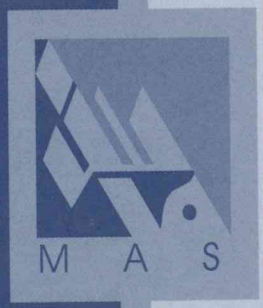

Palestine Economic Policy Research Institute

Cost Structure, Economies of Scale and Their Effect on the Competitiveness of Palestinian Industries

Basim Makhool
Nasr Atyani

March 2004

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Funding: This Study was funded by International Development Research Centre-IDRC and The Ford Foundation

Palestine Economic Policy Research Institute (MAS)
Jerusalem and Ramallah

March, 2004

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5. The second draft is then submitted for evaluation in accordance with the terms of reference to two or three external academic experts specializing in the subject. Provided that there is a positive evaluation by at least two experts, the researcher is asked to review the study taking into consideration the objective recommendations of these experts.
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Summary

The aim of this study is to identify cost structure in various branches of Palestinian industry through estimating the relative distribution of the components of production costs. The study also compares the performance of Palestinian industry with that of selected countries in terms of average wages, productivity and the efficiency of the labor wage. In addition, the study estimates the cost function in various branches, thus allowing for estimation of economies and returns to scale.

To achieve these objectives, the researcher estimated some statistical indicators using descriptive and quantitative methods and worked from the results of the 1999 Industrial Survey by the Palestinian Central Bureau of Statistics and the United Nations Industrial Development Organization (UNIDO).

The study is in six parts. **Part one** includes an introduction, study objectives and methodology. **Part two** presents a brief overview of the current situation in the West Bank and Gaza Strip industrial sector. **Part three** discusses the impact of Israeli measures on the industrial sector and future prospects. **Part four** provides a theoretical background and reviews literature related to cost structure. **Part five** covers an econometric model and data. **Part six** presents the statistical results and their analysis. The study ends with recommendations to improve competitiveness.

There are 14,179 firms in the industrial sector in the Palestinian Territories, 95% of them manufacturing firms. In 2002, the industrial sector employed 65,500 people and produced US $976.9 million worth of goods. The value added amounted to $367 million. However, Palestinian industry faces a number of problems resulting from Israeli policies, weak forward and backward links, the small size of firms, high import and export costs, plus a lack of support from relevant institutions and public policy towards this sector. Israeli measures, intended to suppress the Intifada, have heightened the problems and increased the challenges facing the Palestinian economy. As demand for Palestinian industrial products has declined, the cost of production, imports, transportation, distribution, and marketing have increased. These exceptional circumstances and difficult challenges in the Palestinian Territories have created deep frustration and anxiety for the future among investors, owners, and managers of firms.

Competitiveness is influenced by several factors, including the structure of production costs, quality of production, and government policies towards the investment environment. The most important factors affecting production costs are the cost of factors of production, productivity, and efficiency. To estimate cost functions, three means are used: statistical, engineering, and survival. The study used statistical methods to estimate the Trans Log Cost Function. On the basis of this function, it is possible to estimate the degree of economics scale and returns scale. The econometric model was estimated for 1,417 of the firms that had suitable data. For the purposes of comparison and testing whether there were statistically significant differences, the model was estimated for large firms employing more than nine workers.

Results and Recommendations

Cost structure indicators

Costs of production are divided into five groups: production inputs of goods, production inputs of non-goods, labor wages, cost of capital, fees and taxes. The costs of production in the Palestinian industrial sector are distributed, in general, as follows: cost of capital share (6,7%); fees and taxes (8%); wages and salaries (21.5%); production inputs of non-goods (6.6%), and production inputs of goods (57.3%). Like the production inputs of goods, the production inputs of non-goods differed from one industrial branch to another.

The costs of production inputs of goods in the Palestinian industrial sector are distributed between raw materials (79.8%); fuel (6.2%); water (0.7%); electricity (3.6%); packaging and bottling material (4.1%); spare parts (2.7%); and other inputs (2.9%). The importance of these differences stems from their influence on the choice of appropriate policies to improve competitiveness. For example, branches in which raw materials represented the largest part of production inputs costs could be assisted by importing raw materials collectively and through collective negotiations with suppliers of raw materials, thus making it possible to obtain lower prices and better quality.

The share of labor wages is second in terms of relative importance, averaging 21.5% of total production costs. However, the importance of labor costs differs from one industry to another. In the apparel and garment industry, the average cost was 94.6% while in toy manufacturing it was 2.2%.

In general, a rise in average labor wages in the Palestinian Territories of 10% would increase total production costs by 2.1%, a low percentage indeed. Negative effects can be overcome through increasing worker productivity. This point is important since Palestinian manufacturers have complained about the high cost of labor in the Palestinian Territories and its negative repercussions on competitiveness. Such fears were heightened following the implementation of the Palestinian Labor Law giving workers greater rights and establishing the possibility of a minimum wage in the Palestinian Territories

Capital absorbs a small percentage of total production costs (6.7%), possibly due to the dependence of Palestinian firms on self-financing. The depreciation value is low due to the use of outdated machines and equipment. Industrial capital is characterized by the rise of depreciation to 96% of total capital costs in the Palestinian Territories.

Productivity, Wages, Efficiency of Labor Usage Compared to Other Countries

Average Wages in the Palestinian Industrial Sector

The average wages of employees in manufacturing industry in the West Bank and Gaza Strip was about $4,096 per annum in 2000 compared to $32,177 in Israeli manufacturing, $3,485 in Jordan, $18,524 in Italy, and $7,478 in Turkey. In Egypt, average wages in 1998 were $2,243. However, the importance of absolute differences in wages between countries in determining competitiveness depends largely on the productivity of those wages. That is, how much does the dollar spent on labor produce?

Wage Productivity

In the West Bank and Gaza Strip, wage productivity in manufacturing was $2.09 in 2000. That is, one dollar spent on labor will generate $2.09 of value added. For comparison, productivity in Israel was $1.62 in the same year. This means that the productivity of the dollar spent on labor in the Palestinian Territories was higher than in Israel. In Egypt, productivity was $2.93 in 1998. In 2000, productivity was $2.53 in Italy, $3.86 in Jordan, and very high in Turkey at $6.15.

These results reflect the weakness affecting Palestinian industry: low productivity rather than high wages.

Efficiency of Labor Wage

The efficiency of labor wage is measured by dividing wages by the value added produced. The average labor usage efficiency in manufacturing in the West Bank and Gaza Strip was $0.48 in 2000. However, this index differs from one country to another: it was $0.62 in Israel compared to $0.4 in Italy, $0.16 in Turkey and $0.26 in Jordan. In Egypt, it was $0.324 in 1998. Labor usage efficiency is ???? compared with Jordan, less than 29% in comparison with Egypt and 66% and 69% in Turkey and Indonesia respectively. Labor efficiency usage in Palestinian industry is generally low and indicates that any policy to improve competitiveness must focus on improving productivity and, accordingly, efficiency usage.

Estimated Results of Econometric Model and Indicators Deduced from It

Estimated results of all firms

Palestinian industry enjoys economies of scale of $0.72. This measures the flexibility of costs with respect to production. Therefore, a rise in production volume of 10% would increase production costs by 7.2%. In other words, Palestinian industry has increased returns to scale, with the degree of returns estimated at 1.39. That is, an increase in production inputs of 10% would increase production volume by 13.9%. This would result in a drop in average production costs per unit of the products under study, thus increasing profits.

There are significant differences in the degree of economies and returns of scale between different branches of industry. The degree of economies of scale ranged from 0.57 in quarry extraction and stones to 0.939 in plastics industries. Some industries are suffering from diseconomies of scale or decreasing returns to scale. These branches include other foodstuffs, the textile industry excluding garments, and metal construction products. This indicates that some firms operating in these branches are not working efficiently.

Results also indicate low elasticity of total costs with respect to wages. Elasticity for all industrial branches was estimated at 0.33, meaning that an

increase in average wages of 10% would increase production costs by 3.3%. Significant differences were noted between industrial branches in the sensitivity of production costs to changes in wages, ranging from 0.916 in household products to 0.11 in other wood products.

Estimated Results of Large Firms

Generally, large firms enjoyed economies of scale of 0.67, although there were significant differences in the degree of economies of returns of scale among large firms in various industrial branches.

Recommendations

In light of these findings, the researcher makes the following recommendations:

- The existence of economies of scale in some industrial branches and diseconomies in others demonstrates clearly that a number of Palestinian firms are failing to operate effectively. That is, these firms have not reached or exceeded an optimal size. The existence of economies of scale indicates that the firms in operation are small and could increase in size. In the case of diseconomies of scale, the firm exceeds its optimal size and need to be made smaller by granting licenses to new producers in these branches.
- Increased productivity is the basic means to improve the competitiveness of Palestinian industries.
- Incentives are required for projects which enjoy economies of scale to allow for self-expansion or merger. Government programs should be established to stress the importance of expansion and merger of small projects to counteract their weak competitiveness.
- Licensing policies towards industrial firms which pay insufficient attention to the degree of economies and returns of scale should be reviewed.
- Low labor efficiency usage in Palestinian industry in general indicates that any policy aimed at improving competitiveness must concentrate on higher worker productivity rather than wage cuts. Productivity can be enhanced in a number of ways, including the development of management and production systems, obtaining production inputs at lower prices and higher quality, finding less costly alternative inputs, improving product quality, making use of economies of scale, and vertical integration.