DO GOVERNMENTS PICK WINNERS OR LOSERS? AN ASSESSMENT OF INDUSTRIAL POLICY IN EGYPT

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Abstract

This paper assesses the merits of selective intervention (or industrial policy) in the Egyptian manufacturing sector over the period 1980-2000 to determine whether this policy contributed to increased diversification and improved performance of difference industries. The paper finds no positive association between the preferential incentives accorded to different industries and their performance, and attributes this results to the way the incentives were designed. Looking ahead, the paper argues in favor of redesigning industrial policy to target activities with positive spillover effects rather than specific sectors, and new rather than old products and technologies. Last but not least, the new industrial policy should be performance-based and ought to be applied for a pre-specified period of time.

ملخص

تقوم هذه الورقة بتقييم سياسة الحكومة المصرية في مساندة أنشطة وقطاعات اقتصادية بعينها – وهي ما تعرف بالسياسة الصناعية – خلال الفتر من ١٩٨٠ إلى ٢٠٠٠، بهدف تحديد مدى مساهمة هذه السياسة في تطوير أداء الصناعات وتنويع هياكل الإنتاج. وبالاستناد إلى هذا التقييم، تخلص الدراسة إلى عدم وجود ارتباط إيجابي بين الحوافز التفضيلية ومستوى أداء الصناعات التي حصلت عليها. وتعزو الورقة تلك النتيجة إلى قصور في تصميم هذه الحوافز، مما يؤكد على أهمية إعادة تصميم السياسة الصناعية بحيث تستهدف أنشطة اقتصادية ذات آثار خارجية إيجابية بدلاً من قطاعات بعينها، ومنتجات وتكنولوجيات جديدة، وأن تكون هذه السياسة مرتبطة بالأداء ومحددة بفترة زمنية معروفة مسبقاً.

I. INTRODUCTION

No debate in the development literature has survived as long and as intensely as that related to government intervention in economic activities. In the last half a century alone, views and actual policies changed considerably. In the 1950s and 1960s, it was believed that markets fail widely and government intervention was necessary to speed up the process of economic transformation and the rate of economic growth. Most developing countries adopted import substitution strategies in conjunction with high levels of protection, central planning, public ownership, and non-uniform policies across sectors and activities. But in the 1970s and 1980s it became increasingly evident that governments fail too, and according to some, even more than markets. So, the pendulum swung in the opposite direction. Pro-market reforms were adopted, especially in the 1980s, frequently with the support of the World Bank and IMF. The Washington Consensus was derived from the conviction that macroeconomic stability, trade and price liberalization, privatization, and competition are key ingredients for rapid economic growth.

The experience of the last 15 years has given grounds for rethinking the role of government. On one hand, the colossal failure of the socialist system in Eastern Europe and the Soviet Union offered the strongest evidence in favor of markets as the best mechanism for allocating resources and motivating economic agents. On the other, the apparent failure of market reform in Latin America in achieving high and shared economic growth strongly suggested that government intervention could do some good (De Ferranti et al. 2002). The latter point is reinforced by the success of active industrial policy in East Asia, at least according to a number of studies (e.g., the World Bank 1993), in achieving high and sustained levels of shared economic growth.

Presently, the quest is to find a middle ground where markets and governments play positive and complementary roles. In this paper we attempt to contribute to this pursuit by assessing one particular type of government intervention, referred to in the literature as industrial policy,[1] in the Egyptian manufacturing sector. The questions we address are the

[1] Despite its name, industrial policy is commonly used to refer to selective government intervention in any productive sector of the economy. Interventions could take the form of subsidies, protection from competition, or public ownership of assets. These interventions involve a form of discrimination that goes beyond protection of property rights, improving contract enforcement, and regulation of non-competitive markets. They are meant to enhance economic diversification by enabling industries to acquire dynamic comparative advantages, which markets would fail to do on their own.

following: Did industrial policy in Egypt make a difference in the performance of different industries over the period 1980-2000? If not, what went wrong? Finally, what lessons can we draw from the experience of other countries?

The remainder of the paper is organized as follows. In the next section, we briefly review the literature on industrial policy. In section III, we assess the performance of the manufacturing sector in Egypt over the period 1980-2000, and attempt to determine whether the variations in the performance of different industries are associated with industrial policy variables. In section IV, we benchmark industrial policy in Egypt against the lessons learned from the experiences of East Asia and Latin America, and offer some suggestions for reform in Egypt.

II. THE INDUSTRIAL POLICY DEBATE

The literature on industrial policy, both theoretical and empirical, is extensive. We have no intention of reviewing this literature here.[2] Rather, we are interested in placing the analysis of the Egyptian case in the context of the current debate. For this reason, we offer only a brief summary of the rationale for and arguments against industrial policy, followed by our take on the best way of analyzing country cases, including Egypt.

The Rationale for Industrial Policy

Traditionally, the rationale for industrial policy was linked to the infant industry argument. This argument is based on the notion that new industries will not be able to compete against their rivals, especially foreign competitors, because they incur high production costs initially. Protection and other forms of direct and indirect subsidies (e.g., tariffs, cheap credit) would enable these firms to grow, increase productivity and reduce the cost of production over time. Without support, Baldwin (1969) argued that entrepreneurs would not have the motivation to: (i) invest in knowledge acquisition because of knowledge spillover, (ii) train their workers because of labor mobility, (iii) produce new products with static positive externalities because they cannot internalize the benefits, and (iv) undertake new projects if the initial cost of assessing these projects is high. From the perspective of society, extending support to such

[2] For a recent survey, see, for example, Pack and Saggi (forthcoming), Rodrick (2000).

activities is justified as long as the discounted stream of benefits generated from learning by doing outweigh the discounted stream of subsidies (Pack and Saggi forthcoming).

Hausmann and Rodrik (2003) and Rodrick (2004) reformulated the arguments for industrial policy, emphasizing two types of market failures that weaken the motivation of entrepreneurs to diversify in low-income economies: information externalities and coordination externalities. With respect to information externalities, they point out that diversification of the productive structure requires "discovery" of the cost structure of new activities through random experimentation with new products and the adaptation of foreign technologies to local conditions. By providing support to this process, countries would be able to move beyond specializing in products in which they currently have comparative advantage to products in which they could acquire one. Once the discovery is made by one entrepreneur, it is followed by imitative entry by others.

In support of the randomness of the process, they point out several examples of countries that have very similar factor endowments, but end up specializing in different types of products. Among these examples, they cite Bangladesh and Pakistan, two countries that appear to have similar initial resources. Yet, Bangladesh exports a substantial number of hats while Pakistan exports virtually none. At a higher level of income, they indicate that Korea is a major exporter of microwave ovens and barely exports any bicycles, while the pattern is reversed in Taiwan. They make a similar point regarding the successful cases of garments in Bangladesh, cut flowers in Colombia, and IT in India. Finally, they use the Chilean experiment with the salmon industry to point out that a state entity can successfully act as the entrepreneur.

Beyond the above anecdotes, perhaps the most compelling argument in favor of industrial policy is the observation that it is difficult to find a developed or a newly-developed economy that made the transition without some kind of industrial policy that ignited a process of diversification. And it is through diversification, spillover, and sharing of knowledge that these economies were able to move to a higher and more sustainable level of economic growth and prosperity.

With respect to *coordination externalities*, the point is simple but compelling. Many projects require simultaneous, large-scale investment to be profitable. Investment in one project is not profitable without investments in other related projects. If the fixed cost of these

other projects is high and no one is playing the role of coordinator, none of the investments in that industry will take place. The coordination failure is particularly acute where new industries exhibit scale economies in the presence of non-tradable inputs (Rodrik 1996). It is also a common characteristic of most low-income countries.

The need to coordinate investment and production decisions, especially in the early stages of development, is not new. The idea finds its origin in the big push strategies of development, and more recently in the concept of clusters in particular sectors (e.g., tourism, pharmaceuticals). The practical problem is that most industries tend to operate as clusters, although many of them can operate without clusters as pointed out by Rodriguez-Clare (2004). This observation led Rodrik (2004) to argue against extending support to specific sectors. Instead, he argues in favor of supporting the adoption of new technologies, the development of new products, or training of workers to meet the demand for skills associated with new techniques. Supporting existing establishments or traditional products does not necessarily help the process of diversification and economic growth, and may at the end only mean lost resources to society.

The Case Against Industrial Policy

Notwithstanding the strong appeal of the arguments for industrial policy, the counter-arguments seem equally powerful. To begin with, the success of industrial policy hinges on the assumption that the government is better informed than the private sector about potential winners, their geographical location, and the nature of appropriate technology. It is also based on the assumption that government can identify instances of coordination failures and design support schemes that generate more benefits than costs. Both assumptions may not hold in practice, and the private sector may be better informed. Imperfect information on the part of the government is further exacerbated by the lack of penalties for bureaucrats who make the wrong decisions. Bureaucrats rarely pay for their mistakes and politicians are not typically penalized through the ballot box in less than democratic countries. Thus, society may be better off if the government were to refrain from adopting active industrial policy, focusing instead on only what government can and should do. The latter includes protecting property rights, enforcing contracts and providing sound policies.

The second counter-argument is that governments may not always do what is good for advancing the development process. Motivated by the desire to stay in power, governments

are likely to use industrial policy to favor their political supporters at the expense of their opponents. In addition, because industrial policy favors some business ventures and not others, it could lead to corruption and rent-seeking behavior on the part of some bureaucrats and private entrepreneurs (Nogues 1990).

The above arguments are not mere fears. Many of them are supported by empirical evidence, which broadly suggests that industrial policy has been ineffective or has been abused with little returns to society (See, for example, Krueger 1980; Pack 2000; Noland and Pack 2002). Without recounting the findings of this literature, suffice it to note that it is widely believed that industrial policy in Latin America resulted in inefficient allocation of resources, discrimination against exports, and even a deterioration of income distribution (Edwards 1994; Noland and Pack 2003). Even in East Asia, where industrial policy is believed to have worked, there is evidence that industries that received support did not experience higher productivity growth compared with those that did not (Pack 2000). There is also evidence that industrial policy promoted capital-intensive sectors at the expense of employment creation, or low export performers. More recently, the Asian crisis of the late 1990s has been partly blamed on earlier government direction of credit (Noland and Pack 2002).

The Bottom Line

It is clear from the above discussion that there are strong arguments for and against industrial policy. The empirical evidence is equally divided, offering support to the claims of both supporters and opponents alike. The dilemma is that industrial policy is needed to enable developing countries to escape the trap of specialization in a few traditional commodities. But there are no guarantees that this policy works. Even if the right intervention is made, politics, rent-seeking behavior, corruption, and weak institutions could stand in the way of the benefits of industrial policy.

From the perspective of learning from experience, one way to resolve the above dilemma is to change the nature of the question being posed altogether. Instead of asking whether industrial policy is needed or not, it is probably more productive to ask about the conditions under which it works.[3] After all, if we believe that no country was able to make the

[3] There is a parallel here with the literature on institutional economics. For sometime, the focus was on making the point that “institutions matter." Once the case was made, the focus has shifted to "in which way they matter."

transition to a more diversified, dynamic and prosperous economy without industrial policy, it is reasonable to focus attention on understanding the conditions under which this policy can be effective. This is the line of inquiry we pursue in the rest of the paper.

III. Industrial Policy and the Egyptian Manufacturing Sector

Turning to the analysis of the Egyptian case, we assess the effectiveness of industrial policy in Egypt in two ways. First, we analyze the performance of the manufacturing sector over the period 1980-2000, using measures of diversification and total factor productivity (TFP) as yardsticks. Second, we explore the extent to which industrial policy has contributed to observed variations in performance by regressing TFP change on a host of industrial policy and sector-specific variables. These results provide information about the effectiveness of industrial policy, but offer no explanations as to why this policy may or may not have worked. We take up the latter point in section IV.

Performance of the Manufacturing Sector, 1980-2000

Like other developing countries, Egypt has adopted an active industrial policy, especially since the early 1960s. This policy persisted until the early 1990s when a structural adjustment program was adopted and some elements of industrial policy were phased out or reduced. This program and subsequent reforms included price and trade liberalization, privatization, reduction of subsidies, and income tax reform. However, many features of the initial industrial policy remain in place. Most notably, public ownership is still pervasive, the level of tariff dispersion is relatively high, and implicit subsidies of inputs, especially of energy, continue. More recently, support is increasingly being extended to SMEs, while the European Union has provided financial support to help existing industries adjust to greater competition resulting form the EU-Egypt FTA.

If industrial policy was effective, we should observe more diversification of the Egyptian economy in general and the manufacturing sector in particular over time. We should also observe TFP improvements as firms acquire or adapt new technologies and know how, as information sharing and knowledge diffusion take place, and as coordination problems are resolved. The question is whether these expectations are fulfilled or not.

To find out, we look at a number of indicators of diversification and estimate TFP change for the entire manufacturing sector. The analysis covers 16 specific industries over the

1980s and 1990s. Although we would have liked to assess the performance of all productive sectors in the Egyptian economy since 1960, we believe that the diversity within the 16 industries and the time span covered offer sufficient variations to test the effectiveness of industrial policy.

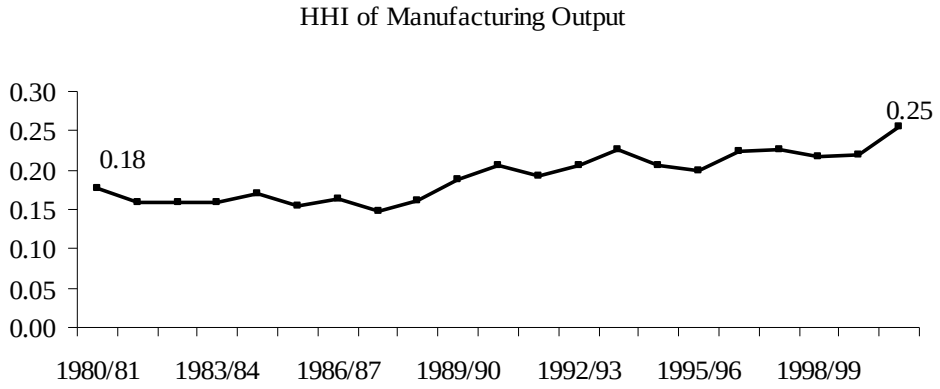
Diversification

One measure of diversification is the *Herfindahl-Hirschman Index (HHI)*, which is calculated as follows:

$$HHI = \frac{\sqrt{\sum_{i=1}^{N}\left(X_i / X\right)^2} - \sqrt{1/N}}{1 - \sqrt{1/N}}$$

where Xi is the share of output of the i^{th} industry in total output X, and N is the number of industries. The HHI takes on the value of 0 in the case of complete diversification and the value of 1 in the case of maximum concentration. The results of the calculation are shown in Figure 1.

Figure 1. HHI Index of the Manufacturing Sector in Egypt, 1980/81-1998/99



Source: Authors' calculations.

The most striking observation about Figure 1 is that the manufacturing sector in Egypt has become more concentrated over time.[4] That is not to say that there were no new products

[4] This finding is consistent with Abdel Khalek (2001).

or technologies during the 1980s and 1990s. Casual observations suggest otherwise. For example, Egypt now produces new IT products and exports improved ceramic products. However, these and other new products were not produced on a scale large enough to make the index of the manufacturing sector appear more diverse over time.

Another way of looking at the issue is by checking whether the list of major export items continues to exhibit concentration in a few products or if it includes new products. On the basis of the information provided in Table 1, the trend is not in favor of more diversification. In fact, the most important 12 export items accounted for 59 percent of total exports in 2003 compared with only 30 percent in 1983. Moreover, although there are a few new products on the list (e.g., inorganic chemicals, sanitary products, and coal), their export values are not very high. For most of the period, petroleum products, textile and clothing, and iron and steel were the main export items.

Table 1. Top 12 Export Items in Egypt, Ranked by 1983 Exports (US$ m)

	1983	1986	1992	1995	2000	2003
Petroleum products	469	348	153	496	1,555	2,110
Textile yarn, fabrics, made-up articles	253	432	395	571	413	279
Aluminium	96	165	188	198	128	92
Oils & perfume materials, toilet and cleansing	33	19	29	35	53	52
Manufactures of metals	23	15	52	48		
Clothing	18	35	163	253	314	233
Sugar, sugar preparations and honey	14	20				
Printed matter	13	19				
Vegetables. preserved or prepared	12	8	17	25		
Iron and steel	10	16	138	160	133	376
Fertilizers	8	2	44	65	78	70
Medical, pharmaceutical Products	8	10	29	35	50	51
Rice			57	57	104	150
Footwear			20	10		
Inorganic chemicals					82	124
Sanitary, plumbing, lighting fixtures and fittings					358	37
Coal, coke and briquettes					46	57
Share in total exports (%)	30	37	37	42	70	59

Source: UN, International Trade Statistics Yearbook, different issues.

Finally, we compare the level of diversification in Egypt with that of other countries with a similar level of per capita income, using a diversification index compiled by

UNCTAD/WTO. The data provided in Table 2 indicate that the manufacturing sector in Egypt is less diversified on average than the sample of listed countries.[5] The concentration in the manufacturing sector in Egypt is particularly noticeable when it comes to sophisticated products like chemicals, non-electric machinery, and electronic components. The gap is also more apparent when Egypt is compared with countries like Brazil, China, and Indonesia with respect to most products.

Table 2. Product Diversification Index of Manufacturing Products in Egypt Compared to Lower Middle-Income Countries, 2003*

	Fresh food	Processed food	Wood	Textiles	Chemicals	Leather products	Basic manufactures	Non-electric mach.	Electronic components	Clothing	Misc. manufacturing	Minerals
Egypt	***9***	***17***	***7***	***24***	***8***	***4***	***19***	***9***	***4***	***12***	***18***	***3***
Indonesia	7	5	12	43	40	4	35	12	32	44	15	4
Colombia	4	14	9	21	28	9	5	50	14	14	22	3
Romania	9	18	10	33	16	7	29	38	5	37	6	2
Peru	10	2	4	36	28		3	31		5	8	6
Sri Lanka	8	9	12	25	5	5	6	3	14	38	25	3
Brazil	7	7	7	17	66	5	28	28	35	12	22	5
Bolivia	5	3	6	3	4	2	1	13		5	2	3
China	26	39	29	72	137	12	90	43	41	59	60	7
Thailand	12	17	25	91	47	9	61	20	12	28	27	6
Tunisia	8	9	8	12	7	4	23	26	13	19	19	2
Morocco	12	11	6	24	3	5	15		10	24	26	5
Ukraine	9	10	15	6	19	6	30	34	22	34	37	8
Syria	8	7		13	13	2	23			14	15	1
El Salvador	2	14	7	7	11	6	23	31	3	10	16	2
Jordan	9	9	8	20	10		9	19	14	15	5	2
Jamaica	6	5			3					2		1
Ecuador	3	6	11	21	13		13			15	6	1
Bulgaria	13	23	17	38	27	8	12	27	19	36	28	2
Philippines	7	8	6	24	31	4	6	20	3	31	18	2
Paraguay	2	3	4	6	8	1	6			7	3	
Armenia	3	1		2	4		2	35	10	5	2	2
Honduras	4	10	11	6	4		13			6	15	3
Kazakhastan	3	4			6		12	7				2
Guatemala	4	6	14	34	20	9	20	18	2	5	23	2
Average	**8**	**10**	**11**	**25**	**23**	**6**	**20**	**25**	**16**	**20**	**18**	**3**

Source: UNCTAD/WTO, International Trade Center: http://www.intracen.org/countries/

*Higher index value reflects higher product diversification.

[5] This conclusion is also reached by Kheir-El-Din (2001).

Collectively, the HHI index, the composition of major export items, and the UNCTAD/WTO diversification index suggest that industrial policy in Egypt has not led to a level of diversification consistent with Egypt's level of per capita income and long history of active industrial policy. It could be argued that this outcome is due to the limited time horizon of the analysis in this paper. Had the analysis been carried out using data from 1960 onwards, industrial policy would have been associated with increased diversification. Furthermore, it could be argued that the observed concentration in recent years is due to pro-market reforms in the 1990s, which reduced the extent of active industrial policy.

The first argument is valid, even without further analysis. After all, one of the slogans of the 1960s was "we are going to produce all products from the needle to the rocket," and policies were put in place to make that slogan come true. What is at issue is whether the diversification that must have taken place then was always justified. The example of the auto industry suggests otherwise. Support to this industry for almost half a century only produced a number of relatively small factories, mainly for assembling imported parts to sell in the domestic market. All these factories operate at a much lower scale of operation than the minimum scale of the industry elsewhere. The other issue is whether industrial policy was designed in such a way as to minimize the cost and maximize the benefits? We return to this point in section IV.

As for the second point, we are less convinced that the reforms of the 1990s are to blame for the increased concentration in the manufacturing sector. After all, industrial policy influences the future patterns of the structure of the sector, not its past patterns. Moreover, Imbs and Wacziarg (2003) found that the patterns of sectoral concentration and diversification in a large cross-section of countries are such that as poor countries get richer, sectoral production and employment become less concentrated and more diversified. This process continues until relatively late in the process of development, when economies mature and per capita income increases significantly. Only then do the patterns become more concentrated. Clearly the Egyptian economy has not matured yet and the level of per capita income places Egypt in the group of low middle-income countries.

Total Factor Productivity (TFP)

If industrial policy is about providing support to initially high cost industries on the premise that performance will improve over time, we would expect industries that received support to

perform better than those that did not. To find out, we estimated TFP for the 16 industries comprising the manufacturing sector in Egypt over the period 1980-2000. The methodology we used is explained in the Technical Appendix at the end of the paper. Suffice it to note here that our TFP estimates are made using the Malmquist index, using a data-envelopment analysis (DEA) for cross-industry analysis of TFP growth. This approach requires fewer restrictions than other approaches. It is based on constructing a linear production frontier for each year. The frontier production function is constructed by the solution of a sequence of linear programming problems, one for each year. The degree of technical inefficiency is the distance between the observed data point and the frontier.

The data requirement to compute TFP was extensive. Furthermore, the information about output, intermediate inputs, capital, and labor was not readily available in a convenient format for immediate use. Even more demanding was the calculation of the price indices to deflate output and inputs. The data set we used, its sources and manipulations are given in the Technical Appendix of this paper. The TFP estimates are given in Table 3 below for each industry of the manufacturing sector. These estimates point out that:

- TFP change averaged less than one percent a year (0.75 percent to be accurate) over the period 1980-2000.
- The peak of productivity improvement was seen in the first half of the 1990s, and the weakest performance was found in the second half of the 1990s.
- The standard deviation is quite high, especially in the 1980s. This variance is even more noticeable for individual industries, turning frequently from negative to positive TFP change.

Table 3. TFP in Manufacturing Industries in Egypt, 1980/81-2000/01

Sector	TFP Growth				
	1980/81-1994/85	1985/86-1990/91	1991/92-1995/96	1996/97-2000/01	1980/81-2000/01
Food Processing	-0.46	1.48	1.42	0.67	0.75
Spinning and Weaving	-0.04	0.96	1.72	0.59	0.81
Readymade Garments	0.67	2.16	1.89	0.59	1.33
Leather and Leather Products	1.61	-0.27	-0.90	1.32	0.44
Footwear	-1.25	0.62	2.44	0.77	0.65
Wood and Wood Products	0.46	-0.30	1.70	5.44	1.83
Furniture	1.72	0.75	-0.42	1.17	0.81
Paper and Printing	0.55	-0.30	1.11	1.06	0.61
Chemicals	0.96	5.39	-0.57	-0.24	1.39
Rubber, Plastic and Related Products	1.36	2.40	2.78	-0.65	1.47
Porcelain, China and Ceramics	0.10	2.33	3.01	-2.48	0.74
Glass Products	0.57	0.30	0.88	-0.14	0.40
Non-Metal Products	1.55	-1.56	-0.75	-0.92	-0.42
Steel, Iron and Metal Products	1.76	-1.29	0.85	0.02	0.34
Machinery and Equipment	-0.06	1.92	1.91	-1.38	0.60
Means of Transportation	1.29	0.86	-0.48	-0.96	0.18
Mean	**0.67**	**0.97**	**1.04**	**0.30**	**0.75**
Standard Deviation	**0.84**	**1.64**	**0.26**	**0.67**	**0.53**

Source: Authors' calculations.

Overall, productivity improvements were modest and the results exhibit significant variations across sectors and over time. These variations provide the basis for explaining what may have caused them, which is what we do in the next subsection.

The Contribution of Industrial Policy to Performance

To explore whether TFP improvements are associated with active industrial policy or not, we ran a 2 stage least square regression (2SLS) of the following equation:

$$TFP_{it} = \beta_{it} + \gamma X_{it} + \phi Z_{it} + U_{it} \quad , \text{ i = 1,…….N, t = 1,……T} \qquad (4)$$

Where

TFP_{it} is the TFP change of industry i in period t,

X_{it} denotes a set of sector specific and exogenous variables,

Z_{it} denotes a set of industrial policy variables, and

U_{it} is the error term.

The 2SLS technique was used to overcome the possible presence of endogeneity of different policy variables. The specific equation that we estimated and the results obtained are shown below:

TFP = -1.7 - 0.03*ERP - 14.91*SUB+ 0.66*GDP + 0.06*KL + 0.03*FIRM

(-1.9) (-6.3) (-19.4) (9.7) (23.4) (0.72)

R-square : 0.96 DW: 1.99

The estimated regression is quite satisfactory, with R square explaining 96 percent of the variations in TFP. However, the results are not supportive of the hypothesis that industrial policy variables were associated with improved TFP change.

More specifically, the estimated equation includes the three industrial policy instruments that are most frequently used in Egypt to support specific industries: namely, effective rates of protection (ERP), subsidies (SUB), and barriers to entry (Firm).[6] ERP is estimated using Corden (1966), subsidies are defined as the ratio of explicit transfers to each industry divided by the total subsidy to all industries, and market structure is measured by the ratio of the number of firms in each industry relative to the total number of firms in the manufacturing sector. These variables were estimated for each industry for the entire period analyzed. Our expectations were that these variables would have a positive sign if industrial policy was effective in improving performance over time.[7] This hypothesis is not supported by the data. Industries that received greater protection and subsidies performed less well than industries that did not. Similarly, industries that operated in relatively less competitive markets, performed less well than industries that faced greater competition. Rather than

[6] Although tax exemptions have been used extensively, it was not possible to estimate a consistent index for this variable for each industry for the period analyzed here.

[7] We also tried other industrial policy variables such as the share of FDI in total investment, and the share of public investment in totoal investment. But both variables were found to be insignificant.

benefiting from support to overcome initially high costs of production, supported industries seem to have relaxed and exerted less effort than was needed for industrial policy to be beneficial.

In addition to the above industrial policy variables, we included two other variables: capital intensity (measured by KL ratio) and GDP growth rate. Capital intensity was included to neutralize the effect of variations in technology across industries, and GDP was included to capture the effect of demand on capacity utilization, thus TFP. Both variables were found to have a positive sign, as expected, and both were significant.

Of course association is not the same as causation, and the results should be interpreted with caution. Nevertheless, the analysis can at least be taken to question the usefulness of industrial policy in Egypt with respect to TFP improvement. As for diversification, although the policy may have made a contribution at an earlier stage, protection of infant industries may have lead to a permanent state of infancy in some instances. Subsidies may have led to excessive expansion and little motivation to improve productivity. In the process, industrial policy may have encouraged some rent-seeking behavior and resistance to openness. The next question is: why did industrial policy in Egypt fare less well than hoped for, and what can be done to make it more effective? These are the questions we address next.

IV. Toward More Effective Industrial Policy for the Manufacturing Sector in Egypt

Starting from the premise that the Egyptian economy needs an effective industrial policy to grow more rapidly and become more diversified and dynamic, we focus in this section on identifying areas where reforms of the current policy are needed.

Most of the discussion is based on contrasting Egypt's industrial policy against lessons derived from the experience of East Asia and Latin America. In the remainder of this section we first assess the design of industrial policy in Egypt, and then make some policy recommendations.

An Assessment of Industrial Policy Design in Egypt

In a very fundamental way, the design of industrial policy is about resolving tensions between different choices. The four most important areas of tension are the following:[8]

- The tension between supporting old versus new activities.
- The tension between providing support on the basis of convictions versus measurable outcomes.
- The tension between providing open-ended support versus time bounded support.
- The tension between supporting activities versus supporting sectors.

The way the above tensions are resolved arguably makes the difference between effective and ineffective industrial policy. Indeed, it has been pointed out that the success of East Asia is due to a good resolution of these tensions, while the limited success or even failure of industrial policy in Latin America is due to the poor resolution of these tensions. In general, most analysts believe that industrial policy will be successful if it targets new rather than old activities, rewards entrepreneurs for measurable outcomes, extends support for a pre-specified period of time, and supports activities rather than specific sectors (see, for example, Rodrik 2004; World Bank 1993; Amsden 1989; and Wade 1990). The question is: how did Egypt resolve these tensions?

Supporting old versus new activities

With respect to the tension between supporting *old or new activities*, Egypt's record is somewhat mixed and seems to have evolved over time. At the initial stage of industrial policy in the 1960s, the tension was resolved in favor of supporting new activities, perhaps because there were very few to begin with. This policy led to diversification and in some instances the successful creation of new areas of comparative advantage. With a weak (or weakened) private sector, the government took it upon itself to play the role of an entrepreneur, initiating new industries such as iron and steel, pharmaceuticals, and auto manufacturing. These initiatives were backed by high levels of protection, barriers to entry, and price control. In retrospect, public ownership was not always successful, but it left a legacy of accumulated

[8] Rodrik (2004) lists 10 key lessons or preconditions for success, including the four listed here.

local know how and physical infrastructure in a wide range of industries that allowed the private sector to flourish subsequently.

From the mid-1970s to the end of the 1980s, the tension was mostly resolved in favor of old activities. Tax incentives were provided to relatively large projects, sometimes because they were foreign, and frequently because they were in certain sectors or geographical locations. Not much attention was paid to whether these projects expanded the capabilities of the economy to produce new products or new technology. Meanwhile, old industrial policies were left unchanged despite their decade-long prevalence. The trade regime remained highly protective, price control was pervasive, subsidies persisted, and restrictions on entry were common.

More recently, especially starting in 1991, industrial policies favoring existing industries were reduced. Prices were liberalized, quantitative restrictions on imports removed, trade liberalization adopted in phases (the latest of which occurred in 2004), public ownership partially dismantled, and investment incentives somewhat streamlined. Nevertheless, there has been no conscious effort to provide support to new activities that have the potential to expand the capabilities of the Egyptian economy into new areas of comparative advantages. On the contrary, the highest effective rates of protection continue to be given to traditional industries like textiles and clothing, and leather products (see Table 4). Furthermore, one area where a new industrial policy is being perused rigorously is related to small and medium enterprises (SMEs). While this support may be justified on other grounds, like employment creation, it is clearly derived from the notion of size rather than diversification into new products or the adoption/adaptation of new technology.

Table 4. Nominal and Effective Protection in Manufacturing in Egypt, 2000 and 2004 (%)

Manufacturing sectors	Nominal		Effective	
	2000	2004	2000	2004
Food	10.4	7.8	15.4	9.3
Textiles	24.0	9.2	27.6	10.3
Clothes & footwear	38.3	26.7	43.4	31.6
Wood & products	12.9	7.3	12.4	6.9
Paper & printing	15.6	10.2	15.0	9.7
Leather & products	30.0	29.5	34.4	36.1
Rubber	29.1	13.6	32.7	14.9
Chemical	10.6	4.8	8.9	3.2
Non-metallic	23.1	14.7	26.2	16.7
Basic metal	12.5	5.9	11.0	3.7
M&E	14.3	8.7	14.1	8.8
Transport	33.6	18.1	38.3	20.4
Simple average	21.2	13.0	23.3	14.3
Standard deviation	9.8	8.0	11.9	10.5

Source: Galal and Refaat (2005).

Support on the basis of convictions versus measurable outcomes

With respect to *the tension between providing support on the basis of convictions or measurable outcomes*, industrial policy in Egypt seems to have been based on the former. The only exception is a recent subsidy program, which linked payment of subsidy to exports. Otherwise, all other support instruments were not linked explicitly to measures such as productivity, exports, or employment. The experience of East Asia is very different. Subsidized credit was conditioned upon meeting certain export targets. This performance-based reward must have put a lot of pressure on the recipients to improve productivity in order to compete internationally. No such a system was adopted in Latin America, which may explain why industrial policy was not as effective in that region.

The problems of failing to link support to measurable outcomes are obvious. It becomes difficult to judge the success or failure of a given policy intervention. As a result, both good and bad performers benefit at the expense of the rest of society. At the same time, much effort and resources tend to be expended on securing these advantages or lobbying against their removal. On their part, bureaucrats can claim their programs are successful in order to continue receiving funding.

Open-ended support versus time-bounded support

The merit of announcing *ex ante* that support will be withdrawn at a certain date in the future is that beneficiaries will realize from the start that they will have to survive on their own at a given point in time. This prior knowledge would motivate them to do the best they can to succeed. An additional merit to including a sunset clause is that it saves scarce financial and human resources that could be put to other uses. Equally important, the time limit puts an end to activities that fail to generate a new comparative advantage once sufficient time for experimentation is allowed. It helps to cut losses rather than letting inefficient industries drain the rest of the economy.

In the Egyptian context, industrial policy has had no sunset clauses. Perhaps the only exception is related to the tax breaks given to investment, with durations that were specified by law. Otherwise, trade protection, subsidies, and entry restrictions were all open ended. To be sure, these policies were changed from time to time, but the changes were brought about by broader economic reforms rather than by learning that certain industries were not performing well.

Supporting activities versus supporting sectors

The merit of focusing support on activities rather than sectors is that industrial policy in this case will be guided by the principle of correcting instances of market failures. Furthermore, the benefits of the policy will cut across different sectors, rather than benefit some sectors and not others. By comparison, the focus on certain sectors is problematic because it is difficult to agree on which sectors to pick and which sectors to leave behind. It is true that industrial policy, even in East Asia, was not always indifferent with respect to sectors. But most of the support was either linked to performance targets or generic. Sufficient public resources were allocated to R&D, technical training, and subsidized credit.

Industrial policy in Egypt seems to favor specific sectors, with a particular focus on investment incentives. The preferred sectors range from tourism and to land reclamation. It is true, however, that the government also allocates public resources to the development of science and technology, training, and subsidized credit. The problem with these programs concerns their effectiveness. Most expenditure on R&D is not oriented to meet private sector needs. Training is not generally demand driven and subsided credit now goes essentially to

SMEs, which, as noted earlier, may be justified on social grounds, but not on the grounds of moving the Egyptian economy into new areas of specialization.

Implications for Future Industrial Policy

The above analysis, together with the previous findings related to the limited effectiveness of industrial policy, have strong implications for future industrial policy in Egypt, at least for the manufacturing sector. The most obvious implication is broad: there is a strong case for rethinking industrial policy as part of a process of rethinking the role of the state in economic activity. The new version of industrial policy should aim at moving the economy into areas of new comparative advantages that go beyond the current patterns of production.

Perhaps the most important principles of the new industrial policy are those that seem to have characterized the successful experience of East Asia. The main features of this policy are:

- Targeting new activities rather than existing ones,
- Rewarding entrepreneurs on the basis of measurable outcomes rather than on prior convictions,
- Providing support only for a pre-specified period of time rather than make open-ended commitments, and
- Supporting activities with broad benefits rather than targeting specific sectors.

These suggestions are broad in nature and need further work to translate them into specific reform programs. Moreover, they abstract from a discussion of the best institutional arrangements to carry them out in such a way as to shield public officials from influence while engaging the private sector in a constructive dialogue about the best opportunities for a prosperous economy. Nevertheless, we hope that these suggestions can serve as a good starting point for a productive discussion about future industrial policy in Egypt, not only for the manufacturing sector but also for other productive sectors of the economy.

TECHNICAL APPENDIX

In this appendix, we briefly explain the methodology used to calculate total factor productivity (TFP). We also document the sources of our data and any adjustments we made to facilitate the analysis, as well as the data utilized for possible use by other researchers.

1. TOTAL FACTOR PRODUCTIVITY ESTIMATION

We estimated TFP growth using the Malmquist index calculated using the data-envelopment analysis (DEA). The DEA is a non-parametric mathematical programming approach to frontier estimation, which has the advantage over parametric techniques of assuming no specific functional form for the production function to estimate its parameters. The approach is based on constructing a linear production frontier for each year in the sample by the solution of a sequence of linear programming problems, one for each year. Technical inefficiency is determined by the distance between the observed data point and the frontier. The model starts by solving the following linear programming problems assuming constant returns to scale:

$$\max_{\varphi,\lambda} \ \varphi_h$$

$$\text{s.t.} \quad \varphi_h Y_{hq} - \sum_{i=1}^{n} \lambda_i Y_{ip} \leq 0$$

$$\sum_{i=1}^{n} \lambda_i K_{ip} \leq K_{ip}$$

$$\sum_{i=1}^{n} \lambda L_{ip} \leq L_{hq}$$

$$\lambda_1, \ldots\ldots, \lambda_n \geq 0$$

The Malmquist TFP index, which was first introduced by Caves, Christensen, and Diewert (1982), measure the TFP change between two data points by calculating the ratio of the distances of each data point relative to a common technology (Krüger 2003). The estimation does not require information about input prices nor does it require equating prices and marginal products. And the index can be decomposed into two components: the first represents the change in productive efficiency and the second the rate of technological progress.

The Malmquist index is calculated as the geometric mean of the ratio of two distance functions, which gives the maximum increase of output in one period to reach a boundary of

the technology set in a previous period. Following Färe et al. (1994), the output-oriented Malmquist TFP change index between period t and period t+1 is given by:

$$M_h^{t+1}\left(x_h^t, y_h^t, x_h^{t+1}, y_h^{t+1}\right) = \left[\frac{D_h^t\left(x_h^{t+1}, y_h^{t+1}\right)}{D_h^t\left(x_h^t, y_h^t\right)} \frac{D_h^{t+1}\left(x_h^{t+1}, y_h^{t+1}\right)}{D_h^{t+1}\left(x_h^t, y_h^t\right)}\right]^{1/2} \qquad (1)$$

which has an equivalent representation as:

$$M_h^{t+1}\left(x_h^t, y_h^t, x_h^{t+1}, y_h^{t+1}\right) = \underbrace{\frac{D_h^{t+1}\left(x_h^{t+1}, y_h^{t+1}\right)}{D_h^t\left(x_h^t, y_h^t\right)}}_{EF_h^{t+1}} \left[\frac{D_h^t\left(x_h^{t+1}, y_h^{t+1}\right)}{D_h^{t+1}\left(x_h^{t+1}, y_h^{t+1}\right)} \frac{D_h^t\left(x_h^t, y_h^t\right)}{D_h^{t+1}\left(x_h^t, y_h^t\right)}\right]^{1/2}_{TP_h^{t+1}}$$

where

$D_h^{t+1}\left(x_h^t, y_h^t\right)$ denotes the distance from period t observation to the period t+1 technology.

EF_h^{t+1} is the change in productivity efficiency.

TP_h^{t+1} is the rate of technological change between the two periods; t and t+1.

If the index has a value greater than one, this indicates a positive TFP growth from period t to period t+1, while a value less than one indicates a decline in TFP.

2. DATA AND DATA SOURCES

To compute TFP, we collected data on output and inputs for 16 manufacturing industries in Egypt at the 3-digits level of the ISIC, rev3. classification (see Table A.1 for a listing of these industries) over the period 1980/81-2000/01. The sources and data for each variable were obtained and processed as follows:

- *Output, material inputs and labor*. Data on output, intermediate inputs and labor for the 16 industries were compiled from the *Annual Industrial Statistics Bulletin* issued by CAPMAS. The data covered both public and private sector firms. The labor input was measured as the number of workers per industry. Material inputs data included local and imported inputs, packing materials, fuel, electricity and spare parts.
- *Capital*. As customary, we employed the perpetual inventory method (PIM) to construct the capital stock series for different industries. Data on gross capital formation were

obtained from the *Annual Industrial Statistics Bulletin*. The calculation of the capital stock involved estimating an initial capital stock for each industry. Starting from the initial capital stock, additions to the stock were added and depreciation was subtracted to obtain the capital stock for subsequent years (1981/82-2000/01). Gross capital formation used in the calculations were deflated using the GDP deflator.

The initial capital stock was calculated for two categories of assets: land and buildings, and machinery and equipment using the formula:

$$K_t = I_t(1+g)/(g+\delta),$$

where

K_t is the initial capital stock for period t, which was 1980/81 in our case.

I_t is the gross capital formation for the base year taken as an average of investments over five years.

g is the average growth rate of output over five subsequent years.

δ is the depreciation rate (2.5 percent for buildings, and 8 percent for machinery and equipment).

The decomposition of gross capital formation of each industry into these two categories was based on their shares in fixed assets as calculated from CAPMAS publication *Financial Statistics and Indicators*. These shares are given below:

Shares of Fixed Assets Components in Total Assets (%)

ISIC-Rev. 2	Industries	Land & Buildings	Machinery & Equipment
31	Food, beverages & tobacco	28	72
32	Textile, apparel & leather	28	72
33	Wood, wood products & furniture	40	60
34	Paper and paper products & printing	20	80
35	Chemicals, petroleum & plastic products	23	77
36	Non-metallic mineral products	23	77
37	Basic metals	24	76
38	Fabricated metal products, machinery & equipment	27	73
39	Other manufacturing industries	14	86

Source: Authors' calculations.

- *Price indices.* Several price indices were calculated (Paasche, Laspeyres, Fisher, and Divisia), but the latter was the index used to deflate outputs and inputs of different industries in the process of estimating TFP. The price index of each industry was constructed on the basis of information about values and quantities of more than 200 commodities under each of them for each year of the 20 years under consideration.

In addition to data to estimate TFP, the following variables were constructed to test the relevance of industrial policy variables to changes in TFP:

- *GDP growth rates.* GDP growth rates for the period 1980/81-2000/01 were calculated using data from the *World Development Indicators*.
- *Share of subsidies to total output.* Data on direct subsidies obtained from the *Annual Industrial Statistics Bulletin* were used to compute the ratio of subsidies to output for the 16 industries over the period 1980/81-2000/01.
- *Distribution of firms by industry*. Data from the UNIDO industrial database on the number of firms by industry were used to calculate the share of number of firms to total industrial firms. This index reflects the degree of concentration in different industries.
- *Effective rates of protection (ERP)*. ERPs for different industries were obtained from Refaat (1999).

Finally, all data were filtered using HP Filter (Hodrick and Prescott 1980) to smooth the data and to correct for real business cycles fluctuations. The actual data used are given Tables A.2 to A.9.

Table A.1. List of ISIC Codes and Description of the Different Manufacturing Industries

ISIC. Rev2.	Manufacturing Sectors
311, 312	Food manufacturing
321	Textiles
322	Wearing apparel
323	Leather and products of leather
324	Footwear
331	Wood and wood and cork products
332	Furniture
341, 342	Paper and paper products, printing and publishing
351, 352, 353, 354	Industrial chemicals, other chemical products, petroleum refineries miscellaneous products of petroleum and coal
355, 356	Rubber and plastic products
361	Pottery and china
362	Glass and glass products
369	Other non-metallic mineral products
371,372	Iron, steel and non-ferrous metal industries
381, 382, 383	Fabricated metal products, machinery and equipment
384	Transport equipment

Source: UNIDO. 2003.

Table A.2. Output and Input Data: 1980/81-1984/85 [9]

Sector	Average			
	Output (LE 000)	**Inputs (LE 000)**	**Capital (LE 000)**	**Workers (000)**
Food Processing	5,488	4,440	2,215	145
Spinning and Weaving	3,553	2,410	4,793	311
Ready-made Garments	258	170	380	9
Leather and Leather Products	75	61	178	4
Footwear	120	65	213	7
Wood and Wood Products	104	72	126	7
Furniture	97	65	47	5
Paper and Printing	1,118	744	1,112	33
Chemicals	4,825	2,798	8,420	96
Rubber, Plastic and Related Products	657	502	353	19
Porcelain, China and Ceramics	85	37	50	4
Glass Products	102	75	103	12
Non-Metal Products	806	353	2,852	47
Steel, Iron and Metal Products	2,428	1,374	3,675	65
Machinery and Equipment	2,960	2,055	2,140	79
Means of Transportation	962	909	1,380	32
Average of all industries	**1,477**	**1,008**	**1,752**	**55**
Standard Deviation	**1,810**	**1,291**	**2,300**	**79**

Source: Authors' calculations using CAPMAS data.

[9] Data are filtered using HP Filter.

Table A.3. Output and Input Data: 1985/86-1990/91

Sector	Average			
	Output (LE 000)	**Inputs (LE 000)**	**Capital (LE 000)**	**Workers (000)**
Food Processing	8,303	6,347	2,779	181
Spinning and Weaving	5,898	3,610	4,275	274
Readymade Garments	484	371	235	18
Leather and Leather Products	104	74	235	3
Footwear	186	118	271	10
Wood and Wood Products	181	117	104	8
Furniture	146	93	44	7
Paper and Printing	1,392	960	1,033	38
Chemicals	7,222	4,158	6,068	113
Rubber, Plastic and Related Products	1,044	714	368	23
Porcelain, China and Ceramics	241	147	66	8
Glass Products	243	136	135	14
Non-Metal Products	1,858	750	5,680	45
Steel, Iron and Metal Products	3,724	2,451	1,702	73
Machinery and Equipment	3,417	2,590	1,354	105
Means of Transportation	1,606	732	4,303	60
Average of all industries	**2,253**	**1,460**	**1,791**	**61**
Standard Deviation	**2,705**	**1,861**	**2,136**	**76**

Source: Authors' calculations using CAPMAS data.

Table A.4. Output and Input Data: 1991/92–1995/96

Sector	Average			
	Output (LE 000)	**Inputs (LE 000)**	**Capital (LE 000)**	**Workers (000)**
Food Processing	11,592	8,928	3,300	201
Spinning and Weaving	6,606	4,611	3,889	277
Ready-made Garments	1,434	481	362	34
Leather and Leather Products	87	68	93	3
Footwear	166	107	288	8
Wood and Wood Products	206	113	65	7
Furniture	209	132	56	9
Paper and Printing	2,121	1,480	1,377	38
Chemicals	16,007	8,234	8,767	125
Rubber, Plastic and Related Products	1,287	862	301	28
Porcelain, China and Ceramics	217	139	125	7
Glass Products	419	217	338	15
Non-Metal Products	3,407	2,064	5,114	61
Steel, Iron and Metal Products	4,676	3,049	4,582	71
Machinery and Equipment	6,617	3,615	2,404	130
Means of Transportation	2,145	1,463	1,164	54
Average of all industries	**3,575**	**2,223**	**2,014**	**67**
Standard Deviation	**4,620**	**2,849**	**2,511**	**79**

Source: Authors' calculations using CAPMAS data.

Table A.5. Output and Input Data: 1996/97-2000/01

Sector	Average			
	Output (LE 000)	Inputs (LE 000)	Capital (LE 000)	Workers (000)
Food Processing	11,671	8,471	3,914	188
Spinning and Weaving	5,454	3,522	2,923	236
Ready-made Garments	776	469	506	64
Leather and Leather Products	63	47	52	3
Footwear	89	51	470	7
Wood and Wood Products	13	6	116	1
Furniture	467	314	92	19
Paper and Printing	2,040	11,740	1,982	38
Chemicals	14,656	1,439	11,489	118
Rubber, Plastic and Related Products	1,363	904	515	25
Porcelain, China and Ceramics	297	158	174	5
Glass Products	509	207	481	14
Non-Metal Products	2,357	2,216	3,623	60
Steel, Iron and Metal Products	3,946	2,443	3,847	61
Machinery and Equipment	4,540	1,903	4,038	84
Means of Transportation	1,719	1,551	861	26
Average of all industries	**3,123**	**2,215**	**2,193**	**59**
Standard Deviation	**4,295**	**3,303**	**2,931**	**69**

Source: Authors' calculations using CAPMAS data.

Table A.6. Output and Input Data: 1980/81-2000/01

Sector	Average			
	Output (LE 000)	Inputs (LE 000)	Capital (LE 000)	Workers (000)
Food Processing	9,111	6,933	3,046	177
Spinning and Weaving	5,331	3,501	4,029	274
Ready-made Garments	710	360	366	30
Leather and Leather Products	82	62	146	3
Footwear	140	86	304	8
Wood and Wood Products	130	80	103	6
Furniture	225	147	59	10
Paper and Printing	1,663	3,600	1,382	37
Chemicals	10,315	4,100	8,549	113
Rubber, Plastic and Related Products	1,081	741	385	24
Porcelain, China and Ceramics	204	117	101	6
Glass Products	307	154	256	14
Non-Metal Products	2,055	1,299	4,293	52
Steel, Iron and Metal Products	3,631	2,252	3,363	68
Machinery and Equipment	4,289	2,517	2,427	98
Means of Transportation	1,589	1,144	2,015	43
Average of all industries	**2,554**	**1,693**	**1,926**	**60**
Standard Deviation	**3,230**	**1,990**	**2,328**	**75**

Source: Authors' calculations using CAPMAS data.

Table A.7. Share of Subsidies to Output, 1980/81-2000/01

Sector	Share of subsidies to output (%)			
	1980/81-1984/85	1985/86-1990/91	1991/92-1995/96	1996/97-2000/01
Food Processing	2.11	1.71	0.67	0.10
Spinning and Weaving	3.68	0.30	0.06	0.03
Ready-made Garments	0.14	0.00	0.01	0.21
Leather and Leather Products	3.46	2.70	0.02	0.00
Footwear	0.07	0.01	0.00	0.02
Wood and Wood Products	0.06	0.00	0.00	0.00
Furniture	0.00	0.00	0.00	0.02
Paper and Printing	0.06	0.12	0.04	0.13
Chemicals	2.74	0.67	0.05	0.04
Rubber, Plastic and Related Products	0.00	0.00	0.02	0.01
Porcelain, China and Ceramic	0.00	0.00	0.00	0.08
Glass Products	0.03	0.01	0.09	0.00
Non-Metal Products	0.78	0.17	0.08	0.09
Steel, Iron and Metal Products	0.00	0.06	0.24	0.83
Machinery and Equipment	0.02	0.04	0.49	0.82
Means of Transportation	0.00	0.00	0.00	0.00
Average	**0.82**	**0.36**	**0.11**	**0.15**

Source: Authors' calculations using CAPMAS data.

Table A.8. Effective Rates of Protection in Manufacturing Industries: 1986-97

Sector	Effective Rates of Protection			
	1986	1994	1996	1997
Food Processing	17	7.5	6.3	6.4
Spinning and Weaving	788	68.2	49.8	47.6
Ready-made Garments	348	87.3	61.8	55.9
Leather and Leather Products	35	79.6	52.7	47.6
Footwear	160	94.1	53.6	50.8
Wood and Wood Products	40	6.8	6	6.1
Furniture	296	128.8	95.2	83.8
Paper and Printing	36	17.6	18.3	17.8
Chemicals	75	9.2	9.1	9.2
Rubber, Plastic and Related Products	563	50	45.6	43.1
Porcelain, China and Ceramics	214	90.8	60.9	56
Glass Products	54	39.4	23.8	23.2
Non-Metal Products	1	29	18.4	18.5
Steel, Iron and Metal Products	120	26.4	19.4	18.1
Machinery and Equipment	39	22.5	15	14.5
Means of Transportation	628	65	57.8	55.6

Source: Refaat 1999.

Table A.9. Number of Firms by Industry to Total Number of Firms: 1980/81-2000/01

Sector	Share of subsidies to output (%)			
	1980/81-1984/85	1985/86-1990/91	1991/92-1995/96	1996/97-2000/01
Food Processing	0.46	0.49	0.49	0.58
Spinning and Weaving	0.16	0.12	0.11	0.09
Ready-made Garments	0.02	0.04	0.05	0.05
Leather and Leather Products	0.01	0.01	0.01	0.01
Footwear	0.02	0.01	0.01	0.01
Wood and Wood Products	0.02	0.01	0.01	0.00
Furniture	0.01	0.01	0.01	0.02
Paper and Printing	0.03	0.03	0.03	0.03
Chemicals	0.03	0.03	0.03	0.03
Rubber, Plastic and Related Products	0.02	0.03	0.03	0.03
Porcelain, China and Ceramic	0.00	0.00	0.00	0.01
Glass Products	0.01	0.01	0.01	0.01
Non-Metal Products	0.12	0.07	0.07	0.06
Steel, Iron and Metal Products	0.01	0.02	0.02	0.01
Machinery and Equipment	0.09	0.09	0.09	0.07
Means of Transportation	0.01	0.01	0.02	0.01

Source: UNIDO, several issues.

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