed that the impact of structural change in the national economy during 1977-1996 was evident in agriculture, while manufacturing achieved net benefits from the process of reallocating labor away from the agricultural sector.[3]

It is worth noting that some economists, when analyzing the ability of various sectors to create jobs, measure employment elasticity with respect to investment. In this case, the percentage change of employment in each sector—as well as in subsectors— that corresponds to one percentage point change in investment is calculated. The values of these elasticities are then compared with the relative share of sectoral activities in total investments. For example, when applying this analysis to manufacturing industries in Egypt during 1992/1993-1995/1996, there were some subsectors that were able to generate many jobs merely because they were industries that received high shares of investment, though they are not labor-intensive by nature (such as engineering and some textile and non-metal industries); while other activities—such as wood and non-metal industries—are highly labor-intensive by nature but did not receive a relatively high share of investment allocations. Thus, the study finds that the investment policy applied during that period had no role in directing scarce resources to the sectors with high employment elasticities, which by nature are capable of creating many jobs, nor in encouraging the sectors that received large investments to change their usage of production inputs towards labor-intensive production techniques.[4]

This shows that the concept of employment elasticity—whether with respect to GDP or investment—reflects the ability of various sectors to create jobs, and is used to measure structural changes in the national economy and to assess macroeconomic policies. It is worth noting here that there is an important difference between the concept of labor-intensive and

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[3] Ibid, pp. 17-19.

[4] Abdel Latif, L. (2001), "Investment Policy, Employment and Poverty in Egyptian Manufacturing," in Nassar, H. and Heba El Laithy, (eds.), Socio-economic Policies and Poverty Alleviation Programs in Egypt, CEFRS (Cairo University) and SFD, Cairo.

that of employment-intensive activities. The first refers to the nature of the production technique prevailing in the activity and whether it uses more labor or capital to produce one unit of output. The second concept refers to the number of jobs generated by increased output of this activity. In other words, the concept of labor intensity refers to an average concept (i.e., E/Y), while employment intensity or elasticity refers to a margin concept ($\frac{dE/E}{dY/Y}$). An activity in a given sector—such as agriculture—may be labor-intensive, but due to certain considerations—such as agricultural land scarcity and labor saturation, or producing crops that do not require many laborers such as wheat—does not generate many jobs in a certain period, consequently, the employment elasticity of output in this sector would be low.

2.2. The Relation between Employment Growth and Productivity Growth

Structural distortions in the labor markets of labor-abundant developing countries raise important questions regarding the nature of the relationship between employment growth and productivity growth, and whether it is a compatibility or tradeoff relationship in various time horizons. On one hand, it is widely known that in order to reduce the rising rates of unemployment and informal employment, developing countries seek to adopt strategies of creating employment opportunities in labor-intensive sectors. However, this approach may lead to interest in non-decent, low productivity jobs, which generate low incomes, reflecting negatively on the national economy, and increasing employment at the expense of productivity. On the other hand, increasing labor productivity is the only way to improve living standards and attain sustainable long-term growth. However, there are always concerns that increasing productivity would lead to capital intensive production techniques replacing labor-intensive techniques and the resulting substantial destruction of formal jobs. Thus, it is necessary to take productivity into consideration when explaining employment elasticities in various sectors and when taking their values into account in planning human resources and economic policies.

In fact, these questions stem from the nature of relationship between GDP and employment and productivity as referred to by the following basic identity:

$$Y_i = E_i \times P_i \tag{6}$$

where Y_i and E_i represent GDP and employment respectively in sector i, while P_i refers to worker productivity in the sector. This form means that the changes in GDP are the outcome of change in employment and productivity:

$$LnY_i = LnE_i + LnP_i \tag{7}$$

$$\Delta LnY_i = \Delta LnE_i + \Delta LnP_i \tag{8}$$

In other words, when GDP grows at a given rate, any increase in the employment growth rate must be coupled with an equivalent reduction in labor productivity growth. From these equations, the employment elasticity to GDP equals:

$$\varepsilon_i = 1 - \varepsilon P_i{}^5 \tag{9}$$

where ε_i refers to employment elasticity with respect to sectoral output, and εP_i is the productivity elasticity with respect to sectoral output. Using equation (9) with different GDP growth scenarios, the relationship between employment elasticities and the growth of both employment and productivity becomes evident, as shown in Table A1 of the statistical appendix. Various scenarios show the extent of tradeoff or compatibility between the trend of employment growth and that of productivity growth—with respect to GDP growth—in light of different elasticities; and the potential for employment growth together with increased productivity becomes evident. In economies with positive GDP growth rates, if employment elasticities range between zero and unity, this means a positive increase in both employment and productivity, and whenever the value of elasticities within this range increases, it corresponds to growth more intensive in employment (and less in productivity).[6]

In this context, the literature on labor economics—particularly modern literature— teems with analyses of whether the increase in productivity must take place at the expense of the increase in employment. These analyses[7] find that it is necessary to take into consideration the time horizon in which the increase in productivity takes place, and the dynamics of the

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[5] From equation (8) we find that:
$$\frac{\Delta Y_i}{Y_i} = \frac{\Delta E_i}{E_i} + \frac{\Delta P_i}{P_i}$$
$$1 = \frac{\frac{\Delta E_i}{E_i}}{\frac{\Delta Y_i}{Y_i}} + \frac{\frac{\Delta P_i}{P_i}}{\frac{\Delta Y_i}{Y_i}} \quad .$$

[6] Kapsos, s., op.cit, p.5.

[7] ILO (2004), World Employment Report 2004-2005, Chapter 2.

relationship between it and employment as a result of structural changes. In the short run, structural reforms and frictional changes are usually coupled with a tradeoff between productivity growth and employment, leading to labor reduction at the sectoral level. However, on the long run—and at the aggregate level—markets respond to these changes, and high productivity growth rates are usually associated with similar employment growth rates.

The experience of advanced industrial countries clearly indicates these facts. They managed to achieve high rates of economic growth and living standards, and to reduce poverty substantially due to rapid and sustainable productivity growth. But increased capital-intensive investments and advanced technological innovations, which led to this substantial productivity growth, also led at several points in time to a large-scale destruction of jobs in the short run. Nevertheless, with the continuous economic growth associated with substantial structural changes, jobs decreased in waning industries, while at the same time, new jobs were created in expanding sectors. Thus, the structural changes observed in advanced industrial countries, and the associated productivity growth, produced what is called "creative destruction" of jobs.

Since output is the product of both employment and productivity, the question is whether it is necessary for establishments with increasing productivity to require fewer workers, and therefore, have to lay off workers. In this respect, there is no single definite answer. There are, however, four observations that may help in understanding the relationship between productivity and employment:[8]

1. There are sources of productivity growth that may have neither direct nor indirect impact on reducing employment. Examples include improved product quality, more use of existing capacities, more efficient use of raw materials, more efficient internal organization of the establishment, better training and even better treatment of workers.

2. Increased productivity, which leads to an increase in the market share of the establishment, and hence, an increase in employment opportunities therein, may reduce employment in competing establishments. Consequently, any analysis of the effects of increased competitiveness and increased market shares of establishments should take into account the net impact of these aspects on overall employment.

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[8] Ibid, p. 80.

3. Increased productivity due to mechanization may reduce labor demand. Thus, at the level of the establishment, the net impact on employment will be determined by the size of market demand, and whether the reduction in labor demand per each unit of output—due to mechanization—will be offset by increasing labor demand as a result of expanded GDP due to increased market demand (i.e., whether the impact of high employment elasticity exceeds that of low employment elasticity).

4. The reduction in labor demand resulting from increased productivity could be offset by increasing labor demand within the same sectors or in other sectors, as a result of creating new products or expansion of markets. For example, in developed countries the reduction in employment in rural areas due to mechanization was offset by increased labor demand in urban service and manufacturing sectors.

Although the direct impact of productivity gains may lead to labor layoffs in one sector, the labor market could offset this in the long run by increasing employment in another sector, depending on how both the demand for the product and GDP expansion develop, even though markets take time to adjust. Therefore, a close analysis of the relationship between employment and productivity growth must take into account the time horizon on one hand, and how markets, institutions and economic actors respond to productivity growth on the other hand. This would lead to understanding how productivity growth in a given sector in the economy impacts overall GDP and employment growth. Moreover, close analysis requires taking into consideration the different dimensions of the demand side, including macroeconomic policies, the general investment environment and innovations. That is because focusing only on the supply side of employment ignores the fact that there are changes taking place in demand over time that lead to GDP growth and creation of new jobs to meet increasing demand. This is because technological progress ultimately leads to expanding and creating new markets. Thus, while the business cycle controls labor markets in the short run, aggregate demand policies, technological changes and labor market institutions play the bigger role in identifying labor supply and demand in the medium and long runs.

Since labor markets' adjustment to structural changes and productivity growth takes time, labor market institutions should play an important role in improving market efficiency and ensuring security to laborers via financial aids and retraining of laid off workers in order to reduce the costs incurred by the national economy during times of change.

A final point regarding the relationship between employment and productivity is that increasing both of them to attain sustainable long-term growth requires adopting a strategy based on two integrated pillars: first, investing in growing dynamic sectors, and second, building capacities in the sectors that absorb many workers. It is important that the two pillars are closely and simultaneously integrated, since the attempt to achieve a boom by investing only in capital-intensive, dynamic subsectors (such as some branches of the ICT industry) will not lead to poverty reduction. Most of the poor neither work in these sectors nor possess the skills and training necessary to work therein. Thus, the real challenge lies in expanding dynamic sectors in the national economy and deepening forward and backward linkages between them and other sectors where most labor are engaged, while at the same time building capacities and increasing the productivity of workers in labor-abundant sectors. In fact, this strategy will positively impact the lives of workers in the short and medium runs, as it will provide them with decent jobs, and will benefit them in the long run since these workers will be equipped with the basic skills and training needed to compete for jobs in the growing economy.[9]

2.3. Shortcomings in Using Employment Elasticity to GDP Index

Using the employment elasticity to GDP index—reflecting the employment intensity of growth—is surrounded by a set of caveats that should be taken into account when deriving results regarding labor market performance, and when attempting to formulate economic policy recommendations. The most important of these caveats are as follows:[10]

1. The index refers to a correlation rather than a causality relationship between employment and GDP. Also, the relationship between the two variables is bidirectional; i.e., each variable impacts the other. As previously indicated, GDP growth is associated with employment growth. Additionally, from the perspective of overall economy production function, the usage of labor and other factors of production generates GDP. Thus, the more increase in labor growth, the more increase in GDP growth. Therefore, the employment elasticity index focuses merely on the first direction of the relationship; i.e., the demand side (where GDP represents aggregate

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[9] Ibid, pp. 109-110.

[10] Kapsos, S., op.cit; Islam and Nazara, op.cit; and Khan, A.R. (2005), Growth, Employment and Poverty, ILO/UNDP.

demand), and hence ignores the second direction; i.e., the supply side (i.e., GDP creation resulting from using labor).

2. The methodology used takes into account the employment and GDP variables only, ignoring other variables that may influence the relationship. The concept of employment elasticity is also affected by the prevailing technology and knowhow whose change leads to a change in employment intensity. Also, economic policy may increase or reduce employment growth with GDP growth, if it is biased towards labor or capital. More important is the rate of change in real wages (i.e., the nominal wage rate deflated by the price of the product produced by worker). Economists believe that this rate should be taken into account, stressing the importance of calculating partial elasticity of employment to GDP (which usually takes a positive sign), and calculating another partial elasticity of employment to real wage (which takes a negative sign).

3. The values of employment elasticities in a given country may demonstrate large fluctuations from one period to another. These fluctuations may be attributed to real changes in the relationship between employment growth and GDP growth. They may also be attributed to statistical calculations, e.g., GDP growth being very minimal and nearing zero, hence employment elasticities change substantially. Therefore, it is important to take this into account when explaining the results of the elasticities index.

4. It may be wrongly assumed that positive trends of employment intensity reflect positive overall economic performance and good results towards poverty reduction. Therefore, it is necessary when assessing the trends of employment elasticities to take into account other economic variables such as GDP growth trends, inequality, real wages, poverty rates and type of business.

5. At the aggregate level, the employment elasticity index fails to differentiate between the GDP impact (at the national economy level) and its impact at the sectoral level, on employment in each sector.

In spite of the above-mentioned shortcomings, economists still use the elasticity index as a good proxy of employment intensity of growth for two reasons. The first is the existence of a relatively stable relationship between employment and GDP—known as the Okun law— in industrial countries; this relationship helps determine the growth thresholds at which employment creation becomes significant. The second reason is that some methodological

problems of the measurement method can be overcome, so as the tool remains useful in formulating economic policy.[11]

Moreover, several economists—particularly those affiliated with the International Labour Organization—believe that while the employment elasticity index cannot determine the impact of GDP growth on employment growth from the causality perspective, it is used as an index of the actual degree of employment intensity of growth, which is in itself a result of the general system of incentives that determines the choice of labor-intensive production techniques instead of other techniques. In other words, high employment elasticity means that the general system of incentives is "employment-friendly" or pro employment, and vice versa. In the opinion of these economists, the use of gross elasticity instead of partial elasticity is because the former is capable of revealing any unwanted increase in real wages or any other unfavorable increase in the incentives system that impacts the choice of production techniques. For example, several studies observe high employment gross elasticity in manufacturing industries in East Asian countries during the 1970s (ranging between 0.7 and 0.8). Analyses attribute this rise in employment gross elasticity to its calculation at a period when real wage rates were increasing by approximately the same rate of per capita income. However, the pro employment nature of the incentives system managed to overcome this trend, producing this high employment intensity. As for the case of India for instance, during the 1990s, although the real wage per worker increased by a much lesser rate than the average per capita income, elasticity reached less than (0.3), indicating that there were other elements in the incentives system that ran strongly counter to employment intensity.[12]

3. EMPLOYMENT INTENSITY OF OVERALL AND SECTORAL GROWTH IN EGYPT

The issue of employment content of growth gains special importance in the case of the Egyptian economy, similar to most developing countries that have a surplus in manpower. Growth composition stands on an equal footing with the growth rate and its sustainability in terms of its impact on labor market performance and employment conditions, as attested by the status of the Egyptian economy since the 1970s to date. High GDP growth rates, which characterized the 1970s—ranging between 7 and 10 percent on average per annum—were not employment intensive and the basic source of growth was the sectors with capital intensive

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[11] For more details, see Islam and Nazara, op.cit, pp. 5-7.

[12] Khan, A.R, op.cit, Section 4.

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production techniques (such as petroleum). Hence, the 1970s was a decade of jobless growth. Furthermore, most of the 1980s and 1990s were characterized by poor and unstable economic performance. Modest GDP growth rates were associated in several years with an inadequate employment content to absorb the increasing numbers of new entrants to the labor market. Thus, the many problems characterizing the Egyptian labor market—such as high and escalating unemployment rates, underemployment, and informal employment—are the outcome of long years of weak economic growth and low employment content thereof.

The issue of employment intensity of growth gains more importance due to its relationship with combating and alleviating poverty. Most of the poor depend on the only production asset they possess, which is work, to break the vicious circle of poverty. Even when the various strategies combating poverty improve the poor's potentials to acquire other assets such as land or loans, these strategies will not be successful unless the poor acquire productive jobs. Thus, modest economic growth or growth with inadequate employment content, or both, do not contribute to resolving the poverty problem, but rather deepen its incidence and severity. Needless to say in this regard that it is not enough for the poor, who do not possess the luxury of being unemployed, to engage in informal, low-wage and low productivity jobs in most cases, because it will not result in lifting them out of poverty and improving living standards. On the contrary, these kinds of jobs feed the circle of impoverishment in the economy.

In light of the above, this section focuses on measuring the employment intensity of economic growth by estimating employment elasticity to GDP at the national level first, then at the sectoral level. It also focuses on explaining the significance of these elasticities with respect to structural change in the pattern of generating value added and employment.

3.1. Employment Elasticity at the National Level

In this section, we apply the method of calculating point elasticity, referred to previously in the conceptual framework. Employment elasticity to GDP is estimated at the national level using the following equation:

$$\Delta Ln\ (E) = \beta_0 + \beta_1 \Delta Ln(Y)$$

where $\Delta Ln\ (E)$ refers to the change in employment logarithm and $\Delta Ln\ (Y)$ denotes the change in real GDP logarithm, β_0 is the intersection of the regression curve, and β_1, the slope of the curve, represents employment elasticity of GDP.[13]

The following data were used to calculate β_1, the employment elasticity to GDP:

- **GDP and Employment data:** GDP and employment data cover the period 1980/81-2004/2005, based on the Ministry of State for Economic Development data posted on the ministry's website (www.mop.gov.eg).[14] It was necessary to estimate the employment elasticity of growth for a relatively long period so as to match the dynamic nature of this concept. This period allows observing the change in the relationship between growth and employment on one hand, and reaching more accurate estimates to use in predicting the relationship between growth and employment in the long run, on the other hand.

- **Wholesale Price Index (WPI):** Nominal GDP data at factor cost were used due to unavailability of a real GDP data series that is based on one base year for the whole period. The WPI of 1986 was then used as a deflator to calculate real GDP. It is worth noting that the only reason for using 1986 as a base year is the availability of data, since there is no relatively long series of indices that can be used as a deflator of GDP except World Bank data. Given the importance of using domestic and consolidated data sources, the WPI series was used, which is also available for the various manufacturing industries, as will be indicated below.

Due to using long time series for macro variables, it was necessary to test the stationarity and integration of these time series, and to determine their degree of co-integration at the national and sectoral levels.[15] Moreover, the serial correlation was undertaken by estimating the auto-regression model AR(K). It is worth noting that dummy variables were used to observe shocks and/or structural changes, but the results were not any different.

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[13] As used in Kapsos, S., op.cit, p. 3.

[14] The 1980/81 data are unavailable on the ministry's website, therefore, they were obtained from the data of "The Reference Document on Key National Economy Variables for the Period 1959/60-1999-2000" issued by the Ministry of Planning in August 2000, and are consistent with the data of the following period.

[15] The Phillips-Peron (PP) and the Augmented Dickey-Fuller (ADF) tests showed that the time series of GDP and employment are non-stationary, and that the co-integration of these variables is of the first degree, hence the first differences lead to achieving the stationarity condition.

The calculation using this method resulted in a value of employment elasticity of (0.53) at a 5 percent level of significance. This elasticity value is comparable to the averages observed internationally, taking into consideration different periods and scope of coverage. Employment elasticities at the national economy level in the Euro area and in the US ranged during 1986-1990 and 1997-2000 between (0.4) and (0.6) respectively.[16] Also, the elasticity value in a group of OECD countries ranged between (0.5) and (0.6) during the 1990s.[17] In an ILO study, the elasticity in Indonesia was estimated during 1977-1996 at a value ranging between (0.6) and (0.7).[18] It is useful at this point to note that an ILO study had estimated the value of employment elasticity to GDP in the Egyptian economy during 1983-1995 at (0.61), defined as the product of dividing growth in employment (1.84) by the growth in GDP (2.99).[19]

Referring back to equation (9), which explains the nature of the relationship between employment elasticity and productivity elasticity with respect to GDP, shows that the estimated elasticity in this paper indicates that almost half of the economic growth achieved between the early 1980s and year 2005 is attributed to productivity gains, while the other half is attributed to the increase in employment.

It is useful at this point of the analysis to identify the change that might have occurred in employment elasticity to GDP in the Egyptian economy throughout the study period, which covers a quarter century. Table A2 of the statistical appendix shows values of employment elasticities during the study period divided into four time periods. Given the inability to estimate the values of point elasticities during these four periods by using the regression equation due to the limited number of observations for each period, elasticities were estimated based on the arc elasticity method referred to in Section 2; i.e., by dividing the percentage change in employment by the percentage change in GDP.

As shown in the table, employment elasticity to GDP has been increasing from one period to another; rising from merely (0.04) during 1980/81-1985/86 to a high value of (0.85)

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[16] Mourre, G. (May 2004), Did the Pattern of Aggregate Employment Growth Change in the Euro Area in the Late 1990s?, ECB, WP no. 358.

[17] Boltho, A. and Andrew, G. (1995), Can Macroeconomic Policies Raise Employment? International Labor Review, Vol. 134, pp. 451-470.

[18] Islam and Nazara, op.cit, p.11.

[19] Cornell (1998), Job Creation and Poverty Alleviation in Egypt: Strategy and Programmes, ILO, (www.ilo.org).

during 1998/99-2004/2005. These values are a bit surprising in light of the developments in the national economy since the early 1980s and over the past years, whether with respect to GDP growth rate or to employment growth rate, which requires further research and explanation.

Regarding GDP growth rate, Table A3 of the appendix shows the GDP growth rate at constant factor cost during 1981/82-2002/03, according to the World Bank World Development Indicators. The table indicates that real GDP growth has witnessed a strong downward trend from about 11.3 percent at the beginning of the period to approximately 3.2 percent towards the end of it, which reflects poor development performance, particularly if compared to the high growth rates achieved during the second half of the 1970s reaching 10.2 percent on average per annum as a result of exceptional abundance of external resources during that period. If we divide this long period into sub periods based on the developments in internal and external conditions of the Egyptian economy, we will find that the period 1981/82-1985/86 had witnessed an obvious decline in annual average growth rates. This decline was attributed to the fall in world oil prices by more than half their value during that period, and the associated sharp decrease in the remittances of Egyptians working abroad, and the consequent decline in foreign currency resources and aggravation of Egypt's external debt problem. In addition, the period 1986/1987-1990/1991 witnessed a continued decline in growth rates with increased internal and external imbalances. Also, the Kuwait liberation war had an effect manifested by the return of Egyptian workers and decline in remittances. The following period, which extended to 1997/1998, was characterized by modest GDP growth rates as a result of the contractionary policies of the Economic Reform and Structural Adjustment Program (ERSAP), the negative impacts of the Luxor terrorist attack as well as the Asian financial crisis and its repercussions. No sooner had GDP growth rate started picking up during the first two years of the last period—from 1998/1999 to 2002/2003—than the Egyptian economy was exposed to another setback: a sharp recession that extended to all economic activities. Such recession was the product of stalled government efforts in the area of structural reform on one hand, and external crises such as the September 11attacks, the war on Iraq and mounting instability in the Middle East, on the other hand.

To sum up, Egypt's economic performance during the last quarter century was characterized by weak growth rates in general and a strong downward trend during the whole period, with volatile increases. Since labor market performance is necessarily affected by

GDP growth, employment growth in the Egyptian economy was modest and lagged behind labor force growth. The employment growth rate during 1980/81-2004/05 averaged around 2.6 percent per annum, while annual average labor force growth rate reached 2.8 percent. Table A4 of the appendix shows annual growth rates of employment compared to those of GDP at constant prices. These rates indicate that during the first period (1980/81-1985/86), employment growth was not matched with GDP growth although the latter was fluctuating around a generally downward trend. This weak employment rate—coupled with the effect of applying capital intensive production techniques during the 1970s—was reflected in exacerbating unemployment, which reached 11.2 percent in the mid-1980s according to the 1986 census. This explains the acutely low employment intensity during that period, recording (0.04) only. During the second half of the 1980s, annual employment growth rates stabilized at an average of (2.7 percent) in spite of fluctuating GDP growth rates around a downward trend, which slightly increased employment intensity though it remained at a low level of (0.09). During the intervening years between the early and mid-1990s (1991/92-1997/98), employment intensity rose markedly, reaching (0.46) as a reflection of higher employment growth rates than in the previous years. This may seem strange and contradictory to the negative impact of contractionary economic reform policies on employment, in addition to the fact that there was no notable positive trend during that period towards shifting to labor-intensive production techniques. The rising trend in employment intensity since the mid-1980s until the mid-1990s can be explained by increased informal—or unregulated—employment in the Egyptian economy. This explanation can be confirmed by comparing the 1986 census to the 1996 census, which showed that the number of the informally employed had doubled between both censuses to reach about 5 million individuals—outside the agricultural sector—and that it increased during that decade at a high rate of 8.7 percent on average per annum. This figure represented about 31 percent of total employment, about 47 percent of the employed in the private sector, and about 86 percent of non-agricultural private sector employment.[20]

The above explanation applies to the high employment intensity during the last period 1998/99-2004/2005. Despite the reduction in GDP annual growth rate, particularly from 2000

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[20] El Ehwany, N. and M. Metwally, (2002), "Labor Market Competitiveness and Flexibility in Egypt," in Togan, S. and Hanaa Kheir-El-Din, (eds), Competitiveness in MENA Countries, ERF, Cairo, p. 120.

to 2003, the annual growth rate of employment maintained approximately the same previous average rate, increasing employment intensity considerably to (0.85). It is also likely that informal employment is responsible for this high intensity as some studies estimated the size of informal employment at about 6.9 million in 2002/2003.[21]

Explaining the increased employment intensity of economic growth in Egypt throughout approximately a quarter century by the increase in informal employment is consistent with the various estimates of the size of informal labor since the mid-1980s to date. Increased employment intensity of growth from one sub period to another indicates that the basic source of economic growth is the substantial increase in employment at the expense of productivity growth, which is also consistent with the nature of informal employment.

In what follows, we will study the sectoral elasticities of employment, shedding more light on the nature of employment growth with output growth.

3.2. Employment Elasticities at the Sectoral Level

As previously mentioned in Section 2, the uses of employment elasticities to output are multiple. In addition to using them in identifying the ability of various sectors to generate job opportunities, and the consequent possibility of directing investments to the most employment intensive sectors, economic literature sheds light on an important usage of employment elasticities with respect to output. This usage is related to observing structural change mechanisms in employment and the significance of this change to the various stages of economic development. The significance of this change can be summed up by the fact that economies move through the development process from being economies dominated by agricultural production to economies dominated by industrial and service activities.

To measure structural changes, economists use two indices for the sectoral employment intensity of growth. The first index is elasticity to GDP, which shows the percentage change in sector employment that is associated with a one percent change in overall GDP. The second is elasticity to sectoral value added, which shows the percentage change in sector employment that is associated with one percent change in the output of the sector. While elasticity to GDP shows whether employment is growing or contracting in a certain sector, in general and in relation to other sectors—elasticity to output of the same sector gives an indication of whether

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[21] Nassar, Heba et al. (2006). Demographic Gift and Job Requirements ... The Case of Egypt. The Egyptian Cabinet. IDSC. P.15.

growth in the sector's output is primarily attributable to employment growth or productivity growth. In case it is the latter, it may imply implementing labor-replacing production techniques, and the potential existence of labor surplus in this sector in the future.[22] In what follows, we will estimate sectoral employment elasticities for the same period (i.e., 1980/81-2004/05) for six sectors. In each sector, we will estimate the two employment intensity indices; i.e., employment elasticity in the sector with respect to output of the same sector, and employment elasticity in the sector with respect to overall GDP.

Sectoral employment elasticities were estimated in agriculture; manufacturing and mining; petroleum and electricity; construction and building; production services (which include trade, finance and insurance; transportation, storage, telecommunications and Suez Canal; and restaurants and hotels); and finally social services (which include real-estate services, public utilities, social insurance, general government and social and personal services).

It is worth noting that most international studies estimate employment elasticities of growth with respect to three major sectors: agriculture, industry (including mining) and services. While this issue is clear and straightforward with respect to agriculture, it is a different matter for industry and services, as some studies classify the construction and building sector under industry whereas others put it under services. In this study, however, the employment elasticity of growth for the construction and building sector was estimated separately, given the importance of this sector in providing jobs to a significant segment of informal labor, in addition to the importance of indicating that available jobs in this sector lack homogeneity, as the sector includes consultants, engineers and technicians side by side with temporary, unqualified and limited-skill labor. Moreover, this sector provides decent jobs to some and non-decent jobs to others, using the ILO definition of that concept. In light of the above, and after excluding construction and building from the service sector (contrary to the WTO definition of the service sector and its various component sectors), production services were placed in one separate group, while social services were placed in another group due to the different nature of their contributions to GDP and employment. Also, the electricity and petroleum sectors were put in one group, being both capital intensive sectors.

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[22] Kapsos, op.cit, pp. 9-10.

It is worthy to note here a main problem that faced researchers when measuring sectoral employment elasticities. The problem is related to the method of classifying economic sectors due to the different classification of 2001/2002 data compared to the previous period. According to the classification covering the period 1980/81-2000/01, data of the insurance sector were included under the production services sector, while social insurance data were classified under social services. The 2001/02-2004/05 classification combined both insurance and social insurance data and reclassified them under social services. A substantial increase in their value was also noted in 2001/2002 as compared to the previous year. Thus, average relative distribution of insurance and social insurance in the total of these two items was calculated for the period 1995/96-2000/01, and this percentage was applied to the total of the two items during 2001/2002-2004/2005 to separate the two items and reclassify them in accordance with the classification used prior to 2001/2002.

By applying the aforementioned regression equations when estimating point elasticity at the national level, and by using value added data for each sector and total employment in the sector, employment elasticity to sector's output was calculated as shown in Table 1, column (1), while productivity elasticity was calculated in column (2) as (1- employment elasticity in the sector). Also, employment elasticities in each sector were estimated with respect to overall GDP as shown in column (3).

Table 1. Estimating Employment Elasticities to Value Added and to GDP in Various Sectors during 1980/81-2004/2005

Sector	Employment elasticity to value added in the sector (1)	Productivity elasticity to value added in the sector (2)	Employment elasticity to GDP (3)
Agriculture	0.32	0.68	0.27
Manufacturing and mining	0.61	0.39	0.44
Petroleum and electricity	0.32	0.68	0.30
Construction and building	0.53	0.47	0.28
Production services	0.48	0.52	0.46
Social services	0.58	0.42	0.48

Source: Authors' calculations.

Table 1 shows that a structural change in the employment structure in the Egyptian economy was associated with the change in the structure of generating value added over the past quarter century. Unlike in the 1960s and 1970s when the agricultural sector was dominating, and the manufacturing sector was important for GDP and employment structure,

the table's column (1) indicates that the manufacturing and mining sector was the most employment intensive sector with growth during the period, followed by social services, then construction and building. Agriculture's ability to generate jobs in response to the growth of value added therein was weak and resembled that of sectors that are capital intensive by nature such as petroleum and electricity. This finding may seem strange in light of what is known about the importance of the agricultural sector to the Egyptian economy. Although the share of agriculture in GDP has declined by about 14 percentage points since the mid-1970s to date, the agricultural sector still contributes about 15 percent to GDP and percentages ranging between 10 to 18 percent to GDP growth. It also absorbs about 28 percent of total employment in addition to contributing approximately 12 percent of total agricultural exports.[23] Given what is known about this sector as being labor-intensive by nature and as a job provider for a large percentage of rural population, it was assumed that it would have been employment intensive as well, and that the employment elasticity of agricultural output would have been high contrary to the findings of the estimation of elasticity values in the above table.

The lower elasticity value could be explained by several factors. Firstly, the relative scarcity and saturation of agricultural lands; i.e., lands in the Delta and Valley suffer from pressure of large numbers of workers on limited agricultural land. Thus, a one percent increase in the value added of the agricultural sector generated only a limited number of jobs. In this regard, it is worth noting that agricultural landholdings in both lower and upper Egypt are small and highly segmented in a way that does not allow for extensive use of high-tech production techniques, which would have theoretically led to machinery replacing labor. Secondly, agriculture in desert lands—currently on the increase—applies capital intensive production techniques due to reliance on dripping irrigation and machinery, which does not create many jobs. A third factor is the growth in the productivity of employed persons in agriculture, which was positive during 1981/82-2001/02 and fluctuated around a generally upward trend at an annual growth rate of 2 percent as indicated in Table A5 of the statistical appendix. This explanation is supported by column (2) of Table 1, which indicates that the value of productivity elasticity rose to 0.68, i.e, more than two thirds of growth in agricultural output is attributed to productivity growth. There may be another reason for the low employment elasticity in the agricultural sector related to crop composition. Growing some

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[23] Ministry of State for Economic Development, www.mop.gov.eg.

crops—such as wheat—does not require many laborers, while the growing of other crops—such as vegetables—needs many laborers. Consequently, the agricultural crop composition during the study period may reveal growing crops that did not generate many jobs. To identify this effect, the crop composition during that period should be analyzed, which is beyond the scope of this study.

As for the petroleum and electricity sector—which comprises capital intensive activities—productivity growth contributed about 68 percent to output growth in this sector, while employment growth as a source of sector's output growth was clear in three cases: manufacturing and mining; construction and building; and production services, and its impact exceeded that of productivity growth.

The structural change in employment in the Egyptian economy is confirmed in column (3) of Table 1, which indicates a high value of employment elasticities to GDP growth in the two service sectors, and a low value in the case of agricultural employment. These values mean that employment increases in service sectors, particularly in the social services sector, at a much higher rate than in the agricultural sector. This trend is supported by other indicators such as development of the various sectors' relative shares in employment and in GDP for the same period as shown in Table A6 of the statistical appendix. The table shows decline of the relative contribution of the agricultural sector to GDP by about 8 percentage points and to employment by about 9 percentage points. It also shows an increase in the relative contribution of social services to employment and an increase in the relative contribution of production services to GDP.

It is worth noting that the importance of service sectors in the Egyptian economy does not indicate a positive structural shift, similar to that witnessed in advanced countries, which includes a strong contribution of the service sectors to generating GDP and employment, and at a much higher degree compared to agriculture, and to industry in its broader meaning. That is because in this case, the services that generate income and jobs are high-tech services with high productivity, which are mostly production services. In the case of the Egyptian economy, social services, mostly general government and personal services, are the largest contributor to employment. Moreover, an important part of production services is traditional, low productivity services in informal small and micro enterprises, particularly in trade,

distribution and transportation. Thus, the high relative weight of services in employment—as reflected by high elasticities of services—does not indicate positive structural change.

In this regard, the Egyptian case resembles that of other developing countries where increased service employment does not reflect a successful shift of the economy towards higher productivity levels, but rather more unemployment hidden in unregulated service activities with low productivity, particularly in urban areas. Unlike the case of India where labor was absorbed in high productivity service sectors, the number of the employed in low productivity services increased in urban areas in Indonesia, Brazil and Mexico as a result of population pressure and the decline in the ability of agriculture in rural areas and of manufacturing in urban areas to provide jobs.[24]

Finally, Table A6 of the appendix shows that the relative contributions of the manufacturing and mining sector to GDP and employment are changing around stable trends, in a way that does not point to the increase in the role of this sector in the Egyptian economy—as compared to services. Hence, the value of employment elasticity in this sector is close to the values of services elasticities, but is almost double the employment elasticity in both agriculture, and construction and building.

It is worth mentioning in this regard that the manufacturing sector—next to trade, and construction and building sectors—has the largest number of informal labor engaged in micro and small enterprises.[25]

From the above, it is clear that over the past quarter century the Egyptian economy has shifted towards becoming a primarily service-oriented economy with informal labor increasing in micro and small enterprises together with the small and micro manufacturing sector. This has been coupled with a decline in the capacity of the agricultural sector to absorb labor.

Since the study period includes the years following the Egyptian government's adoption of the economic reform program in the early 1990s, and in light of the assumed impact of the changes that took place in the structure of GDP and employment—which accompanied implementation of the program and effecting of market forces—on the values of employment elasticities calculated for the whole period, we divided the quarter century into two sub

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[24] ILO, World Employment Report 2004-2005, pp. 114.
[25] EL Ehwany, N., op.cit, Table (10).

periods. The first sub period covers 1980/81-1990/91; i.e., prior to the reform program, while the second sub period includes 1991/92-2004/05, i.e., after implementing the program. This division is motivated by the desire to test whether the shift of the Egyptian economy toward a service economy, as previously mentioned, is related to implementation of the economic reform program, or that these trends began prior to the program.

Table 2 below shows the values of employment elasticities during the two periods.

Table 2. Estimation of Employment Elasticities to Value Added and to GDP in Various Sectors

Sector	1980/81-1990/91			1991/92-2004/05		
	Employment elasticity to value added in the sector	Productivity elasticity to value added in the sector	Employment elasticity to GDP	Employment elasticity to value added in the sector	Productivity elasticity to value added in the sector	Employment elasticity to GDP
Agriculture	0.23	0.77	0.47	0.31	0.69	0.25
Manufacturing and mining	0.46	0.54	0.66	0.60	0.40	0.66
Petroleum & electricity	0.31	0.69	0.28	0.31	0.69	0.34
Construction and building	0.51	0.49	0.39	0.54	0.46	0.38
Production services	0.48	0.52	0.45	0.49	0.51	0.46
Social services	0.52	0.48	0.51	0.54	0.46	0.43

Source: Authors' calculations.

Table 2 shows the same trends of structural change indicated in the first table related to the long period regarding the shift of employment structure in favor of services and at the expense of the agricultural sector. Using the employment elasticity index with respect to the value added generated in each sector, it turns out that during the ten years preceding adoption of the reform program, the most employment intensive sectors were social services, construction and building, and production services. Conversely, the ability of the agricultural sector was limited in generating jobs in response to agricultural value added growth. This employment structure, prevailing in the 1980s, is considered a result of the open door (*infitah*) policy during the 1970s. In this respect, it is worth noting that the size of informal employment reached about 2.5 million according to the 1986 census, of whom more than one third were engaged in trade activities, and one fifth worked in construction and building.[26] Furthermore, the informal sector was responsible for generating the overwhelming majority of jobs outside the public and agricultural sectors, particularly in rural Egypt.

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[26] Ibid, p. 115.

Also, using the employment elasticity to GDP index during the 1980s shows a relative rise in the values of employment elasticities in the social services and production services sectors. The manufacturing sector was the most employment intensive—particularly the informal part of it—with respect to GDP during the two periods.

In short, employment trends and their implications for the Egyptian economy were not the outcome of the 1990s, but can be traced back to the early 1970s and the 1980s as a result of the economic policies during these two decades that negatively affected labor market conditions.

Given the importance of the manufacturing sector and the role it plays in the national economy as a whole and in employment in particular, we will devote the following section to examine employment elasticities to manufacturing output at the sub-sectoral level.

4. EMPLOYMENT INTENSITY IN THE MANUFACTURING SECTOR

The manufacturing sector occupies a position of special importance in economies worldwide. In spite of the important role of the service sectors and its implications for the degree of advancement and positive structural change, the manufacturing sector remains one of the important sectors that countries are keen on supporting during their various development phases. This is due to its being the backbone of sustainable development, and to its ability to efficiently use resources and constantly develop human resource skills, in addition to its ability to provide productive and permanent jobs. Furthermore, the manufacturing sector enjoys important forward and backward linkages, allows the introduction and application of modern techniques and helps link the national economy to international value chains. Hence, the progress of countries is measured by their degree of industrialization, the ratio of manufacturing exports to total exports, and the technological content in their manufacturing products and exports.

In Egypt, the manufacturing sector traditionally played an important role in generating value added and in employment as well as sectoral linkages. Although the relative contribution of the sector to GDP and to employment has fluctuated, as shown in Table A6 of the appendix, the sector contributes to both by 17 and 12 percent—on average—respectively. Furthermore, manufacturing exports represent 55 percent of total exports on average.[27] In

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[27] Ministry of State for Economic Development, op.cit.

light of the importance of the employment elasticity value for manufacturing growth (0.6) during the long period extending a quarter century as indicated in the previous section, it is important to analyze the degree of employment intensity in manufacturing sub sectors to identify which of these sub sectors was capable of creating jobs with output growth.

For this purpose, annual industrial production data for the period 1980/81-2003/04 were used to obtain production and labor data in the various manufacturing subsectors, at the third level of the international standard industrial classification revision 2 for the period 1980/81-1995/96, and revision 3 for the period 1996/97-2003/04, applying concordance between the two revisions in accordance with the third level of revision 2. The WPI of various manufacturing industries was also used to calculate the real value of manufacturing production.

Table 3 below shows employment elasticities to value added in various manufacturing industries, estimated using the generalized least squares regression equation and pooled data of value added and labor, at the third level of the international industrial classification for each industry for the period 1980/81-2003/2004. It is worth noting that serial correlation and cross-section weights of the seemingly unrelated regression were also accounted for.

Table 3. Values of Employment Elasticities to Output in Various Manufacturing Industries for the Period 1980/81-2003/04

	Industry	Elasticity
1.	Food, beverages and tobacco products	0.87
2.	Spinning and weaving, garments, leather and footwear	0.34
2.1	*Spinning and weaving*	0.56
2.2	*Ready-made garments*	0.74
2.3	*Leather and footwear*	0.33
3.	Wood and wooden products including furniture	0.68
4.	Paper and paper, printing and publishing products	0.43
5.	Chemicals and chemical products, petroleum products, coal, rubber, and plastics	0.45
5.1.	*Basic chemicals, fertilizers, petroleum and coal products*	0.58
5.2.	*Paints, medicine, soap, cosmetics, rubber and plastics*	0.62
6.	Nonmetal mining products except petroleum and coal	0.42
7.	Basic metal industries	0.23
8.	Metal products, machinery and equipment industry	0.14
9.	Other manufacturing industries*	-

Source: Authors' calculations.
* Employment elasticity of growth for other manufacturing industries was not estimated due to inadequate observations and unavailability of WPI for this sector.

Based on the above table, manufacturing industries could be divided into three groups:

1. Group one includes high employment intensive manufacturing industries, which comprise food, beverages and tobacco; wood and wooden products including furniture; and ready-made garments.

2. Group two includes moderately employment intensive industries—though weak according to international standards—comprising chemicals; paper and paper products; and nonmetal mining products.

3. Group three includes weak employment intensive industries, which comprise spinning and weaving, garments and leather; and basic metal industries in addition to metal products, machinery and equipment.

As for the first group, *food industries* are one of the sub sectors that traditionally contributed highly to generating value added in the manufacturing sector and to total employment in this sector as indicated by Table A7 of the appendix. While the employment intensity in this industry is high (0.87)—which is further manifested by its increased absorption of employment during the study period from around 19 to around 22 percent—the relative contribution of food industries to manufacturing value added declined by about 8.5 points. This decline is attributed to the decrease in the relative importance of investments devoted to this industry as indicated by Table A8 of the appendix. Thus, the high value of employment intensity and increased employment in food industries, and their declining relative share in investments and value added, are explained by increased informal employment in micro enterprises, and domestic and roving activities in this industry. This is confirmed by the low value of the productivity elasticity of employment in this industry. We must differentiate here between two different sectors comprising the food industries: Firstly, the modern sector, which produces for the domestic market and for exporting to external markets. This sector applies capital intensive production techniques and complies with international health safety standards, anti-child labor criteria as well as other criteria. Secondly, the traditional sector, which produces for the domestic market and most of its establishments are informal, and applies labor intensive production techniques. While the former provides jobs indirectly—outside the production lines—employment intensity rises in the latter with output growth, which consequently explains the high elasticity value. These facts demonstrate the need to support this sector and its two subsectors, and to devote more domestic investments to it together with attracting multinationals desiring to operate in the

Middle East and North Africa in these industries, particularly in greenfields. This trend is supported by the fact that food exports have achieved positive growth rates since 2002 ranging between 21 and 49 percent (particularly dairy products, frozen vegetables, sugar and sweets) to various export destinations.[28] Furthermore, a study of the large enterprises proposed for investment under the government program of the one thousand factories for the period 2005-2011 shows that several projects in food industries are promising with high export opportunities (see Table A9 of the appendix).

As for the *wood and furniture industry*, in spite of its modest contribution to manufacturing value added and overall industrial employment, the value of employment elasticities in this industry is high (0.68). In other words, this industry managed to generate many jobs especially in the governorates traditionally famous in this area (such as Damietta). However, Table A8 of the appendix shows a decline in investment in this industry throughout most of the study periods. Hence, wood industries need support by solving the many problems they face, on top of which are the shortage, high prices and low quality of raw materials, as well as competition from South East Asian products.

The second group of manufacturing industries, *chemical and chemical products industries,* is considered the most important of these industries because a substantial part thereof is linked to petroleum. The appendix shows that its relative importance more than doubled during the study period with respect to manufacturing value added, and increased by about 4.5 percentage points with respect to employment. A great leap occurred in the relative share of these industries in total investments (Table A8 of the appendix) since the mid-1990s and until the last years of the study period (65 percentage points). It is worth noting here that the group of chemical and chemical products industries includes two subsectors that vary in terms of the applied production technique, and consequently in terms of their ability to generate jobs.[29] The first subsector includes—as shown in Table 3—"basic chemicals, fertilizers, petroleum products and coal"; i.e., the group of heavy chemical industries, which are capital and energy intensive. The second subsector includes "paints, medicine, soap, rubber and plastics," which are labor intensive industries. Although the production technique used differs in both groups of industries, estimating employment elasticities showed a

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[28] IMC Egypt (May, 2006), Food Export Strategy Study, Final Report, pp. 31-36.

[29] It was mentioned previously in Section 2 that there is a distinction between "labor intensity" and "employment intensity" and that it is not necessary for a labor-intensive activity to be employment-intensive.

similarity in the degree of employment intensity, which may be attributed to directing large—domestic and foreign—investments to the petrochemical industries, rendering them able to create jobs even though they are capital intensive by nature.

Table A9 of the appendix shows that several chemical projects belonging to the second subsector possess high export opportunities, on top of which are white and gray cement (which are part of the chemical industries), glass, synthetic paints and some pharmaceutical industries. The table also shows that there are high export opportunities for fertilizers.

The *nonmetal mining products industries* are important in the structure of manufacturing value added and employment, especially that they include wall, floor and facade ceramic tiles, whose exports increased substantially over the past years, with Egypt now occupying an advanced ranking (26) in world exports. Although these industries possess high export opportunities, the investments directed to them decreased in the last two years of the study period.

The third group, characterized by low employment intensity, comprises two capital intensive industries, namely, *basic metals, and machinery and equipment industries* (including engineering, electrical and electronics industries). It is worth noting that the latter include some engineering industries and some industries related to vehicle parts, which apply labor intensive production techniques rather than high-tech technologies, and can generate numerous employment opportunities. However, we were unable to estimate the employment elasticity in these industries due to inadequate observations.

The third group also includes another industry which is *spinning and weaving, garments and leather*, which exhibited a very modest value of employment elasticity (0.34). Traditionally, this industry was one of the most job-generating industries, especially in its readymade garments component. However, several factors led to a decline in the relative position of this industry, including public sector firms' dominance and tough competition from countries such as China, Turkey and Indonesia, in addition to elimination of the quota system, which prevailed under the "Multi-Fiber Agreement," and entry of the "Agreement on Textiles and Clothing" into force in early January 2005. Tables A7 and A8 of the appendix show a decline in the relative position of this industry in manufacturing value added by 10 percentage points, in the employment structure by more than 7 percentage points, and in manufacturing investment by more than 15 percentage points since the beginning of the

1980s. These developments in the spinning and weaving and readymade garments industry are attributed to the declining role of the public sector with the beginning of the economic reform program, and increased privatizations. For example, the number of the employed in public sector factories during 1996/97-2002/03 declined by about 27.1 percent in the weaving industry and by about 96 percent in readymade garments. This was not offset by an increase in the number of the employed in private sector factories, where the percentage of increase during the same period—for both industries—reached 13 percent only.[30] However, caution must be observed when explaining the value of employment elasticity to output in the spinning and weaving and readymade garments industry, particularly when it comes to economic policies. Table 3 above indicates that the values of employment elasticities to output in these industries differ substantially. They rise to (0.74) in the case of readymade garments—which is a labor intensive industry—and register a lower value in spinning and weaving (0.56), which is capital intensive. The elasticity value in leather and footwear industries amounts to (0.33) only, although they are labor-intensive industries. For accuracy purposes, one should separate these components when estimating the values of elasticities. It is also necessary to identify the relative weight of each subsector in the manufacturing structure in order to find out the impact of development in each subsector on the employment intensity of the industry as a whole.[31]

In short, the structure of value added in manufacturing industries is biased towards industries that depend primarily on natural resources. However, a clear change has occurred in this structure in a way that increased reliance on food industries—which depend on land and agricultural resources—and chemical industries, which depend on petroleum, with the importance of some subsectors decreasing in a traditionally important industry, namely, spinning and weaving and readymade garments.

This was reflected in high values of employment intensity in the first two industries, with modest intensity in some subsectors of spinning and weaving and leather industries. These findings indicate the importance of revisiting the industrialization strategy so as to take into account the ability of various manufacturing sub-sectors to create jobs, and hence direct investments to such industries in addition to providing incentives and creating the conducive

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[30] Calculated from annual industrial production data.

[31] See in this respect: Kassem, M. and Abdel Latif, A. (2005), The Egyptian Textiles and Clothing Industry, Sub-Regional Conference on Improving Industrial Performance and Promotion of Employment in North Africa, UNIDO, Tunisia.

legal and institutional framework. For example, if the manufacturing subsectors are highly employment intensive—with high relative contribution in manufacturing output and employment, and with high growth rate of exports and large export opportunities—and at the same time investments directed to them are on the decline, hence, the industrialization policy should provide incentives to these industries, provided that these incentives are linked to certain employment and export objectives. Continuing these incentives should also be linked to performance and achieving objectives at the end of designated periods. Another example, if the manufacturing subsectors contribute highly to manufacturing employment and exports, and receive a substantial percentage of investments, but the productivity of labor therein is low, this requires increasing labor productivity through enhancing labor skills and human capital.

In sum, there is a need to revisit the industrial policy so as to take into account the employment component therein. However, this does not mean that this element should govern industrial policy; there are other objectives that may be complementary or contradictory to this objective. What is required is that industrial policy should take into account an element that has long been ignored in the economic policies of successive governments, namely, the employment intensity of growth in various economic sectors as well as sub sectors.

CONCLUSION

This paper sends several messages:

1- It is time for decision makers to consider the employment objective as a principal goal that must be achieved through a package of macroeconomic policies, if the ultimate objective of development efforts is to improve the living standards of citizens and alleviate poverty, and if we are targeting inclusive economic development.

2- The structure of the Egyptian national economy and the characteristics of the population and labor force necessitate that economic policies take employment intensity as an important criterion—along with other considerations—when formulating objectives and identifying priorities.

3- Adopting a strategy of high and employment-intensive growth does not mean that it will be at the expense of labor productivity or that labor would be pushed into non-decent and unproductive jobs in some service or manufacturing sectors with limited benefits whether in

terms of value added or productive and permanent employment. It is necessary to direct investments to the sectors that are capable of creating productive jobs with the purpose of absorbing the increasing numbers of new entrants to the labor market, while increasing labor productivity through focusing on education, health and training.

4- Despite shortcomings in the employment elasticities index with respect to GDP growth, using it—along with other indices—is useful in identifying the various sectors that contribute to achieving the high employment objective.

5- Increased employment intensity with respect to economic growth in Egypt throughout the past twenty five years primarily reflects the increase in informal employment. The structural change in the pattern of generating value added and employment during this period in favor of the service sectors—particularly social services—does not indicate a positive trend, but rather reflects more unemployment hidden in unregulated, low productivity activities.

6- Food, wooden products, chemicals, and readymade garments are considered promising employment intensive industries. Regarding the spinning and weaving industry, although the employment elasticity index shows a decrease in its capacity to create jobs, the components of this sector need to be studied closely. Their relative weight should also be analyzed, in addition to solving the problems facing manufacturing subsectors and enhancing the productivity of workers.

7- Increasing employment requires increasing exports, which entails increasing labor productivity in order to improve the quality and specifications of products.

These facts point to the importance of revisiting the industrialization strategy to take into account the ability of various industries to generate productive and decent jobs, provided that the strategy be based on the two integrated pillars mentioned in Section 2, namely, investing in growing dynamic sectors, and building capacities in the sectors that absorb high employment.

Finally, this paper represents an initial attempt to estimate employment elasticities in the national economy, with all the difficulties involved in measurement and explanation. But it takes more attempts to scrutinize results and identify their implications for economic policies. Achieving the productive employment objective requires conducting similar studies for all sectors and subsectors of the economy to identify the employment elasticities of growth

therein and their relation to productivity, and use these indicators—besides others such as the ability to export—to identify the appropriate instruments of economic policy.

Statistical Appendix

Table A1. Implications of Employment Elasticities

Employment Elasticity	GDP Growth	
	Positive GDP Growth	**Negative GDP Growth**
$\varepsilon < 0$	(-) Employment Growth (+) Productivity Growth	(+) Employment Growth (-) Productivity Growth
$0 \leq \varepsilon \leq 1$	(+) Employment Growth (+) Productivity Growth	(-) Employment Growth (-) Productivity Growth
$\varepsilon > 1$	(+) Employment Growth (-) Productivity Growth	(-) Employment Growth (+) Productivity Growth

Source: Kapsos, op.cit, p. 4.

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Table A2. Employment Intensity of Growth at the National Level (1980/81-2004/05)

	Year	GDP (LE thousand)	Deflator 1986/87 = 100	Real GDP (LE thousand)	Labor (000)	Log Real GDP	Log Labor	Arc Elasticity		
								ΔE/E	ΔY/Y	ε
1	1980/81	15,494,000	49	31,880,658	11,439	17.28	9.34			
2	1981/82	21,526,000	53	40,691,871	10,522	17.52	9.26			
3	1982/83	25,412,000	60	42,637,584	10,795	17.57	9.29			
4	1983/84	30,080,000	67	44,761,905	11,072	17.62	9.31			
5	1984/85	35,638,000	75	47,390,957	11,367	17.67	9.34			
6	1985/86	41,433,000	87	47,788,927	11,669	17.68	9.36	0.02	0.04	0.50
1	1986/87	49,335,000	100	49,335,000	11,998	17.71	9.39			
2	1987/88	58,630,000	120	48,696,013	12,334	17.70	9.42			
3	1988/89	73,170,000	153	47,948,886	12,685	17.69	9.45			
4	1989/90	91,535,000	185	49,398,273	13,032	17.72	9.48			
5	1990/91	110,011,000	218	50,556,526	13,376	17.74	9.50	0.11	1.23	0.09
1	1991/92	131,057,000	250	52,485,783	13,742	17.78	9.53			
2	1992/93	146,160,000	278	52,575,540	14,011	17.78	9.55			
3	1993/94	162,967,000	297	54,945,044	14,436	17.82	9.58			
4	1994/95	191,010,000	315	60,657,352	14,879	17.92	9.61			
5	1995/96	214,185,000	338	63,349,601	15,340	17.96	9.64			
6	1996/97	247,028,000	359	68,810,028	15,825	18.05	9.67			
7	1997/98	266,757,700	369	72,292,060	16,149	18.10	9.69	0.18	0.38	0.46
1	1998/99	282,578,000	373	75,737,872	16,569	18.14	9.72			
2	1999/2000	315,667,000	378	83,487,702	17,000	18.24	9.74			
3	2000/01	332,543,800	383	86,735,472	17,340	18.28	9.76			
4	2001/02	354,564,000	398	89,153,633	17,684	18.31	9.78			
5	2002/03	390,619,000	440	88,878,043	18,179	18.30	9.81			
6	2003/04	456,322,000	509	89,668,304	18,628	18.31	9.83			
7	2004/05	506,511,000	563	89,966,430	19,220	18.31	9.86	0.16	0.19	0.85

Source: Authors' calculations based on the Ministry of State for Economic Development (MoED) database.

Table A3. GDP Growth Rate at Constant Factor Cost (1981/82-2002/03)

Year	Growth rate	Year	Growth rate
1981/82	11.3	1997/98	4.6
1982/83	7.4	1998/99	6.3
1983/84	6.1	1999/2000	5.1
1984/85	6.6	2000/2001	3.3
1985/86	2.6	2001/2002	3.1
1986/87	2.5	2002/2003	3.2
1987/88	5		
1988/89	4.7		
1989/90	4.8		
1990/91	3.7		
1991/92	1.9		
1992/93	2.5		
1993/94	3.9		
1994/95	4.7		
1995/96	4.9		
1996/97	5.3		

Source: Calculated from the World Bank, World Development Indicators.

Table A4. Annual Growth Rates of Employment and GDP at Constant Prices (1980/81-2004/05)

Year	Employment	GDP	Year	Employment	GDP
1980/81	4.2	17.2	1998/99	2.6	6.1
1981/82	2.2	6.2	1999/2000	2.6	5.4
1982/83	2.6	5.1	2000/2001	2	3.5
1983/84	2.5	9.7	2001/2002	2	3.2
1984/85	2.7	5.9	2002/2003	2.8	3.1
1985/86	2.7	4.5	2003/2004	2.6	4.1
1986/87	2.8	3.9	2004/2005	2.4	5.1
1987/88	2.8	5.5			
1988/89	2.8	4.9			
1989/90	2.7	5.7			
1990/91	2.6	1.1			
1991/92	2.7	4.5			
1992/93	2.0	2.9			
1993/94	3.0	4			
1994/95	3.1	4.6			
1995/96	3.1	5			
1996/97	3.2	5.5			
1997/98	2	5.6			

Source: Calculated from MoED data.

Table A5. Annual Growth Rates of Labor Productivity (1981/82-2001/2002)

Period	Agriculture	Manufacturing	Production services	Social services	National economy
1981/82-1984/85	1.4	5.6	1.8	2.3	4.4
1985/86-1989/90	2.1	-2.0	1.2	1.6	1.4
1990/91-1994/95	1.9	-1.0	-0.3	0.5	0.5
1995/96-1999/2000	2.1	-1.9	2.4	3.1	1.7
2000/01-2001/02	3.0	-1.2	3.0	2.6	1.2
1981/82-2001/02	2.0	0.0	0.9	2.1	1.6

Source: El Issawi, Ibrahim (2007), *The Egyptian Economy in Thirty Years*, Third World Forum, Egypt 2020, Academic Library, p. 304.

Table A6. Development of Relative Shares of Various Sectors in GDP and Employment (1980/81-2004/05)

	Contribution to GDP (%)							Contribution to Employment (%)						
Year	Agriculture	Manuf-acturing	Petroleum & electricity	Const-ruction	Production services	Social services	Total	Agriculture	Manuf-acturing	Petroleum & electricity	Const-ruction	Production services	Social services	Total
1980/81	22.86	13.47	14.83	4.78	26.20	17.88	100	36.72	12.50	0.73	5.74	18.90	25.41	100
1981/82	18.83	12.71	13.20	5.44	30.04	19.79	100	38.96	12.15	0.81	5.05	14.98	28.06	100
1982/83	19.94	12.85	11.77	5.30	30.34	19.80	100	38.38	10.42	0.82	4.10	12.97	33.30	100
1983/84	19.02	13.46	11.50	5.26	30.53	20.23	100	37.81	10.65	0.84	4.22	13.14	33.35	100
1984/85	17.90	14.78	10.93	5.26	30.32	20.80	100	37.20	10.85	0.86	4.39	13.31	33.39	100
1985/86	18.51	15.33	8.81	5.55	30.57	21.24	100	36.68	11.07	0.91	4.60	13.37	33.37	100
1986/87	20.49	16.49	4.87	5.72	31.52	20.91	100	36.09	11.24	0.93	4.84	13.58	33.33	100
1987/88	18.96	17.74	5.57	5.53	31.81	20.39	100	35.52	11.20	0.94	4.90	13.61	33.83	100
1988/89	19.67	18.10	4.32	5.56	32.24	20.10	100	34.92	11.12	0.95	5.04	13.76	34.21	100
1989/90	19.38	17.77	5.40	5.52	32.60	19.34	100	34.31	11.07	0.97	5.18	13.88	34.59	100
1990/91	17.37	16.38	11.37	5.11	32.03	17.74	100	33.74	11.00	0.99	5.33	13.96	34.99	100
1991/92	16.54	16.58	11.62	5.14	33.27	16.85	100	33.12	10.92	1.01	5.45	13.99	35.50	100
1992/93	16.71	16.71	11.51	4.86	32.89	17.33	100	32.67	11.04	1.02	5.67	13.85	35.75	100
1993/94	16.87	17.20	10.34	5.22	32.34	18.03	100	32.01	11.24	1.03	5.86	14.01	35.84	100
1994/95	16.78	17.45	9.88	4.97	32.59	18.33	100	31.30	11.37	1.03	6.06	14.18	36.06	100
1995/96	17.26	17.71	8.75	5.15	32.61	18.51	100	30.59	11.48	1.03	6.28	14.34	36.28	100
1996/97	16.95	17.56	8.76	4.90	33.55	18.28	100	30.00	11.58	1.03	6.52	14.88	35.99	100
1997/98	17.11	18.29	7.42	5.15	33.39	18.63	100	29.74	11.66	1.04	6.89	14.82	35.86	100
1998/99	17.32	19.54	6.22	5.15	33.11	18.65	100	29.31	11.92	1.06	7.23	14.93	35.55	100
1999/2000	16.74	19.39	8.94	4.80	32.25	17.88	100	28.91	12.14	1.06	7.55	15.13	35.21	100
2000/01	16.56	19.09	9.50	4.74	32.13	17.98	100	28.67	12.18	1.08	7.72	15.27	35.08	100
2001/02	16.46	19.77	9.95	4.67	31.07	18.07	100	28.43	12.30	1.10	7.77	15.38	35.02	100
2002/03	16.34	18.49	12.48	4.28	30.42	17.99	100	28.08	12.55	1.09	7.73	15.60	34.96	100
2003/04	15.18	18.33	14.09	4.05	30.91	17.44	100	27.86	12.53	1.09	7.83	15.79	34.90	100
2004/05	14.86	17.76	14.19	3.97	31.79	17.42	100	27.52	12.68	1.12	7.93	16.09	34.67	100
Average	**18**	**17**	**10**	**5**	**32**	**19**	**100**	**33**	**12**	**1**	**6**	**15**	**34**	**100**

Source: Authors' calculations based on the MoED Database.

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Table A7. Production and Employment Structure in Manufacturing Industries (1980/81-2003/04) (%)

Industry	Production						Employment					
Year	80/81	85/86	90/91	95/96	00/01	03/04	80/81	85/86	90/91	95/96	00/01	03/04
Food & beverages and tobacco	29.89	27.90	25.62	22.12	24.08	21.44	19.26	20.42	22.17	18.72	15.92	21.57
Spinning & weaving and garments, and leather	19.93	16.74	16.32	12.68	10.65	9.88	37.22	31.10	29.02	29.81	30.99	29.78
Wood and wooden products including furniture	1.00	1.49	0.66	0.66	1.11	0.46	1.29	1.45	1.31	1.55	1.72	1.50
Paper and paper, printing and publishing products	4.44	5.12	2.98	3.89	3.63	3.46	3.89	5.54	3.45	3.04	4.77	3.49
Chemicals and chemical products, petroleum products, coal, rubber and plastics	15.25	18.12	26.41	29.79	33.59	33.41	11.37	14.71	12.89	13.72	17.98	15.85
Nonmetal mining products except petroleum and coal products	4.39	5.41	5.71	7.17	6.17	5.90	6.23	6.23	6.81	7.91	4.28	7.15
Basic metal industries	11.19	9.08	9.49	8.45	7.90	13.13	8.41	7.78	6.61	6.76	8.57	5.81
Metal products, machinery and equipment	13.82	15.96	12.63	15.10	12.52	12.17	12.24	12.61	17.56	18.07	15.78	14.56
Other manufacturing industries	0.10	0.18	0.18	0.14	0.35	0.15	0.09	0.17	0.17	0.42	0.01	0.27
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Authors' calculations based on annual industrial production database.

Table A8. Structure of Capital Formation in the Manufacturing Industries (1980/81-2003/04) (%)

Year / Industry	80/81	85/86	90/91	95/96	00/01	03/04
Food & beverages and tobacco	11.18	5.81	9.44	12.60	2.10	8.85
Spinning & weaving, garments and leather	19.34	12.43	7.08	32.85	3.99	3.96
Wood and wooden products including furniture	1.03	(0.95)	(0.70)	(0.18)	0.04	(12.51)
Paper and paper, printing and publishing products	2.67	9.96	(0.39)	17.45	7.49	2.72
Chemicals and chemical products, petroleum products, coal, rubber and plastics	17.88	9.39	39.70	23.47	80.60	88.37
Nonmetal mining products except petroleum and coal products	13.13	40.19	21.42	18.28	(0.39)	(9.25)
Basic metal industries	8.07	8.82	18.68	(8.28)	5.51	3.26
Metal products, machinery and equipment	26.58	14.38	4.89	3.90	0.65	14.13
Other manufacturing industries	0.11	(0.04)	(0.11)	(0.13)	0.00	0.47
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Authors' calculations based on annual industrial production database.

Table A9. Large Projects Proposed for Investment in Egypt According to the Governmental Program (the 1000-Factory Project)

Chemical Projects

Project	For exporting	For domestic production	Remarks
Gray and white cement	Exports increased by 971% Egypt's ranking in world exports: 7	Imports declined by 44% Egypt's ranking in world imports: 115	High export opportunities
Flat glass	Exports increased by 28% Egypt's ranking in world exports: 40	Imports declined by 13% Egypt's ranking in world imports: 36	High export opportunities
Azote fertilizers	Exports increased by 13% Egypt's ranking in world exports: 16	Imports increased by 14% Egypt's ranking in world imports:90	Increasing production to satisfy domestic market needs and high export opportunities
Chlorine	Exports increased by 62% Egypt's ranking in world exports: 34	No data available on imports	High export opportunities
Writing and printing paper	Exports increased by 224% Egypt's ranking in world exports: 43	Imports declined by 4% Egypt's ranking in world imports:34	High export opportunities
Transport vehicle rubber tires	Exports increased by 36% Egypt's ranking in world exports: 49	Imports increased by 4% Egypt's ranking in world imports:45	Increasing production to satisfy domestic market needs and high export opportunities
DAP fertilizer using ammonia	Exports increased by 77% Egypt's ranking in world exports: 4	No data available on imports	High export opportunities
Production of acetylene liquid gas	Exports increased by 33% Egypt's ranking in world exports: 51	Imports increased by 6% Egypt's ranking in world imports:75	High export opportunities
Synthetic paints	Exports increased by 18% Egypt's ranking in world exports: 72	Imports declined by 3% Egypt's ranking in world imports:59	High export opportunities
Plastic boxes for glass containers	Exports increased by 76 Egypt's ranking in world exports: 76	Imports declined by 14% Egypt ranking in world imports:80	High export opportunities
Polyphosphates 3	Exports increased by 130% Egypt's ranking in world exports: 33	Imports increased by 4% Egypt's ranking in world imports:7	High export opportunities
Automotive glass	Exports increased by 77% Egypt's ranking in world exports: 43	Imports increased by 12% Egypt's ranking in world imports:83	Increasing production to satisfy domestic market needs and high export opportunities
Pharmaceutical containers	Exports increased by 91 Egypt's ranking in world exports: 91	Imports declined by 4% Egypt's ranking in world imports:95	High export opportunities
Medicines and pharmaceuticals	Exports of some medicines increased by 25%; Egypt's ranking in world exports: 50 Exports of some medicines increased by 49%; Egypt's ranking in world exports:32	Imports increased by 11% Egypt's ranking in world imports:38	Increasing production to satisfy domestic market needs and high export opportunities

Spinning and Weaving, Garments and Leather Projects

Project	For exporting	For domestic production	Remarks
Complex for spinning and weaving; and tailoring shirts from cotton fabrics	Exports declined by 5% Egypt's ranking in world exports: 43	Imports declined by 28% Egypt's ranking in world imports: 72	Offsetting reduction in exports
Manufacture of threads and synthetics; polyester and acrylic fiber	Exports declined by 12% Egypt's ranking in world exports: 43	Imports increased by 32% Egypt's ranking in world imports: 31	Satisfying domestic market needs and offsetting reduced exports
Production of flax fabrics	Exports declined by 26% Egypt's ranking in world exports: 60	Imports increased by 3% Egypt's ranking in world imports: 57	Satisfying domestic market needs and offsetting reduced exports
Production of mixed fabrics	Exports increased by 10% Egypt's ranking in world exports: 35	Imports declined by 19% Egypt's ranking in world imports: 67	High exporting opportunities
Production of synthetic fabrics (viscose)	Exports increased by 44% Egypt's ranking in world exports: 43	Imports increased by 25% Egypt's ranking in world imports: 51	Increasing production to satisfy domestic market needs and high export opportunities
Manufacturing of readymade suits for men	Exports increased by 11% Egypt's ranking in world exports: 34	Imports declined by 8% Egypt's ranking in world imports: 26	High export opportunities
Manufacturing of readymade suits (men/ women)	Exports increased by 9% Egypt's ranking in world exports: 43	Imports increased by 9% Egypt's ranking in world imports: 30	Increasing production to satisfy domestic market needs and high export opportunities
Readymade casual apparels (e.g., T-shirts)	Exports increased by 9% Egypt's ranking in world exports: 34	Imports declined by 15% Egypt's ranking in world imports: 92	High export opportunities
Mixed fiber blankets (cotton-synthetics)	Exports increased by 38% Egypt's ranking in world exports: 35	Imports increased by 29% Egypt's ranking in world imports: 83	Increasing production to satisfy domestic market needs and high export opportunities
Wool fabrics and cotton towels	Exports increased by 8% Egypt's ranking in world exports: 9	Imports declined by 9% Egypt's ranking in world imports: 89	High export opportunities
Cotton underwear for men	Exports increased by 3% Egypt's ranking in world exports: 26	Imports declined by 42% Egypt's ranking in world imports: 99	High export opportunities
Cotton underwear for women	Exports increased by 12% Egypt's ranking in world exports: 31	Imports declined by 17% Egypt's ranking in world imports: 36	High export opportunities
Miscellaneous leather products	Exports increased by 28% Egypt's ranking in world exports: 57	Imports increased by 29% Egypt's ranking in world imports: 75	Increasing production to satisfy domestic market needs and high export opportunities
Projects to manufacture shoes, sandals and slippers	Exports increased by 40% Egypt's ranking in world exports: 59	Imports declined by 16% Egypt's ranking in world imports: 82	High export opportunities

Food Projects

Project	For exporting	For domestic production	Remarks
Integrated complex for slaughtering, preparing and freezing meat, and processing animal remains (skin - bones)	Exports increased by 48% Egypt's ranking in world exports: 41	Imports declined by 19% Egypt's ranking in world imports: 67	High export opportunities
Manufacture of skimmed dried milk; and production of natural butter	Exports increased by 21% Egypt's ranking in world exports: 88	Egypt's ranking in world imports: 12	Increasing production to satisfy domestic market needs and high export opportunities
Extraction of food oils from corn seeds	Egypt's ranking in world exports: 20	Imports increased by 163% Egypt's ranking in world imports: 11	Increasing production to satisfy domestic market needs and high export opportunities
Production of full cream milk	Egypt's ranking in world exports: 68	Imports declined by 12% Egypt ranking in world imports: 126	High export opportunities
Refining, packaging and producing fatty acids to produce ghee	Exports increased by 18% Egypt's ranking in world exports: 49	Imports increased by 1% Egypt's ranking in world imports: 18	Increasing production to satisfy domestic market needs and high export opportunities
Carbonated water (glass and metal containers)	Exports increased by 49% Egypt's ranking in world exports: 68	Imports increased by 107% Egypt's ranking in world imports: 60	Increasing production to satisfy domestic market needs and high exporting opportunities
Drying garlic and onion	Exports increased by 11% Egypt's ranking in world exports: 15	Imports increased by 7% Egypt's ranking in world imports: 77	Increasing production to satisfy domestic market needs and high export opportunities
Preparing and packaging fresh and frozen (preserved) vegetables and fruits	Exports increased by 119% Egypt's ranking in world exports: 41	Imports increased by 47% Egypt's ranking in world imports: 51	Increasing production to satisfy domestic market needs and high export opportunities
Extraction of olive oil	Exports increased by 55% Egypt's ranking in world exports: 24	Imports increased by 4% Egypt's ranking in world imports: 86	Increasing production to satisfy domestic market needs and high export opportunities
Extracting and packing natural water	Egypt's ranking in world exports: 88	Imports reduced by 17% Egypt's ranking in world imports: 62	High export opportunities

Mining Projects

Project	For exporting	For domestic production	Remarks
Sewing and preparing (cutting, and polishing) marble and granite	- Marble exports increased by 21% Egypt's ranking in world marble exports: 2 - Granite exports increased by 9% Egypt's ranking in world granite exports: 30	Marble imports declined by 1% Egypt's ranking in world marble imports: 55	High export opportunities
Ceramic tiles for walls, floors and facades	Exports increased by 37% Egypt's ranking in world exports: 26	Imports declined by 30% Egypt's ranking in world imports: 159	High export opportunities

Source: Authors' calculations using the WTO ITC's Trade Competitiveness Map (Trademap) data 2000-2004.