

INTERACTIONS BETWEEN TAXES AND ECONOMIC GROWTH IN THE CONTEXT OF INCLUSIVE ECONOMIC GROWTH FACTORS¹

Andranik MARGARYAN
PhD Student, ASUE

Key words: income tax, profit tax, value added tax, economic growth, inclusion

Introduction

In the context of improving and adjusting economic policy, the effects of the tax system on economic growth are of great importance, especially in the context of ensuring inclusive economic growth. From this point of view, one of the significant results for theoretical and practical policy is the problem of assessing these effects. It is obvious that the tax mechanisms and the design of tax rates operating in a particular country affect the decision-making process. Moreover, the issue concerns both individual and corporate taxes.

In economic terms, the crucial issues in the case of taxes levied on both personal income and income from economic activities relate, on the one hand, to the assessments of one or another stimulus (expenditure multiplier) given to economic growth due to the expenditure of state revenues generated through aforementioned activities, and, on the other hand, to the assessments of the effects on economic growth as a result of the reduction in investments (in the case of companies) after tax collections from taxpayers. Within the framework of this study, the effects of taxes were assessed comprehensively through econometric modeling, taking into account both the set of the most significant macroeconomic fundamentals determining economic growth and its inclusiveness (employment, productivity, investments - gross fixed capital formation, inflation), as well as the interactions and mutual relationships of these factors.

Methodology

Guided by the above problem, the method of econometric analysis with a specification typical for *vector autoregressive models (VAR)* was chosen for modeling, which made it possible to take into account the existing theoretical and practical problem of endogeneity between these variables. [Gujarati&Porter, 2009, 657], as well as to consider the dynamic nature of the above-mentioned connections. The model looks like this:

$$Y_t = \mu + \sum_{i=0}^p \phi_i * Y_{t-1} + X_t \Gamma + \varepsilon_t \text{ where:}$$

Y_t – the vector of endogenous variables at time t : $t = \overline{2006Q1:2024Q4}$,

μ - is the vector of constants,

ϕ_i – the matrix of coefficients of the lagged variables of the endogenous variable,

X_t – the matrix of exogenous variables at time t : $t = \overline{2006Q1:2024Q4}$,

¹ The work was supported by the Science Committee of the Republic of Armenia, in the framework of research project No. 23AA-5B025.

Γ - the matrix of coefficients of exogenous variables,

ε_t – the random error of the model at time t : $t = 2006Q1:2024Q4$:

In line with the modeling objectives, three VAR models with the above-mentioned specifications were considered, each of which presents the main interactions of value added tax (VAT), income tax, and profit tax with the aforementioned macroeconomic fundamentals. In particular, in the case of *income tax (the first model)*, the automatically adjusted sample of quarterly time series of the given tax type, real economic growth, productivity, employment, and gross fixed capital formation growth indices for 2008-2023 was considered as endogenous variables. The real economic growth index of the Russian Federation for the same period was included in the model as a macroeconomic exogenous fundamental describing external demand.

In the case of *profit tax (second model)*, the model includes as endogenous variables an automatically adjusted sample of quarterly time series of this tax type, real economic growth, gross fixed capital formation and export growth indices for 2006-2023. As macroeconomic exogenous fundamental model describing external demand, the indices of real economic growth of the Russian Federation and world copper prices for the same period were included.

In the case of VAT (third model), the model included as endogenous variables an automatically adjusted sample of quarterly time series of following growth indices for 2004-2024 for the VAT, real economic growth, inflation, and import growth import growth from re-export effects. The research database was formed using information from the Ministry of Finance of the Republic of Armenia [<https://minfin.am/hy>], Statistical Committee of the Republic of Armenia [<https://armstat.am/am/?nid=13>], as well as the Bloomberg database. [<https://www.bloomberg.com/professional/products/data/>].

Literature review

In the economic literature, one often encounters claims about the various effects of taxes on economic growth. According to the studies of one group of theorists, in the case of developed countries, the effects of taxes on economic growth are contradictory. According to this approach, an increase in both personal income tax and corporate tax in developed countries negatively affects economic growth, while in the case of value added, this effect has a positive sign. According to these studies, a 1 percent increase in personal income tax leads to a 0.16 percent decrease in economic growth, while, say, a 1 percent increase in value added tax is accompanied by a 0.33 percent increase in GDP [Shaqiri et al., 2024, 136]. The same approaches are developed by another group of researchers [Gashi, et al., 2018, 66], who believe that the favorable effects of the tax system on economic growth can be achieved by expanding the tax base and reducing tax privileges. In this context, the findings of V. Fang [Fang, 2024] and Nguyen et al. [Nguyen et al., 2021] are also relevant.

According to another research group, based on data from 21 OECD countries, it was found that taxes have a negative impact on growth. Coefficient estimates in a baseline model developed based on panel and cluster analysis showed that a 10% reduction in the personal income tax rate (respectively, the corporate income tax rate) can increase GDP growth by 0.6% (respectively, 0.3%) [Alfo et al., 2023, 1289]. The findings of Collaku et al. [Çollaku et al., 2023, 36] are also relevant.

According to one of the existing views on the issue under consideration, the effects of taxes, as well as state spending, on economic growth are not so unambiguous. In particular, according to Desislava Stoilova, there is no justification for the fact that an increase in the tax burden has an unambiguously negative effect on economic growth. Moreover, according to this analyst, the increase in all types of taxes, except for excise tax, does not reduce economic growth, while the increase in social spending from the state budget negatively affects economic growth [Stoilova, 2024, 251].

According to the observations of some theorists, the relationship between the tax burden and economic growth is dynamic and depends on the specific conditions of a given country. In particular, considering the issue on the example of Turkey, two researchers came to the conclusion that these two factors are in a two-way interdependence, and the directions of these effects depend on the stage of the economy in the cycle. In general, these theorists conclude that the overall tax burden should be reduced, especially for low-income citizens [Ozpence, Mercan, 2020, 152]. In their analyses, International Monetary Fund experts Ruud de Mooij and others [Ruud de Mooij, 2020] evaluate the tax system of a particular country from the perspective of its inclusiveness, which they demonstrate that studies in this context have even led to the “ranking” of elements of the tax system according to the criterion of their impact on economic growth.

Scientific novelty

The article, based on VAR modeling, reveals trends representing the dynamics of the interrelationships between income tax, economic growth, employment, and labor productivity. In particular, it is substantiated that an increase in income tax negatively affects economic growth, employment, and labor productivity.

Using the same modeling technique, the negative impact of corporate tax increases on economic growth has been revealed. At the same time, one of the trends revealed in this context is that corporate tax increases negatively affect gross fixed capital formation.

One of the novelties achieved by the research on the effects of value-added tax is that, other things being equal, the increase in VAT initially leads to positive effects, and after a certain time (after 4 quarters) turns to negative effects. Another result containing an element of novelty in the research is that the moment of the peak effect of value-added

tax on inflation is simultaneously the turning point of the positive effect of this type of tax on economic growth.

Analysis

The inclusion of growth indices of the selected variables in the model under consideration made it possible to manage the stationarity problem, which was tested using the Augmented Dickey-Fuller test, as a result of which it was found that all series involved in the models are stationary. The time series were previously adjusted for seasonality using the Census X12 methodology. All three models presented are stable (Inverse roots of AR characteristic polynomial), and they also lack the phenomena of autocorrelation, as well as heteroskedasticity, which were tested using the Lagrange multiplier serial autocorrelation test (LM serial autocorrelation) and White's test.

The results of the estimation of the impulse response functions of the first VAR model are presented in tabular form in the table below (see Table 1).

Table 1. Summary results of the VAR model describing the interactions between income tax, economic growth, employment, productivity, and investment (1% shock)

	Maximum impact (% points)	Period of maximum impact (quarter)	Cumulative impact (% points)	Period of recovery to pre-shock situation (quarter)
Economic growth	-0.2	3	-0.6	9
Employment	-0.13	3	-0.17	6
Productivity	-0.1	4	-0.7	15
R ²	0.75			
R ² adjusted	0.56			

The results of estimating the impulse response functions of the first VAR model are as follows:

✓ As a result of a 1 standard deviation positive shock in the direction of income tax growth, real GDP growth exhibits its maximum negative response after 3 quarters, decreasing by about 1.7 percentage points and maintaining the negative impact over 9 quarters, cumulatively amounting to 5.14 percentage points. If we normalize the above-mentioned impact by representing 1 percentage point as a shock (the standard deviation of income tax is 9.03 percentage points), then a 1 percentage point increase in income tax leads to a maximum decrease of 0.2 percentage points after 3 quarters and the pre-shock level of economic growth is restored after 9 quarters, resulting in a cumulative negative impact of 0.6 percentage points over the given period.

In parallel, if we consider the effects of income taxes on productivity and employment, we can see that in this case too the effects are mostly negative. In particular:

✓ As a result of a 1 standard deviation positive shock in the direction of income tax growth, productivity exhibits its maximum negative response after 3 quarters, decreasing

by about 1.2 percentage points and maintaining the negative impact over 6 quarters, cumulatively amounting to 1.54 percentage points. In the case of normalization of the impact, a 1 percentage point shock in income tax leads to a maximum decrease in productivity after 3 quarters, by 0.13 percentage points, and the cumulative negative impact over 6 quarters is 0.17 percentage points.

✓ The situation is somewhat different for employment, and the negative effects on employment are even longer lasting and larger. Specifically, following a 1 standard deviation positive shock to income taxes, employment shows its maximum negative response after 4 quarters, falling by about 0.8 percentage points and remaining negative for up to 15 quarters, for a cumulative 6.6 percentage points. In the normalized case, a 1 percentage point shock to income taxes leads to a 0.1 percentage point decline in productivity after 4 quarters, for a cumulative negative impact of 0.7 percentage points over 15 quarters.

✓ In this context, it is important to address not only the effects of income tax on macroeconomic fundamentals, but also to consider the feedback, endogenous phenomena observed in the economy. In particular, if we consider the effects of economic growth and employment on income tax revenues, we can see that the cumulative positive effects of shocks of 1 standard deviation of economic growth and employment (the standard deviations of economic growth and employment are 7.5 and 5.1 percentage points, respectively) are manifested in the 9th and 10th quarters, respectively, amounting to a cumulative 11.8 percentage points (normalized: 1.57 percentage points) and 8.1 (normalized: 1.59 percentage points). The results of the second VAR model estimation are presented in Table 2.

Table 2. Summary results of the VAR model describing the interactions between corporate income tax, economic growth, exports, and investment (1% shock)

	Maximum impact (% points)	Period of maximum impact (quarter)	Cumulative impact (% points)	Period of recovery to pre-shock situation (quarter)
Economic growth	-0.03	4	-0.1	5
Gross fixed capital formation	-0.1	2	-0.5	16
R ²	0.75			
R ² adjusted	0.64			

The results of the estimation of the second model are as follows:

✓ As a result of a positive shock of 1 standard deviation in the direction of the increase in the corporate tax, real GDP growth exhibits its maximum negative response after 4 quarters, decreasing by about 0.8 percentage points and maintaining the negative effect over 5 quarters, cumulatively amounting to 1.76 percentage points. If we normalize the above effect, representing 1 percentage point by the magnitude of the shock, then a 1 percentage point increase in corporate tax leads to a maximum decrease of 0.03 per-

centage points after 4 quarters and the pre-shock level of economic growth is restored after 5 quarters, resulting in a cumulative negative effect of 0.1 percentage points over the given period.

✓ However, in the case of profit tax, it is extremely important to address the study of the effects of this tax type on the investment environment and long-term rates of capital accumulation. In particular, the results of the study show that as a result of a 1 standard deviation positive shock in the direction of profit tax growth, gross fixed capital formation exhibits its maximum negative response after 2 quarters, decreasing by about 3.7 percentage points and maintaining the negative effect for about 16 quarters, cumulatively amounting to 15.4 percentage points. If we normalize the above effect by representing 1 percentage point as the magnitude of the shock, then a 1 percentage point increase in profit tax leads to a maximum decrease of 0.1 percentage points after 2 quarters and the pre-shock level of economic growth is restored after 16 quarters, resulting in a cumulative negative effect of 0.5 percentage points over the given period.

✓ In parallel, if we consider the endogenous feedback between corporate income tax and economic growth, a positive shock of 1 standard deviation of economic growth leads to a 3 percentage point (normalized: 0.4 percentage point) increase in corporate income tax after 4 quarters, and cumulative positive effects are observed after about 8 quarters, amounting to 8.3 percentage points (normalized: 1.1 percentage points).

The results of the third model estimation are summarized in Table 3.

Table 3. Summary results of the VAR model describing the interactions between VAT, economic growth, exports and investment

	Maximum impact (% points)		Period of maximum impact (quarter)		Cumulative impact (% points)	Period of recovery to pre-shock situation (quarter)
	Positive	Negative	Positive	Negative		
Economic growth	0.084	-0.096	4	8	-0.14	9
Import	0.24	-0.16	3	7	0.06	6
Inflation	0.1		4		0.3	8
R^2	0.71					
R^2 adjusted	0.61					

The results of the third model assessment are as follows:

✓ In the case of an increase in the value-added tax, the situation is slightly different, since VAT is considered a consumption tax and is mainly levied on the price of final consumer goods. It follows that additional VAT revenues are also an incentive for producers, since in a small open economy, under conditions of high demand, producers receive additional incentives to increase output volumes, which ultimately leads to additional economic activity. However, additional tax collections do not lead to a change in

production and entrepreneurial behavior, since ultimately the final consumer is the main bearer of the tax burden. However, this phenomenon may continue until the moment when price changes significantly affect consumer behavior and cause a turning point effect in terms of economic growth. In this regard, the results of this analysis do not deviate from the logic of the above theoretical foundations. In particular, it can be observed that as a result of a 1 standard deviation positive shock in the direction of VAT growth, real GDP growth initially exhibits growth trends, reaching a maximum of 1.5 percentage points in the 4th quarter. However, starting from the 5th quarter, the direction of the impact changes to negative and economic growth exhibits its maximum negative response after 8 quarters, decreasing by about 1.7 percentage points and maintaining the negative impact until the 11th quarter, cumulatively creating a net negative result of 2.4 percentage points compared to the initial period of the shock. If we normalize the above effect by representing 1 percentage point as a shock, then a 1 percentage point increase in VAT initially leads to a maximum positive effect of 0.084 percentage points, then the direction of the effect changes and amounts to a 0.096 percentage point decline after 8 quarters, and the pre-shock level of economic growth is restored after 11 quarters, leading to a cumulative negative effect of 0.14 percentage points over the given period.

✓ The situation is identical in the case of the other component of the VAT tax base, the import component. The only difference lies in the magnitude of the responses. In particular, as a result of a 1 standard deviation positive shock in the direction of VAT growth, imports, adjusted for the impact of re-exports, initially show growth trends, reaching a maximum of 4.2 percentage points in the 3rd quarter. However, starting from the 6th quarter, the direction of the impact changes to negative and economic growth shows its maximum negative response after 7 quarters, decreasing by about 2.9 percentage points and maintaining the negative impact until the 10th quarter, cumulatively making a net positive result of 1.02 percentage points compared to the initial period of the shock (the negative cumulative effect in the 7th-10th quarters is 7.8 percentage points, however, the positive result in the 1st-6th quarters exceeds the negative effect in the aforementioned quarters). If we normalize the above effect by representing it in terms of a 1 percentage point shock, then a 1 percentage point increase in VAT initially leads to a maximum positive effect of 0.24 percentage points, then the direction of the effect changes and constitutes a 0.16 percentage point decline after 7 quarters, and the pre-shock level of economic growth is restored after 11 quarters, leading to a cumulative net positive effect of 0.06 percentage points over the given period. If we aggregate the effects of a 1 percentage point positive VAT shock on the domestic and import tax bases, we obtain a negative effect of 0.08 percentage points.

✓ In parallel, as we mentioned, in the case of VAT, the cornerstone is the impact on the inflationary environment and the purchasing power of the population, which in turn are the main determinants of consumer behavior and, subsequently, the inclusiveness of

economic growth. The results of the study prove that the moment of the peak impact of the value-added tax on inflation is the turning point of the positive impact of the tax on economic growth. In particular, as a result of a positive shock of 1 standard deviation in the direction of VAT growth, inflation shows its maximum response after 4-5 quarters, increasing by about 1.2 percentage points, while the inflationary background is maintained for about 8 quarters, cumulatively amounting to 5.4 percentage points. If we normalize the above effect by representing a 1 percentage point shock, then a 1 percentage point increase in VAT leads to a maximum of 0.1 percentage point inflation after 4-5 quarters, and the inflationary background is maintained for 8 quarters, cumulatively amounting to 0.3 percentage points.

✓ If we consider the endogenous feedback loops between VAT and economic growth and imports, then the cumulative effects of positive shocks of 1 standard deviation of economic growth and imports (the standard deviations of economic growth and employment are 7.5 and 16.98 percentage points, respectively) are manifested by additional increases in VAT collections in the 5th and 9th quarters, respectively, amounting to a cumulative 20.4 percentage points (normalized: 2.7 percentage points) and 13 percentage points (normalized: 0.8 percentage points).

Conclusion

The analyses conducted within the framework of this research document that the tax system in the Republic of Armenia, represented by three major types of taxes: income tax, profit tax, and value added tax, is closely interconnected with both economic growth itself and the inclusiveness factors that explain economic growth and characterize the quality of growth. In particular, the main results of the study document the quantitative negative effects of direct taxes on economic growth and inclusiveness factors that characterize growth.

Considering the negative impacts of income tax revenues on economic growth, employment, as well as productivity, when implementing reforms in the framework of this type of tax, for example, the transition from a flat taxation mechanism to a progressive one, it is necessary to take into account both the impacts on different social groups, in particular, to focus on the socially vulnerable and employed in low-income groups, establishing a non-taxable threshold or a relatively low rate, and to simultaneously consider the combination of possible structural and innovative policy instruments of the government along with the change in the income tax rate, which will allow to compensate for the negative impact of the income tax on productivity. It is also important to balance the goals of the state's economic policy, in particular, to combine the objectives of ensuring economic growth with policy measures aimed at reducing the disproportionate distribution of income, since, on the one hand, the transition from a flat to a progressive income

tax rate can mitigate income inequality, while, on the other hand, relatively high tax rates can penalize the rate of economic growth.

As for the profit tax, since in this case the main channel that negatively contributes to economic growth is the impact on investments, within the framework of this study it is proposed to supplement the set of deductible business expenses defined by Article 110 of the Tax Code of the Republic of Armenia from the profit tax base with a provision for recognizing and reducing the income reinvested by the organization as an expense, which will allow to somewhat curb the negative effects on capital accumulation and investments, and consequently on economic growth.

In the case of an increase in the VAT, the situation is slightly different, since indirect taxes generally do not have a significant impact on producer behavior, being included in the price of final consumption goods, and even vice versa. In the case of a limited market and small-open economy, such as the Republic of Armenia, the high level of demand creates additional price incentives (which also includes VAT) for producers in terms of expanding production volumes, while the tax burden is transferred from the producer to the consumer. However, this phenomenon may continue until price changes significantly affect consumer behavior and cause a turning point effect in terms of economic growth. In this regard, the results of this analysis largely confirm the logic of the above theoretical principles.

References

1. Alfò M, Carbonari L, Trovato G. On the effects of taxation on growth: an empirical assessment. *Macroeconomic Dynamics*. 2023; 27(5):1289-1318. doi:10.1017/S1365100522000219
2. D.N. Gujarati, D.C. Porter, "Basic econometrics", The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY, 10020, 5th edition, 2009, p.657, 785-790.
3. B. Gashi, G. Asllani, L. Boqolli. The Effect of Tax Structure in Economic Growth. *International Journal of Economics & Business Administration*, Volume VI, Issue 2, 2018, 56-67. https://www.researchgate.net/publication/330898917_The_effect_of_tax_structure_in_economic_growth
4. Çollaku L., Balaj D., Hajdini A. Correlation between Tax Revenues and Gross Domestic Product: Evidence from the Developing Economy. *Corporate and Business Strategy Review*. 2023;4(1): 31–38. <https://doi.org/10.22495/cbsrv4i1art3>
5. Fang, W. (2024). Negative Impact of Income Tax on Economic Growth. SHS Web of Conferences, 188, 02003. <https://doi.org/10.1051/shsconf/202418802003>
6. Nguyen, Anh D. M., Luisanna Onnis, and Raffaele Rossi (2021). "The Macroeconomic Effects of Income and Consumption Tax Changes," *American Economic Journal: Economic Policy* 13 (2): pp. 439-466. <https://orca.cardiff.ac.uk/id/eprint/149459/>
7. Shaqiri, V., Elshani, A. and Ahmeti, S. (2024) "The Effect of Direct and Indirect Taxes on Economic Growth in Developed Countries", *Ekonomika*, 103(2), pp. 123–139. doi:10.15388/Ekon.2024.103.2.7.

8. Stoilova D.G. Tax Structure and Economic Growth: New Empirical Evidence from the European Union. *Journal of Tax Reform*. 2024;10(2):240–257. <https://doi.org/10.15826/jtr.2024.10.2.167>
9. Ozpence O., Mercan N. The relationship between tax burden and economic growth: Turkey case. *Journal of Business, Economics and Finance*. 2020;9(2):143–154. <https://doi.org/10.17261/Pressacademia.2020.1220>
10. Ruud de Mooij, Ricardo Fenochietto, Shafik Hebous, Sébastien Leduc, and Carolina Osorio-Buitron. (2020). Tax Policy for Inclusive Growth after the Pandemic . <https://www.imf.org/en/Topics/imf-and-covid19>

Andranik MARGARYAN

Interactions between taxes and economic growth in the context of inclusion factors

Key words: income tax, profit tax, value added tax, economic growth, inclusion

The aim of the article is to assess the dynamic relationships and interactions between taxes, economic growth and other macroeconomic fundamentals in the context of ensuring inclusive economic growth based on econometric models. As a result of the research, the trends in the movement of taxes that are the main sources of the budget - income tax, profit tax and value added tax - were revealed, as well as the interactions and interactions of the observed macroeconomic fundamental factors - economic growth, employment, investments, productivity and inflation. According to the research, an increase in income tax and profit tax, as a rule, has a negative impact on economic growth, while the effects of profit tax and value added tax on other macroeconomic fundamentals are contradictory. The effects of income tax are also negative on labor productivity, and the effects of profit tax are twofold. In a certain situation, the negative impact of the increase in the corporate tax on investment and gross fixed capital formation can seriously affect the inclusiveness indicators of economic growth. The effects of the increase in the value-added tax on economic growth in the first stage of the stimulus action contribute to economic growth, but gradually this increase changes the direction of its impact and becomes simply negative, due to the negative impact of price factors on consumer behavior.