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SYSTEM DYNAMIC MODEL OF CORPORATE INCOME TAX REVENUES IN UKRAINE

Tax competition in the world is increasing year by year, forcing countries to reform their tax systems in order to remain competitive in this sphere. Economic growth of the country is an important indicator of how effective its tax system is. Improving economic situation leads to economic growth of the country. Corporate income tax is a tool of investment and innovation stimulation, it increases production in the country and GDP, which in turn contributes to economic growth and, as a consequence, to filling the state budget with tax revenues.

There is a little reason to expect that different taxes have the same impact on the economy. We will look at corporate income tax which is one of the main budget-forming taxes and which is for more than 12% of total government tax revenues in total account. Rate of corporate income tax can have different impact on tax revenues because of existence of a shadow economy.

According to Laffer Curve, there is an optimum tax rate which are exceeded causes decrease of tax revenues. The Laffer Curve by itself doesn't say whether a tax cut boosts or lowers revenues. Revenue response to a tax rate change depends on the tax system in place, the time period being considered, the ease of moving into underground activities, the level of tax rates already in place, the prevalence of legal and accounting-driven tax loopholes, and the proclivities of the productive factors. If the existing tax rate is too high, then a tax-rate cut results into increased tax revenues.

The object of the research is identification of the effect of corporate income tax changes on economic growth in Ukraine. First of all, in the future research it will be necessary to establish the sign of the impact of corporate income tax rate in Ukraine using the econometric tools. The research of the impact of corporate income tax rate on tax revenues in Ukraine may show whether tax rate in our country is at the optimum level, below or above it. The dynamic model of impact of corporate income tax on economic growth in Ukraine will be created after that.

We will focus on corporate income tax rate, corporate income tax revenues and trends that are specific to them. Starting in the second quarter of 2011, corporate

income tax rate had been gradually reduced from 25% to 18% (established in 2014) and is currently one of the lowest in the European Union. Fiscal function of the tax during this time period had also undergone changes, which were influenced by reduction of the rate, the tax reform in 2014-2016 and the crisis in the Ukraine.

From 2004 to 2010, the share of corporate income tax revenues in GDP of Ukraine ranged from 3.57% to 5.27%. From 2011 to 2015, there was a trend towards a gradual decrease in this indicator. Thus, within five years, the share of corporate income tax revenues in GDP of Ukraine fell more than twice (from 4.16% to 1.76%). The gradual recovery of the Ukrainian economy from 2016 made positive effect on corporate income tax revenues (in 2016 the share in GDP increased by 0.52%, in 2017 and 2018 remained almost at the same level).

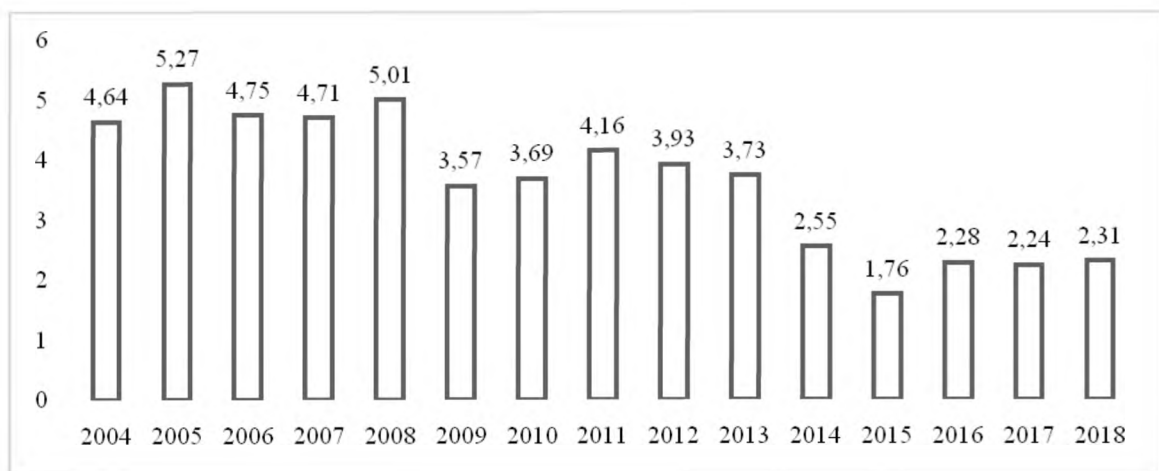


Figure 1. Income from corporate income tax in 2004-2018, % of nominal GDP of Ukraine

Corporate income taxation can directly and indirectly affect economic growth. Thus, various tax benefits (for example, for a particular sector of the economy or for a particular form of enterprise) can both contribute to economic growth and increase the state budget deficit at the expense of unrealized potential tax revenues.

In different countries, the impact of corporate income taxation on economic growth may vary. This is determined by how large the economy is, what type of country it is (highly developed or developing, etc.), the structure of the tax system (which are other taxes and their rates), the method of taxation (progressive, regressive or proportional) and other factors.

Too high corporate income tax rate leads to increase of level of shadow economy in the country and, as a result, corporate income tax revenues decrease. At the same time, increasing corporate income tax rate to optimum level should promote growth of corporate income tax revenues. When tax rate exceeds its optimum level, corporate income tax revenues start to decrease. In turn, growth of corporate income tax revenues promotes increase of total government revenues that also consist of other tax and non-tax revenues. Higher level of government revenues leads to increase of government spending and, as a result, growth of GDP.

Corporate income tax debt and corporate income tax overpayments have impact on size of corporate income tax revenues and, as a consequence, on economic growth. Corporate income tax is one of three taxes that create about 90% of the whole tax debt, which reduces its fiscal importance in the budget-forming process. Corporate income tax overpayments complicate forecasting of tax revenues in subsequent periods and increase the tax burden on taxpayers. The largest share in the total amount of overpayments is from corporate income tax (42.6% in 2018).

Another way of influence of corporate income tax rate is through investments. The higher corporate income tax rate in the country is established, the lower profit of firms after taxes are paid. This means that firms have less capital for investments and, as a consequence, GDP of the country decreases.

In the model we will calculate GDP using expenditure method, that's why we need to add exogenous variables – net export and consumption:

$$GDP = C + I + G + X_n,$$

where C – Consumption (exogenous variable), I – Investments (endogenous variable), G – government spending (endogenous variable), X_n – net export (exogenous variable).

The level of GDP makes it possible to determine GDP growth, which reflects economic growth rate in Ukraine Summarizing all of the above, the initial causal-loop diagram is as follows:

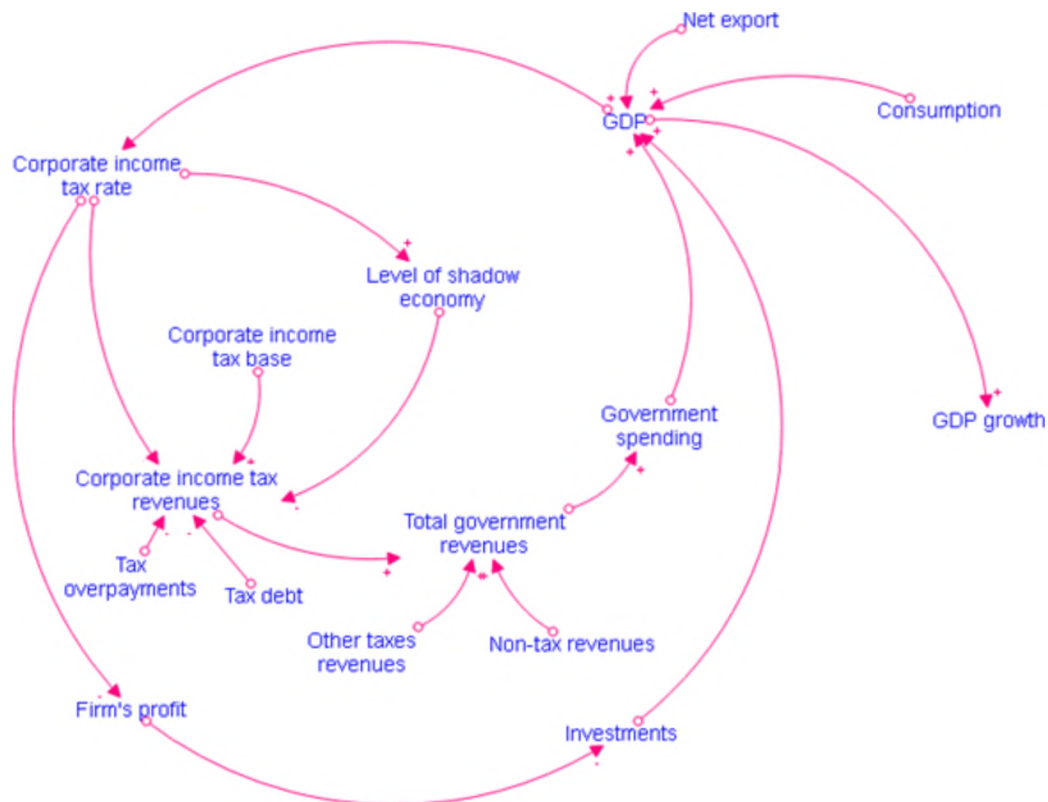


Figure 2. Causal-loop diagram of corporate income tax impact on GDP growth

Initially, we do not identify the effect of corporate income tax rate on corporate income tax revenues and the effect of GDP on corporate income tax rate.

The following research will help to determine whether corporate income tax rate in Ukraine is at the optimum level according to Laffer Curve and how the change in corporate income tax rate can affect economic growth taking into account different ways of taxation impact on GDP.

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MODELING OF HOURS AND EMPLOYMENT FOR UKRAINE USING SYSTEM DYNAMIC METHOD

The main target of the model is to develop the system dynamics model about hours and employment for Ukraine. The model shows how different parameters such as labour hour productivity, desired production, employment influence on.

The time horizon in this model is 2008-2017. The data is annual. The main source of information on data was the official website of Ukrainian statistics <http://www.ukrstat.gov.ua>. Some data was also found on <https://data.worldbank.org/>.

It is important for every business to create a pleasant workplace where employees can work in a safe environment. Setting the rules of employment in advance that clearly stipulate terms and conditions of employment and the standards for treatment, including working hours, wages, rules on personnel and duties, is essential to not cause disputes between an employer and employees.

We can see how our model works (Figure 1). We look at the Hours per worker model and the relationship between our data. At the same time we can see connection between Employment. Labor hour productivity is equal to labor productivity/ standard hours per worker, where:

$$\begin{aligned} \text{Labor productivity} &= \text{real private AD} / \text{Employed} \\ \text{Desired labor hours} &= \text{Desired production} / \text{Labor hour productivity} \end{aligned}$$