



Impact of Taxes and Fees on the Productivity of the Palestinian Industrial Sector

Yousef Abdel Jawad*, Shaker Zabada

Department of Economic, An- Najah National University, Nablus, Palestine. *Email: Yousef.abed.1989@hotmail.com

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ABSTRACT

The study aimed to determine the effect of taxes and fees on the productivity of the industrial sector in Palestinian case, also in the details at the level of economic activity. To achieve the objectives of this study, the descriptive and quantitative methodology was used. Based on the data of the economic survey series cross sectional data in 2015 was used and, provided by the Palestinian Central Bureau of Statistics, the ordinary least squares method was used in regression analysis. The study found that the effect of taxes on the productivity of the industrial sector is small in general and varies according to the nature of the economic activity. This is different from the expectation that the effect of taxes will be negative. This is mainly because the high degree of tax evasion in Palestine while it does not constitute as a burden in other countries.

Keywords: Productivity, Taxes, Fees, Industrial Sector

JEL Classifications: D2, L2, O4, G38

1. INTRODUCTION

The Palestinian economy has been in a special situation. Since 1967, the Israeli authorities have imposed a series of restrictions, represented in land confiscation, settlement construction, water diversion, seizing land and sea crossings and making the Palestinian economy dependent on it. Palestinian Central Bureau of Statistics (PCBS) (2016) indicates that 83% of Palestinian exports go to Israel, and 58.3% of imports come from Israel.

For a clearer view the main economic indicators in Palestine for 2015 indicate that gross domestic product (GDP) at constant prices reached about 7721.72 billion US dollars, While the GDP per capita is 1745.9 US dollars, the number of employment was 1295.4 thousand people, the unemployment rate reached 25.9%, and the current account deficit by 1712.9 million US dollars, PCBS (2016).

According to the PCBS (2016), the contribution of industrial activities to the GDP is about 13.4%. The percentage of employed

persons in the industrial sector reached 13.7% of the total number of workers in Palestine. The percentage of establishments operating in the industrial sector reached 13.5% of the total institutions operating in Palestine.

The State's ability to spend on public expenditure and to increase economic growth depends on the financial resources it has to finance its investments. Taxes are an important tool for the state to achieve many economic goals. In Palestine, Gross domestic tax revenues was USD 605.2 million and accounted for 21.5% of total net revenues in 2015, while gross domestic non tax revenues accounted for 8.9%, earmarked collections accounted for 2.0%, total clearance revenues constituted 73.1% of total net revenues in 2015. Since the domestic tax revenues continued to rise from 2007 to 2015 as a result of tax reforms in the area of tax collection and in line with the Government's development and reform plan.

According to the data from the Palestinian Monetary Authority, the financial grants to support the Palestinian authority budget decreased by 43.4% between 2013 and 2015. In order to compensate for the

shortfall and fluctuation in the financial grants provided to support the PA budget, several means were used, including government reforms in the field of tax collection, It caused by the rate of tax revenues increased by 25.7% between 2011 and 2015. Palestine Monetary Authority (2017), PCBS (2016).

This increase in taxes may have different economic effects on the productivity of the industrial sector in Palestine, and there is a need to find the impact of taxes and fees on productivity in the industrial sector in Palestine.

2. LITERATURE REVIEW

Many financial economists studied the relationship between corporate income taxes, investment and productivity, and evidence has been found that excessive regulatory and government policies have negative consequences for the business environment and economic development, Since Hall and Jorgenson in 1967, work has been shown that changes in the cost of capital can reasonably explain overall investment, where higher corporate income taxes have had a negative impact on investment by increasing the cost of capital used. Many studies examined the theoretical and empirical interpretations of this relationship, but the studies that deal with the relationship between taxes and productivity were lower than those that examined the relationship between taxes and investment. This is because there is no single measure of productivity. Galindo and Pombo (2011).

A study by Auerbach and Hines (2001) confirmed that taxes affect productivity, creating distortions by influencing prices and decision-making for businesses and households, these distortions lead to the redistribution of inputs within firms or industries that can have implications for growth. Where any change in the price of a production input can result in a reduction in the use of a production input in a company or industry, so all unused inputs in this company or industry may be reallocated to a less productive company or industry, or not used at all. Thus reducing efficiency in the use of production inputs, thereby reducing total factor productivity (TFP).

In Vartia (2008) analyze the impact of different tax policies on investment and productivity at the industrial level of the Organisation for Economic Co-operation and Development (OECD), to examine whether industries are affected differently by taxation, the study showed that investment responds negatively to the increase in corporate tax rate, The study analyzed potential linkages between taxes and productivity, and examined the hypothesis that taxes affect productivity through different channels, and the study found that high tax-income companies are negatively affected by productivity, while tax incentives for research and development have a positive impact on productivity.

The previous study was combined with a study of Galindo and Pombo (2011), to analyze the impact of corporate taxes on investment and productivity. The study used data from 42 developing countries from the World Bank's business environment surveys, and examined whether companies of different sizes are affected differently by taxes. The study showed that both

investment and productivity responded negatively to increase the corporate tax rate, and these effects were stronger in large companies.

Whereas Hussain (2015), analyzed the impact of change in tax policy on TFP in the United States. The study showed that the permanent tax increase has a strong, lasting and negative impact on TFP, which represents about 80% change in output after increase in tax.

More broadly, study of Everaert et al. (2014) analyzed the impact of fiscal policy on TFP for OECD countries during the period 1970-2012. The results showed that the shift to the transfer of production expenditure has a positive effect on TFP. Indirectly, there is a positive impact on TFP, by allowing access to global technology, comes through reducing corporate taxes and reducing barriers to international trade.

While the study of Dechezleprêtre and Sato (2017) confirmed the scope and nature of regulations on economic activity can negatively affect productivity, growth and economic activity. Because of the taxes are an important element in the chart of regulations that define the business environment, many of the ideas that have been explored can be brought down to tax policies.

3. METHODOLOGY AND DATA

3.1. Methodology

In this study, the methodology of descriptive and quantitative analysis will be used. The ordinary least squares (OLS) method used in data analysis, and the tested from the following variables:

$$TFP=f(Wages, Capital\ intensity, TAX\ Fees)$$

Where the dependent variable in this study is the TFP in the industrial sector. And the independent variables are:

- Wages: Wages and compensation of workers in the industrial sector. Capital intensity: Ratio of capital to labor in the industrial sector (as an indicator of volume).
- TAX fees: Taxes on income and profits of the enterprise, export duties, and customs duties.

And by using the SPSS.20 program and the Microsoft Excel program, raw data will be processed, analyzed and results obtained.

3.2. The Data

The sample of the study was 2512 institutions, covering both the West Bank (61%) and the Gaza Strip (39%), and for a period from 1/1/2015 to 31/12/2015. Thus, the data cross-sectional was used, distributed across all economic sectors. The source of the data is the economic survey series for 2015 (PCBS). Covering the industrial survey, which includes mining and exploitation activities quarries, manufacturing, electricity, gas, steam, air condensation, water supply, sanitation activities and waste management.

3.3. Description of Study Variables

In order to achieve the objectives of the study, we provide a statistical description of the study variables at the level of

the Palestinian territory, and at the level of economic activity (mining and quarrying, manufacturing, electricity, gas, steam, air conditioning, water supply, and processing) is necessary.

3.3.1. Description of the study variables at the level of Palestine

The number of establishments operating in Palestine in 2015 reached 135,880 establishments for all economic activities, of which 18056 were operating in the industrial sector. 2512 establishments were selected, representing the industrial sector in the economic survey series, 66% for the West Bank and 34% for the Gaza Strip.

From Table 1, the average number of workers in the industrial sector in the Palestinian Territory is about 10 workers, and the worker receives an annual wage of 21206 Israeli shekels while the working capital density in the Palestinian Territory during the year 2015 reaches 87175, which it means that the operating institutions spend an average of 87175 NIS on fixed capital in 2015 for every single worker in the institution.

3.3.2. Description of the study variables at the level of economic activities

The industrial sector is divided into several major economic activities: Mining and quarrying, manufacturing, electricity, gas, steam, air conditioning, water supply, sanitation and waste management and treatment. Each major economic activity involves several economic activities, including mining and quarrying activities for the extraction of marble and granite, salt extraction, precious metal extraction, etc., and includes manufacturing industries on several activities, such as food industry, industry Textiles, fertilizer industry, etc., while the electricity, gas, steam and air conditioning industry includes the generation, transmission and distribution of energy, the sale of electricity to consumers, the production and distribution of chilled air, the production of ice, etc. Sewage and waste management and treatment contains several activities, such as rainwater harvesting activities, water purification for the purpose of selling, waste collection, wastewater treatment etc.

The establishments operating in the manufacturing industry in Palestine are 94.03%, while the establishments are working in drinking water and sanitation, about 3.18%, and about 2.43% for enterprises engaged in mining and quarrying activities, while institutions operating in the electricity, gas, steam and air conditioning sectors accounted for 0.36% of the total number of establishments in the industrial sector.

From Table 2, it is found that the average number of workers in enterprises engaged in mining and quarrying activities and

Table 1: Statistical description of the study variables at the level of Palestine

Variables	Range	Mean±SD
Labor	960	10±37
Wage per labor	167625	21206±10753
Capital intensity	5052850	87175±209313
Taxes and fees	4851136	24226±177248

The table was calculated by the researcher, based on the economic survey series data for 2015. *Currency in Israeli Shekel. SD: Standard deviation

manufacturing enterprises is about 10 workers per enterprise, while the average number of workers in enterprises engaged in water supply, sanitation and waste management activities To about 5 workers, and enterprises operating in the activities of electricity supply, gas, steam and air conditioning, the average number of workers in one institution to 216 workers.

For the average annual wage per worker, workers in the electricity, gas, steam and air conditioning systems receive the highest annual wage rate of about 40,000 Israeli shekels compared with their counterparts in other activities, and about 28,000 Israeli shekels as the average annual wage of the worker in mining and quarrying activities, while The annual wage rate of the worker in the manufacturing industries and worker in the water supply, sewage and waste management activities is converged and processed, with an annual average wage of NIS 20910 and NIS 20413 respectively.

In view of the intensity of fixed capital, electricity, gas, steam and air conditioning supply activities are the most intensive activities of fixed capital, followed by enterprises engaged in water supply activities, sanitation activities, waste management and treatment, mining and quarrying activities, while the intensity of fixed capital in manufacturing activities is the lowest.

4. MODEL

The following model was used to study the effect of taxes and fees on the productivity of the industrial sector in Palestine:

$$TFP = \alpha_0 + \alpha_1 Wages + \alpha_2 Capitalintensity + \alpha_3 TAXFees \quad (1)$$

To give a clearer sight of the effect of the average wages of workers and the average taxes and duties per worker on the productivity of enterprises in the industrial sector, I divided the wages, taxes and fees on the number of employees, taking into account the natural logarithm of variables on both sides, Thus, the model used in this study takes the following form:

Table 2: Statistical description of the study variables at the level of economic activities

Industrial sector	Variables	Range	Mean±SD
Mining and quarrying	Labor	60	10±10
	Wage per labor	163914	27999±20354
	Capital intensity	2233364	228677±457891
	Taxes and fees	47500	6639±9764
Manufacturing industry	Labor	750	10±30
	Wage per labor	76230	20910±9750
	Capital intensity	2541751	76304±151039
	Taxes and fees	4851136	24206±177413
Electricity, gas, steam and air conditioning	Labor	957	216±328
	Wage per labor	95763	40011±29271
	Capital intensity	2926136	505660±948104
	Taxes and fees	2036448	306967±672747
Water supply, sanitation and waste management	Labor	260	5±29
	Wage per labor	90000	20314±15189
	Capital intensity	5048586	250188±624162
	Taxes and fees	430000	6401±48314

The table was calculated by the researcher, based on the economic survey series data for 2015. *Currency in Israeli Shekel. SD: Standard deviation

$$\ln(TFP) = \alpha_0 + \alpha_1 \ln\left(\frac{\text{Wages}}{\text{Labor}}\right) + \alpha_2 \ln(\text{Capitalintensity}) + \alpha_3 \ln\left(\frac{\text{TAXFees}}{\text{Labor}}\right) \quad (2)$$

Where $\alpha_1, \alpha_2, \alpha_3$ represent the elasticity of the average wage per worker, the elasticity of the capital intensity, and the elasticity of the average tax or fee per worker, respectively.

And the mathematical expression used in this study to calculate TFP as follows:

$$TFP = \frac{\text{Total output}}{\text{labor} + \text{capital}} \quad (3)$$

Where total output represents total production value of establishments operating in the industrial sector. Labor: Paid workers in the industrial sector. Capital: The value of fixed capital in the industrial sector.

And TFP was calculated as in Kisi (2015), using the following mathematical expression:

$$TFP = \frac{\text{Total output}}{\text{Labor} + \text{material} + \text{equipment} + \text{energy} + \text{capital}} \quad (4)$$

However, in this study, the variables (material, equipment, energy) were excluded because the PCBS did not provide these variables in the industrial survey.

The selection of variables and method of analysis in model (2), was based on different previous studies, since there are many studies that linked the taxes and productivity, including a study Galindo and Pombo (2011), which dealt with the impact of taxes on corporate productivity, and Varita (2008) to analyze the impact of tax policies on investment and productivity in firms using the OLS method. The two studies agreed on the negative impact of taxes on corporate productivity.

Whereas a study Ehrenberg and Smith (2012) examined the impact of wages on productivity and found that higher wages in the enterprise than wages in the market lead to commitment by employees, which increases their productivity. In addition, an institution that pays higher wages can attract workers with better quality, experience and skills. And according to Nikulin (2015), he showed a strong relationship between wages and productivity in

Poland, Czech Republic, Estonia and Hungary. While Duke (2016) showed that Wage increases are another means of increasing productivity, since employers have few reasons to invest in new capital and increase productivity when real wages stagnate. So, when employers face rising labor costs, they will invest and innovate, which is key to increasing productivity.

While Tasrif (1995) showed the effects of technological changes on productivity growth in developing countries, using changes in capital-labor ratio. In addition, the study of Turcotte and Renneson (2014) examined the effect of capital intensity on productivity.

5. RESULTS

To determine the effect of the independent variables on the productivity of the industrial sector at the level of Palestine, and by using the OLS method, the coefficients of the model were estimated from Equation (2), and the results are shown in Table 3.

Table 3 shows that the productivity of enterprises operating in the industrial sector is expected to increase by 0.197%, this is mainly because the high degree of tax evasion in Palestine, and it could be because of the taxes and fees represent pressure on the product to increase productivity, to cover taxes and fees paid, in addition to the large tax evasion in Palestine, Which amounts to about 70% for 2015, so taxes do not constitute a burden as in other countries.

On the other hand, when wages per worker are increased by 1%, the productivity of enterprises will increase by 0.311%. This finding is consistent with the Ehrenberg and Smith (2012) study, which asserts that wage increases lead to commitment by employees. In addition, a higher paying institution can attract workers with better quality, experience and skills.

And it is expected that when the capital intensity increases by 1%, the productivity of institutions will fall by 0.74%. This is due to the nature of the labor-intensive Palestinian industries in addition to the lack of capital to modernize the industrial sector in Palestine.

To determine the impact of taxes and fees on the productivity of the main activities of the industrial sector in Palestine, the OLS method was used in the analysis of Equation (2).

Table 4 shows that taxes and fees affect the productivity of manufacturing industries only, where the institutions operating

Table 3: Regression results at the level of the industrial sector in Palestine

Variables	Coefficients	Standard error	t- stat	P-value
Ln (Wage per labor)	0.311	0.053	5.810	0.000
Ln (Capital intensity)	0.740	0.022	34.119	0.000
Ln (Tax and fees per labor)	0.197	0.022	9.163	0.000
Intercept	4.475	0.515	8.688	0.000
Observation	2512			
R ²	0.57			
Adjusted R ²	0.569			
F- Statistics	392.485			
Prob.(F- Statistics)	0.000			

Dependent variable: Ln (TFP). The table was calculated by the researcher, based on the economic survey series data for 2015

Table 4: Regression results at the level of the main economic activities in the industrial sector in Palestine

Activities of the industrial sector	N	R ²	Adjusted R ²	Standard error of estimate	F- statistic	Prob. F- statistic
Mining and quarrying	61	0.218	0.137	0.6956	2.694	0.064
Manufacturing industries	2362	0.572	0.570	0.7915	373.676	0.000
Electricity, gas, steam and air conditioning activities	9	0.775	0.437	1.1664	2.292	0.318
Water supply and sanitation activities and waste management and treatment	80	0.447	0.115	0.8024	1.347	0.359

The table was calculated by the researcher, based on the economic survey series data for 2015. N: Represent the number of establishment in the sample, where the number of industrial establishments in Palestine reached 18056 in 2015

Table 5: Regression results at the level of manufacturing industries in Palestine

Variables	Coefficients	Standard error	t- stat	P-value
Ln (Wage per labor)	0.302	0.055	5.462	0.000
Ln (Capital intensity)	-0.746	0.022	-33.319	0.000
Ln (Tax and fees per labor)	0.199	0.022	9.050	0.000
Intercept	4.615	0.535	8.629	0.000
Observation		2362		
R ²		0.572		
Adjusted R ²		0.57		
F- Statistics		373.676		
Prob.(F- Statistics)		0.000		

Dependent variable: Ln (TFP) .The table was calculated by the researcher, based on the economic survey series data for 2015

in the manufacturing industries, constitute about 94% of the institutions operating in the industrial sector.

To study the effect of taxes and fees on the productivity of manufacturing industries in Palestine, we analyze Equation (2) by using the OLS method.

Table 5 shows that if taxes and fees are increased for each worker by 1%, the productivity of enterprises operating in manufacturing will increase by 0.199%, and by 0.302% when the increase in wages per worker by 1%, while productivity decreased by 0.746%, when increasing the capital intensity by 1%.

6. CONCLUSIONS

When increasing the taxes and fees per worker by 10%, productivity in the industrial sector will increase by 1.97% at the level of Palestine. And on the level of economic activities, productivity will increase by 1.99% in manufacturing industries, when taxes and fees increase by 10% per worker. These results converge with Duke (2016), which suggests that increasing direct costs has a positive impact on productivity, when employers face higher costs, they will invest and innovate, a key to increasing productivity. But these results differ with Galindo and Pombo (2011) and Varita (2008), who note that the increase in taxes has a negative impact on the productivity of operating institutions. This difference can be explained by the large tax evasion in Palestine, which reached 70%, so the taxes do not constitute a burden as in other countries.

From the above, recommendations can be made to decision-makers to develop prudent fiscal policies aimed at senior taxpayers, and to reduce tax evasion.

On the other hand, when wages increase by 10% per worker in the industrial sector in Palestine, productivity will increase by 3.11%.

And at the level of economic activities, will increase by 3.02% in the manufacturing industries when taxes and fees increase by 10% per worker. These results are close to the Ehrenberg and Smith (2012) study, which indicated that the wage increase has a positive impact on the productivity of the operating institutions. So we can come up with a recommendation to decision-makers to work on incentive wage policies in the industrial sector because of the positive impact on the productivity of the industrial sector as a whole. The intensity of fixed capital has a negative impact on the productivity of manufacturing activities in the industrial sector. This is due to the nature of Palestinian industries, which are labor-intensive rather than fixed capital, in addition to the lack of fixed capital in the Palestinian industrial sector.

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