The Impact of Taxes on the Standard of Living: A Case Study from Palestine

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Abstract: Taxes are a vital component of fiscal policy, as governments use tax revenues to either stimulate or slow down economic activity. The purpose of this paper is to examine the cause-and-effect relationship between taxes and real GDP per capita in the State of Palestine. The data, covering the period from 1996 to 2022, was obtained from the Palestinian Monetary Authority. An Autoregressive Distributed Lag model was employed to assess this relationship. The results indicate that taxes have a lag effect and a significantly positive impact on real GDP per capita. This finding is valuable for policymakers in understanding the influence of tax revenues on the Palestinian economy—particularly given that Israel controls part of the tax revenue collection process. In the case of Palestine, taxes contribute to the dissemination of knowledge among the population. Future research should explore more effective methods of tax collection and propose amendments to existing tax laws.

Key Words: Autoregressive Distributive Lag Model, Fiscal Policy, Palestinian Economy, Tax Revenues

1. INTRODUCTION

This interplay takes on an even greater significance in the context of developing economies, where fiscal imbalances and macroeconomic instability can pose formidable challenges to growth and development. One such economy is Palestine, a region beset with a myriad of economic and political complexities.

The purpose of this paper is to explore the effect of tax revenue on economic growth in Palestine. As a case study, it will shed light on the intricate dynamics of these economic factors within a unique geopolitical context.

Tax revenue, a critical source of government finance, plays a pivotal role in shaping a country's fiscal policy and by extension, its macroeconomic environment.

Through rigorous empirical analysis, this study hopes to contribute to the existing body of literature on fiscal policy and macroeconomic performance, with a particular focus on the Palestinian context. The findings of this study could potentially guide effective policymaking and fostering sustainable economic growth in Palestine.

Taxes play an important role in fiscal policy for a country's economy. In developed countries, taxes are used to achieve economic stability. On the other hand, in developing countries taxes are used to achieve economic development. The government utilizes taxes to raise the economic and productive efficiency of a country by monitoring economic resources and exploiting them to full potential (Hijazi, 2001). Tax legislation influences the investment, consumption, savings, employment and inflation of an economy (Al-Mahaeni, 2003).

In 1994, the Oslo agreement was reached resulting in the establishment of the Palestinian National Authority. In 2004 the Palestinian Legislation Council established the first Palestinian Income Tax Law (Act 17/2004) which took effect legally in the year 2005. During the Israeli occupation era prior to 2005, the Jordanian and the Egyptian income tax law was enforced in the West Bank and Gaza, respectively (Alawna, 1992). In 2011, major reforms were amended to the Palestinian Income Tax Law which resulted in the adaption of new Income Tax Law (Act 8/2011). One of the major changes was using the Israeli currency (Shekel) for taxing the Palestinian income, in addition to rates reduction and exemptions.

The Council of Tax Administration in the Ministry of Finance is responsible for administrating the Palestinian tax matters. The Council is structured into five directorates differentiated by type of taxes, namely the General Directorate of Income Taxes, the General Directorate of Property taxes, the General Directorate of Customs, Excise and Tobaccos, the General Directorate of Value Added Tax and the General Directorate of Petroleum.

In addition, according to the Paris Economic Protocol signed between Palestinian Authority and Israeli Government, some taxes are collected by the Israeli government on behalf of the Palestinian Government. These Taxes are known as the 'maqasa' and they should be transferred over to the Palestinian Government and they include the following:

1. Direct taxes on Palestinian labor wages: This refers to income tax deducted from Palestinian workers' salaries.
2. Indirect taxes on imports from Israel: These include various taxes such as VAT (Value Added Tax) and customs duties on goods imported from Israel into the Palestinian territories.
3. Indirect taxes on imports from other countries: These may include taxes such as VAT, customs duties, and other fees levied on goods imported into the Palestinian territories from countries other than Israel. (Hillis, 2021)

The collected taxes, maqasa, are supposed to be transferred to the Palestinian Authority on a regular basis according to agreed-upon procedures outlined in the protocol. The purpose of this arrangement is to support the Palestinian Authority financially and enable it to carry out its governmental functions, including providing public services and infrastructure development. The maqasa system has created a level of economic dependency of the Palestinian Authority on Israel. Since the PA relies on Israel for the collection and transfer of significant portions of its revenue, any disruptions or delays in the transfer of these funds can have serious consequences for the Palestinian economy and the functioning of the Palestinian government. The control and transfer of tax revenues through the maqasa system also have political implications. It can be used as a tool by Israel to exert pressure on the Palestinian Authority or to influence political developments in the region. Disputes over tax revenues and delays in their transfer have been sources of tension between the two parties in the past (Hillis, 2021). Table 1 shows the Palestinian government tax revenue from 1996 to 2022.

Table 1: The Palestinian government tax revenue for the period from 1996 to 2022

Year	Tax Revenue (including clearance – USD Million)	Non-tax Revenue (USD Million)
1996	559.6	85.9
1997	689	118.3
1998	771.6	96.8
1999	827.5	114
2000	828	111
2001	183	92
2002	213	82
2003	639	124
2004	904	146
2005	1,125.00	245.00
2006	565	157
2007	1,520.00	122.00
2008	1,409.80	486.20
2009	1,391.50	283.60
2010	1,673.20	254.50
2011	1,969.60	220.00
2012	2,057.60	232.10
2013	2,287.70	254.40
2014	2,658.30	270.50
2015	2,653.50	249.80
2016	2,958.40	607.10
2017	3,241.70	390.80
2018	3,093.50	430.30

Year	Tax Revenue (including clearance – USD Million)	Non-tax Revenue (USD Million)
2019	2,982.50	355.70
2020	3,137.30	374.60
2021	3,771.80	402.50
2022	4,293.00	458.10

Source: Palestine Monetary Authority https://www.pma.ps/en/Statistics//TimeSeriesData.

We noticed from the table above there is a general upward trend in tax revenue over the years, where tax revenue in 1996 was $559.6 million increasing to a total of $4,293 million. At the same time, non-tax revenue also shows an increasing trend, indicating potential diversification in revenue sources or improved revenue collection mechanisms. Meanwhile Table 2 shows Palestinian Real GDP per capita covering the period from 1996 to 2022.

Table 2: Macroeconomic indicators for Palestine for the period from 1996 to 2022

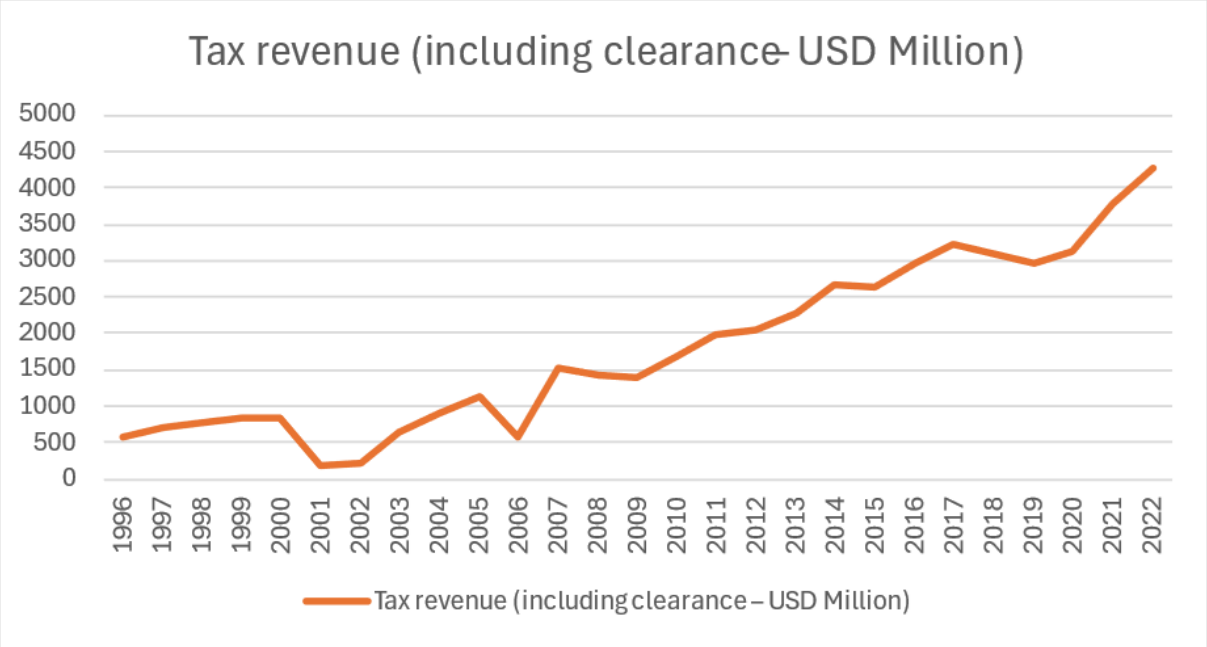
Year	Real GDP per capita (USD)	Real GDP at (2015) prices (USD)
1996	2249.2	5483.5
1997	2442.2	6287.8
1998	2701	7189.1
1999	2830.2	7784.4
2000	2506.5	7118.4
2001	2208	6455.6
2002	1877.6	5649.4
2003	2080.1	6441.2
2004	2463.6	7853.4
2005	2,659.20	8,740.10
2006	2553.3	8653
2007	2,570.00	8,980.80
2008	2,686.90	9,648.00
2009	2,841.90	10,477.10
2010	2,929.80	11,082.40
2011	3,131.60	12,146.40
2012	3,242.10	12,886.90
2013	3,314.50	13,492.40
2014	3,233.00	13,471.10
2015	3,277.90	13,972.40
2016	3,489.80	15,211.00
2017	3,463.10	15,426.90
2018	3,417.70	15,616.20
2019	3,378.30	15,829.00
2020	2,922.50	14,037.40
2021	3,051.50	15,021.70
2022	3,086.80	15,612.50

Source: Palestine Monetary Authority https://www.pma.ps/en/Statistics//TimeSeriesData.

These indicators offer insights into the economic performance and welfare of the Palestinian population over time. Real GDP per capita measures the economic output per person, adjusted for

inflation. It generally increases over the years, indicating economic growth and improvement in living standards. Real GDP at constant prices provides a measure of the total economic output, adjusted for inflation. It shows an overall increasing trend over the years, reflecting economic growth. The graph below shows the Tax Revenues from 1996 to 2022.

Figure 1: Tax Revenue



Source: Palestine Monetary Authority https://www.pma.ps/en/Statistics//TimeSeriesData.

The graph above shows the tax revenue over time. We notice that there is an overall increase in the tax revenue over time. The graph shows that there was a decrease in the tax revenue in 2001 and 2002. This decrease was due to the political instability caused by the Second Intefadah. With the end of the Second Intifadah, the tax revenue continued to increase till 2006 when it took another downward drop. This was caused by the political instability caused by the elected Hamas led government. However, after the resolution of that government was monotonically increasing till the year 2022.

The paper will proceed as follows, the next section will discuss the relevant theoretical framework; literature review section stating the relevant literature to the paper; methodology section explaining the model that will be used in the analysis process; results section showing the output from the E-views software; and finally, conclusion section asserting the ending remarks.

1.1. Literature Review

Numerous empirical and theoretical studies have examined the relationship between taxation and macroeconomic performance, particularly economic growth and development. Most of the literature agrees that taxes, as a fundamental component of fiscal policy, influence economic activity both positively and negatively depending on their structure, administration, and macroeconomic context (Alinaghi and Reed, 2021; Kawano and Slemrod, 2016).

Abdulrahman et al. (2023) examined the effect of tax reform on economic growth in Sudan from 1961 to 2021. Utilizing data from the World Bank and applying the ordinary least squares method, they concluded that population growth and foreign direct investment significantly influence economic growth, whereas tax reform had a relatively minor impact. Their findings suggest that while taxes matter, other macroeconomic variables might play a more direct role in determining growth in some developing economies.

Mai and Van (2022) studied tax revenues and economic development in Southeast Asian countries using quantitative analysis and World Bank data. Their research showed that per capita GDP has a positive impact on tax revenues, supporting the notion that economic growth enhances a country's fiscal capacity. The study implies that rising income levels can lead to more robust revenue collection mechanisms in emerging markets.

Alinaghi and Reed (2021) conducted a meta-analysis using 979 tax-growth estimates from 49 studies across OECD countries. They found that the impact

of taxes on GDP growth depends on how tax changes are integrated into the broader fiscal framework. Specifically, a 10% increase in taxes can either decrease GDP growth by 0.2% or increase it by 0.2%, depending on whether it is part of a tax-negative or tax-positive fiscal strategy. Their findings highlight the importance of complementary spending and deficit policies.

Hillis (2021) provided a deep dive into the political and economic effects of the Israeli government's withholding of Palestinian clearance revenues (maqasa). He argued that this practice directly threatens the financial stability of the Palestinian Authority, affects budgetary operations, increases public debt, and weakens investor confidence. Hillis emphasized that the Palestinian government's fiscal sovereignty is compromised, which diminishes the long-term effectiveness of tax policy.

Abd Hakim (2020) analyzed the differential effects of direct and indirect taxes on economic growth across 51 countries from 1992 to 2016. Using dynamic panel data and the GMM estimation method, the study revealed that direct taxes significantly hinder economic growth, while indirect taxes had no significant effect. However, direct taxes positively contributed to total tax revenue collection. This highlights the trade-off between tax efficiency and growth in designing tax policy.

Oumer and Ramakrishna (2020) studied the relationship between government revenue, public expenditure, and GDP in Ethiopia. Their findings indicated that positive shocks in fiscal deficits led to increases in GDP, while negative shocks had a contractionary effect. The study underlines the interdependence between fiscal balance and economic performance in low-income countries.

Rehman, Khan, and Kousar (2020) explored the effects of different sources of government revenue on economic growth in Pakistan. The study concluded that tax revenues significantly and positively affect GDP growth, reinforcing the notion that efficient tax systems can finance growth-enhancing public investment in developing countries.

Al-Fatlawi (2019) investigated the dynamic effects of fiscal policy on the GDP of the United States between 1990 and 2017. He found that increasing taxes negatively impacts GDP, suggesting that higher tax rates may disincentivize private sector productivity and reduce aggregate demand, consistent with traditional Keynesian analysis.

Egbunike, Emudainohwo, and Gunardi (2018) studied the impact of tax revenue on the economic growth of Nigeria and Ghana. Their analysis showed a positive relationship between tax revenue and GDP, indicating that when managed properly, taxes support development in sub-Saharan African countries.

Alkhatib and Abdul-Jabbar (2017) examined factors contributing to tax evasion in Palestine. Drawing on economic deterrence theory, they found that higher penalties, greater likelihood of detection, and increased tax awareness significantly reduce tax evasion. This highlights the importance of institutional design and taxpayer behavior in achieving tax compliance.

Babatunde, Ibukun, and Oyeyemi (2017) analyzed the relationship between taxation and economic growth in Africa from 2004 to 2013. Their study revealed that taxation has a statistically significant and positive effect on GDP growth, suggesting that both high and low levels of taxation can be conducive to economic performance depending on the fiscal environment.

Iriqat and Anabtawi (2016) focused on the causality between tax revenue and GDP in Palestine from 1999 to 2014. Their findings indicated no Granger-causality between tax revenues and macroeconomic indicators such as GDP, government spending, and investment. However, the current study using updated data and modeling suggests the reverse causality from GDP to taxes may be emerging.

Based on the theoretical framework and the reviewed literature, the following research hypothesis is proposed:

H_o (Null Hypothesis):

There is no statistically significant relationship between tax revenue and Real GDP per capita in Palestine.

H_1 (Alternative Hypothesis):

There is a statistically significant and positive relationship between tax revenue and Real GDP per capita in Palestine.

2. MATERIAL AND METHODS

2.1. Theoretical Framework

The main challenge for governments around the world is to permanently increase the well-being of citizens by implementing appropriate economic policies and programs through direct participation in local and global economic activities. Governments try to achieve this goal by providing public goods, such as: roads, bridges, dams, ports, and public services such as education, security,

health, sanitation, etc. that constitute the economic and social infrastructure. All of these economic activities generate lucrative employment opportunities and accelerate economic growth and development in the short, medium and long term (Kawano and Slemrod, 2016).

Taxation is defined as the transfer of real economic resources from the private sector to the public sector to finance public sector activities. It is the transfer of financial resources from private economic agents such as households and corporate bodies, to the public sector to finance community development (Okeke, et. al, 2018).

The tax system leverages itself as a real tool that mobilizes the nation's internal resources and also lends itself to creating an enabling environment for promoting economic growth. Therefore, taxes play a major role in helping the country meet its needs and promoting self-reliance. The need for tax payments has been a phenomenon of global importance as it affects every economy regardless of national differences.

Taxes are one of the most important economic tools used by governments to finance public spending and achieve economic and social development in countries. Here are some of its importance (Tchamyou and Asongu, 2017):

1- Financing public spending: Taxes are collected from individuals and companies and directed to finance public services, such as health, education, transportation, security, etc., in order to improve the quality of life for citizens.
2- Stimulating economic growth: Taxes help finance economic projects, provide infrastructure, and encourage private investments, which enhances economic growth and increases job opportunities.
3- Distributing wealth more equitably: Taxes can be used to balance the distribution of wealth in society, as the wealthy are taxed at higher rates than the poor, which helps reduce the gap between social classes.
4- Controlling prices and inflation: Taxes can be used to control prices and inflation, as a tax can be imposed on luxury and entertainment products to reduce excess spending and inflation.
5- Improving the trade balance: Taxes can be used to improve the economic balance in countries, as taxes can be imposed on imported products to encourage local industries and improve the trade balance.

In the nineteenth century, the modern tax system was developed, as countries began to determine the type and rates of taxes based on income, wealth, and consumption. In the twentieth century, countries began to develop the tax system further, and taxes began to include all people and companies at specific rates according to the different types of taxes. Such as taxes on income, value added, inheritance, gifts, real estate, sales, etc. The modern tax system requires continuous development and modernization, as the economy, technology, financial and tax laws change continuously, which requires updating the tax system to keep pace with these changes and ensure the sustainability of tax revenues. (Terefe and Teera, 2018).

Tax revenues are the incomes that the government receives from imposing taxes on citizens, residents, companies, and institutions. These revenues include all types of taxes imposed by the government, such as income tax, value-added tax, corporate tax, and other taxes. Tax revenues also help stimulate economic growth, enhance investment in infrastructure and public projects, and contribute to providing financial stability for the government and the state. The size of tax revenues depends on several factors, such as quality, tax rates, size of the economy, employment rate, national income, economic growth rates, and others. Tax revenue levels vary between different countries, as tax rates, types of taxes, and levels of the economy differ between different countries (Tchamyou and Asongu, 2017).

Total tax revenue as a percentage of GDP reflects the government's share in raising the economy's resources through taxes. This measure can be used as an indicator of the government's ability to control the state's resources. The tax burden is measured by total tax revenues as a percentage of GDP. This indicator includes all levels of government, and is measured in millions of dollars and a percentage of GDP. (Tchamyou, 2019).

In short, taxation is the transfer of income or resources from the private sector to the public sector in order to empower the public sector to implement some -if not all- of the nation's economic and social goals. Taxes may be imposed on wealth, income, or in the form of price surcharges, and these taxes may be collected through the following revenues (Akhor and Ekundayo, 2016):

- Direct tax: It is a tax imposed directly on a person or company and this person or company is expected to pay the tax. In other words, a direct tax is a tax imposed directly on the income and property of

individuals and companies which includes the following: personal income tax, corporate income tax, petroleum profits tax, capital gains tax and others.

- Indirect taxes: These are taxes imposed on people or groups who are not intended to bear the burden or occurrence but will pass it on to other people. They are usually imposed on goods or services that do not fall directly on the producer or the first payer but on their final payers and consumers.

Economic growth is defined as the process by which the real income per capital of a country increases over a long period of time and is measured by the increase in the quantity of goods and services produced in a country. A growing economy produces more goods and services in each successive period of time. Hence, from a broader perspective, it means raising people's standard of living and reducing inequality in income distribution.

Economic growth is the foundation of long-term prosperity and is traditionally linked to capital accumulation and innovations that foster technical progress. Classical and neoclassical growth models conceptualize this relationship differently. The Harrod–Domar model emphasizes the roles of savings and investment in driving growth (Harrod, 1939; Domar, 1946), while the Solow–Swan model extends the analysis by incorporating capital accumulation, labor force expansion, and exogenous technological progress (Solow, 1956; Swan, 1956). Within these frameworks, economic growth can be expressed as a function of investment ratios, population growth, and technical change. Classical economics, in particular, denotes growth as a function of the profit share in national income, suggesting a positive relationship between high profit rates and high long-run growth (Nelson, 2000). Building on this foundation, modern growth theories emphasize the importance of human capital (Lucas, 1988), innovation, and knowledge spillovers as engines of sustained growth (Romer, 1990). Moreover, institutional quality critically mediates these processes: inclusive institutions encourage investment, innovation, and efficient allocation, thereby reinforcing the growth effects of profits and capital accumulation (Acemoglu, Johnson, & Robinson, 2001). Thus, economic growth emerges from the combined effects of profit shares, capital accumulation, technical progress, human capital, and institutional frameworks.

For several decades, economic performance has not been impressive. The persistence of the economic crisis, with its attendant problems of high inflation, high exchange rates, debt accumulations, an adverse balance of payments, and high inflation rates, is difficult to explain (Sanusi, 2012).

Now we will consider the different theories that study the relationship between taxes and macroeconomic variables. Ricardo is considered one of the most prominent thinkers of the classical school, who worked to deepen the views and ideas of this school, and through his analysis of the growth process, and the division of society's resources into three categories (land, labor, and capital). He considered the capitalist class is the producer and is necessary for the process of Economic growth. This is because it consumes a small part of its income that comes from profits and the rest turns into savings, which are considered the basis for capital accumulation (Kurz, 2010).

Ricardo confirms that taxes are an important factor in financing economic growth, but he warns against increasing their rates on the profits of capitalists, so as not to hinder the flow of economic growth.

The Keynesian model is another theory that explains the relationship between economic growth and social transformations, and it is considered one of the most widely used models in the study of economic development. The hypothesis of the Keynesian model is based on the fact that income rises over time. There is a period of time in which societies are characterized by increased productivity and economic growth, and then there is a reversal in the long term. This growth results in social transformations that include the increase of the middle classes and social separation, which leads to a trend, where the model naturally moves toward stability. The Keynesian model is used to study the effect of economic growth on the distribution of wealth in society. According to the model, wealth and income rise over time, and when societies reach a certain level of wealth, the distribution of wealth shifts from being concentrated at least below them to a more equal distribution, and economic growth contributes to this transition. The Keynesian model can be used in taxation by analyzing the effect of tax policies on the distribution of wealth. For example, governments can use taxes to direct economic growth towards higher levels of income. Thus, contributing to reduce inequality in distribution, but if taxes are imposed unfairly this can increase inequality in distribution between economic groups (Roberts, 1978).

To study the cause-and-effect relationship between taxes and GDP we can start with the simple

Keynesian model stating the GDP is represented by the following equation:

(1) GDP= C+I (r)+ G(t)+ (X-M)

Where:

C is consumption

I is investment

r is interest rate

G is government spending

T is taxes

X is export

M is import

According to the simple above Keynesian model, taxes have direct effect on GDP. Keynes had realized that through taxes, governments can either stimulate or slow down an economy. In other words, taxes are a vital component of fiscal policy.

Let us now develop a mathematical model that shows GDP per capita as a function of taxes, using topological space and economic theory. Let the state space be a compact Hausdorff topological space $S : \Theta \times T$, where Θ captures fundamentals (technology, preferences, endowments, shocks) and $T \subset [0,1]^k$ is the vector of tax instruments (e.g., labor, capital, consumption, and payroll taxes). Assume T is nonempty, compact, and convex; equip S with the product topology.

For each state $s(\theta,T) \in S$, consider a standard competitive economy: firms choose production plans in a closed, convex production set $Y(\theta)$; households solve continuous, strictly quasi-concave utility maximization problems with feasible sets $B(\theta,T,P)$; the government's budget constraint links τ to public expenditures/transfers $G(T,\theta)$. Prices lie in the simplex P (compact).

Define the equilibrium correspondence $E : S \rightrightarrows X$ mapping s to the set of competitive equilibria x = (P, allocations) (Debreu, 1959; Mas-Colell et al., 1995). Under standard assumptions (non-emptiness, convexity, closedness of choices; continuity of preferences/technologies; feasibility; free disposal), E(s) is nonempty, convex, and upper hemi continuous; existence follows from Kakutani and continuity results follow from Berge's Maximum Theorem (Berge, 1997; Border, 1985; Debreu, 1959).

Let aggregate (real) GDP per capita be a continuous aggregator $y : X \to R+$ (e.g., national-income identity at equilibrium prices) and compose to obtain the GDP per capita correspondence

$$Y(\theta,T) := \{y(x) : x \in E(\theta,T)\}$$

If the equilibrium is unique (or a selection rule is continuous), we get a continuous function $y^*(\theta,T)$. Thus, in the topological sense, GDP per capita is a continuous function of taxes (via equilibrium allocations), and small changes in T lead to small changes in y^* (Berge, 1997; Mas-Colell et al., 1995).

Proposition (continuity): If (i) households' and firms' problem data are continuous in (θ,T), (ii) choice sets are compact-valued and satisfy Berge's conditions, and (iii) the equilibrium is unique, then $y^*(\theta,T)$ is continuous on S.

Sketch: Upper hemi continuity and non-emptiness of E follow from standard GE arguments (Debreu, 1959). Uniqueness plus closed-graph/compact-value yield a continuous selection. Composition with continuous $y(\cdot)$ implies continuity of y^* (Berge, 1997; Border, 1985; Mas-Colell et al., 1995).

To reason about the direction of effects, use monotone comparative statics on lattices when feasible (single crossing / super modularity). If the after-tax wedge enters payoffs with increasing differences, tax increases that are "order-raising" in T imply order-preserving responses in choices and hence in y^* (Milgrom & Shannon, 1994). More generally, differentiable environments allow signable derivatives via envelope/implicit-function methods; with only topology, one gets semi continuity and selection-stability results.

With a production function,

(2) $Y = AK^{1-\alpha}(G)^{\alpha}L^{\beta}$ and $G = TY$ (balanced budget), steady-state output per capita satisfies:

(3) $y*(T) \propto (1-T)^{1-\alpha}T^{\alpha}$

An inverted-U: too little taxation underprovides productive public goods; too much taxation creates distortionary wedges (Barro, 1990). The argmax is interior at $T^* = \alpha$ in the baseline model.

In neoclassical growth with perfect commitment and no frictions, the optimal long-run capital tax is zero; high capital taxes depress the steady-state capital stock and hence y^* (Chamley, 1986; Judd, 1985). This pins down a negative long-run effect of capital taxation on GDP per capita.

Diamond–Mirrlees (1971) show that, under certain conditions, optimal taxes preserve production efficiency, guiding the mix toward consumption / labor bases rather than intermediate inputs,

supporting higher y^* for a given revenue need. Atkinson–Stiglitz (1976) provides conditions under which differentiated commodity taxation is redundant if nonlinear income taxes are available.

Tax structures that finance high-spillover public inputs (education, R&D infrastructure) can raise long-run y^* by raising the idea production function's productivity (Romer, 1990), while broad wedges on innovative effort or misallocation can depress y^* (Hsieh and Klenow, 2009).

Quantitative macro with micro-founded frictions estimates revenue and output responses to tax changes; calibrated Laffer curves typically peak at moderate rates, with output decreasing as rates push beyond the peak—again implying an inverted-U relation between T and y^* conditional on the tax base and margins (Trabandt and Uhlig, 2011).

Under the general-equilibrium topological framework above, one can view policy as a continuous operator on equilibria. Specific models then deliver shape restrictions on $y^*(T)$:

- If public spending is productive and financed by proportional taxes with standard wedges, $y*(T)$ is continuous and unimodal (Barro, 1990).
- If the margin is capital income, asymptotically optimal $TK \to 0$ and $\partial y* / \partial TK < 0$ near the steady state (Chamley, 1986; Judd, 1985).
- With production efficiency, an optimal tax system favors bases that minimize wedges in production, helping sustain higher $y*$ for given revenue (Diamond and Mirrlees, 1971; Atkinson and Stiglitz, 1976).
- With monotone comparative statics conditions (lattice structure, single-crossing), directional responses of $y*$ to tax changes can be established without full differentiability (Milgrom and Shannon, 1994).

Formally, in a compact topological GE environment with standard regularity, GDP per capita can be represented as a continuous function of tax instruments. Economic theory then characterizes the shape of that function: often inverted-U when taxes fund productive public inputs, decreasing in highly distortionary margins like capital in the long run, and sensitive to the tax mix and institutional features that affect production efficiency and innovation.

2.2. Data and Methodology

In this section, we will construct an econometric model that will estimate the functional relationship between GDP per capita (RGDPPC) and taxes (T). After showing that RGDPPC is a function of T, we will use empirical data to calculate this relationship. The data for this paper was collected from the Palestine Monetary Authority (PMA) website covering the period from 1996 to 2022. The variables considered are RGDPPC and T. these variables were listed and a number of statistical tests will be applied to study the interaction of these variables within one another.

The Augmented Dickey-Fuller test is a statistical test used to determine whether a unit root is present in a time series dataset, which indicates whether the series is stationary or non-stationary. Stationary means that the variable is stationary, indicating that it does not exhibit trends or patterns over time and has a constant mean and variance. Non-Stationary means that the variable is non-stationary, suggesting that it exhibits trends or patterns over time and does not have a constant mean and variance. Stationarity is an essential concept in time series analysis because many statistical techniques assume stationary data Greene (1995).

The Granger Causality Test is a statistical test used to determine whether one time series variable "Granger-causes" another, meaning that past values of the first variable help predict the current values of the second variable. The lag length represents the number of past observations considered when assessing causality. In the Ganger Causality Test, "Yes" suggests that there is evidence of Granger Causality from the first variable to the second. "No" suggests that there is no evidence of Granger causality from the first variable to the second (Granger, 1969).

After conducting the Granger Causality Test to determine the direction of the relationship, we will use the Autoregressive Distributive Lag (ARDL) model to study the cause-and-effect of the taxes on Real GDP per Capita.

The ARDL model is used to analyze time series data and the relationships between variables when:

1- Having variables that are integrated of different orders.
2- Having a single long-run relationship between variables in a small sample size
3- Capturing short-term and long-run impacts of independent variables on a dependent variable
4- Analyzing dynamic relationships with time-series data in single-equation framework.

5- Testing for cointegration or the existence of a long-run relationship among variables (Nkoro and Uko, 2016).

This paper will employ the ARDL method. The data will cover the period from 1999 to 2022 (24 observations). The software automatically selected four Max Dependent Lags. The Akaike Information Criterion (AIC) was used to determine the best model. The selected model is ARDL(3, 2), meaning 3 lags of the dependent variable (T) and 2 lags of the independent variable (RGDPPC). The Dynamic Regressors are the lags of RGDPPC and the Fixed Regressor is the constant term (C). The number of models evaluated was twenty based on different lag configurations. These tests had aided in studying the cause-and-effect relationship of taxes on the standard of living of the Palestinian population.

3. RESULTS AND DISCUSSION

The data for the analysis was collected from the Palestinian Monetary Authority and the E-views 12 software was used to analyze the data. We will start our analysis by conducting the Augmented Dickey-Fuller (ADF) test to show whether the variables are stationary or non-stationary.

Table 3: Augmented Dickey-Fuller Test

Variable	Stationary / Non-Stationary
T	No unit root at first difference
RGDPPC	No unit root at first difference

Source: E-views software output

The table above presents the results of ADF tests conducted on various variables. Each row in the table represents a different variable, and the columns describe the outcome of the ADF test for each variable. The Stationary / Non-Stationary column indicates the outcome of the ADF test for each variable. For all variables (T and RGDPPC), the test indicates "No unit root at first difference." This means that after differencing the data (i.e., subtracting each value from the previous value), the resulting series becomes stationary. In other words, the variables are stationary after taking the first difference.

Table 4: Granger Causality Test

Variable	Lag Length	Granger Causality
RGDPPC T	2	Yes
T RGDPPC	2	No

Source: E-views software output

The above table presents the results of the Granger Causality Test for various pairs of variables. The Variable column lists the pairs of variables being tested for Granger Causality. In this case, the pairs are combinations of different economics, with one variable leading and the other following. The lag length column indicates the lag length used in the Granger Causality Test. The Ganger Causality column indicates the outcome of the Granger Causality Test for each pair of variables. Granger causality is detected from RGDPPC to T at a lag length of 2. This implies that past values of RGDPPC help predict the current values of T. These results provide insights into the potential directional relationships between the variables tested. Now we will conduct the Autoregressive Distributive Lag Model to study the cause-and-effect relationship, Table 5 summarizes the results of this model.

Table 5: Autoregressive Distributive Lag Model

Variable	Coefficient	t-Statistic	Probability*
T (-1)	0.354992	1.517594	0.1475
T (-2)	0.302177	1.195136	0.2484
T (-3)	0.619051	2.521911	0.0219
RGDPPC	1.058016	2.981698	0.0084
RGDPPC(-1)	-0.715063	-1.438969	0.1683
RGDPPC(-2)	-0.627039	-1.429057	0.1711
C	620.0441	0.834905	0.4154
R-squared	0.958801		
Adjusted R-squared	0.944260		
S.E. of regression	275.5417		
Sum squared resid	1290695.		
Log likelihood	-164.7662		

F-statistic	65.93784
Prob(F-statistic)	0.000000
Mean dependent var	1932.663
S.D. dependent var	1167.084
Akaike info criterion	14.31385
Schwarz criterion	14.65745
Hannan-Quinn criterion	14.40500
Durbin-Watson stat	2.208693

Note: * p-values and any subsequent tests do not account for model selection
Source: E-views software output

In the table above, each row represents the coefficient, t-statistic, and p-value for the variables included in the model:

- T (-1) (Lag 1) Coefficient = 0.354992 and p-value = 0.1475. The first lag of tax revenue is positively related to current tax revenue but not statistically significant at the usual 5% level. The p-value (0.1475) suggests it is not statistically significant.
- T (-2) (Lag 2) Coefficient = 0.302177 and p-value = 0.2484. The second lag also has a positive coefficient, but it is not statistically significant either (p-value > 0.05).
- T (-3) (Lag 3) Coefficient = 0.619051 and p-value = 0.0219. The third lag of tax revenue is statistically significant at the 5% level (p-value < 0.05), with a coefficient of 0.619051. This suggests that past tax revenues (three periods ago) have a meaningful positive effect on current tax revenue.
- RGDPPC (Current) Coefficient = 1.058016 and p-value = 0.0084. The current level of real GDP per capita has a positive and statistically significant relationship with tax revenue. A 1-unit increase in RGDPPC is associated with an increase in tax revenue of approximately 1.06 units. The p-value (0.0084) indicates strong statistical significance.
- RGDPPC(-1) (Lag 1) Coefficient = -0.715063 and p-value = 0.1683. The first lag of RGDPPC is negative but not statistically significant at the 5% level (p-value > 0.05).
- RGDPPC(-2) (Lag 2) Coefficient = -0.627039 and p-value = 0.1711. Similar to the first lag, the second lag of RGDPPC is also negative but not statistically significant (p-value > 0.05).
- C (Constant) Coefficient = 620.0441 and p-value = 0.4154. The constant term represents the baseline value of tax revenue when all the variables are zero. The p-value (0.4154) shows it is not statistically significant at the 5% level, suggesting that the constant term does not contribute meaningfully to the model.
- The value of R-squared = 0.958801. This indicates that about 95.88% of the variance in tax revenue is explained by the model, which is very high. The model fits the data well.
- The value of the Adjusted R-squared = 0.944260. This is a more conservative measure of the model's goodness-of-fit that adjusts for the number of predictors. The adjusted R-squared is still quite high, suggesting that the model remains strong even after accounting for the number of parameters.
- The F-statistic = 65.93784 and p-value = 0.000000. The F-statistic tests the overall significance of the model. The p-value (0.000000) is less than 0.05, which strongly indicates that the model as a whole is statistically significant.
- The Durbin-Watson statistic = 2.208693. This statistic tests for autocorrelation in the residuals (errors). A value close to 2 suggests that there is no significant autocorrelation. Since this value is around 2, there is no evidence of autocorrelation in the residuals.

The results of this study provide compelling evidence on the dynamic relationship between tax revenues and real GDP per capita in the Palestinian context. The ARDL(3,2) model revealed a statistically significant and positive effect of current real GDP per capita on tax revenue. This finding aligns with prior literature, such as Mai and Van (2022), who found a similar relationship in Southeast Asian countries, and Rehman et al. (2020), who observed it in Pakistan. The positive association suggests that as income levels rise, the capacity and efficiency of tax collection improve, even in constrained political environments such as Palestine.

Furthermore, the statistical significance of the third lag of tax revenue implies that past tax performance has a persistent impact on current tax revenue. This

result is consistent with the idea of fiscal inertia, whereby governments may gradually improve tax collection mechanisms or build on past institutional knowledge to enhance revenue streams over time.

In contrast to Iriqat and Anabtawi's (2016) findings, which reported no Granger causality between tax revenues and GDP for Palestine during an earlier period, this study's results based on more recent data (1996–2022) suggest that GDP per capita does Granger-cause tax revenue. This shift may indicate improved macroeconomic interdependencies or structural changes in the Palestinian economy, such as enhanced fiscal governance or evolving political realities.

The findings also reflect the relevance of fiscal policy even in politically constrained or semi-autonomous economies. The ability of tax revenue to respond to macroeconomic performance (as captured by GDP per capita) reinforces the arguments by Alinaghi and Reed (2021), who found that fiscal impacts of taxes are conditional on the overall economic context. Despite the asymmetric and politically vulnerable tax collection framework in Palestine—most notably through Israel's control over clearance revenues (Hillis, 2021)—the internal economic capacity to generate revenues through taxation remains intact and growing.

Moreover, the positive relationship observed in this study may be partially explained by the Keynesian framework, which emphasizes the role of fiscal policy in managing aggregate demand. In the Palestinian case, increased tax revenues might have enabled the government to expand public employment or services, thereby raising consumption and contributing to GDP growth. As Hijazi (2001) and Al-Mahaeni (2003) noted, tax policy in developing economies is often directed at economic development rather than mere stabilization, further validating the growth-enhancing role of taxation in Palestine.

This research also contributes to broader theoretical debates on the applicability of classical and Keynesian tax-growth theories in unstable or transitional economies. While classical theorists like Ricardo cautioned against excessive taxation on capital, this study shows that, in Palestine, increased tax revenue does not hinder growth but rather coexists with improvements in GDP per capita. This may be due to the composition of tax structures, reliance on indirect taxation, or efficient government allocation of resources.

Lastly, the discussion must recognize the limitation that the relationship established here is associative and not necessarily indicative of causality beyond the bounds of the ARDL and Granger causality tests. Additionally, political disruptions, external aid dependency, and Israeli control over key revenue sources all introduce exogenous shocks that complicate long-term fiscal planning and policy implementation in Palestine.

4. CONCLUSIONS

The ARDL(3, 2) model was the most suitable model for the data, it indicated that the tax revenue is influenced by its own past values, with a significant effect from tax revenue, the third lag. The RGDPPC is positively related to tax revenue, and the effect of current RGDPPC is statistically significant. Meanwhile, the past values of RGDPPC do not show significant effects on tax revenue. The overall fit of the model is very good, with high R-squared and significant F-statistics and the Durbin-Watson statistic suggests that there is no significant autocorrelation in the residuals, supporting the reliability of the model. The model appears to be robust in explaining the relationship between real GDP per capita and tax revenue, with past tax revenues having a significant role in determining current tax revenues.

In this paper, we have examined the effect of taxes on Real GDP per capita. The motivation of this study stemmed from the utilization of taxes by Israel as a tool of pressure against the Palestinians, frequently withholding taxes collected on behalf of the Palestinian Authority. This prompted us to investigate how taxes impact the Palestinian economy as a whole. In addition, we wanted to investigate whether economic theory would hold in a VUCA environment. Our analysis has indicated that taxes have a significant positive effect on Real GDP per capita. These findings imply that taxes contribute positively to economic growth in the Palestinian economy, aligning with the results of Hijazi (2001) and macroeconomic theories, where Real GDP per capita is a function of taxes. Therefore, the tax variable emerges as one of the independent variables influencing Real GDP per capita. Thus, in the Palestinian situation, taxes are succeeding in promoting economic growth and raising the standard of living of the population. An increase in taxes is leading to an increase in the Real GDP per capita for Palestinians, i.e., an increase in taxes is resulting in more job opportunities or better paying jobs. This might be because the tax increase is creating more jobs in the public sector and/or more benefits are given to the employees working in the public sector, i.e., the Palestinian government is using the extra revenue to employ more people and giving the foregone benefits to their employees. As

a result, taxes are promoting the knowledge transfer to the Palestinian population through the creation of more jobs and grants better benefits to their employees.

Overall, our analysis provides valuable insights for policymakers, economists, and analysts to evaluate the fiscal health of Palestine, identify trends, and formulate appropriate fiscal policies to support economic growth and stability. We noticed that there have been improvements in Real GDP per capita. Policymakers can utilize the data presented here to assess economic performance, pinpoint areas for improvement, and devise policies to foster sustainable economic growth and development.

However, the study's limitation lies in the limited inclusion of macroeconomic variables reflecting the standard of living or well-being of the Palestinian population. For instance, poverty levels could have been explored to ascertain whether taxes tend to reduce poverty through effective programs. This area warrants further investigation for the Palestinian case. Additionally, a longer time-series period would have yielded more accurate results. Although the semi-independent Palestinian economy emerged in 1994, a longer time span, ideally spanning 40 years, would provide more robust insights. Quarterly data would also enhance accuracy.

In conclusion, taxes indeed play a vital role in the economic growth process of the Palestinian economy. Yet, challenges persist, particularly concerning the withholding of taxes by Israeli authorities, which pressure and control the Palestinian government to advance their political agenda. This underscores the urgent need for an independent Palestinian State with control over its borders and tax collection, free from Israeli hegemony.

Future studies should focus on amending and updating tax laws, and how does this effect economic growth in Palestine. In addition, studies should include research on more effective methods for tax collection and how these methods would reflect positively on the economy.

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