

Does Taxation Influence Efficiency of Public Services Provision: Case of European Countries

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Public services are identified as services that provided by the government of certain jurisdiction (country or local community) in order to ensure citizens' welfare and social protection. Efficiency of public services provision depends on numerous economic, social and institutional factors. In turn, numerous scientific debates are about optimisation of taxation in order to increase efficiency of public goods provision. Therefore, the purpose of the research is to clarify empirically the cohesion between public services provision and taxation for the sample of European countries (Latvia, Lithuania, Estonia, Czech Republic, Germany, Slovak Republic, Hungary, Poland, Romania, Bulgaria, Slovenia, and Ukraine) for 2005-2018. Correlation analysis and panel data regression analysis results allow concluding that provision of public goods (safety, education, health care) highly dependent on social contributions and taxes on goods and services, and less on taxes on income, profits and capital gains. Moreover, taxes growth dynamics in chosen European countries is twice, triple or even five times more rapid than growth dynamics of all dependent variables (only government expenditures on education and social contributions annual growth rates are almost equal). Such a discrepancy might results in increase of social tensions, shadow economy, intensification of tax avoidances and tax evasion processes, lack of population to government loyalty. All this proves the necessity of improvement of financial resources redistribution in order to improve efficiency of public services provision.

Key words: budget, government expenditure, government efficiency, public goods, tax revenue.

УДК 336.131:336.228

JEL Codes: C323, E62, H21, H41

Introduction. Traditionally, public services are identified as services that provided by the government of certain jurisdiction (country or local community) in order to ensure citizens' welfare and social protection. It is used to judging about government efficiency on it success in public services provision. Meanwhile both state and local budgets of almost all countries are formed dominantly from tax revenues; there is a strong correlation between taxpayers' sufficiency and quality of public services provision. Namely, taxpayers more willingly agree with a high tax burden if they obtain sufficient in quantity and quality volume of public goods and services. Otherwise, if taxpayers meet high tax burden and insufficient public services provision policy they likely to be more loyal to tax evasion schemes. Thus, research of the cohesion between public services provision and taxation issues become an interesting and valuable task both from theoretical and empirical perspectives.

Problem statement. Different issues of public services and goods provision in general and its efficiency in terms of tax burden in particular are explored by such scientists as Aronsson & Blomquist [1], Arora & Chong [2], Atkinson & Stern [3], Besley, Pande, Rahman, and Rao [4], Hongyan [5], Jack [6], Piggott & Whalley [7], Prasad [8], Stiglitz & Dasgupta [9] and others.

Despite existence of numerous publications concerning identification of the efficiency of public services provision policy and clarification of factors affecting it, there is still no consensus

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<https://doi.org/10.21272/mer.2020.87.14>



between scientists on this certain issue. Thus, it becomes an urgent task to realize an empirical research aimed at assessment of cohesion between public services provision and taxation for Ukraine and neighbour countries. Ukrainian government might use all obtained findings in order increase efficiency of public services provision in our country.

The purpose of the research is to clarify empirically the cohesion between public services provision and taxation in sample of European countries.

Results of the research. Variety of public services that are guaranteed by the government might be different in different countries, but traditionally it includes provision of education, health care and safety (military issues). Thus, it was created a subset of dependents variables that consists of such indicators as government military expenditure (annual % growth), government expenditure on education (annual % growth), domestic general government health expenditure (annual % growth), and general government final consumption expenditure (annual % growth). It should be noted that general government final consumption expenditure includes all government current expenditures for purchases of goods and services (including compensation of employees) [10].

In turn, in order to measure taxation issues it was created a subset of independent variables that includes such indicators as social contributions (annual % growth), taxes on goods and services (annual % growth), and taxes on income, profits and capital gains (annual % growth). GDP per capita (current local currency unites) is chosen as a control variable.

Country sample consists of 12 European countries such as Latvia, Lithuania, Estonia, Czech Republic, Germany, Slovak Republic, Hungary, Poland, Romania, Bulgaria, Slovenia, and Ukraine. Time period – 2005-2018. All data collected from the World Development Indicators Collection in the World Bank DataBank [10]. Summative statistics for the sets of dependent, independent and control variables presented in Table 1.

Table 1

Summative statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Military	156	6.698	13.443	-34.25	64.8
General	155	1.473	2.704	-9.8	7.99
Education	120	6.094	12.119	-21.55	54.39
Health	144	7.044	8.837	-19.07	36.07
Contributions	156	7.017	8.587	-28.26	35.91
GoodsTaxes	156	7.417	9.638	-20.77	47.89
IncomeTaxes	156	7.396	16.399	-53.82	86.67
GDPpc	156	313 000	875 000	7 001.572	4 360 000

In turn, in order to identify the cohesion between public services provision and taxation in the above-mentioned European countries it is used correlation analysis and panel data regression analysis in Stata software.

Based on the first stage of the research – correlation analysis (Table 2), it can be concluded that according to the Chaddock scale there is moderate positive correlation between government military expenditure and taxes on income, profits and capital gains; and between social contributions and both government expenditure on education and domestic general government health expenditure. While other correlation cases between dependent and independent variables reveal low correlation, except correlation between general government final consumption expenditure and both social contributions and taxes on goods and services that is negligible.

Table 2

Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Military	1.000						
(2) General	0.396	1.000					
(3) Education	0.285	0.307	1.000				
(4) Health	0.371	0.452	0.531	1.000			
(5) Contributions	0.471	0.292	0.640	0.682	1.000		
(6) GoodsTaxes	0.450	0.214	0.490	0.472	0.572	1.000	
(7) IncomeTaxes	0.529	0.321	0.467	0.412	0.601	0.570	1.000

The next stage of the research is pane data regression analysis aimed at clarifying whether variation of public services financing has the same scale as variation of taxation issues. Results of the regression analysis presented in Tables 3-6.

Table 3

Regression results of influence of taxes on general government final consumption expenditures

General	Coef.	St.Err.	t-value	p-value	Sig
Contributions	0.082	0.028	2.93	0.003	***
GoodsTaxes	-0.014	0.029	-0.50	0.618	
IncomeTaxes	0.030	0.016	1.84	0.066	*
GDPpc	0.000	0.000	-0.07	0.945	
Constant	0.789	0.295	2.68	0.007	***

Namely, general government final consumption expenditure mostly depends on social contributions and taxes on income, profits and capital gains. Specifically, at 1 % level an increase of social contribution annual growth rate in 1 % leads to the increase of general government final consumption expenditure annual growth rate in 0.082 %. While, an increase of taxes on income, profits and capital gains in 1% results in increase of general government final consumption expenditure annual growth rate in 0.03 % at 10 % level. Thus, it can be concluded that general government final consumption has by far less rapid annual growth dynamic that social contributions and taxes on income, profits and capital gains.

Table 4

Regression results of influence of taxes on government military expenditures

Military	Coef.	St.Err.	t-value	p-value	Sig
Contributions	0.386	0.122	3.17	0.002	***
GoodsTaxes	0.247	0.124	2.00	0.046	**
IncomeTaxes	0.225	0.070	3.20	0.001	***
GDPpc	0.000	0.000	-0.62	0.536	
Constant	0.699	1.276	0.55	0.584	

In turn, military expenditure strongly depends on all types of taxes. Namely, 1 % increase in social contributions annual growth rate causes 0.386 % increase in military expenditure annual growth rate; 1 % increase in taxes on goods and services annual growth rate results in 0.247 % increase of the dependent variable; 1 % increase in taxes on income, profits and capital gains annual growth rate leads to 0.225 % increase of military expenditure annual growth rate. Empirical research results allow highlighting that change of military expenditure is at least triple less rapid that change of all mentioned taxes and social contributions.

Table 5
 Regression results of influence of taxes on government expenditures on education

Education	Coef.	St.Err.	t-value	p-value	Sig
Contributions	0.780	0.145	5.38	0.000	***
GoodsTaxes	0.205	0.117	1.76	0.079	*
IncomeTaxes	0.053	0.069	0.78	0.438	
GDPpc	0.000	0.000	-0.50	0.615	
Constant	-0.147	1.183	-0.13	0.901	

Variation of government expenditures on education annual growth rate highly depends on variation of social contributions annual growth rate (1 % increase of this independent variable results in 0.78 % increase of the dependent variable) and taxed on goods and services annual growth rate (1 % increase of the independent variable results in 0.205 % increase of the dependent variable). Thus, it can be concluded that government expenditures on education and social contributions annual growth rates are almost equal, while taxes on goods and services increase almost five times more rapidly.

Table 6
 Regression results of influence of taxes on domestic general government health expenditures

Health	Coef.	St.Err.	t-value	p-value	Sig
Contributions	0.450	0.080	5.59	0.000	***
GoodsTaxes	0.182	0.077	2.38	0.017	**
IncomeTaxes	0.068	0.045	1.49	0.136	
GDPpc	0.000	0.000	-1.39	0.166	
Constant	2.550	0.796	3.20	0.001	***

Finally, domestic general government health expenditures similarly to the previous dependent variable also closely dependent on variation of social contributions and taxes on goods and services. Specifically, 1 % increase of social contributions annual growth rate results in 0.45 % increase of the dependent variable. While 1 % increase of taxed on goods and services annual growth rate results in only 0.182 % increase of the dependent variable. Thus, social contributions annually growth twice faster that domestic general government health expenditures, while taxes on goods and services annual growth is more than five times more rapid.

Conclusions and prospects of further research. Empirical research results allow concluding that all dependent variables (government expenditure on education annual growth

rate, government military expenditure annual growth rate, domestic general government health expenditure annual growth rate, and general government final consumption expenditure annual growth rate) influenced by social contributions annual growth. Meanwhile, taxes on goods and serviced growth rate is impactful for all dependent variables except government expenditure on education annual growth rate. In turn, taxes on income, profits and capital gains annual growth rate has impact only on general government final consumption expenditures and government military expenditure annual growth rates. Besides taxes growth dynamics in chosen European countries is twice, triple or even five times more rapid than growth dynamics of all dependent variables (only government expenditures on education and social contributions annual growth rates are almost equal).

These findings lead to conclusion that in Ukraine and neighbor European countries public services provision highly depends on taxes and social contributions. Nevertheless, there is significant disparity in their annual growth rates. Namely, increase of tax revenue not necessarily will lead to the increase of quantity and quality of provision of such public services as education, health care and safety. Such a situation might result in an increase of social tensions, shadow economy, intensification of tax avoidances and tax evasion processes, lack of population to government loyalty, etc. Thus, it is necessary to develop a strategy aimed at increase of efficiency of public services provision in chosen European countries that might help to eliminate above-mentioned negative consequences.

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Manuscript received 13 December 2019

Влияет ли налогообложение на эффективность предоставления общественных услуг: опыт европейских стран

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Общественные услуги (блага) определяются как услуги, предоставляемые правительством определенной страны или местного сообщества в целях обеспечения благосостояния и социальной защиты граждан. Эффективность предоставления общественных услуг зависит от многочисленных экономических, социальных и институциональных факторов. В свою очередь, многочисленные научные дискуссии касаются именно оптимизации налогообложения с целью повышения эффективности предоставления общественных благ. Таким образом, цель исследования состоит в том, чтобы эмпирически выявить связь между предоставлением общественных благ и налогообложением для выборки европейских стран (Латвия, Литва, Эстония, Чешская Республика, Германия, Словакия, Венгрия, Польша, Румыния, Болгария, Словения, и Украина) за 2005-2018 гг. Результаты корреляционного анализа и регрессионного анализа на панельных данных позволяют сделать вывод о том, что предоставление общественных благ (безопасность, образование, здравоохранение) сильно зависит от динамики социальных отчислений и налогов на товары и услуги, и в меньшей мере – от налогов на доходы, прибыль и прирост капитала. Более того, динамика роста налогов в избранных европейских странах в два, три или даже пять раз быстрее, чем динамика роста всех зависимых переменных (только ежегодные темпы роста государственных расходов на образование и социальные отчисления почти равны). Такое несоответствие может привести к росту социальной напряженности, теневой экономики, интенсификации процессов уклонения от уплаты налогов и снижения лояльности к правительству среди населения. Все это доказывает необходимость совершенствования перераспределения финансовых ресурсов в целях повышения эффективности предоставления общественных благ.

Ключевые слова: бюджет, государственные расходы, эффективность правительства, налоговые поступления, общественные блага.

*Mechanism of Economic Regulation, 2020, No 1, 152–158
ISSN 1726-8699 (print)*

Чи впливає оподаткування на ефективність надання суспільних послуг: досвід європейських країн

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Суспільні послуги (блага) визначаються як послуги, що надаються урядом певної країни або територіальної громади з метою забезпечення добробуту та соціального захисту громадян. Ефективність надання суспільних послуг залежить від численних економічних, соціальних та інституційних чинників. У свою чергу, численні наукові дискусії стосуються саме оптимізації оподаткування з метою підвищення ефективності надання суспільних благ. Таким чином, мета дослідження полягає в тому, щоб емпірично виявити зв'язок між наданням суспільних благ і оподаткуванням для вибірки європейських країн (Латвія, Литва, Естонія, Чеська Республіка, Німеччина, Словаччина, Угорщина, Польща, Румунія, Болгарія, Словенія, і Україна) за 2005-

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Чи впливає оподаткування на ефективність надання суспільних послуг: досвід європейських країн

2018 рр. Результати кореляційного аналізу та регресійного аналізу на панельних даних дозволяють зробити висновок про те, що надання суспільних благ (безпека, освіта, охорона здоров'я) сильно залежить від динаміки соціальних відрахувань та податків на товари і послуги, і в меншій мірі – від податків на доходи, прибуток і приріст капіталу. Більш того, динаміка зростання податків в обраних європейських країнах в два, три або навіть п'ять разів швидше, ніж динаміка зростання всіх залежних змінних (тільки щорічні темпи зростання державних витрат на освіту і соціальні відрахування майже рівні). Така невідповідність може призвести до зростання соціальної напруженості, тіньової економіки, інтенсифікації процесів ухилення від сплати податків і зниження лояльності до уряду серед населення. Все це доводить необхідність вдосконалення перерозподілу фінансових ресурсів з метою підвищення ефективності надання суспільних благ.

Ключові слова: бюджет, державні витрати, ефективність уряду, податкові надходження, суспільні послуги.

JEL Codes: C323, E62, H21, H41

Table: 6; References: 10

Language of the article: English