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Determining the Long Run Relationship Between Direct and Indirect Taxes and Economic Growth: Empirical Evidence From the Republic of North Macedonia

Abdulgafur Sinani

Abstract

The theoretical and empirical evidence unanimously emphasize that fiscal policy measures and instruments are essential for economic policymakers that aim to achieve macroeconomic equilibrium and boost economic growth in both developed and developing economies. Taking into consideration this crucial role of the fiscal policy for the economic development, this paper examines the relationship between direct taxes, indirect taxes, labor force and economic growth for the Republic of North Macedonia. Given the absence of a universal framework for implementing fiscal policy measures, this research explores how these policies can be adapted and harmonized to promote economic stability. While the mechanisms and channels for achieving economic policy objectives may share similarities across different economies, their application must be customized to reflect each country's unique macroeconomic conditions and aggregate trends. Employing regression analysis, including the Vector Error Correction Model (VECM) and co -integration methodology, the findings of this study highlight the critical role of fiscal policy in driving economic growth as well as reducing the unemployment rate in post transition economies such as the Republic of North Macedonia. This study also highlights the significance of strategically combining and aligning fiscal policy measures to meet the macroeconomic goals and as such it provides some recommendations for further development and changes in the fiscal policy and measures to be undertaken to ensure sustainable economic growth.

Keywords: Taxes, economic growth, fiscal policy, co – integration, VECM

Introduction

Nowadays, taking into consideration the consequences of the COVID-19 pandemic, as well as the recent Russian invasion of Ukraine, economic growth rates have been tested everywhere across European economies, including the Western Balkan region, events that have recently pushed the entire world into an economic and social crisis. On the other hand, the green and digital transition agenda emphasizes the need for well-designed and efficient tax systems which will provide sustainable fiscal revenues by also stimulating productivity and innovation, where indirectly will enhance and boost sustainable and inclusive growth.

It is well known that taxation is considered as a main instrument for generating public revenues, needed to provide public goods. Fasoranti (2013) highlights that the importance of tax lies in its ability to generate revenue for the government, influence the consumption trends and grow and regulate economy through its influence on vital aggregate economic variables. However, indirect and direct taxes have different effects on economic growth due to the way they impact individuals, businesses, and overall economic activity, but the effects of them on economic growth are interconnected. Moreover, direct taxes, imposed directly on income, wealth, and corporate profits, can influence individuals' incentives to work, invest, and innovate. Lower direct tax rates can foster entrepreneurship, capital formation, and efficient resource allocation, thereby potentially enhancing economic growth. However, excessive taxation may dampen these incentives and distort economic decisions. On the other hand, indirect taxes imposed on consumption and included in the prices of goods and services, impact consumer behavior and purchasing power. While they can be a stable source of government revenue, they may lead to reduced consumption and contribute to inflation. Indirect taxes are generally less distortionary than direct taxes, as they are less likely to directly influence productive activities and investment decisions. Nevertheless, the regressive nature of some indirect taxes raises equity concerns, as they disproportionately affect lower-income individuals. Thus, the optimal balance between direct and indirect taxes depends on their rates, and the broader economic structure. Governments strive to ensure that taxes provide necessary revenue without hindering economic incentives. A well-structured tax system contributes to innovation, entrepreneurship, and capital accumulation and supports sustainable and inclusive economic growth.

Having into consideration all above, the aim of this research paper is to investigate the long run effects of the direct and indirect taxes on the economic growth of the Republic of North Macedonia, by using quarterly time series data based on the

period 2000q1 to 2021q4. The study employs the technique of the Vector Error Correction model and the cointegration analysis to assess the effects of direct and indirect taxes on the economic growth for both long run and short run dynamics

The following section is dedicated to the relevant literature review of the effects of direct and indirect taxes on economic growth, while the third section reveals the research methodology and data specification used for the empirical analysis. The fourth section interprets the empirical findings, while the last section provides the main conclusions and recommendations based on the empirical findings for the case of the Republic of North Macedonia and in general for other economies in the region.

Literature Review

Although there is no consensus regarding the level of impact of direct and indirect taxes on economic growth, which varies across the development of economies, there exist plenty of research that has investigated the effects of direct and indirect taxes on the economic growth in both developed and developing economies with mixed and controversial findings.

Balasoiu et al. (2023), while analyzing the effects of direct taxation on the economic growth in the EU countries find that corporate income taxes have a significant negative impact on the economic growth for both clusters of high- and limited fiscal efficiency countries. Also, Popov and Zaharia (2021) in their study by analyzing the effects of income taxes on the economic growth of EU countries, during the time period 2013 – 2019 find that personal income tax and value-added tax rates did not significantly impact the economic growth, while corporate income tax has negatively impacted the economic growth of these countries.

Nguyen et al., (2021) analyzed the macroeconomic effects of income and consumption tax changes and have concluded that in the short run, if average income tax rate is decreased by 1% point, GDP immediately would increase by 0.78% after the tax changes. In addition, Gomis-Porqueras and Smith (2020) have examined the effects of income taxation on economic growth, where their findings have implied a negative correlation among income taxes and GDP, suggesting that higher income tax rates will decrease the incentives for individuals and companies to engage in economic activities like labor, savings, and investments.

In their paper, Ibraimi & Alili Sulejmani (2017) by using the co-integration methodology and VECM technique have analyzed the effects of indirect taxation on the

economic growth in the Republic of North Macedonia, for the period 2000 – 2016. Their findings imply that there exist positive effects of the indirect taxes on the GDP rate growth in North Macedonia, which is mainly due to the dominance of the taxes from consumption compared to other taxes in North Macedonia.

Martens and Morten (2013) in their study have investigated the effects of personal and corporate income taxes on the economy of the US, by utilizing the SVAR methodology. Their findings suggest that reductions in both personal and corporate income taxes have positive effects on GDP growth, with corporate tax changes having a more pronounced impact on business investment.

Arnold et al., (2011) have evaluated the impact of tax policies, including direct taxes, on economic recovery and growth. It emphasizes that well-designed tax reforms, such as lowering marginal tax rates, can promote economic recovery and long-term growth. The study also discusses the importance of addressing fiscal sustainability concerns while implementing pro-growth tax measures.

In his research Scarlet (2011) has examined the relationship between taxation and economic growth for the case of Jamaica for the time period 1990 - 2010, where findings conclude the existence of a strong positive nexus between indirect taxation and economic growth in the long run.

Nellor (2011) in his paper has analyzed the relationship between tax policy changes and economic growth during the 2000s. It finds that countries that reduced corporate and personal income tax rates experienced higher economic growth. However, the study also underscores the importance of considering revenue implications and budgetary constraints.

Arisoy and Unlukaplan (2010), have investigated the relationship between direct and indirect tax and economic growth for the case of Turkey, covering the time period 1968-2006, by using OLS technique, where findings suggest that real output is positively related to indirect tax revenue. Moreover, they suggested that indirect taxes are positively correlated with economic growth in the case of Turkey.

In their paper, Martinez-Vacquez et al (2009), have investigated the effects of direct and indirect forms of taxation yet the main question that still remained largely unanswered is the economic consequences of different mixes of direct and indirect taxes.

By using the unrestricted error correction model, Greenidge and Drakes (2009), have examined the relationship between tax policy and macroeconomic activities,

claiming that total tax and indirect taxes have a contractionary effect on the economy in both the short run and long run period.

Duncan and Peter (2008) in their study developed a measurement of progressive income tax especially in the Personal Income Tax (PIT) rate by employing data for 35 countries over the period 1981-2005, where findings suggested that PIT could promote more equal distribution of income via its progressive characteristics.

Widmalm (2001) in his study reveals that personal income tax has negative impact on economic growth while corporate income tax does not have any significant impact on economic growth. Further, this study assumes that tax structures are not changed during the entire analyzed period and the structure of tax revenues in all countries covered by the empirical analysis remains the same.

In summary, the literature on the effects of direct and indirect taxes on economic growth underscores the importance of tax policy design in influencing incentives for work, investment, entrepreneurship, and overall economic activity. While there is no one-size-fits-all answer, empirical evidence and theoretical insights suggest that well-structured direct and indirect tax policies can contribute to sustainable and inclusive economic growth.

Research Methodology and Data

For addressing the main goal of this paper, i,e., analyzing the effects of direct and indirect taxes on the economic growth in the Republic of North Macedonia for the time period – 2000q1- 2021q4, this paper employs the Vector error correction model technique to determine the long run relationship between direct, indirect taxes and economic growth.

Bearing in consideration the Solow (1956) growth model, where the variations in the rates of labor force and population, savings, physical capital and technological advancement, human capital determine the growth, some of these variables are included in the following equation representing the baseline model of this empirical study:

$$\ln(GDP)_t = \beta_0 + \beta_1 ln\,(IndirTax)_t + \beta_2 ln(DirTax)_t + \beta_3 \ln\,(Gfcf)_t + \beta_4 \ln\,(Lfpr)_t + \varepsilon_t$$

Where real GDP growth rate is defined as the dependent variable, while as independent variables are: Direct taxes, Indirect taxes, Gross Fixed Capital Formation as % of GDP and Labor Force Participation Rate.

The secondary time-series data are taken from the official reports from the Ministry of Finance and Central Bank of the Republic of North Macedonia.

Initially, the data have been analyzed for their unit root to check if the time – series are stationary in their level, where the Augmented Dickey Fuller test has been used in this regard.

Empirical Findings

The first step consists of the analysis of the unit root of the variables through Augmented Dickey Fuller test, however, to execute the test it is necessary to determine the optimal lag structure of the variables included in the analysis. In this regard, the following table illustrates the results of the optimal lag length based on the following four FPE, AIC, HQIC and SBIC information criteria.

Table 1:

Lag structure

Lag	FPE	AIC	HQIC	SBIC
0	5.8e-11	-9.38292	-9.32476	-9.23823
1	1.8e-14	-17.4385	-17.0895	-16.5703*
2	1.3e-14	-17.7851	-17.1453	-16.1935
3	1.1e-14	-17.9955	-17.0648	-15.6804
4	3.0e-15*	-19.298*	-18.0766*	-16.2595

Based on the three information criteria AIC, HQIC and FPE the optimal lag length is determined to be four, which is in line with the literature suggestions that AIC can be used as better criteria for quarterly time series data. The next (Table 2) presents the results of the Augmented Dickey Fuller test for stationarity.

Table 2:

Unit root - Augmented Dickey Fuller test

	Variable	**Augmented Dickey Fuller**	**Comment**
Levels	lnGDPreal	-1.034 (-2.904) MacKinnon approximate p-value for Z(t) = 0.7407	H0 accepted H1 rejected
	lnDirtax	-2.788 (-2.904) MacKinnon approximate p-value for Z(t) = 0.0600	H0 accepted H1 rejected
	lnIndirTax	-1.551 (-2.904) MacKinnon approximate p-value for Z(t) = 0.5080	H0 accepted H1 rejected
	lngfcf	-1.931 (-2.904) MacKinnon approximate p-value for Z(t) = 0.3176	H0 accepted H1 rejected
	lnLFPR	-1.746 (-2.904) MacKinnon approximate p-value for Z(t) = 0.4076	H0 accepted H1 rejected
First difference	ΔlnGDPreal	-3.464 (-2.904) MacKinnon approximate p-value for Z(t) = 0.0090	H0 rejected H1 accepted
	ΔlnDirTax	-5.555 (-2.904) MacKinnon approximate p-value for Z(t) = 0.0000	H0 rejected H1 accepted
	ΔlnIndirTax	-5.284 (-2.908) MacKinnon approximate p-value for Z(t) = 0.0000	H0 rejected H1 accepted
	Δlngfcf	-4.218 (-2.904) MacKinnon approximate p-value for Z(t) = 0.0006	H0 rejected H1 accepted
	ΔlnLFPR	-5.985 (-2.904) MacKinnon approximate p-value for Z(t) = 0.0000	H0 rejected H1 accepted

Augmented Dickey Fuller test results suggest that all the variables are non-stationary at their level i.e. having unit root, but they turn stationarity at their first difference. Such results imply Moreover, such results imply the usage of the co-integration methodology where it is suggested that there exists at least one co-integrated vector, and for this reason Johansen test for co-integration is used to check if there is a long run relationship between direct taxes, indirect taxes and economic growth in the Republic of North Macedonia.

Results from the co-integration analysis by utilizing the Johansen –Juselius test are presented in (Table 3) showing the results from the trace test (λ-trace) and maximum eigenvalues test (λ- max) statistics which are used to demonstrate the existence of long run equilibrium among the model. The null hypothesis of no co-integration (r=0) based on both the trace test and the maximum eigenvalues test among *lnGDP, lnDirTax, lnIndirTax, lngfcf* and *lnLfpr* have been rejected at 5% level of significance.

Table 3:

Johansen co-integration test of co-integration

Maximum rank	**eigenvalue**	λ **trace**	λ **max**
0		77.6826	68.52
1	0.40472	33.5915*	47.21
2	0.18180	16.5367	29.68
3	0.12450	5.2350	15.41
4	0.04861	0.9997	3.76
5		0.01169	
Nr. of observations = 85 Nr of lags = 4			

Since the results of the Johansen – Juselius test imply the existence of at least one co-integrating vector, thus the existence of the long – run relationship between the direct taxes, indirect taxes and economic growth, Vector Error Correction Model framework have been used, which is defined as a restricted VAR model for non-stationary series that are known to be co-integrated. By following the Barro (1990) methodology, this paper uses the following VECM equation:

$$\Delta lnGDPreal = \beta_0 + \sum_{k=1}^{r} \alpha_k \phi_{k,t-1} + \sum_{k=1}^{r} \alpha_{1i} \Delta lnGDP_{t-1} + \sum_{k=1}^{r} \alpha_{2i} \Delta lnDirTax_{t-1} +$$
$$\sum_{k=1}^{r} \alpha_{3i} \Delta lnIndirTax_{t-1} + \sum_{k=1}^{r} \alpha_{4i} \Delta lngfcf_{t-1} + \sum_{k=1}^{r} \alpha_{5i} \Delta lnLfpr_{t-1} + \varepsilon_t$$

Table 4 represents VECM results regarding the long run relationship between lnDirTax, lnIndirTax, lngfcf, lnLFPR and the dependent variable lnGDPreal. The coefficients in the table report the long run parameters of the model.

Table 4:

Vector error correction model – VECM

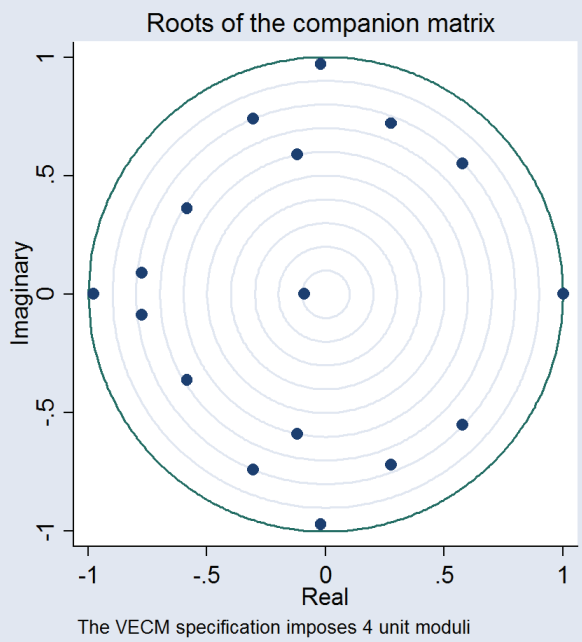
VARIABLE (one co-integration)	B
ΔlnGDPreal	1.000
ΔlnDirTax	- 0.0739 (0.453)
ΔlnIndirTax	0.3713 * (0.000)
Δlngfcf	0.089 (0.653)
ΔlnLFPR	1.913 * (0.000)
Nr. of observations: 83 Log likelihood = 850.6534 Note: β – co-integrating vector; 1.000 – co-integrating vector is normalized with respect to the variable. (*) represent the probability value;	

Finally, from the results that are attained from the Vector error correction model, it can be advocated that there exist a strong and statistically significant positive long run relationship between economic growth and indirect taxes, while on the other side the findings imply a statistically insignificant long-run relationship between economic growth and direct taxes in the case of the Republic of North Macedonia. In addition, there is no evidence for a strong and statistically significant relationship between Gross fixed capital formation and economic growth; while labor force participation rate has a positive effect on the economic growth in the long – run period.

Additionally, post-estimation tests have been used in order to check the stability, residual autocorrelation and test for normally distributed disturbances, where the following graph represents the stability of the Vector error correction model, implying the acceptance of the null hypothesis, thus that the model is stable.

Figure 1:

Stability of VECM



Conclusion

This research article tried to shed light on the long-run effects of direct and indirect taxes on economic growth in the Republic of North Macedonia, by utilizing quarterly time-series data from 2000Q1 to 2021Q4. Employing cointegration analysis and Vector Error Correction Model (VECM), the empirical analysis based on the Johansen-Juselius cointegration test reveals the presence of at least one cointegrating vector, indicating a long-run relationship among real GDP growth, direct taxes, indirect taxes, gross fixed capital formation, and labor force participation rate.

The VECM results demonstrate a statistically significant positive long-run nexus between indirect taxes and economic growth, highlighting their role as a main driver of GDP growth. On the other side, direct taxes show no significant long-run impact on economic growth, due to the tax structure in North Macedonia, where indirect taxes, particularly those on consumption, dominate the composition compared to the direct taxes. These outcomes are in line with neoclassical growth theory and many existing empirical studies (such as Arisoy&Unlukaplan, 2010; Ibraimi & Alili Sulejmani, 2017), which highlight the relatively lower distortionary effects of indirect taxes on productive activities compared to that of the direct taxes. Furthermore, the analysis reveals a positive influence of labor force participation on growth, while gross fixed capital formation shows no significant effect, suggesting potential inefficiencies in capital allocation or external constraints on investment.

This research contributes to the existing literature by providing clear evidence from a small economy such as Republic of North Macedonia, emphasizing the dependent nature of tax-growth dynamics which is also faced by challenges such as the consequences of the COVID-19 pandemic and geopolitical disruptions. However, the main limitation of this study is on the time context, which encompasses tax regime shifts in 2006, 2017, and 2020 (e.g., transitions between flat and progressive income tax systems). These changes, though incorporated, may not fully capture long-run effects.

Based on these findings, the following policy recommendations are proposed to enhance economic growth in North Macedonia:

- **Optimize the Tax composition**: Policymakers should prioritize indirect taxes as a revenue source while minimizing reliance on direct taxes.
- **Enhance Tax Administration**: Implement transparent reforms to improve tax collection efficiency, reduce evasion, and increase voluntary compliance.
- **Promote Growth Fiscal Measures**: Align tax policies with broader macroeconomic objectives by introducing targeted incentives, such as reduced corporate tax rates for innovative sectors or R&D credits, to stimulate private investment and entrepreneurship.
- **Equity and Inclusivity**: To integrate progressive elements into the system, ensuring that growth benefits are distributed inclusively across income groups.
- **Monitor External Shocks**: Given the vulnerability of small open economies to global events, regular testing of tax policies against scenarios like inflation or supply chain disruptions is advisable.

References

Arisoy, I., & Unlukaplan, I. (2010). Tax composition and growth in Turkey: An empirical analysis. International Research Journal of Finance and Economics, 59, 51 – 61.

Arnold, J., Brys, B., Heady, C., Johansson, Å., Schwellnus, C., & Vartia, L. (2011). Tax policy for economic recovery and growth. *The Economic Journal, 121*(550), S59–S80.

Balasoiu, N., Iulian Ch., & Marian O. (2023). "Impact of Direct Taxation on Economic Growth: Empirical Evidence Based on Panel Data Regression Analysis at the Level of Eu Countries" *Sustainability* 15, no. 9: 7146. https://doi.org/10.3390/su15097146

Duncan, D., & Sabirianova Peter, K. (2008). *Tax progressivity and income inequality* (Andrew Young School of Policy Studies Research Paper Series No. 08-26). SSRN. https://doi.org/10.2139/ssrn.1260860

Fasoranti, M. M. (2013). Tax productivity and economic growth. Lorem Journal of Business and Economics. 1(1), 1-10.

Gomis-Porqueras, P., & Smith, R. (2020). Income taxation and growth: New insights from public policy expansion. *J. Econ. Dyn. Control* , *118*, 103974

Greenidge, K., & Drakes, L. (2009). Tax policy and macroeconomic activity in Barbados. http://www.central bank.org.bb.

Ibraimi, A., & Alili Sulejmani, L. (2017). ECONOMETRIC ANALYSIS OF INDIRECT TAXES ON ECONOMIC GROWTH: CASE OF REPUBLIC OF MACEDONIA. KNOWLEDGE - International Journal , 20(1), 249–252. Retrieved from https://ikm.mk/ojs/index.php/kij/article/view/3623

Martinez-Vazquez, J., Vulovic, V., & Lui, Y. (2009). Direct versus indirect taxation: Trends, theory and economic significance. International Studies Program Working Paper, 09 – 11, Georgia State University.

Mertens, K., & Ravn, M. O. (2013). The dynamic effects of personal and corporate income tax changes in the United States. *American Economic Review, 103*(4), 1212–1247.

Musanga, B. (2007). Effects of taxation on economic growth (Uganda's experience: 1987-2005) Unpublished misc qualitative economics. University of Makerere.

Nellor, D. (1987). *The effect of the value-added tax on the tax ratio* (IMF Working Paper, pp. 1–28). International Monetary Fund.

Nguyen, A.D.; Onnis, L.; Rossi, R. (2021). The macroeconomic effects of income and consumption tax changes. *Am. Econ. J. Econ. Policy*, *13*, 439–466

Scarlett, H.G. (2011). Tax policy and economic growth in Jamaica. Bank of Jamaica Working Paper.

Solow, R.M. (1956). A Contribution to the Theory of Economic Growth. *Q. J. Econ.*, *70*, 65–94.

Widmalm, F. (2001). "Tax Structure and Growth: Are Some Taxes Better Than Others?," Public Choice, Springer, vol. 107(3-4), pages 199-219, June.