ROBERT PATER*
ŁUKASZ CYWIŃSKI**

Optimal Size of the Public Sector in Poland in Terms of Employment

Introduction

The public sector is the fraction of the economy made by all government and government-controlled enterprises – in other words, the economy excluding private companies, voluntary organisations, and households. Upfront, the government fulfils its function regarding stabilisation, allocation, and distribution of resources by running a budget. It executes the so-called classical functions of government by ensuring the provision of public goods and services, and by ensuring macroeconomic stability. This task is very complex and depends on an abundant number of determinants – from taxation to geopolitical situation. Essentially government could not fulfil its promises if it did not possess accumulated resources in the form of the public sector.

In this article, we propose a new approach to the measurement of the optimal size of the public sector. The current most common approach is based on government expenditures as a proxy of the government size. We suggest a broader method, by defining the size of the public sector as a share in the gross value of fixed assets ('physical capital') and employment ('labour'). It gives us information about optimal 'assets' of the public sector, and not only its expenditures. We do not aim at evaluating the quality, usefulness or necessity of keeping certain assets of the public or private sector that might be connected to cultural or political context. We simply want to test what relations of the public sector to the private sector would maximize gross domestic product (GDP). We use data for 2002–2014 and assume actual development of main economic aggregates in Poland during this period. Thus, we analyse whether changing the composition of sectors in

* Robert Pater – Department of Economics, University of Information Technology and Management in Rzeszów; e-mail: rpater@wsiz.rzeszow.pl

** Łukasz Cywiński – Department of Economics, University of Information Technology and Management in Rzeszów; e-mail: lukaszcywinski@outlook.com

terms of ownership could lead to a higher GDP, providing no other structural or qualitative change occurs in the Polish economy. We analyse the Polish economy, thus the results are valid only for this economy specific features: its institutional system, economic development model, and other properties.

The efficiency of the public sector depends on the history of the development of institutional nexus and its unique experiences. As a case study for our research, we select Poland. The reason is twofold. First, historically, Polish economy went through the process of deep institutional transformation, characterised by a specific sectoral transition of fixed assets. The initial share of the public sector in the economy was very high, but in the course of extensive privatisation that started in 1989 it has been reduced significantly. Second, there are clear-cut statistical data. Central Statistical Office in Poland publishes capital stock and employment data for the national economy in the breakdown according to the ownership sector and NUTS-2 region.

Poland is an interesting case, because during the analysed period, 2002–2014, public sector size has been gradually diminishing. If we interpret these changes as a shift in the institutional configuration, it is worth finding whether there is an optimal public-sector size and, if so, whether the economy is heading towards it, or driving away from it.

The remainder of this paper is organized as follows. The first section reviews theoretical and empirical research on the relationship between government size and economic growth. The second section describes sources of data and methods of research. The third section contains the analysis of results. The summary is enclosed in the concluding remarks.

1. Literature review

Many economists (Samuelson 1954, pp. 387–389; Tiebout 1956, pp. 416–424; Stiglitz 1982, pp. 17–53; and Auerbach 2009, p. 22) conceptualise the interplay between public and private sectors by applying the framework developed by Musgrave (1939, pp. 213–237). They see the government as a redistributor of taxes with three basic functions: allocation, distribution of public goods and stabilisation. Others (Atkinson 1987, pp. 5–15; Friedman 1980) share Buchanan's (1999, pp. 220) view on the government as "rules of institutions through which individual human beings act collectively rather than individually or privately".

Early contemporary empirical research on the optimal relationship between public and private sectors, conducted to test the above mentioned points of view, dates back to Katz et al. (1983, pp. 871–886) and Korpi (1985, pp. 97–118). Both studies used government expenditures as a proxy of the size of the public sector. According to Stiglitz (2000, p. 39) "no single number can provide an accurate indicator of the government's effect on the economy." Nevertheless, the evaluation of public expenditures allows us to examine the share of the government in the economy. The above mentioned research indicates that we can use government ex-

penditures to overview the economic policy. For instance, while applying a 'treatment policy' to stimulate industrial production during the contraction.

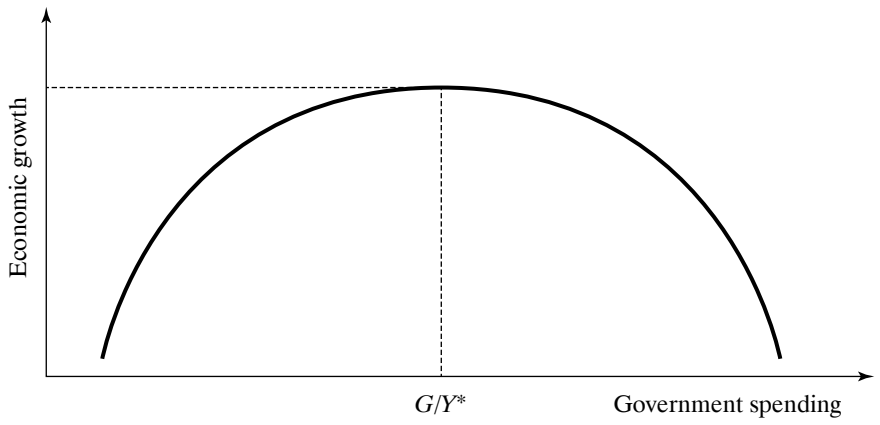
The majority of empirical research on the optimal relationship between public and private sectors use government expenditures as the approximation of the size of the public sector (Gupta et al. 2001, pp. 1–44; Martins and Veiga 2014, pp. 578–597; Pater and Skica 2014, pp. 120–137). Some economists experimented with other data, for instance by creating the opportunity-cost-efficiency-indicators (Afonso et al. 2005, pp. 321–347). Those indicators made it possible to widen and deepen our understanding of various institutional processes on the global scale, for instance by allowing in-depth analysis of institutional quality (see Afonso & Jalles 2016, pp. 83–109).

If we compare both streams of research – those that approximate the size of the public sector using government expenditures and those that use different indicators, e.g. government-efficiency indicators or institutional-quality indicators – we observe that the relationship regarding the impact on economic growth could be either linear or reverse-parabolic. In the case of government expenditures, new research indicates a reverse-parabolic relation, wherein threshold points on the optimal level of expenditures (Asimakopolos and Karavias 2016, pp. 65–68). In the case of institutional quality indicators, the relationship is linear, which means that good institutions positively correlate with economic growth (Acemoglu and Robinson 2012).

Not only economists are interested in an optimum share of government expenditures in the economy, but also politicians. In 1995 Richard Armey introduced this issue to the US Congress. Since then, the visualisation of the government expenditure level that maximises the economic growth is called the Armey curve (Figure 1). According to Armey's visualisation of the threshold, to some point, government expenditures produce positive effects for economic growth, but after passing that point, they create negative effects (see Afonso and Jalles 2016, pp. 83–109, for a detailed explanation).

Figure 1

Armey Curve



Source: Vedder & Gallaway (1998, p. 2).

There is a lot of empirical studies about optimal government expenditures. Scully (1994, pp. 1–17; 1998, p. 4; 2000; 2003) for instance conducted a series of in-depth research on the government expenditures and found that they should equal 20% of the gross domestic product to maximise economic growth. Gupta et al. (2001, pp. 1–44) and Afonso et al. (2005, pp. 321–347) showed that when government expenditures exceed 30% of GDP, they negatively affect the economic growth.

To sum up, previous assessments of the size and scope of the public sector in the literature concentrated on fiscal variables as indicators of government size. They provided useful insights regarding a vast array of institutional configurations. In most cases, investigators used government expenditures as an approximation of the size of the public sector. They used only the 'flow' variables and not the accumulated level (stock) of public sector production factors. These measures can be used to evaluate government efficiency, but are poor indicators of public sector size.

We provide a new approach, by using stock-variables, covering the whole public sector (not only the government) and reaching deeper than fiscal variables. We measure the size of the public sector by employment (the labour input to economic growth) and gross value of fixed assets (the stock of physical capital). With this data, we model gross domestic product per capita as a function of production factors in the public and private sector. To our knowledge, this might be the first attempt of this kind.

2. Data and methods

Our data come from the Local Data Bank (Central Statistical Office). We use data on NUTS-2 Polish regions (voivodships) across 2002–2014. Data on employment come from 'labour market' category – 'employment by other division than PKD' subcategory. They encompass employed (in the actual workplace) in private and public sector. Data on the gross value of fixed assets in the national economy are available from 'investments and fixed assets' category, 'tangible and fixed assets' subcategory. Employment and fixed assets value are available in the breakdown of ownership sector, that is in the private and public sector. These data represent whole sectors. The public sector includes state government, local governments, and publicly-owned enterprises. We took the data on GDP from 'regional accounts' category; they are not available in the breakdown of public and private sectors. Descriptive statistics are presented in Table 1.

The lowest value of employment was in the Lubuskie voivodship in 2003 and the highest in Mazowieckie in 2014. The lowest value of gross value of fixed assets was also in the Lubuskie voivodship in 2002 and the highest in the Mazowieckie voivodship in 2014. During the analysed period, the fastest developing voivodship was Mazowieckie, and the slowest developing one was the Opolskie voivodship.

We analyse gross domestic product per capita in Poland as a function of production factors and the public to private sector ratios. The model takes the form:

$$y_{i,t} = \beta_1 k_{i,t} + \beta_2 l_{i,t} + \gamma_1 \left(\frac{kr}{ku}\right)_{i,t} + \gamma_2 \left(\frac{kr}{ku}\right)^2_{i,t} + \gamma_3 \left(\frac{lr}{lu}\right)_{i,t} + \gamma_4 \left(\frac{lr}{lu}\right)^2_{i,t} + \alpha_i + \varepsilon_{i,t}, \quad (1)$$

Table 1
Descriptive statistics

	Min.	1st Q.	Median	Mean	3rd Q.	Max.	St. dev.
Real GDP per capita	100.0	110.6	125.6	123.0	133.3	151.2	13.7
Gross value of fixed assets	37,028.0	71,429.05	104,039.9	143,547.7	171,809.5	681,031.1	115,956.9
Employ-ment	277,518.0	427,247.2	715,809.5	831,867.3	1,011,618.3	2,342,985.0	500,621.4

Source: own elaboration.

Where $y_{i,t}$ is real GDP per capita (in constant prices of the previous year, 2002 = 100), $k_{i,t}$ is gross value of fixed assets in millions of PLN (stock of physical capital), $l_{i,t}$ is employment (labour input). They represent the typical measures of production factors, which serve as controlling variables in our model. All of the above variables were expressed in natural logarithms. $kr/ku_{i,t}$ is the stock of fixed assets in private and public sector ratio and $lr/lu_{i,t}$ is the employment in private and public sector ratio. α, β and γ are parameters to estimate. α_i may be random or fixed, which will be subject to testing, and $\varepsilon_{i,t} \sim NID(0,\sigma_\eta^2)$ is an error term. $i = 1, \ldots, 16$ denotes NUTS-2 region and $t = 2002, \ldots, 2014$ denotes year.

We tested random effects (GLS estimator) against within estimator using Hausman test. In the case of random effects, we tested random effects estimator against Hausman-Taylor (HT) estimator to find whether the unobservable random effects are not correlated with some other explanatory variables (see Hausman and Taylor 1981, pp. 1377–98). We also tested external instruments (2SLS estimator). We used the public to private sector ratios in the non-profit sectors as instruments, but the null hypothesis was never rejected at conventional significance levels. We also tested the inefficiency in the production process using the likelihood ratio (LR) test. Less than full efficiency in the production process means that its efficiency has a stochastic frontier. In this case, the error term from equation (1) equals $\varepsilon_{i,t} = (\eta_{i,t} - \vartheta_{i,t})$, where $\eta_{i,t} \sim NID(0,\sigma_\eta^2)$ and $\vartheta_{i,t} \sim N(z_{i,t}\gamma_k,\sigma^2)$. $\vartheta_{i,t}$ are independently distributed non-negative random variables, obtained by truncation at zero of the normal distribution (Battese and Coelli 1995, pp. 325–332). In such a model, private to public sector ratios are not in the GDP equation, but in vector $z_{i,t}$ in the inefficiency equation $\vartheta_{i,t} = z_{i,t}\gamma_k + \xi_{i,t}$. Technical efficiency in the production process is computed as $TEP_{i,t} = \exp(-\vartheta_{i,t}) = \exp(z_{i,t}\gamma_k - \xi_{i,t})$. γ_k is a vector of parameters to be estimated, and $k = 1, \ldots, 4$. $\xi_{i,t}$ is a random variable resulted from truncation of the normal distribution at $z_{i,t}\gamma_k$. Error term $\upsilon_{i,t}$ from equation (2) is defined analogously.

3. Results

In 2002 45% of gross value of fixed assets in Poland belonged to the public sector (Figure 2, left panel). In the following years, it slowly decreased to 40% in 2014. Changes in the share of public sector employment were closer to linear and faster. Our research confirms the rich anecdotal evidence that suggests agriculture is the least productive sector in Poland. The share of the gross value of fixed assets in this sector equalled 6% of the total in 2014, and the share of employment equalled 17% of total employment. Low value added generated by this sector (3% only) shows that this sector significantly lowers the country's productivity. The reason for low productivity comes from the ownership structure dominated by individual fragmented agriculture – run by households. After we excluded this sector, the share of public sector employment increases considerably, and its share in the stock of fixed assets increases only slightly (Figure 2, right panel). Time trends do not differ noticeably in comparison to the case wherein this sector was included.

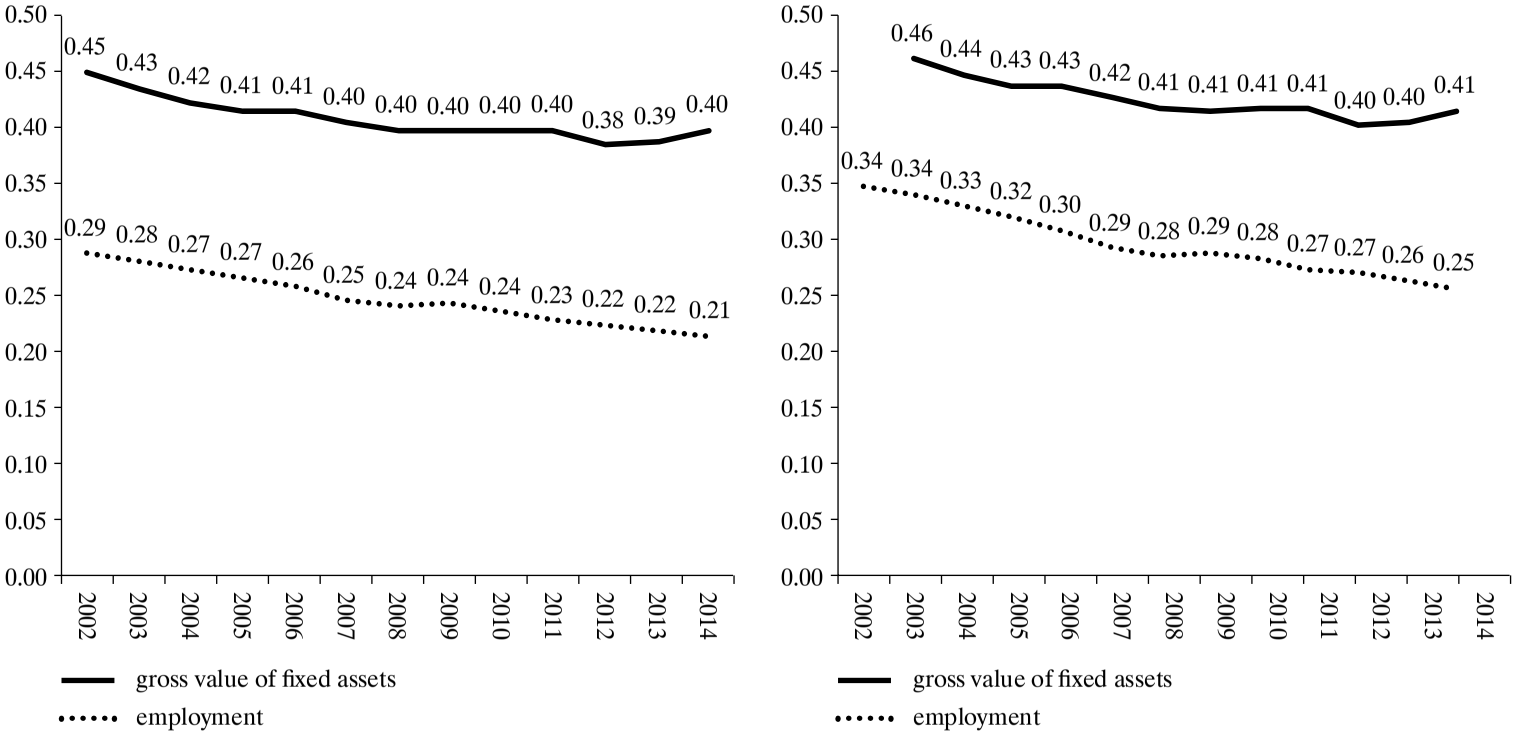
We started modelling real GDP per capita. The estimates of an aggregate production function were shown in Table 2. The baseline model (1) showed decreasing returns to scale; a typical result for a lower than country level of spatial aggregation (Basu and Fernald, 1997, pp. 249–283). Model (2) shows estimates with private to public sector ratios. We showed the Hausman-Taylor method estimates, which were the most appropriate. We tested the inefficiency in the production process but found it to be insignificant. Likelihood ratio test showed full technical efficiency of the production process with our assumptions.

The results indicated that the optimal share of the public sector regarding employment in the Polish economy is lower than then the one observed in 2002–2014. We have estimated it at 20%. This value is lower than the average for the analysed period (25%) and slightly lower than the lowest share, observed in 2014 (21%). Therefore, the relative employment in the public sector in 2008–2014 was higher than the one that maximizes GDP per capita. Regarding the gross value of fixed assets, we did not find the optimal ownership sectors relation, as the coefficients representing these relations were insignificant.

Models (1) and (2) describe the behaviour of the economy in the long run. Model (3) shows short-run estimates, i.e. behaviour of the economy over the business cycle or, fluctuations around the long-run trend. Also, in this case, we did not find optimal physical capital stock. Regarding employment, the maximum short-run economic growth would occur when the share of the public sector was 24%. This estimate is higher than the one in the long run. It is slightly lower than our sample mean, but higher than at the end of this period. We can interpret this result by referring to the business cycle properties. Investing in equipment instead of employment is profitable as it boosts productivity. In such a case employment costs may also diminish, which is especially profitable in the short run. Moreover, allocation of the workforce in the services, especially in the public sector, in opposition to the production sector, narrows the amplitude of cyclical fluctuations. Production sector reacts stronger to shocks than services (Pater 2015, pp. 67–93).

Figure 2

Relative size of the public sector in Poland, with agriculture (left panel), without agriculture (right panel)



Source: Local Data Bank, Central Statistical Office in Poland.

Table 2

Aggregate production function estimates with public and private sector ratios

	(1) Baseline	(2) Hausman Taylor	(3) First differences	(4) Within	(5) Efficiency effects
Dependent variable	GDP per capita			Gross value added per capita (agriculture excluded)	
const		1.84* (1.08)	0.02*** (0.004)		7.26*** (0.17)
$k_{i,t}$	0.39*** (0.02)	0.35*** (0.03)	0.02 (0.07)	0.06 (0.07)	0.38*** (0.05)
$l_{i,t}$	0.47*** (0.07)	0.14* (0.08)	0.35*** (0.11)	0.45*** (0.12)	–0.11** (0.05)
$kr/ku_{i,t}$		0.04 (0.07)	0.01 (0.06)	–0.13** (0.06)	0.12 (0.19)
$(kr/ku)^2_{i,t}$		–0.002 (0.02)	–0.001 (0.02)	0.06*** (0.02)	–0.02 (0.17)
$lr/lu_{i,t}$		0.30*** (0.06)	0.29*** (0.08)	0.18*** (0.05)	–0.75*** (0.07)
$(lr/lu)^2_{i,t}$		–0.04*** (0.01)	–0.05*** (0.01)	–0.03*** (0.01)	0.12*** (0.14)
$const_{efficiency}$					1.21*** (0.03)
σ^2					0.005*** (0.0006)
γ					0.99*** (0.10)
Optimal share	–	0.20	0.24	0.24	0.24
Mean observed share	–	0.25		0.29	
Last observed share	–	0.21		0.25	
F-Statistic	1114.9 [<0.01]	432.0 [<0.01]	9.7 [<0.01]	9.5 [<0.01]	9.7 [<0.01]
Hausman ()	196.0 [<0.01]	86.7 [<0.01]	–	100.8 [<0.01]	–
Likelihood ratio ()	–	–	–	–	125.3 [<0.01]
Mean efficiency	1.00	1.00	1.00	1.00	0.79

p-value: significant at *** 0.01 ** 0.05 * 0.10. Std. errors in (), *p*-values in []. In the efficiency effects model (1c) inefficiency was modelled, thus sectoral ratios signs should be interpreted in an opposite way.

Source: own elaboration.

High amplitude of cyclical fluctuations can be harmful to the economy, as it increases public expenditures and costs of companies' adjustments (in this case, the costs of hiring and firing workers). This is why diminishing public sector relative size would, in the long run, increase economic growth, but in the short run, it might require higher compensation of temporary negative economic and social effects during recessions.

We think that over-employment in the agricultural sector may influence the results. It motivated us to re-specify further models. In models (4) and (5) we excluded agricultural sector. Model (4) shows the efficient within estimator results. We also found significant inefficiency in the production process (model 5). Both models gave the same results regarding the optimal relative size of employment in the public sector. According to them, 24% of employment (agriculture excluded) should remain in the public sector to maximize economic growth. Similar to previous models, these results can be interpreted as the need to decrease the relative size of the public sector in Poland in the long run. Efficiency effects model shows that the sub-optimal employment relations between the ownership sectors statistically significantly reduced production process efficiency. To increase it, the relation between public and private sector should be reduced.

Conclusions

Our results supplement previous assessment of the public sector optimal size. We analysed the impact of the relations between the public and private sector on GDP and productivity. We proposed a broad measure of the public sector based on the stock of gross fixed assets and employment. Such an approach is uncommon in the literature. We think that it gives significant additional information about the optimal size of the public sector, often measured only by expenditures. Its advantage comes from the fact that it is broader than the expenditure approach, encompassing not only fiscal flows but whole assets the economy is equipped in. We are aware that our approach does not have easy-to-apply policy recommendations. The current approach, the one based on expenditures, has a more straightforward fiscal policy application. Our method, however, aims at evaluating the relative size of all public assets. It more accurately captures the actual size of ownership sectors, not only current expenditures.

Data for Poland allowed us to estimate this relation empirically. Since the Central Statistical Office in Poland publishes capital stock and employment in the national economy in the breakdown according to the ownership sector, we were able to calculate the optimal size of the public sector in Poland.

The previous approach to measuring optimal public sector size showed that government expenditures should be within 20%–30% of the gross domestic product to maximise economic growth. We showed that in the case of Poland employ-

ment in the public sector optimally should be around 21% for the whole economy and 24% without agricultural sector. We did not find an optimal share of the gross value of public fixed assets. The results show that regarding labourinput, the optimal size of the public sector should be one percentage point lower than the actual public sector size observed in Poland in 2014. Relations between the public and private sectors can be changed through long-run policy. This is why these results are important for formulating public policy directed to maximising economic growth.

We also found that, in the short run, increasing public sector employment share would decrease economic growth. It does not interfere with the general conclusion that diminishing relative employment in the public sector would be beneficial in the long run. Supporting the potential production should be one of the main objectives of economic policy. However, the results show that lower public sector employment might lead to a higher business cycle variance, i.e. steeper expansions, but also more profound recessions. It would result in more costly short-run adjustments for the economy and society. In such a case possibly more governmental automatic stabilisers would be needed, e.g. tax adjustments and transfer systems, such as unemployment insurance, to reduce temporary harmful effects for the economy and society.

Received: 12 April 2018
(revised version: 5 February 2019)

Bibliography

Acemoglu D., Robinson J., *Why Nations Fail. The Origins of Power, Prosperity and Poverty*. Crown, New York 2012.

Afonso A., Jalles J.T., *Economic Performance, Government Size, and Institutional Quality*, "Empirica" 2016, no. 43.

Afonso A., Schuknecht L., Tanzi V., *Public Sector Efficiency. An International Comparison*, "Public Choice" 2005, no. 123.

Asimakopolos S., Karavias Y., *The Impact of Government Size on Economic Growth. A Threshold Analysis*, "Economic Letters" 2016, no. 139.

Atkinson A.B., *James M. Buchanan's Contributions to Economics*, "The Scandinavian Jour nal of Economics" 1987, no. 89 (1).

Atkinson A.B., *The Collected Papers of Richard A. Musgrave: A Review Article*, "Journal of Public Economics" 1987, no. 33.

Auerbach J.A., *Public Finance in Practice and Theory*, 2009, https://eml.berkeley.edu//~auerbach/pfpt_7_09.pdf (02.01.2018).

Basu S., Fernald J., *Returns to Scale in U.S. Production. Estimates and Implications*, "Journal of Political Economy" 1997, no. 105.

Battese G.E., Coelli T., *A Model for Technical Inefficiency Effects in a Stochastic Frontier Production Function for Panel Data*, "Empirical Economics" 1995, no. 20.

Buchanan J.M., *The Calculus of Consent. Logical Foundations of Constitutional Democracy*, The Calculus of Consent: Logical Foundations of Constitutional Democracy, 1962, http://files.libertyfund.org/files/1063/Buchanan_0102–03_EBk_v6.0.pdf (02.01.2018).

Buchanan J.M., Musgrave R.A., *Public Finance and Public Choice: Two Visions of the State*, MIT Press, 1999.

Central Statistical Office, https://bdl.stat.gov.pl/BDL/dane/podgrup/temat (26.10.2017).

Friedman M., *Free to Choose,* PBS TV Series, 1980, http://miltonfriedman.blogspot.com/ (02.01.2018).

Gupta, S., Leruth L., de Mello L., Chakravarti S., *Transition Economies. How Appropriate Is the Size and Scope of Government?* IMF Working Paper No. 55, International Monetary Fund, Washington 2001.

Hausman J.A., Taylor W.E., *Panel Data and Unobservable Individual Effects*, "Econometrica" 1981, no. 49.

Katz C.J., Mahler V.A., Franz M.G., *The Impact of Taxes on Growth and Distribution in Developed Capitalist Countries: A Cross-National Study*, "American Political Science Review" 1983, 77.

Korpi W., *Economic Growth and the Welfare System: Leaky Bucket or Irrigation System?* "European Sociology Review" 1985, no. 1.

Martins S., Veiga F.J., *Government Size, Composition of Public Expenditure, and Economic Development*, "International Tax Finance" 2014, no. 21.

Mazzucato, M. *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*, Anthem Press, London 2013.

Musgrave R.A., *The Voluntary Exchange Theory of Public Economy*, "The Quarterly Journal of Economics" 1939, no. 53 (2).

Pater R., *The UK Business Cycle and the Structure of the Economy*, in: *Economic Cycles and Uncertainty*, ed. K. Walczyk, "Prace i Materiały Instytutu Rozwoju Gospodarczego", vol. 97, Szkoła Główna Handlowa, Warszawa 2015, p. 67–93.

Pater R., Skica T., *The Productivity of Public and Private Sector in Poland*, "Business and Economic Horizons" 2014, no. 10 (2).

Samuelson P. A., *The Pure Theory of Public Expenditure*, "The Review of Economics and Statistics" 1954, no. 36 (4).

Scully G.W., *What Is the Optimal Size of Government in the United States?* National Center for Policy Analysis Report 1994, No. 188.

Scully G.W., *Measuring the Burden of High Taxes,* National Centre for Policy Analysis Re port 1998, No. 215.

Scully G.W., *The Growth-Maximizing Tax Rate*, "Pacific Economic Review" 2000, no. 5(1).

Scully G.W., *Optimal Taxation, Economic Growth and Income Inequality*, "Public Choice" 2003, no. 115.

Stiglitz J., *Economics of the Public Sector* (3rd ed.), W.W. Norton & Company, New York 2000.

Stiglitz J. E., *The Theory of Local Public Goods Twenty-Five Years After Tiebout: A Perspective,* 1982, http://www.nber.org/papers/w0954.pdf (02.01.2018).

Tiebout C.M., *A Pure Theory of Local Expenditures*, "Journal of Political Economy" 1956, no. 54(5).

Vedder R.K., Gallaway L.E., *Governnment Size and Economic Growth*, Joint Economic Committee, Washington 1998, https://www.jec.senate.gov/public/_cache/files/014ee573-5f0d-45e5-8cc0-869a465c7b36/government-size-and-economic-growth---dec-1998.pdf (02.01.2018).

OPTIMAL SIZE OF THE PUBLIC SECTOR IN POLAND IN TERMS OF EMPLOYMENT

Abstract

The paper contributes to the literature on the public sector optimal size. The most common approach to measure the optimal size of the public sector is based on government expenditures. The authors propose a broader approach to public sector size measurement and define it by the share in the gross value of fixed assets and the share in employment. The approach is based on the stocks of accumulated capital and labour. Contrary to most of the literature, it gives a clear answer on the optimal employment share in the public sector that leads to maximizing gross domestic product per capita.

The authors use Poland as an interesting case study. Public sector size in Poland evolved during 2002–2014, thus at some point it may have achieved the optimal size. The authors analyse the effects of changes in the public sector size on gross domestic product per capita. The authors find that: (a) agricultural sector seriously lowers private sector productivity; (b) the optimal share of the public sector employment in Poland is 20%, and 24% excluding agriculture; (c) the actual share of the public sector in employment in 2014 was one percentage point larger than that which would maximize gross domestic product per capita; (d) there is significant inefficiency in the production process in Poland that can be explained by suboptimal public sector share.

Keywords: public sector, optimal size, ownership sectors, sectoral efficiency, Armey curve

JEL: E61, H11

OPTYMALNE ROZMIARY SEKTORA PUBLICZNEGO W KATEGORIACH ZATRUDNIENIA

Streszczenie

Artykuł stanowi wkład do literatury dotyczącej optymalnej wielkości sektora publicznego. Autorzy proponują szersze podejście do analizy wielkości sektora publicznego za pomocą udziału w wartości brutto środków trwałych i udziału w zatrudnieniu. W artykule brane są pod uwagę miary zakumulowanego kapitału i pracy. W przeciwieństwie do większości badań, które oparte są na miernikach wydatków rządowych, takie ujęcie daje jasną odpowiedź na temat optymalnej wielkości sektora publicznego pod względem zatrudnienia, która maksymalizuje produkt krajowy brutto per capita.

Autorzy traktują Polskę jako interesujące studium przypadku; w którym wielkość sektora publicznego uległa licznym przekształceniom w latach 2002–2014. Analizują wpływ zmian wielkości sektora publicznego na produkt krajowy brutto per capita. Wyniki wskazują, że: a) rolnictwo poważnie obniża produktywność sektora prywatnego; b) optymalny udział sektora publicznego pod względem zatrudnienia w Polsce wynosi 20%, a po wyłączeniu rolnictwa – 24%; c) rzeczywista relatywna wielkość zatrudnienia w sektorze publicznym w 2014 r. była wyższa o 1 punkt procentowy niż ta maksymalizująca produkt krajowy brutto per capita; d) w Polsce występuje istotna nieefektywność procesu produkcji, którą można wytłumaczyć nieoptymalnym udziałem zatrudnienia w sektorze publicznym.

Słowa kluczowe: sektor publiczny, optymalne rozmiary, sektory własności, efektywność ekonomiczna, krzywa Armey'a

JEL: E61, H11

ОПТИМАЛЬНЫЙ РАЗМЕР ПУБЛИЧНОГО СЕКТОРА В АСПЕКТЕ ЗАНЯТОСТИ

Резюме

В статье обсуждается вопрос оптимальной величины публичного сектора. Авторы предлагают более широкий подход к анализу величины публичного сектора, применяя показатель его доли в стоимости брутто основных фондов и доли в общей занятости. В статье используются показатели аккумулированного капитала и труда. В отличие от большинства исследований, которые опираются на показатели правительственных расходов, такой подход дает четкий ответ на тему оптимальной величины публичного сектора с точки зрения занятости, которая максимизирует совокупный ВВП на душу населения.

Авторы рассматривают Польшу в качестве интересного кейса, в котором величина публичного сектора в 2002–2014 годах подверглась многочисленным преобразованиям. Анализируется влияние изменений величины публичного сектора на совокупный ВВП на душу населения. Результаты указывают, что а) сельское хозяйство существенным образом снижает продуктивность частного сектора; б) оптимальная доля публичного сектора в Польше с точки зрения занятости составляет 20%, а после выделения сельского хозяйства – 24%; в) действительная относительная величина занятости в публичном секторе в 2014 г. была на один процентный пункт выше чем та, которая максимизирует валовой ВВП на душу населения; д) в Польше имеется существенная неэффективность процесса производства, которую можно объяснить неоптимальной долей занятости в публичном секторе.

Ключевые слова: публичный сектор, оптимальные размеры, секторы собственности экономическая эффективность, кривая Армея

JEL: E61, H11