THE EFFECT OF TAXATION ON THE SHADOW ECONOMY LEVEL

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Abstract

It is difficult to overestimate the relevance of the issues of interrelation and mutual influence of taxation and the level of the shadow economy in the state in contemporary conditions. When determining the tax policy, it is necessary to take into account the fact that the changes can result in the growth of the shadow economy. First, the article analyses the state of the shadow economy in the countries with different levels of tax burden, and secondly, methods that allow predicting the level of the shadow economy depending on taxation. There made the conclusions based on the results of a comparative analysis of the considered methods and provided recommendations for the employment of these methods.

Keywords

taxation, shadow economy, decision-making models, comparative analysis

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H71, H26

1 INTRODUCTION

The tax issues take a stable position in financial planning at the macro and micro level in the contemporary economic world. under the circumstances of high tax rates, incorrect or insufficient accounting of the tax factor can lead to serious adverse consequences, one of which is the growth of the shadow economy.

An imperfect and frequently changing tax system becomes a substantial deterrent for the development of a successful business, depriving it of a stable functioning and forcing it to go into the shadow.

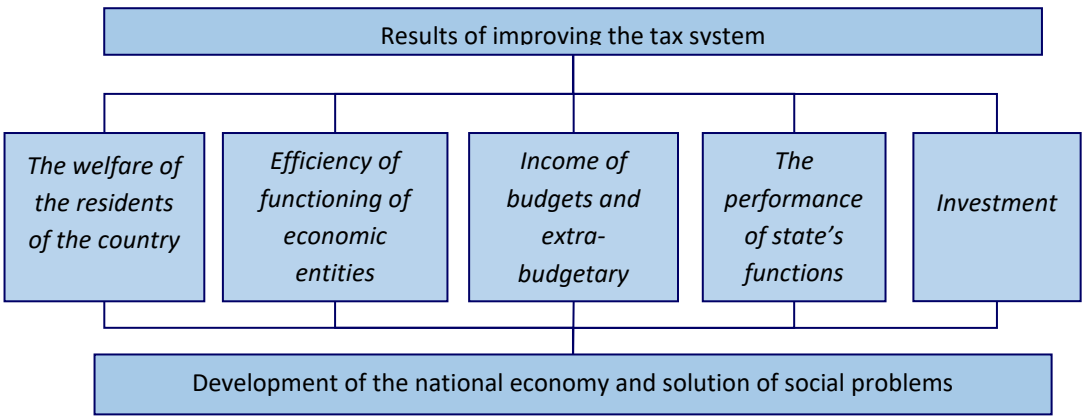
It is obvious that in order to make decisions regarding the changes in the tax system, it is necessary to be able to predict the behaviour of the taxpayers, the changes in their business activity, the amount of revenue collected to the budget, the development or stagnation of the state economy.

2 TAXATION AND THE SHADOW ECONOMY

The principal objective of the tax system at the macro level is to provide economically sound qualitative and quantitative parameters of budget tasks and the long-term programmes of social and economic development of the state based on the developed and adopted tax policy.

Employing the specific tax system, the government can slow down or, on the contrary, create the prerequisites for the favourable development of the enterprises and for solving the economic and social problems of the society. The tax system affects the economic and social processes through its functions. The influence of the tax system on social and economic processes is shown in the diagram in Figure1.

Figure 1: Impact of the tax system



Source: author

If the tax system is not burdensome and efficient, the enterprises can perform economic activities efficiently, thereby increasing the wages of employees, and additional sources of investment appear. And in its turn, the performance of state's functions depends on the income of state budget.

The development of methods, which allow determining the optimal amount of the tax burden for a specific period of development of the national economy, has great scientific and practical importance. A significant contribution to the theory of taxes was made by the American economist, Ph.D. Arthur Laffer.

The concept of Laffer's theory implies the existence of an optimal level of taxation, at which tax revenues reach the maximum. The tax burden is used for the development of tax policy, comparative analysis of the tax burden, for the formation of social policy, as an indicator of the economic behaviour of enterprises and the possibility that the taxpayers enter the "shadow".

In its turn, the shadow economy is a rather complex phenomenon. The complexity of the shadow economy is manifested not only in the absence of generally accepted mechanisms and methods for assessing its level, but, above all, in a single definition of this phenomenon. In its most general form, the shadow economy can be defined as economic activities and income derived from these activities that are outside the system of state regulation, taxation, or supervision.

A methodological approach to understanding the shadow economy as an economic category was proposed by Pierre Lemieux (Lemieux., 2007), who based his study on the ideas of Adam Smith ("On the wealth of Nations"). Smith believes that the basis of modern society is the division of labour and its objective consequence – the relations of exchange. Pierre Lemieux, developing Smith's idea, noted that the shadow economy arises in the sphere of exchange as a result of restrictions related to rules, taxes and prohibitions. Exchange relations were considered as the main reason for the emergence of the shadow economy in all its most well-known models; nevertheless, the contemporary researchers consider the shadow economy not only within the sphere of exchange, but also as the production, distribution and consumption of goods and services, which are not controlled by the society.

The shadow economy is a phenomenon of economic activity, which is inherent objectively to the society. Hans F. Sennholz believed that the properties of the shadow economy are the result of the need of human nature to choose the optimal alternative from the given ones: even in the ancient world the rulers established the laws and regulations and implemented them through violence and terror, and the population either obeyed or found ways to resist, often

preferring not exposing the economic activities to the control (Hans F. Sennholz, 1984).

It is obvious that any theoretical research and conclusions should be based on actual indicators of the level of the shadow economy and the tax burden at the contemporary stage of economic development in different countries (see Table 1).

Table 1: Comparative characteristics of a number of countries on the share of taxes in the GDP and the size of the shadow sector in years 1990, 2005, 2013 and 2018. [6, 7, 8]

Country	Tax burden on the economy, % of GDP				Shadow economy, % of GDP			
	1990	2005	2013	2018	1990	2005	2013	2018
Countries with high rate of taxes (more than 40% of GDP)								
Sweden	53,6	50,7	42,8	44,3	10,8	17,5	14,7	13,3
Denmark	47,1	49,6	48,6	48,0	13,2	16,5	13,0	15,2
Belgium	43,1	45,4	44,7	45,3	17,6	20,1	18,1	20,6
Norway	41,8	44,9	40,8	42,2	7,6	17,6	14,8	14,1
Austria	40,4	44,3	42,5	43,2	10,7	10,3	8,0	8,9
Finland	44,7	44,3	44,0	44,1	13,3	16,6	13,7	13,5
France	43,0	43,7	45,0	45,3	11,4	13,8	11,0	14,1
Italy	38,9	42,2	42,6	44,4	20,0	24,4	22,0	24,95
Countries with moderate rate of taxes (from 30 to 40 % of GDP)								
The Netherland	42,8	39,3	36,3	38,6	12,6	12,0	9,8	10,8
Germany	32,6	37,7	36,7	37,6	12,6	15,6	13,7	12,0
Canady	36,6	37,4	30,6	30,7	10,9	14,3	11,9	13,9

Russian Federation	43,3	36,7	34,11	28,7	10-11	50,1	40,0	38,4
Great Britain	35,9	36,1	32,9	35,2	10,2	12,0	10,5	11,1
Spain	33,0	35,1	32,6	32,9	19,5	21,3	19,2	24,5
Switzerland	30,6	35,1	27,05	28,2	8,6	9,0	7,9	7,2
Greece	29,3	35,1	33,5	33,8	24,5	27,6	25,8	27,0
Portugal	29,4	39,3	36,3	32,5	12,6	12,0	19,4	21,9
Estonia	n/a	n/a	n/a	32,5	n/a	n/a	15,7	16,7
Czech Republic	n/a	n/a	n/a	35,5	n/a	n/a	n/a	14,8
Countries with low rate of taxes (less than 30 % of GDP)								
Australia	29,4	30,1	27,3	26,5	14,2	12,6	8,0	12,1
USA	26,7	29,1	25,4	24,3	12,2	8,2	7,0	8,3
Brazil	n/a	28,4	37,8	35,3	n/a	39,8	n/a	37,6
Argentina	n/a	21,7	n/a	29,5	n/a	25,4	n/a	24,1
Mexica	n/a	16,5	19,6	10,0	n/a	30,1	n/a	
Lithuania	n/a	n/a	n/a	16,0	n/a	n/a	15,3	18,7
Latvia	n/a	n/a	28,9	27,6	n/a	n/a	23,8	24,2

N.B. n/a – not available

As can be seen from the data in Table 1, there is no obvious correlation between the level of the tax burden and the size of the shadow economy. Therefore, the mathematical models that allow estimating the taxpayer's behaviour in case of possible changes in tax system come to the first position in the process of making decisions on reforming the tax system.

Models of taxpayers' decision-making are optimisation models; they are models that assume finding the extremum (minimum or maximum) of the taxpayers' target function under a given system of restrictions.

The process of creating optimisation models of the shadow economy usually involves the choice of the amount of income hidden from the tax authorities, which is considered by the agent (individual, company). There are three main types of models in this group:

1. In 1972, Allingham M. G. and Sandmo A. proposed a model for choosing a local taxpayer in one of their first works "Income Tax Evasion: A Theoretical Analysis"; this model allowed them to model how much income a taxpayer would hide from the state, depending on the tax rate and the probability of receiving a fine (Allingham, M. G., Sandmo, A., 1972).

The proposed model describes the following situation: the taxpayer has a total income W, which is set under the influence of various external factors (exogenously), and only the taxpayer knows its real size. The government as an agent knows only the information that the taxpayer provides to it and that can be verified. The government sets a tax rate (%) on the taxpayer's income τ, and this rate is introduced into the model.

Under the proposed conditions, the taxpayer is faced with a choice: to show the income W to full extent to the government and to pay taxes in full, or to show only part of the income X and to pay taxes only for this part. The authorities, in their turn, can check the taxpayer with probability p, and if it occurs that the taxpayer has hidden the part of his income (W-X), then he will have to pay a fine (in %) of this sum in the amount of π ($\pi > \tau$). The taxpayer is a risk-phobe, hence has a concave utility function U.

To solve this problem, the taxpayer maximises the mathematical expectation of his utility function in X:

$$[U] = (1 - p)U(W - \tau X) + pU(W - \tau X - \pi(W - X)) \quad (1)$$

Allingham and Sandmo have shown that the taxpayer will hide part of their income if the following system of restrictions is met:

$$\left\{ p\pi > \tau \left[p + (1 - p) \frac{U'(W)}{U'(W(1-\pi))} \right] \; p\pi < \tau \right\} \quad (2)$$

If the first restriction is violated, the taxpayer hides all his income; if the second one is violated, the taxpayer pays taxes in full.

Within these limits, i.e. when only part of the taxpayer's income is hidden, the authors showed that an increase in the tax rate τ increases the amount of hidden income, and an increase in the probability of verification p or penalties π reduces it.

Also, in this model, the authors have shown that the income tax generates more tax evasion than other taxes (for example, VAT). They also have shown that the size of the shadow economy does not always depend linearly on taxes: on the one hand, the increase in taxes increases the desire to enter the shadows; on the other hand, the increase in taxes reduces the taxpayer's real income, which increases his risk aversion; in other words, the taxpayer begins to be afraid to hide his income (see formula (1)).

2. The approach by Levenson and Maloney (Levenson et al., 1996) is based on the assumption that entrepreneurs remain in the official economy not because of fear of penalties for being in the shadows, but because doing business in the real sector creates benefits from government-provided goods and services. As it happens in the previous model, it is taken into account that the activities in the official economy are associated with the constant costs for the entrepreneurs, since they must comply with the rules established by the state. Levenson and Maloney assumed that entrepreneurs tend to start their businesses in the informal sector to avoid high compliance costs. When a firm reaches a sufficient size, it switches to the formal economy to take the benefits provided by the state, which improve its business environment. Modelling the dynamic transition between the formal and informal sectors is the merit of these authors.

3. Friedman, Johnson, Kaufmann and Zoido-Lobaton (Friedman, 2000) in their model assume that entrepreneurs go to the shadow economy not only because of the presence of taxation, but also because of the activities of corrupt officials. It is assumed that the entrepreneur has income Y, which he can use to expand production in the official economy and make a profit in $R(T)Y$ (R is the return on investment projects, R>1, T is the total tax revenue), or hide and do not pay taxes on this income. From the funds left in the official economy, the entrepreneur pays tax t, as well as corruption tax r, which is paid in the form of

bribes to corrupt officials. D is the amount of income hidden from taxation. The entrepreneur bears the cost of being in the shadows in the amount of ***kD2 / 2***, where ***k*** is a parameter describing the effectiveness of the legal system.

The entrepreneur maximises his utility function:

$$U = (1 - t - r)(Y - D)R(T) + D - \left(\frac{kD^2}{2}\right) \rightarrow max_D \quad (3)$$

The result of maximisation is as follows:

$$D^* = \left(\frac{1}{k}\right)(1 - (1 - t - r)R(T)) \quad (4)$$

Total tax revenues are described by the following formula:

$$T = tR(T)(Y - D^*) \quad (5)$$

It can be noted that the increase in the corruption tax increases the amount of hidden income and reduces the total tax revenue.

The authors also suggest that the growth of total tax revenues affects the effectiveness of the legal system k(T). After considering the situation when k(T) have the following dependence: if $T \leq T^*$, then $k(T) = k_L$, if T>T*, then k(T) = k_H ($k_H > k_L$), the authors demonstrate that there are situations when an increase in the tax rate can reduce the level of the shadow economy. This is due to the fact that an increase in the total tax revenues leads to an improvement in legal institutions, as well as an improvement in the quality of public goods, which affect the profitability of investment projects.

3 RESULTS AND CONCLUSION

For the purposes of this research, the shadow economy is defined as economic activity and income from it that avoid government regulation, taxation, control and are not reflected in official GDP estimates.

The analysis of the global shadow economy showed that the countries of Eastern Europe are characterized by a relatively high level of the share of the shadow economy (from 17 to 35%). The high share of the shadow economy in GDP makes the study of the shadow economy in Eastern Europe relevant.

Models of making decision by the taxpayer on the size of the shadow economy are often restricted by maximising the utility function of an individual with the

given parameters of the external environment without the possibility of influencing it. In game models there is a possibility of interaction between the taxpayer and the environment.

A review of foreign scientific literature shows that among the various interpretations, there is no clear understanding of the phenomenon of "shadow economy". Therefore, the absence of a single term indicates an ambiguous understanding of the subject.

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