Assessment of Fiscal Decentralization Influence on Social and Economic Development

OLENA CHYGRYN[1], YURIY PETRUSHENKO[2], ALINA VYSOCHYNA[3] and ANNA VORONTSOVA[4]

[1] Associate Professor of the Department of Economics, entrepreneurship and Business Administration, Sumy State University, Sumy, Ukraine, e-mail: echigrin@econ.sumdu.edu.ua
[2] Professor, Head of the Department of International Economics, Sumy State University, Sumy, Ukraine, e-mail: y.petrushenko@uabs.sumdu.edu.ua
[3] Senior Lecturer, Department of Accounting and Taxation, Sumy State University, Sumy, Ukraine, e-mail: a.vysochyna@uabs.sumdu.edu.ua
[4] Researcher of the scientific research work, International Economics Department, Sumy State University, Sumy, Ukraine, e-mail: a.vorontsova@uabs.sumdu.edu.ua

ARTICLE INFO

ABSTRACT

Transformation of the mechanism of responsibility redistribution between central and sub-central government resulted in expansion of fiscal decentralization (FD) ideas. The concept of fiscal decentralization in general features was formed at the second half of XX century, however, key ideas appeared far more earlier. Nevertheless, many controversial empirical research results are focused on the identification of fiscal decentralization influence on economic and social development (different empirical researches confirmed its positive, negative or insignificant influence). Thus, because of dynamic change of worldwide socio-economic trends, it becomes crucial to realize up-to-date empirical comprehensive research on fiscal decentralization impact on different aspects of country social and economic development. This article is devoted to the analysis of peculiarities, positive and negative consequences of fiscal decentralization and empirical testing of hypothesis that fiscal decentralization positively affected country social and economic development aspects. For this purpose, evolution of fiscal decentralization concept was analized. Main positive features (increase of transparency and accountability of sub-central government financial policy, amendment of public services quality etc.) and risks of its implementation (increase of macroeconomic instability due to lack of centralized control, along with high dependence of fiscal decentralization measures efficiency on competence of sub-central governments, decrease of large-scale social projects financing and others) were found. Thence, there is no single opinion about the impact of fiscal decentralization on country social and economic development, the main objective of the research is to test empirically the hypothesis that expansion of FD positively affected different measures of social and economic development (economic growth rate, inflation,

employment rate, social contribution and others) (Simionescu et al., 2017; Lazányi et al., 2017). Testing the hypothesis of FD's positive influence on different parameters of social and economic development was realized on the base of panel data analysis for the set of European countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Montenegro, Romania, Serbia, Slovenia, Turkey and Ukraine). Methodologically it was realized through the using of panel data regression model (independent variables – measures of fiscal decentralization, dependent variables – measures of social or economic development) in Stata 12/SE. This research allowed to confirm the hypothesis on positive impact of different measures of fiscal decentralization on GDP, GDP growth rate, foreign direct investments, and social contributions. Nevertheless, negative impact of fiscal decentralization on GNI per capita and export of goods and services was found. Besides, increase of public finance centralization stimulates inflation. There was identified controversial impact of different parameters of fiscal decentralization on dynamic of import of goods and services, accordingly.

INTRODUCTION

Numerous debates concerning the role of centralized control in financial resources redistribution process in order to ensure economic development resulted the expansion of decentralization ideas and strengthened the role of local governments. Practically, formation of an effective fiscal system that would ensure balanced and sustainable development of the whole country and certain regions or municipalities at the same time dramatically depends on the level of centralization in the country. This is why the ability of local authorities being financially independent and functioning on the base of fair distribution of powers and resources became economically more viable, which causes attention of scholars to such a phenomenon as fiscal decentralization (Hybka, 2016; Sekula and Smiechowicz, 2016; Sekula, 2017).

Over the past three decades, many countries have started their work towards decentralization reform implementation in order to improve effectiveness of public finance management. In addition, such international organizations as the World Bank, the United Nations and the Organisation for Economic Co-operation and Development (OECD) are actively supporting the process of transformation towards decentralization in many developing countries (Mohamadi and Bohma, 2017; Morscher et al., 2017).

The aim of our study is to analyze peculiarities, pros and cons of fiscal decentralization and realize empirical testing of hypothesis on positive effect of fiscal decentralization on social and economic development items. Main contribution of the paper lies in testing of the hypothesis of positive influence of fiscal decentralization on different parameters of social and economic development and it's realization on the basis of panel data analysis for the set of European countries using the regression model in Stata 12/SE.

The concept of decentralization in general features was formed at the second half of XX century, but its key ideas appeared far more earlier. The greatest contribution to the development of the fundamental foundation of decentralization concept has been made by C. M. Tiebout (1956), R. A. Musgrave (1959), M. Olson (1969) and W. Oates (1972). According to Tiebout hypothesis (1956), decentralization enhances competition among subnational governments in providing impure public goods according to consumer-voter's preferences ("*Tiebout sorting*").

He states that it also contributes to the effectiveness of budgetary regulation of socio-economic development of regions (see also Ambroziak, 2016; Slusarczyk, 2018). R. A. Musgrave (1959) believed that the decentralization of intergovernmental relations contributed to the efficient allocation of resources or public goods.

M. Olson (1969) introduced the principle of *"fiscal equivalence"*, which requires subnational governments make decisions about the size of necessary both public spending and mobilized public revenues. This principle is considered as one of the fundamental principles of decentralization concept. W. Oates (1972) proposed a decentralization theorem that formalizes the efficiency of decentralized decision on providing local public goods.

It should be noted that the current stage of development decentralization reforms include political, administrative and fiscal decentralization. Each of the above-mentioned perspectives has its own specific features (Pimonenko, 2017; Pimonenko and Chigrin, 2014). Thus, political decentralization is aimed to transfer powers from central to local authorities, administrative decentralization is focused on transition of functional responsibilities from central to local governments, and fiscal decentralization is aimed at transforming financial relations between different levels of government (Sanusi et al. 2017). However, despite the existence of difference between these components of the concept of decentralization, as a rule, they are implemented together to ensure positive synergistic effect and maximum benefits for all economic agents.

Fiscal decentralization usually involves the transfer of a significant amount of budget authority to subnational government level with the simultaneous expansion of their financial capabilities. This corresponds to fundamental principle of decentralization concept and European Union legislation – subsidiarity of public services provision, which reflects the transfer of authority and responsibility of decision-making process to the lowest level (closely to the citizens) (Melnyk et al., 2018; Pilia, 2017). Unless, it is more effective at national or regional level.

1. LITERATURE REVIEW

Comprehensive analysis of FD consequences allows to summarize its positive and negative aspects. So, the most widespread positive results of FD can be summarized as follows: fostering accountability and transparency of local government activities (Feruglio and Anderson, 2008; Faguet, 2012; Vasylyeva et al., 2014), and improving quality of public service delivery through compliance the principle of subsidiarity (Martinez-Vazquez, 2011; Faguet, 2012; Zizlavsky, 2016). Despite broad support of fiscal decentralization measures, experts also emphasize the existence of certain risks of its implementation, such as: an increase of macroeconomic instability level due to lack of centralized control over local finances (Feruglio and Anderson, 2008; Siemiatkowski, 2017); high dependence of reform effectiveness on the competence of local authorities (Bahl, 1999; Hart and Welham, 2016; Bobenic Hintosova et al., 2018); lack of financial support for projects covering several jurisdictions (for example, repairing roads of that cover territory of several regions - Shah, 2004; Chygryn, 2016); deepening of horizontal imbalances and competition between municipalities for financial resources (Lyeonov et al., 2018). Therefore, taking into account all these risks and benefits of FD is an integral precondition of its effective implementation.

The main issue to be solved by FD is transfer of a number of liabilities to the level of sub-central governments in order to ensure the principle of subsidiarity of the provision of public services, as well as strengthening the fiscal autonomy of local governments by expanding the range of sources of own revenues formation. For that reason, there are two perspectives of FD in the world of practice such as: cost decentralization and revenue decentralization. In addition, FD may also result in the transformation of intergovernmental transfers system and expansion the capacity of subnational governments to carry out the external borrowings.

Despite a lot of positive sides of FD, there are many controversial empirical research results focusing on identification of FD influence on economic and social development (different empirical researches confirmed its positive, negative or insignificant influence).

The study of relationship between the measures of decentralization and socio-economic indicators have begun in 90s of the last century and included both single-country and cross-country studies with various time period, methods and models basis.

Many theoretical and empirical studies focused on the relationship between FD and economic growth (usually expressed through the Gross domestic product (GDP)). However, it should be noted that the researches had quite contradictory results. Thus, the positive and statistically significant cohesion between the indicator of decentralization and economic growth was confirmed by W. Oates (1993, 1995), A. Limi (2005), J. Martinez-Vazquez and R. McNab (2006), S. Leonov et al. (2012). In contrast, H. Davoodi and H. Zou (1998) proved a significant negative relationship, S. Yilmaz (2000), and T. Baskaran and F. Lars (2009) describe very weak and not statistically significant impact.

Some group of scholars paid particular attention to the interconnection of decentralization indicators and macroeconomic stability of the country. For instance, J. Rodden and E. Wibbels (2002), T. Vasilyeva et al. (2018) proved positive and statistically significant impact of FD on the reduction of state budget deficit and level of inflation. In contrast, B. Neyapti (2010) described negative and statistically significant impact of decentralization on macroeconomic stability.

Cohesion between decentralization and income inequality in academic circles is equally important (Nounamo Nguedie, 2018). Positive and statistically significant effect on the Gini coefficient was empirically confirmed by C. Sepúlveda and J. Martinez-Vazquez (2011), but B. Neyapti (2006) showed negative and statistically significant impact of income decentralization on household income inequality. Z. Scott (2009) researches relationships between decentralization and service delivery, economic development and social cohesion (in order to mitigate or exacerbate conflicts in society). This research reveales the next empirical results – lack of clear statistically significant impact of decentralization on economic development. However, targeting the local authorities in providing high-quality public services for their citizens could contribute to economic growth. This study also does not confirm positive / negative impact of statistically significant relationship of decentralization and conflict level in society.

The issue of the relationship between the results of decentralization reform and the social sphere indicators in the country is also the subject of theoretical and empirical researches (Nelson, 2017; Krasnyak and Chygryn, 2015). Worthy of note is the I. Szarowska (2014) study, which distinguishes such channels from decentralization to economic activity as government education spending, performance of the educational system, government capital spending, and human capital, that gives their theoretical substantiation. J. Faguet (2004), in his work, provided justification for the positive statistically significant impact of decentralization on providing higher quality educational and other social services at local level, at the same time more free access to population for these services (Faguet and Sanchez, 2014). There is also positive statistically significant relationship with regard to health services, but somewhat in comparison weaker than the same for educational services (Martinez-Vazquez et al., 2015).

J. E. Ligthart and P. van Oudheusden (2015), T. Prince (2017) examine the relationship between the indicator of decentralization of public service provision and trust to government-related institutions (confidence in national and local authorities, government, political parties, etc.). The result of this study among 42 countries over the period 1994-2007 was a confirmation of hypothesis that FD contributes to increasing public confidence in government-related institutions and leads to lower perceptions of corruption in government. Thus, because of controversial above mentioned results and dynamic change of worldwide socio-economic trends, it becomes necessary to realize up-to-date empirical comprehensive research on FD impact on different aspects of country social and economic development.

2. METHODOLOGY

In order to realize the above-mentioned task we tested the hypothesis about positive influence of FD on different measures of social and economic development of the country by using panel data regression model. Technically, it was realized with Stata 12/SE.

Traditionally, the regression equation can be described by the next formula:

$$y_{it} = \alpha + x_{it}\beta + v_i + \epsilon_{it} \qquad (1)$$

where y_{it} – dependent variable (measure of social or economic development);
x_{it} – independent variable (measure of fiscal decentralization);
$v_i + \epsilon_{it}$ - error term.

We are interested in finding value of coefficient β, as it illustrates how changes on fiscal decentralization measures affect country social and economic development measures.

Research is based on data collected for 12 European countries such as Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Moldova, Montenegro, Romania, Serbia, Slovenia, Turkey, and Ukraine. These countries were chosen because of geographical proximity and similarity of socio-economic development. Time horizon of the research is 2006-2015. There is no more recent data because the latest available period that allowed collecting balanced panel data was year 2015. All dependent variables (indicators of social and economic development) were collected from the World Development Indicators Database of the World Bank. The set of dependent variables include below:

- GDP (current US$);
- GDP growth (annual %);
- GNI per capita, purchasing-power parity (current international $);
- Exports of goods and services (% of GDP);
- Imports of goods and services (% of GDP);
- Inflation, GDP deflator (annual %);
- Foreign direct investment, net inflows (balance of payments, current US$);
- Employment to population ratio, 15+, total (%) (national estimate);
- Unemployment, total (% of total labor force);
- Social contributions (% of revenue).

All the above-mentioned indicators comprehensively describe different perspectives of country social and economic development. Key indicator is used to describe economic growth is GDP. Nevertheless, in some cases it is not informative to use absolute measure of GDP, so in numerous empirical researches it is often used GDP per capita or GDP growth rate. We added to the set of dependent variables both absolute and relative measures of GPD to increase feasibility of the results. We also used gross national income per capita indicator as a measure of country economic development, hence unlike GDP, it allows to assess somehow level of country residents' prosperity, and i.e. it takes into consideration incomes gained by residents inside and outside of the country of residence also. Using of both (GDP and GNI) indicators helps to get more adequate empirical results. In turn, export and import to GDP ratios are used to characterize countries' international trade activity that is an integral part of globalized economic relations.

Employment and unemployment rates and social contribution to revenue ratio illustrate social perspective of country development. We used employment to population ratio to characterize labor force country capacity, while unemployment to total labor force ratio reflects somehow the level of ineffective usage of labor force country capacity.

All independent variables (measures of FD) were collected from Fiscal Decentralization Reports of Network of Associations of Local Authorities of South-East Europe (NALAS), and indicators of fiscal decentralization for Ukraine were calculated according to NALAS methodology using statistical data from the reports provided by the State Treasury of Ukraine. Set of independent variables include the next indicators:

− Consolidated Public Revenues as % of GDP;
− Local Government Revenue as % of Public Revenue;
− Local Government Revenue as % of GDP;
− Own revenue as % of local government revenue;
− Shared taxes as % of local government revenue;
− Local Government Investments as % of total public investment.

According to NALAS methodology, consolidated public revenues include budget revenues and financial resources of off-budget social security funds. Consolidated Public Revenues to GDP ratio illustrates centralization of public finance sector, i.e. how much money redistributes via state budget. Higher level of this indicator characterizes higher level of centralization. In turn, local government revenue consists of all financial resources gained by local government, including local borrowings but excluding intergovernmental grants from the state budget. Besides, own revenue of local governments include inflows from local taxes; gains from the sale or rental of municipal assets; fines, penalties, also interest; local user fees and charges; fees for permits, licenses, and the issuance of official documents. Finally, shared tax is one of fiscal equalization policy instrument that allows to increase local budget's fiscal capacity throughout redistribution of revenues from collected national taxes.

Besides, local government investment to total public investment ratio was chosen as a measure of fiscal decentralization indicator. Since as a rule local governments have more or less enough financial resources to cover provision of basic public services at local level. So, adequacy of financial resource in financing certain investment issues in addition to basic public services financing is one of the evidences of local governments' satisfactory fiscal capacity and efficiency of fiscal decentralization implementation.

Research consists of a few stages: the first stage identifies influence of each separate independent variable on each certain indicator of economic development; the second stage identifies influence of all independent variables by adding a new variable to each next equation. Both stages were realized through using of panel data regression analysis of Stata 12/SE.

3. EMPIRICAL RESULTS

General information on the set of dependent and independent variables among 12 countries over the period 2006-2015 is presented in table 1. Data presented in the table allows to admit that quantity of observations is different for some variables (panel data set is slightly unbalanced), but this variance is not that much dramatic and does not affect the feasibility of empirical results. Besides, panel data regression instrument of Stata 12/SE has internal mechanisms, which help to deal with both balanced and unbalanced panel data.

Absolute measure of GDP is one of the main indicators of economic growth. For the researched period, its value in average is 113 billion US $. In 2016 the largest amount of GDP was in Turkey (863.711 billion US $), the lowest in Montenegro (4.374 billion US $). In turn, better evidences of economic dynamics could be described by relative measure such as GDP growth rate. The average growth of GDP of analyzed countries is 2.32% with variation of 4.28 for the period or research. It varies from -14.8% (minimum value) for Ukraine in 2006 to 11.11% (maximum value) for Turkey in 2011. On the average, the GNI per capita for our observations was 13950.25 US $,

which means that in this study was analyzed average upper-middle income countries (by classification of the World Bank). In fact, there were 16.7% of lower middle-income countries in 2015 (Moldova, Ukraine), and 83.3% of upper-middle income countries (Albania, Bosnia and Herzegovina, Romania, Macedonia, Montenegro, Bulgaria, Slovenia, Croatia, Turkey, Serbia).

Table 1. Descriptive statistics for the set of variables

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
GDP	120	1.13e+11	2.14e+11	2.70e+09	9.51e+11
GDPg	120	2.32	4.28	-14.80	11.11
GNIpc	120	13950.25	6440.61	3570.00	30590.00
Exp	120	40.76	12.99	20.45	76.99
Imp	120	55.38	15.37	23.36	97.14
Deflator	120	5.71	5.85	-0.99	38.88
FDI	120	3.48e+09	4.75e+09	-3.46e+08	2.20e+10
Empl	115	45.51	7.29	30.70	60.20
Unempl	120	14.26	8.31	3.90	36.1
Soc	95	28.73	11.06	0.00	39.82
DEC1	120	35.81	6.38	22.23	50.00
DEC2	120	20.51	13.72	7.00	66.25
DEC3	120	6.92	3.15	2.10	16.04
DEC4	116	36.24	14.81	10.00	83.00
DEC5	115	24.75	17.57	0.00	57.00
DEC6	110	44.38	29.46	10.00	188.52

Note: GDP – GDP, US $; GDPg - GDP growth, %; GNIpc - GNI per capita (PPP), US $; Exp - Exports of goods and services (% of GDP); Imp - Imports of goods and services (% of GDP); Deflator - Inflation, GDP deflator, %; FDI - Foreign direct investment, net inflows (BoP), US $; Empl - Employment to population ratio, 15+, total (national estimate), %; Unempl - Unemployment, total (% of total labor force); Soc - Social contributions (% of revenue); DEC1 - Consolidated Public Revenues (% of GDP); DEC2 - Local Government Revenue (% of Public Revenue); DEC3 - Local Government Revenue (% of GDP); DEC4 - Own revenue (% of local government revenue); DEC5 - Shared taxes (% of local government revenue); DEC6 - Local Government Investments (% of total public investment).

Source: author's calculation on the base of World Development Indicators database and NALAS Fiscal decentralization reports.

Likewise, the average value for exports of goods and services to GDP ratio is 40.76%, at the same time for import of goods and services to GDP ratio - 55.38%; this tendency allows to admit a situation of trade deficit. As for GDP deflator as measurement of economy's inflation among analyzed 12 European countries it is averaged at the level of 5.71%, that allows to conclude that walking type inflation existed in these countries. In 2015 the highest inflation level was in Turkey (8%) and Ukraine (17%), deflation was in Albania (-0.2%) and Croatia (-0.1%). Net inflows of foreign direct investment in average among analyzed countries is 3.179 billion US $. In 2015 the lowest level was in Moldova (90 million US $), the highest level in Turkey (12.307 billion US $).

The average employment to population ratio is 45.51% with variation of 7.29, which means that this amount of population is employed. In 2015 the lowest level of employment rate was in Bosnia and Herzegovina (31.1%), the highest level was in Slovenia (52.1%) and Ukraine (56.4%). The average unemployment rate is fixed at the level of 14.26%. In 2015, the lowest level was in Moldova (4.1%) and Romania (95.9%), the highest level was in Macedonia (23.7%) and Bosnia and Herzegovina (26%). As we can see, those two indicators are not directly related. Unemployment rate indicates only the number of unemployed population who are looking for job. Social contribu-

tions indicator among analyzed countries in average covers 28.73% of revenue. This indicator has the largest amount of missing values, and in 2015 was the lowest for Ukraine: 18% of revenue and the highest for Bosnia and Herzegovina (39% of revenue).

More detailed country-specific characteristic on averaged fiscal decentralization indicators for 2006-2015 is presented in figure 1 and 2.

Figure 1. Average values of local government revenue to GDP ratio and consolidated public revenue to GDP ratio for the period 2006-2015, %
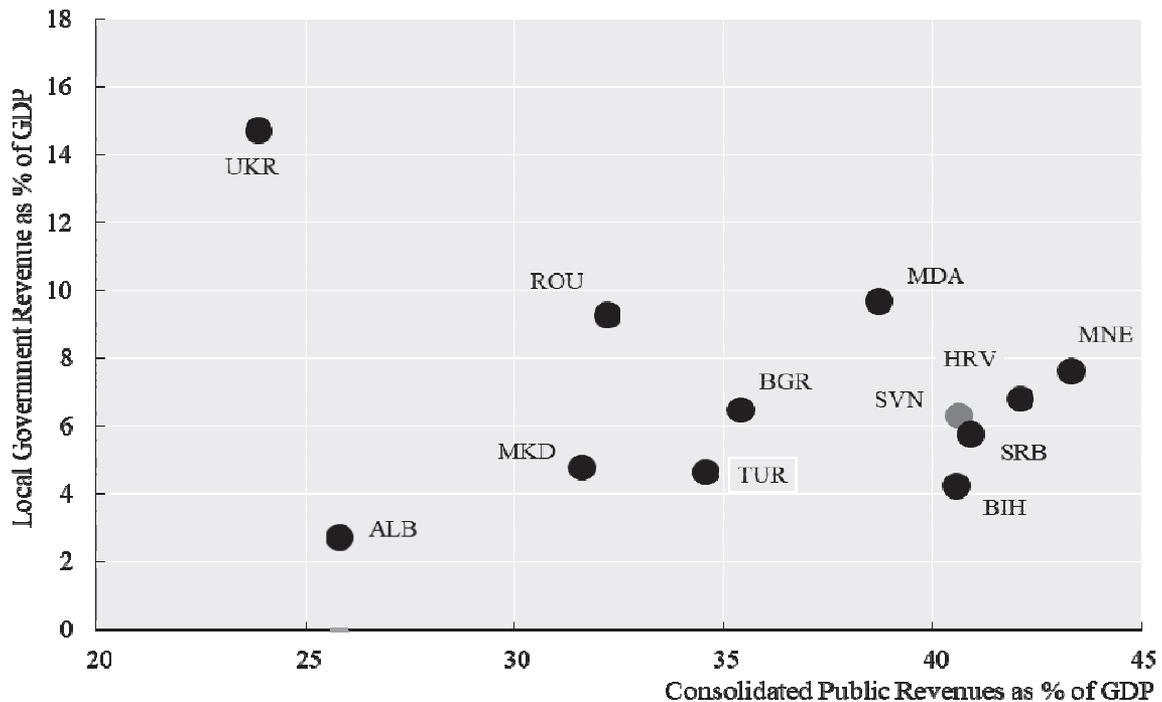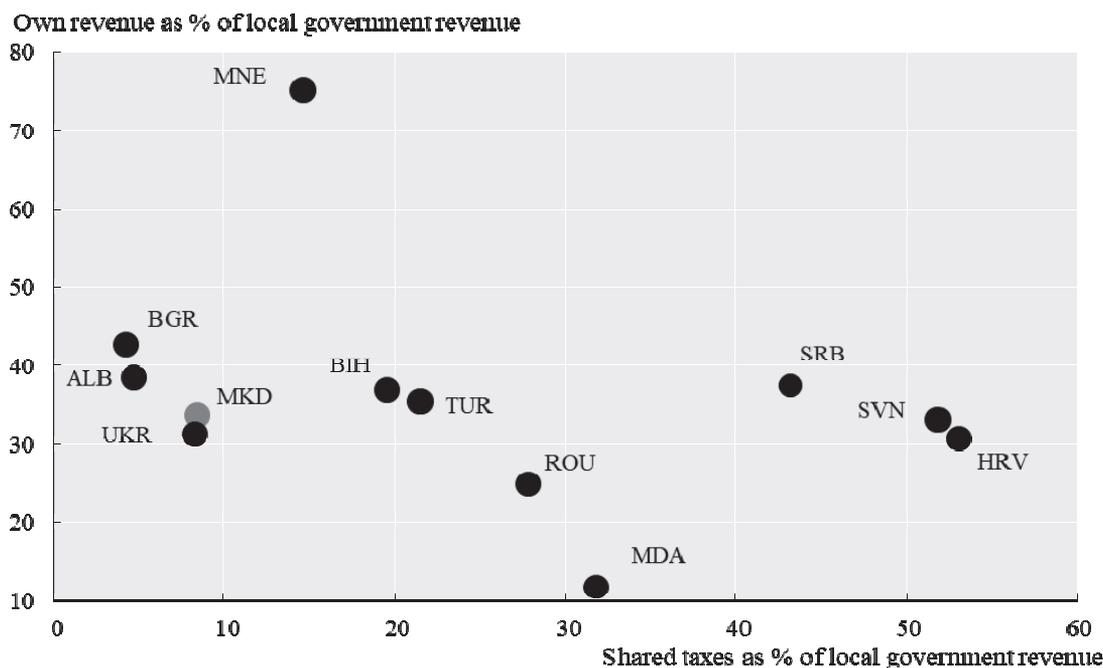

Note: ALB – Albania; BIH – Bosnia and Herzegovina; BGR – Bulgaria; HRV – Croatia; MKD – Macedonia; MDA – Moldova; MNE – Montenegro; ROU – Romania; SRB – Serbia; SVN – Slovenia; TUR – Turkey; UKR – Ukraine.
Source: author's calculation on the base of NALAS Fiscal decentralization reports.

According to the data (Figure 1) Ukraine, Albania, Macedonia, Romania and Turkey form the group of countries with less centralized public finance sector, because the level of consolidated public revenue to GDP ratio varies from 20% to 35%. In turn, the level of centralization in other countries can be characterized as moderate, because it does not exceed 50%, while value of the researched indicator in 50-60% illustrates a high level of centralization. It also should be noted that local government revenue to GDP ratio varies insignificantly across countries, and its average value for most of countries is in range between 4% and 10%. Nevertheless, there are extreme values of average local government revenue to GDP ratio in Ukraine (maximum value – 14.73%) and Albania (minimum value – 2.74%). Consequently, we can determine that Ukraine is the most decentralized country of the set, since it has the lowest level of centralization of GDP through state budget. However, at the same time it has the highest level of GDP redistribution through the local budgets. Other countries have moderate level of centralization both via state and local budgets. Not surprising, because it is one of the peculiarities of European model of GDP centralization via public finance system.

Figure 2. Averaged values of own revenue to local government ratio and shared taxes to local government ratio for the period of 2006-2015, %

Note: ALB – Albania; BIH – Bosnia and Herzegovina; BGR – Bulgaria; HRV – Croatia; MKD – Macedonia; MDA – Moldova; MNE – Montenegro; ROU – Romania; SRB – Serbia; SVN – Slovenia; TUR – Turkey; UKR – Ukraine.

Source: author's calculation on the base of NALAS Fiscal decentralization reports.

Data, presented in Figure 2, allows to subdivide countries according to the intensity of usage of such fiscal policy instruments as local taxes or shared taxes to ensure fiscal capacity of sub-central governments. Therefore, we can single out a group of countries (Ukraine, Macedonia, Bulgaria, and Albania), which have rather low expansion of shared taxes as fiscal instrument to ensure fiscal autonomy of sub-central governments and at the same time quite limited opportunity to accumulate own revenues, i.e. these countries have insufficient level of local budgets' fiscal capacity. Bosnia and Herzegovina, Romania and Turkey have balanced usage of both above-mentioned fiscal instruments. Serbia, Slovenia and Croatia more apt to use shared taxes to form financial resources of local budgets in contrast to the first group of countries. Two countries, Montenegro and Macedonia, have extremely opposite tendencies of these fiscal instruments' implementation. Montenegro has quite low level of shared taxes usage, but far more higher own revenue to local government revenue ratio, which evidences to high level of fiscal autonomy of sub-central governments. Contrary, Macedonia has extremely low own revenue to local government revenue ratio and significantly high level of shared taxes to local government revenue ratio. Thus, it can be assumed that sub-central governments in Macedonia financially dependent on state budget, especially national taxes and fees.

After a brief characteristic of key tendencies of dependent and independent variables dynamic, we can move to the core stage of the research – testing the hypothesis on positive influence of fiscal decentralization on country socio-economic development.

All statistically significant results are presented in the following tables. It should be noted that most of these results were gained on the first stage (testing of cohesion between separate variables), except table 6, where results of multiple panel data regression are presented.

Testing of the influence of FD indicators on GDP (table 2) allows to find out that increase of share of own revenue in local government revenue and shared taxes in local government revenue will likely result in increase of GDP (indicators are statistically significant at 90% confident interval). Thus, we can conclude that expansion of fiscal capacity of local governments via using of both fiscal instruments (optimization of local taxes system and efficiency of municipal property usage, and redistribution of national taxes) helps to increase the absolute measure of GDP.

Result for the other independent variables on the first stage and whole results for the second stage are statistically insignificant.

Table 2. Influence of FD indicators on GDP

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable - GDP (current US$)				
DEC4	1.60e+09	9.20e+08	1.74	0.082
DEC5	1.46e+09	8.11e+09	1.80	0.071

Testing of the influence of fiscal decentralization on GDP growth (table 3) allows to identify that 1% increase of shared taxes in local government revenue will force 0.058% of annual GDP growth (coefficient is statistically significant at 99% confident interval). The rest of the results are insignificant.

Table 3. Influence of FD indicators on GDP growth

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable - GDP growth (annual %)				
DEC5	0.058	0.023	2.57	0.010

Results from table 2 and 3 argue that shared taxes is the most viable instrument of fiscal decentralization in order not just to ensure fiscal autonomy of sub-central governments, but also to boost economic growth. These findings can be useful for modeling the optimal model of fiscal decentralization and fiscal equalization framework development.

Testing of the influence of fiscal decentralization on Gross National Income per capita (table 4) allows to identify that 1% increase of Local Government Revenue to GDP ratio will result in 357.54$ decrease of GNI per capita (results are significant at 90% confident interval). The other results are insignificant.

Table 4. Influence of FD indicators on Gross National Income per capita

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable - GNI per capita, PPP (current international $)				
DEC3	-357.54	212.24	-1.68	0.092

Testing of the influence of fiscal decentralization on Exports of goods and services to GDP ratio (table 5) allows to identify that 1% increase of Local Government Revenue to GDP ratio will result in 1.72% decrease of Exports of goods and services to GDP ratio (at 99% confident interval). The other results are insignificant. This effect can be explained by: from tables 1 and 2 it is obvious

that increase of local and shared taxes helps to achieve fiscal autonomy of sub-central govern-ments. Thus, expansion of fiscal decentralization (including increase of fiscal autonomy of sub-central governments) results in additional tax burden that can cause slight negative effect for ex-port-oriented companies. But this problem could be partially solved through using of tax exporting (when tax burden increase for non-residents – for instance, taxes on tourism, rent payments for the usage of municipal property etc.)

Table 5. Influence of FD indicators on Exports of goods and services to GDP ratio

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable - Exports of goods and services (% of GDP)				
DEC3	-1.72	0.49	-3.51	0.000

Testing of the influence of fiscal decentralization on Imports of goods and services to GDP ra-tio (table 6) allows to identify statistically significant impact of both Consolidated Public Revenues to GDP ratio (DEC1) and Local Government Revenue to Public Revenue ratio (DEC2) (stage 2). 1% increase of Consolidated Public Revenues to GDP ratio will lead to 0.963% increase of Imports of goods and services to GDP ratio (at 99% confident interval), but 1% increase of Local Government Revenue to Public Revenue ratio will result in 0.207% decrease of Imports of goods and services to GDP ratio (at 95% confident interval). The other results are insignificant.

Table 6. Influence of FD indicators on Imports of goods and services to GDP ratio

Variable	Coefficient	Standard error	Z	P>|z|
Dependent variable - Imports of goods and services (% of GDP)				
DEC1	0.963	0.260	3.71	0.000
DEC2	-0.207	0.106	-1.96	0.050
Cons	25.167	10.104	2.49	0.013

Therefore, we can summarize that centralization of public finance has positive impact on im-ports of goods and services to GDP ratio.

Testing of the influence of fiscal decentralization on Inflation (table 7) allows to conclude that 1% increase of Consolidated Public Revenues to GDP ratio will boost 0.281% inflation per year (at 90% confident interval). The other results are insignificant.

Table 7. Influence of FD indicators on Inflation

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable - Inflation, GDP deflator (annual %)				
DEC1	0.281	0.148	1.90	0.058

Contrary to the previous indicator, centralization of public finance has negative influence on price stability.

Testing of the influence of FD on net inflows of foreign direct investment (table 8) allows to find out that increase of Consolidated Public Revenues to GDP ratio and Local Government Revenue to

GDP ratio will stimulate inflows of foreign direct investment (at 95% confident interval). The other results are insignificant.

Table 8. Influence of FD indicators on net inflows of foreign direct investment

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable – Foreign direct investment, net inflows (BoP, current US$)				
DEC1	2.27e+08	1.02e+08	2.21	0.027
DEC3	4.88e+08	2.29e+08	2.13	0.034

There is no statistically significant influence of FD measures on Employment to population ratio (15+, national estimate), but increase of all independent variables except Local Government Investments to total public investment ratio (DEC6) results in decrease of unemployment to total labor force) ratio (table 9).

Table 9. Influence of FD indicators on Unemployment, total (% of total labor force)

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable – Unemployment, total (% of total labor force)				
DEC1	-0.169	0.106	-1.60	0.110
DEC2	-0.141	0.041	-3.42	0.001
DEC3	-0.579	0.233	-2.48	0.013
DEC4	-0.086	0.049	-1.74	0.083
DEC5	-0.084	0.043	-1.94	0.053

There is also statistically significant (except shared taxes to local government revenue ratio) and dominantly positive (except Local Government Revenue to GDP ratio) influence of fiscal decentralization measures on social contribution to revenue ratio (table 10).

Table 10. Influence of FD indicators on social contribution to revenue ratio

Variable	Coefficient	Standard error	z	P>|z|
Dependent variable – Social contributions (% of revenue)				
DEC1	0.395	0.159	2.48	0.013
DEC2	0.366	0.039	9.46	0.000
DEC3	-1.031	0.381	-2.71	0.007
DEC4	0.138	0.073	1.89	0.059
DEC6	0.043	0.018	2.36	0.018

CONCLUSION

We can summarize that, in most cases statistically significant impact of fiscal decentralization measures on different perspectives of country socio-economic development was confirmed (except employment to population rate). It should be noted that, increase of Consolidated Public Revenues to GDP ratio positively affected import of goods and services, inflow of foreign direct investments, social contribution, and triggered moderate inflation and decrease of unemployment.

Increase of local governments' fiscal autonomy (Local Government Revenue to Public Revenue ratio) stimulates expansion of social contributions, decrease of unemployment and impedes imports of goods and services. Otherwise, increase of Local Government Revenue to GDP ratio negatively affects gross national income per capita, social contributions, exports of goods and services, but stimulates foreign direct investments inflow and decrease of unemployment.

Furthermore, dynamic of GDP is positively affected by expansion of shared taxes in local budget revenues. It was found that shared tax is the most effective fiscal instrument used under the fiscal decentralization implementation that also allows to achieve positive country economic dynamic. It is also notable that, increase of own revenue of sub-central government positively affected absolute measure of economic dynamic. In turn, expansion of local government revenue (in most cases with the help of expansion of local taxation) can negatively affect international trade (both export and import of goods and services), so it will be better to shift tax burden from residents to non-residents through using tax exporting.

Generally, all the revealed tendency and cohesion confirmed a huge impact of fiscal decentralization on socio-economic development and might be taken into account to develop effective government economic policy.

ACKNOWLEDGMENT

REFERENCES

Ambroziak, A. (2016), "Income tax exemption as a regional state aid in special economic zones and its impact upon development of Polish districts", *Oeconomia Copernicana*, Vol. 7, No. 2, pp. 245-267. doi: https://doi.org/10.12775/OeC.2016.015.

Bahl, R. (1999), "Implementation rules for fiscal decentralization", *Working Paper* No. 99-1, Atlanta, GA: Andrew Young School of Policy Studies, Georgia State University, pp. 1-30.

Baskaran, T., Lars, F. (2009), "Fiscal Decentralization and Economic Growth in OECD Countries: Is There a Relationship?", *CESifo Working Paper* No. 2721, July.

Bobenic Hintosova, A., Bruothova, M., Kubíkova, Z. (2018), "Determinants of foreign direct investment inflows: A case of the Visegrad countries", *Journal of International Studies*, Vol. 11, No. 2, pp. 222-235.

Bodman, P., Ford, K. (2006), "Fiscal Decentralization and Economic Growth in the OECD", Macroeconomics Research Group, *Discussion Papers* 7, University of Queensland, Brisbane St. Lucia.

Chygryn, O. (2016), "The mechanism of the resource-saving activity at joint stock companies: The theory and implementation features, *International Journal of Ecology and Development*, Vol. 31, No. 3, pp. 42-59.

Davoodi, H., Zou, Heng-fu (1998), "Fiscal Decentralization and Economic Growth. A Cross-Country Study", *Journal of Urban Economic*, Vol. 43, pp. 244-257.

Faguet, J. P. (2004), "Does decentralization increase responsiveness to local needs? Evidence from Bolivia", *Journal of Public Economics*, Vol. 88, No. 3-4, pp. 867-893.

Faguet, J. P. (2012), *Decentralization and popular democracy: governance from below in Bolivia*, University of Michigan Press, Ann Arbor, MI.

Faguet, J. P., Sanchez, F. (2014), "Decentralization and access to social services in Colombia2, *Public Choice*, Vol. 160, No. 1-2, pp. 227-249.

Feruglio, N., Anderson, D. (2008), "Overview of Fiscal Decentralization" in *Fiscal Decentralization Handbook*, Chapter 1. United Nations Development Program, Bratislava Regional Center.

Hart, T., Welham, B. (2016), *Fiscal decentralization. A public financial management introductory guide*, Overseas Development Institute, Access mode: https://www.odi.org/sites/odi.org.uk/files/resource-documents/11063.pdf.

Hybka, M. (2016), "Allocating tax revenue to sub-central government levels: lessons from Germany and Poland", *Equilibrium. Quarterly Journal of Economics and Economic Policy*, Vol. 11, No. 4, pp. 689-709. doi: https://doi.org/10.12775/EQUIL.2016.031.

Limi, A. (2005), "Decentralization and economic growth revisited: an empirical note", *Journal of Urban Economic*, Vol. 57, pp. 449-461.

Krasnyak, V., Chygryn, O. (2015), "Theoretical and applied aspects of the development of environmental investment in Ukraine", *Marketing and Management of Innovations*, No. 3, pp. 226-234.

Lazányi, K., Virglerová, Z., Dvorský, J., Dapkus, R. (2017), „An Analysis of Factors Related to Taking Risks, according to Selected Socio-Demographic Factors", *Acta Polytechnica Hungarica*, Vol. 14, No. 7, pp. 35-50.

Leonov, S., Vasylieva, T., Tsyganyuk, D. (2012), "Formalization of functional limitations in functioning of co-investment funds basing on comparative analysis of financial markets within FM CEEC", *Actual Problems of Economics*, Vol. 134, No. 8, pp. 75-85.

Ligthart, J. E., Van Oudheusden, P. (2015), "In government we trust: The role of fiscal decentralization", *European Journal of Political Economy*, Vol. 37, pp. 116-128.

Lyeonov, S., Vasylieva, T., Lyulyov, O. (2018), "Macroeconomic stability evaluation in countries of lower-middle income economies" , *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu*, No. 1, pp. 138-146.

Martinez-Vazquez, J. (2011),"The Impact of Fiscal Decentralization: Issues in Theory and Challenges in Practice", *Asian Development Bank*, No. 5, pp. 1-21.

Martinez-Vazquez, J., Lago-Peñas, S., Sacchi, A. (2015), "The impact of fiscal decentralization: a survey", *Working Papers Collection A: Public Economic, governance and decentralisation* 1505, Universidade de Vigo, GEN-Governance and Economics Research Network.

Martínez-Vázquez, J., McNab, R. (2006), "Fiscal Decentralization, Macrostability and Growth", *Hacienda Pública Española*, Vol. 179, Ministerio de Hacienda, Madrid, pp. 25-50.

Melnyk, L., Sineviciene, L., Lyulyov, O., Pimonenko, T., Dehtyarova, I. (2018), "Fiscal decentralization and macroeconomic stability: The experience of Ukraine's economy", *Problems and Perspectives in Management*, Vol. 16, No. 1, pp. 105-114.

Mohamadi, B., Bohma, S. (2017), "Market-driven vs. government-driven banking consolidation around the world", *Financial Markets, Institutions and Risks*, Vol. 1, No. 2, pp. 96-99.

Morscher, C., Horsch, A., Stephan, J. (2017), "Credit Information Sharing and Its Link to Financial Inclusion and Financial Intermediation", *Financial Markets, Institutions and Risks*, Vol. 1,No. 3, pp. 22-33.

Musgrave, R A. (1959), *The Theory of Public Finance – A Study in Public Economy*, McGraw-Hill, New York.

Musgrave, R. A. (1980), "Approaches to a fiscal theory of political federalism" in B. Grewal, G. Brennan and R. Mathews (eds), *The Economics of Federalism*, Australian National University Press, Canberra.

Nelson, E. M. (2017), "Socioeconomic Challenges – A Global Perspective Evaluating Invisible Connections-Resolutioning Necessary Global Collaborative", *Socio Economic Challenges*, Vol. 1, No. 3, pp. 116-119.

Neyapti, B. (2006), "Revenue decentralization and income distribution", *Economics Letters*, Vol. 92, pp. 409-416.

Neyapti, B. (2010), "Fiscal decentralization and deficits: International evidence", *European Journal of Political Economy*, Vol. 26, pp. 155-166.

Nounamo Nguedie, Y. H. (2018), "Corruption, Investment and Economic Growth in Developing Countries: A Panel Smooth Transition Regression Approach", *Socio Economic Challenges*, Vol. 2, No. 1, pp. 63-68.

Oates, W. (1993), "Fiscal decentralization and economic development", *National Tax Journal*, National Tax Association, Washington, pp. 237-243.

Oates, W. (1995), "Comment on Conflicts and Dilemmas of Decentralization by Rudolf Hommes" in M. Bruno and B. Pleskovic (eds.), *Annual World Bank Conference on Development Economic*, The World Bank, Washington, pp. 351-353.

Oates, W. E. (1972), *Fiscal Federalism*, Harcourt Brace Jovanovich, New York.

Olson. M. (1969), "The Principle of 'Fiscal Equivalence': The Division of Responsibilities among Different Levels of Government", *American Economic Review*, Vol. 59, Issue 2, pp. 479-487.

Pilia, G. (2017), "Estonia and Lithuania in transition: A compared analysis of the change and its costs and benefits", *Business Ethics and Leadership*, Vol. 1, No. 2, pp. 12-19.

Pimonenko, T. (2017), "Efficiency of marketing communications in banks", *Business Ethics and Leadership*, Vol. 1, Issue 2, pp. 55-61, DOI 10.21272/bel.1(2).55-61.2017

Pimonenko, T., Chigrin, O. (2014), "The ways of corporate sector firms financing for sustainability of performance", *International Journal of Ecology & Development*, Vol. 29, No. 3, pp. 1-13.

Prince, T. (2017), "Behavioral Finance and the Business Cycle", *Business Ethics and Leadership*, Vol. 7, o. 1, pp. 28-48.

Rodden, J., Wibbels, E. (2002), "Beyond the fiction of federalism: Macroeconomic management in multitiered systems", *World Politics*, Vol. 54, No. 4, pp. 494-531.

Sanusi, K. A., Meyer, D., Slusarczyk, B. (2017), "The relationship between changes in inflation and financial development", *Polish Journal of Management Studies*, Vol. 16, No. 2, pp. 253-265. DOI: 10.17512/pjms.2017.16.2.22

Scott, Z. (2009), "Decentralisation, Local Development and Social Cohesion: An Analytical Review", *GSDRC Research Paper*, Governance and Social Development Resource Centre, University of Birmingham, UK.

Sekula, A., Smiechowicz, J. (2016), "Systems of general grants for local governments in selected EU countries against the background of the general theory of fiscal policy", *Equilibrium. Quarterly Journal of Economics and Economic Policy*, Vol. 11, No. 4, pp. 711-734. doi: https://doi. org/10.12775/EQUIL.2016.032.

Sekula, A. (2017), „Does system of local government subsidisation fulfil revenue equalisation function? Evidence from Poland", *Oeconomia Copernicana*, Vol. 8, No. 4, pp. 523-535. DOI: https://doi. org/10.24136/oc.v8i4.32.

Sepulveda, C., Martínez-Vázquez, J. (2011), "The consequences of fiscal decentralization on poverty and income inequality", *Environment and Planning C: Government and Policy*, Vol. 29, No. 2, pp. 321-343.

Shah, A. (2004), "Fiscal Decentralization in Developing and Transition Economies: Progress, Problems, and the Promise", *Policy Research Working Paper* No. 3282, World Bank, Washington, D.C.

Siemiatkowski, P. (2017), "External financial security of the European Union member states outside the eurozone", *Journal of International Studies*, Vol. 10, No. 4, pp. 84-95.

Simionescu, M., Lazányi, K., Sopková, G., Dobeš, K., Balcerzak, A. P. (2017), „Determinants of economic growth in V4 Countries and Romania", *Journal of Competitiveness*, Vol. 9, No. 1, pp. 103–116.

Slusarczyk, B. (2018), "Tax incentives as a main factor to attract foreign direct investments in Poland", *Administration & Public Management Review*, Vol. 30, pp. 67-81.

Szarowska, I. (2014), "Fiscal Decentralisation and Economic Development in Selected Unitary European Countries", *European Financial and Accounting Journal*, University of Economics, Prague, vol. 2014(1).

Tiebout, C. M. (1956), "A Pure Theory of Local Expenditures", *The Journal of Political Economy*, Vol. 64, No. 5, pp. 416-424.

Vasylyeva, T., Leonov, S., Lunyakov, O. (2014), "Countercyclical capital buffer as a macroprudential tool for regulation of the financial sector", *Actual Problems of Economics*, Vol. 158, No. 8, pp. 278-283.

Vasilyeva, T. Lyeonov, S., Adamickova, I., Bagmet, K. (2018), "Institutional quality of social sector: The essence and measurements", *Economics and Sociology*, Vol. 11, Issue 2, pp. 248-262.

Yilmaz, S. (2000), "The Impact of Fiscal Decentralization on Macroeconomic Performance", National Tax Association, *Proceeding of the 92° Annual Conference on Taxation*, Atlanta, October, 24-26.

Zizlavsky, O. (2016), "The Use of Financial and Nonfinancial Measures within Innovation Management Control: Experience and Research", *Economics and Sociology*, Vol. 9, No. 1, pp. 41-63.