JMFS
Journal of Management and Financial Sciences

Volume XIV
•
Issue 42
pp. 9–24
SGH Warsaw School of Economics
Collegium of Management and Finance

Andrzej Buszko
Faculty of Economy
Warmia and Mazury University
ORCID: 0000-0003-0600-4646

Jarosław Skorwider-Namiotko
Faculty of Economy
Warmia and Mazury University
ORCID: 0000-0002-2401-2204

Impact of shadow economy and corruption on tax efficiency

Abstract

Shadow economy exists in any economy, having a substantial impact on legal economy. It can be conducted separately, but most often it brings about significant consequences to the economic order. It is, therefore, very important to identify the relationships among factors fostering shadow economy. The universal roots of shadow economy are generally recognised, but there is still a considerable area left to be explored. Even though much attention is paid to taxes as the main cause of shadow economy, few investigations have been dedicated to tax effectiveness in terms of social budget expenditure versus total budget revenue. The aim of the study was to investigate the dependence between social budget spending and shadow economy performance. The MIMIC approach was employed to assess the level of shadow economy in selected OECD countries. Furthermore, the correlation between overall tax burdens and shadow economy was estimated. Moreover, the correlation between social spending and tax burdens was assessed. The correlation value between overall social budget expenditure and shadow economy was calculated to be high, at –0.6682. This means quite a strong negative correlation. The higher level of social spending reduces shadow economy performance. However, the correlation level between overall tax burdens and shadow economy is positive, reaching the level of 0.4458. There is a very strong positive correlation between overall tax burdens and

social budget spending, estimated at 0.8984. Based upon the results, it can be concluded that close attention should be paid to tax effectiveness and its relationship with shadow economy performance.

Keywords: tax, efficiency, shadow economy, budget, social spending, correlation
JEL Classification Codes: E26, H26, O17, O43, I25

Introduction

The tax as an economic category which has a fundamental place in debates among researchers, academics, entrepreneurs, and politicians. Taxes are often discussed on the grounds of the theory of optimal tax burdens and competitiveness. Tax competitiveness enhances the effectiveness of tax burdens by pressing taxes flat. Migration of taxpayers is being observed all the time, as they are constantly searching for the best location with regard to available public goods versus tariff burdens. The main objective is to achieve a substantial number of high-level public goods but low levies. In other words, a set of normative prescriptions for tax policy is usually based on maximising social welfare for a given revenue requirement.

This is one of the main factors fostering the emergence and performance of tax havens. Investors scrutinise such an option, and, therefore, international capital penetrates various markets and chooses optimal ones. Some countries prove to be the winners, others are losers with respect to the capital flow. Decision makers should consider two very important factors: tax collections schemes and redistributions. These factors vary from country to country. When identifying tax scheme systems, it is also necessary to consider the relevant economy models. Generally, a liberal model and planned economy can be detected.

The liberal model is perceived as being market-oriented. Several specific models, for example Scandinavian, German, Anglo-Saxon and Asian ones, can be distinguished under this wide framework. There are discernable differences among these types, mainly arising from the role of a government in the economy. In the Scandinavian and German approach, the authorities are quite active, which is reflected by a vigorous budget policy. In contrast, the government plays a minor role, while the activity of citizens is promoted in the Anglo-Saxon and Asian approach. Some similarities can be noticed among Asian countries, especially in Japan and China. Different countries implement different tax regime schemes. In Scandinavian countries, Germany, and France, tax rates are relatively high in parallel to the high level of distribution.

These principles are often undermined by shadow economy. Shadow economy attracts much attention because of its strong influence on the growth of official economy and on public finances. Many empirical studies show the existence of shadow economy in different countries, varied in its scope and category.

Regrettably, we still lack a consistent definition of shadow economy, which is interchangeably referred to as unreported, underground, informal, unregistered, unofficial, moon, or even

parallel economy. Schneider and Chen's definition provides a broad description of shadow economy and includes all unreported economic activities. However, a narrower definition is more appropriate, comprising only market-based legal production of goods and services that are deliberately concealed from public authorities for the following reasons:

- tax evasion or tax avoidance;
- avoidance of paying social security contributions;
- avoidance of having to meet certain legal labour market standards, such as minimum wages, maximum working hours, safety standards, etc.;
- avoidance of having to comply with certain administrative procedures, such as completing statistical questionnaires or other administrative forms [Chen, Schneider, 2018].

Taking the above into consideration, it should be stated that shadow economy is quite closely connected with the budgetary revenue and tax efficiency. Shadow economy is mainly encouraged by:

- high taxes;
- a complicated and contradictory law system pertaining to taxes;
- a higher number of taxation levies (including work and social burdens);
- law requirements concerning legal business activity.

1. Theory of taxes: a literature review

The roots of taxes can be traced back to the time when people began to organise communities. Even tribes implemented taxes paid to their leaders [Wilk, Cliggett, 2011]. Since the early days, much effort has been made to develop the best taxation patterns. In ancient times, some concepts were put forth. Aristotle advocated that businesses should be conducted properly, and taxes were to be regarded as stimulating rather than impeding development. The latter could occur if taxes were excessively high. Thus, some compromise between the level of taxes and the need of revenue was needed. In the medieval times, many scholars and academics grew interest in taxation. As well as studying the way taxes could be collected, they focused on taxes as a tool to aid new settlements and to improve the economy, e.g., Biskup [1970], Bacon [1885] and many others, e.g., Nasir ad Din Tusi, Thomas Aquinas, Duns Scotus, Nicole Oresme. In those days, a crucial problem of an optimal tax scheme was raised. However, this issue was not analysed in detail until the advent of industry. At that time, it became necessary to resolve these questions:

- Which tax should be imposed – on income or on commodity?
- Be it commodity or income taxes – how should the rates vary?

The first attempt to arrive at the solution was made by Frank Ramsey. In 1927, he wrote an article in which he discussed levels of taxes. He raised the following questions: should all commodities and services be levied at the same tax rates? Or should the authorities earn certain revenue through taxes on commodities only? He pointed to the fact that taxes must

be closely linked to the consumer's elastic demand for a good. With that in mind, Ramsey stated that commodities which proved to be inelastic should be taxed more heavily [Ramsey, 1927]. His ideas were more thoroughly developed by Mirrlees, who focused on optimal tax revenue and created a model based on marginal account [Mirrlels, 1971]. This is an optimal model whenever the upper marginal tax rate is zero. Mirrlees argued as follows. If there is a positive marginal tax rate on an individual earning the top income in an economy, and if that income is *y*, then a positive marginal tax rate has a discouraging effect on the individual's effort, generating an efficiency cost. If the marginal tax rate on that earner's income was reduced to zero for any income beyond *y*, then the same amount of revenue would be collected, and the efficiency costs would be avoided. Thus, a positive marginal tax on the top earner's income cannot be optimal [Mankiw et al., 2011). In turn, Auerbach addresses the question of collecting taxes versus the need for securing revenue for the budget. A tax collection scheme is frequently affected by many circumstances (including shadow economy), which can render any system ineffective. Budget expenditure becomes limited and the level of social spending is reduced. In the long term, this will contribute to a budgetary deficit [Auerbach, 1985]. This motivates some researchers to pay attention to the need of securing budgetary revenue and challenge it against a particular set of feasible taxes, especially ones levied on commodities [Stern, 1987]. Other scholars focus on responses of individuals and companies (a behavioural and psychological approach) to the number and rate of taxes. Taxes decrease an individual's opportunities for consumption (the purchasing power is lowered), while forcing companies to invest less [Seade, 1977]. Therefore, budget planners should adjust the taxation structure to satisfy the budget's needs but to ensure that individuals retain their purchasing power and companies make investments [Slemrod, 1990]. Gentry [1999] states that the government has an objective role to play in evaluating different configurations of taxes. In the simplest models, the government's objective is to minimise the excess burden generated by the tax system, while raising a set amount of revenue. More complicated models balance efficiency considerations with equity concerns. The models that include equity are usually more concerned with vertical rather than horizontal equity or the benefit principle [Gentry, 1999]. Sørensen pointed out that an inspiring task was to analyse optimal taxation where a tax system had to serve the goal of redistributing income, while at the same time accounting for non-tax labour market frictions. He suggests that a substantial degree of tax progressivity can be rationalised purely on the grounds of efficiency, especially when unemployment benefits are generous [Sørensen, 2010]. Nowadays, more attention is paid to welfare economics and its taxation implications. Following Blaug's idea of modern welfare economics, which is formally summarised by two fundamental theorems, essential directions are set out for tax planners. The first fundamental theorem states that, subject to certain exceptions, such as externalities, public goods, economies of scale, and imperfect information, every competitive equilibrium is a Pareto optimal. The second fundamental theorem states that every Pareto-optimal allocation of resources is an equilibrium for a perfectly competitive economy, provided that redistribution of initial endowments and property rights is permitted; alternatively expressed, every Pareto-optimal

allocation of resources can be realised as the outcome of competitive equilibrium after a lump-sum transfer of claims on income [Blaug, 2007]. Taking above into consideration, Pareto optimal allocation of budget spending can be hardly achieved without taxation efficiency. Prammer suggests that some tax systems are more conducive to growth, particularly ones relying on consumption, environmental, and property taxation [Prammer, 2011]. To achieve these goals, much consideration of tax effectiveness is due. A chance to relieve some groups of tax burden may lead to an improved tax policy, although tax reductions can also achieve economic goals of fairness and efficiency. In this respect, short- and long-term gains must be considered. If a goal is quick and short-term maximisation of tax revenue, tax effectiveness will decrease in the long run [Kopczuk, Slemrod, 2006]. In other words, decision makers should find out the best compromise among many aspects fostering tax efficiency, including stability, possibility of growth and investment, wealth of individuals, and welfare of the poorer members of the community.

2. Taxation and shadow economy

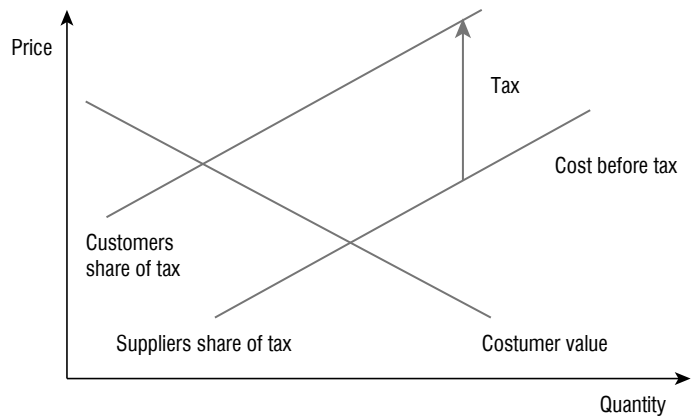
Shadow economy is closely connected with taxation. High levels of taxes foster shadow economy performance. Secondly, complicated and contradictory tax law creates space for illegal activities. Thirdly, a tax gap is regarded to be one of the most visible results of illegal business activity [Andrews, Caldera Sanchex, Johannson, 2011]. However, this economic development is difficult to measure precisely. Thus, not many states estimate the taxation gap, while most concentrate on VAT fraud. A few countries calculate the tax gap employing a whole range of taxes, which means that any comparison between different countries seems extremely difficult [Fonseca, Shaun, 2015]. Nowadays, VAT fraud is the main activity of organised crime groups. Since the tax law in many countries is highly complicated and self-contradictory, animators of shadow economy take advantage of legal loops for both typical fraud and tax evasion. The latter can assume a legal form of tax optimisation. Serious problems arise involving budgetary expenditure and corruption. Generally, a higher level of shadow economy encourages corruption and makes the whole economy less effective.

This affects tax effectiveness substantially. Furthermore, the tax authority's efficiency suffers [Hasseldine, 2007]. Shadow economy exempts taxes and can, therefore, appear more attractive to companies and individuals. This conclusion is important from the point of view of attaining optimal investment effectiveness. Investors and managers always have a choice: they can be active in the legal part of the economy or they can enter shadow economy. Taxes are an important factor influencing their decisions.

In the market-oriented economy, tax is generally shared between two parties: the supplier and the customer. It can be problematic to design a universal formula. For each branch of industry and in every moment during the development of a business, mutual shares can change. On the other hand, the consumer and the supplier take into consideration operations

and mechanisms of shadow economy. Products and services are available from legal and illegal parts of the economy. Thus, if taxes appear to be excessively high, consumers are more likely to turn to shadow economy. Products and services there seem more appealing because they are not charged with a tax. Likewise, this opportunity is noticed by suppliers. High taxes make businesses less profitable, hence in search for an additional income, sometimes even in an attempt to avoid bankruptcy, managers choose shadow economy as an option to thrive or to survive. On the other hand, high taxes are expected to increase revenue to the budget. This should help the government to raise spending. This, however, cannot be regarded as a typical development since corruption (a symptomatic part of shadow economy) changes the level and direction of disbursements. Mauro [1996] proved that corruption modifies the patterns of budgetary spending. Less money is allocated to social spending and education [Mauro, 1996]. Under the influence of shadow economy, there is a growing tendency towards a higher share of public spending allocated to specific goods and services which are produced by oligopoly markets. The reason is that the structure of such markets makes it difficult to identify sources and beneficiaries of corruption [Jajkowicz, Drobiszeva, 2015]. Delavallade [2006] found out that a high level of shadow economy induces more government spending on such goods that involve less public procurement. This way, the government has more possibilities to avoid control. Prado [2011] introduced an interesting model and found out that government expenditures were financed by taxes collected in the formal sector and by enforcement. Higher taxes increase the size of shadow economy, but law enforcement reduces the level of shadow economy performance. Government expenditure is affected by the size of shadow economy, depending on whether the government decides to finance its spending by increasing taxes or by enforcements. Summing up, shadow economy changes the patterns of budget spending and generally makes them less effective.

Figure 1. The impact of taxation on customers' and suppliers' behaviour



Source: Mankiw (2018).

Different categories of public expenditure have different effects on both economic growth and social progress; beyond the direct impact of expenditure on economic performance and public debt, each expenditure category often has an indirect effect on the well-being of individuals and the social progress of a community. The policy design of health programmes, unemployment benefits, pension schemes, and financing of education create problems for the budget [Bruno, Faginni, 2017]. Education is an input into the national production function and has a considerable impact on economic performance [Wolf 2004]. Higher levels of educational expenditure stimulate R&D investment, which increases both production and innovation. In this way a whole country can become more competitive and support the well-being of its citizens. Moene and Wallerstein draw attention to the levels of taxes and welfare spending. They discovered that even high levies could be accepted if welfare spending met expectations. Thus, the budget planners must foresee such budget expenditures. The policy space is characterised by three parameters: the tax rate, the benefit received by households with no other income, and the rate at which benefits are reduced as earnings rise [Moene, Wallerstein, 2001]. Dizaji, Farzanegan and Naghavi [2016] provided a good example of switching the priorities in budget spending. In Iran governed by a democratic mechanism there was a shift in public expenses from the military sphere to pro-productivity social spending like education and welfare. However, during the autocratic regime, more funds from the budget were allocated to the military and public order spheres.

3. Methodological approach

The aim of the research is to determine the relationship between the social budget spending and shadow economy performance. The level of shadow economy is calculated in line with the MIMIC approach. The MIMIC method calculates a hidden variable, i.e., shadow economy level, based on observed and measured indicators. The level of shadow economy is linearly explained by known X causes. The MIMIC model consists of two parts:

$$S = þ\,X + é \tag{1}$$

$$Z = đ\,S + ë \tag{2}$$

In the further (3) step, a reduced equation form is obtained by substituting the first equation with the second one:

$$Z = \varphi\,(þ\,X + é) + \mu = Ľ\,X + v \tag{3}$$

In this way, the MIMIC model becomes a multi-regression function. Structural parameters are appraised with commanding restraints on the Ľ coefficient matrix and the covariance matrix of the error v term. All data used in the equation were assessed with the Likehood procedure, taking into consideration this reduced form and not imposing any restrictions on

the var-cov matrix. In the fourth step, through the normalisation of the reduced equation, the Ľ matrix performed as follows:

$$L' = \varphi \times þ = \varphi\ 2 \times [þ1 + þ2 + þ3 + þ4\ldots]$$

The observed factors are government employment/labour force, tax burden, subsides/GDP, social benefits paid by government/GDP, self-employment/GDP, unemployment rate. The Pearson correlation index was used to verify the correlation between independent variables. The correlation between variables was calculated from the following formula:

$$r_{xy} \frac{\sum_{i=1}^{n}(xi - x_i)(yi - \overline{y})}{\sqrt{\sum_{i=1}^{n}(xi - x_i)^2}\sqrt{\sum_{i=1}^{n}(yi - \overline{y})^2}}$$

Tax effectiveness (Te) is measured by the ratio of social budget expenditure (S) against total tax burdens (Tt).

$$Te = \frac{S}{Tt} x\ 100\%$$

The following hypotheses were put forth:

1. There is a strong positive correlation between shadow economy and overall tax burdens.
2. There is a positive correlation between overall tax burdens and social budget expenditure.
3. There is a negative correlation between social budget spending and shadow economy performance.

The calculations were carried out on the data from selected OECD countries as of 2018. Statistica software was employed.

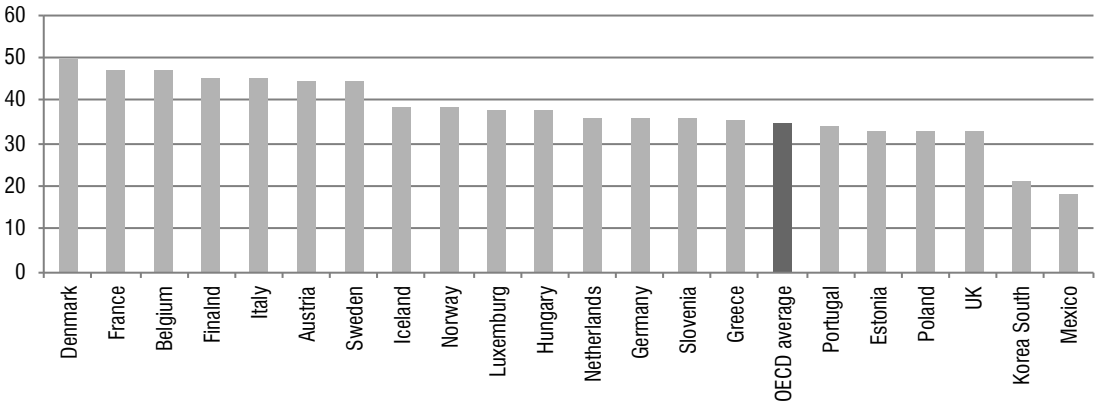
4. Findings and discussion

In 2019, the total tax burdens among the selected countries were highly varied. The highest taxes were noticed in Denmark, nearly 50% of GDP, but the lowest ones were in Mexico, 18.3% of GDP. The OECD average was 35% of GDP. Tax burdens higher than average were observed in France, Belgium, Finland, Italy, Sweden, Ireland, Norway, Luxemburg, Hungary, the Netherlands, Slovenia, and Greece.

High taxes support both the economic and social success of the above-mentioned regions, despite the supposition of their detrimental effect on economic growth and welfare. The top marginal tax rates are about 60%–70% in the Scandinavian countries, as opposed to only 43% in the United States. This means that an average worker entering employment will be able to increase consumption by only 20% of the earned income due to the combined effect of higher taxes and lower transfers. By contrast, an average worker in the United States is able to retain 63% of earnings considering the full effect of the tax and welfare system [Kleven,

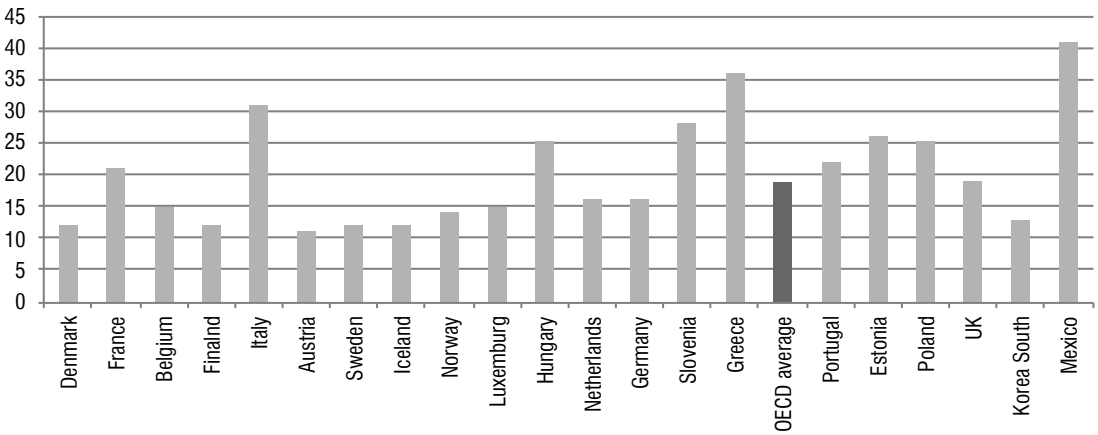
2014]. Lower tax burdens were observed in Portugal, Poland, the UK, South Korea, and Mexico. Figure 3 presents the level of shadow economy in the selected OECD countries, assessed according to the MIMIC approach.

Figure 2. Overall tax burdens in OECD nations, 2019 (GDP %)



Source: Bloomberg Professional Services.

Figure 3. The level of shadow economy in selected OECD countries in 2019 (GDP %)



Source: own calculation based on Bloomberg Professional Services.

As in the case of tax burdens, levels of shadow economy differ. In 2018, the highest level of shadow economy was detected in Mexico, 42% of GDP, followed by Greece, at 37.2% of GDP, and Italy, at 31% of GDP. Poland, Estonia, Portugal, Slovenia, and France were found to have shadow economy exceeding the OECD average level. The smallest shadow economy was identified in the Nordic countries as well as in Belgium and Luxemburg. Countries with a large shadow economy experience some important economic problems, which are conducive to the growth of illegal activities. First, strong deterrence in policies is observed. Secondly, the development of official economy is still unsatisfactory. This especially is true about Greece,

Italy, Portugal, Spain, and even the Baltic States. Permanent unemployment is observed as a characteristic cause of the enlargement in shadow economy. Additionally, self-employment and the structure of economy favourable for the expansion of shadow economy are observed. For example, branches like tourism, agriculture, entertainment, construction industry are suitable for illegal workers. In the Nordic countries, the tax morale, regulations, and quality of public institutions are at a high level, especially when compared with the Mediterranean region. These factors limit the scope of shadow economy.

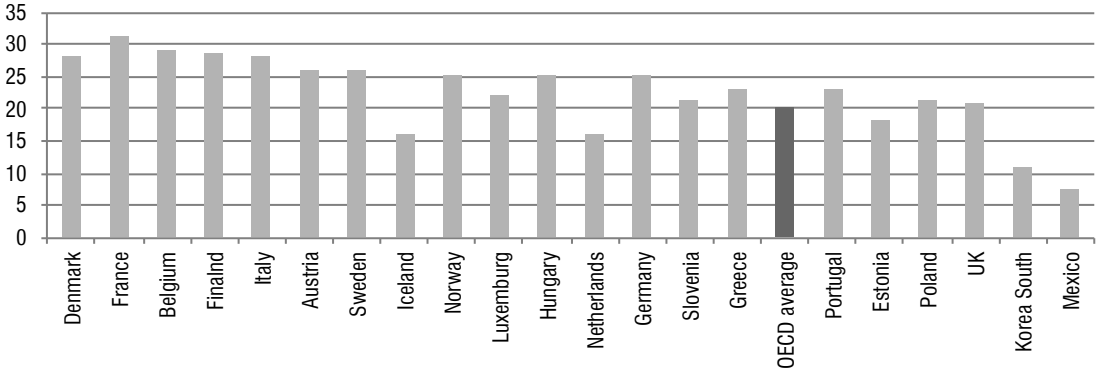
Table 1. Correlation results between overall tax burdens and shadow economy in selected OECD countries in 2019*

Category	Shadow economy	Tax burdens
Shadow economy	1	0.4458
Tax burdens	0.4458	1

$p < 0,05$, t-student test
* the same group as in Figure 2 and 3
Source: own estimation.

The results imply a moderate positive correlation between the overall tax burdens and shadow economy. In other words, a higher rate of taxes contributes to a higher level of shadow economy. This conclusion agrees with the theoretical assumption about the relationship between taxes and shadow economy. Hence, the first hypothesis formulated in this study was partly confirmed. The initial aim was to identify a strong positive correlation. However, based on the research results, it can be concluded that the determined correlation was reasonably strong.

Figure 4. Social budget spending in selected OECD countries in 2019 (GDP %)



Source: Bloomberg Professional Services.

France was the leader among the selected OECD countries with the highest social budget spending (calculated as % of GDP). In 2018, the French government allocated nearly 32% of GDP to this purpose. Quite a large share of GDP allocated to social needs was also found in Finland (28.7%) and Belgium (almost 29%). Italy spent approximately 28% of GDP on social

needs, and practically the same level was noticed in Norway, Germany, Austria, Sweden (ca. 25–26%). A surprisingly low share of GDP dedicated to social expenses was noted in Iceland – in 2018 this country spent only 16.2% of its GDP on social matters. The lowest level in social spending was observed in Mexico (just 7.5%) and Korea (11.3% of GDP). France was an interesting case. The overall expenditure from the state budget spending had been growing steadily since 1960. In parallel, the social expenditure had been growing. France implemented a transparent welfare programme, combining it with the country's economic growth. Despite this, some trends characteristic for OECD countries were also noticed in France. Firstly, expenses on healthcare increased by 2% between the years 2010 and 2019. At the same time, the public funds to counteract spending declined by 1.9% [OECD Social Expenditure Database]. In turn, Mexico faces big economic problems and due to this fact budget disbursement possibilities are limited.

Table 2. Correlation results between overall tax burdens and social budget spending in the selected OECD countries in 2019*

Category	Social budget spending	Tax burdens
Social budget spending	1	0.8984
Tax burdens	0.8984	1

$p < 0.05$, t-student test
* the same group as in Figures 2 and 4
Source: own estimation.

The correlation between overall tax burdens and social budget spending reached a very high value of 0.8984. This is a very strong dependence, meaning that if total tax burdens increase, the social budget grows instantaneously. In this way, our second hypothesis was confirmed. Each country has many options and urgent needs with respect to budgetary expenditure, therefore, social distribution of budgetary funds cannot always be a priority.

Table 3. Correlation results between overall social budget spending and shadow economy in selected OECD countries in 2019*

Category	Shadow economy	Social budget spending
Shadow economy	1	–0.6682
Social budget spending	–0.6682	1

$p < 0{,}05$, t-student test
* the same group as in Figure 2, 3, 4
Source: own estimation.

The value of the correlation between overall social budget spending and shadow economy was calculated to be high, at –0.6682. This is quite a strong negative correlation. The higher level of social spending reduces shadow economy. It is an important finding since it enables setting a more precise direction in efforts to reduce shadow economy. Now, the third hypothesis was confirmed. The result achieved somehow contradicts with other research findings.

Quite many authors state that social budget expenditure does not have a significant impact on shadow economy, reducing its size. This opinion has been expressed by Dabla-Norris et al. [2008], Golias [2013], Perry [2007]. On the other hand, there are two essential factors fostering the performance of shadow economy, that is low workforce skills and low human capital [Kelmanson et al., 2019]. Taking this into consideration, the money allocated from the budget to improve professional skills and human capital resources facilitates the limitation of shadow economy. Furthermore, skillful labour force attracts foreign direct investment, which enables further development. Finally, shadow economy becomes less challenging for entrepreneurs. In fact, taxation and social security contributions, quality of public institutions, public services, regulations of the labour market, transfer payments, and tax morale are among the factors influencing the performance of shadow economy [Malaczewska, 2013]. These areas can be improved by proper social budget disbursements.

The problem of shadow economy growing bigger (in the context of social spending) becomes particularly acute during recession. Without the government's support, the unemployed and the underprivileged turn immediately to shadow economy activity, which is a rational step (quite often the only one) to ensure their survival [Trebica, 2014].

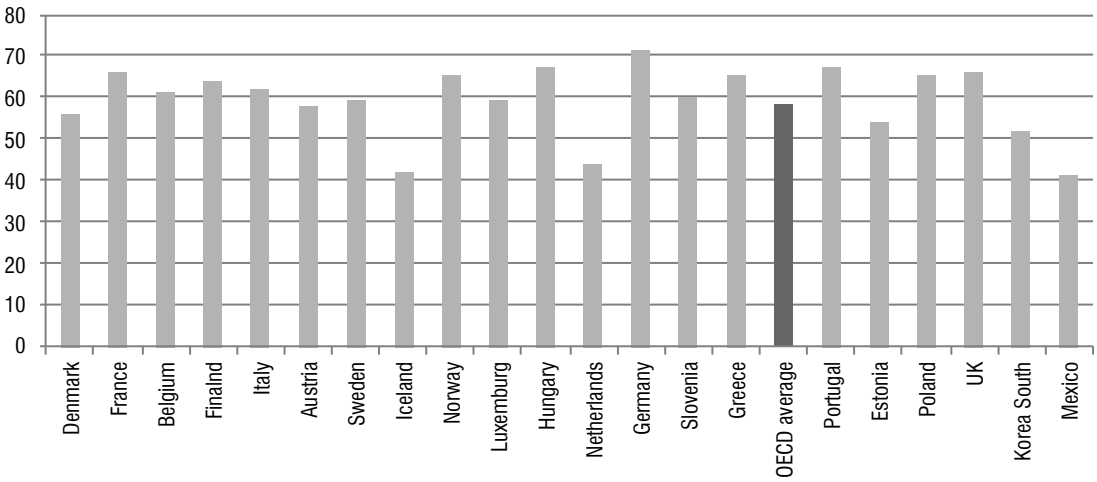
Theoretically, each state is expected to provide a good standard of living for its citizens. Many authors agree that budget spending, including social expenditure, can create a vicious circle in the economy, which may lead to a suboptimal balance of formal and shadow economy activities [Eilat, Zinnes, 2000]. Particularly important is the relation between tax morale and social budget spending. The government does not have to be organised while redistributing income through social spending from the wealth to the underprivileged. But if this is done well, citizens are aware that paid taxes are spent appropriately. Once they know that they will be supported by the government (should such a need arise), citizens are more willing to pay even higher taxes than expected. Social spending connected with a correct economic strategy facilitates innovation, creation of knowledge, and development. Finally, economic progress is enhanced, and this reduces shadow economy. In addition, income inequality diminishes.

Furthermore, many studies have demonstrated that social spending has a noteworthy effect on welfare. Back in the 1990s, Anand and Ravallion [1993] proved that health expenditure had a substantial impact on the nation's health status. Farahani et al. [2010] showed that health expenditures had a significantly positive impact on the underprivileged. However, Mingat and Tan [1998] conclude that additional education spending in developing countries contributes relatively less to levelling differences in educational outcomes in comparison with industrialised countries. Flug et al. [1998] as well as Gebregziabher and Niño-Zarazúa [2011] argue that income volatility, imperfect credit markets, and income inequality are behind the limited improvement in the education in developing countries. Moreover, social spending reduces mortality.

Since most countries face the problem of budget deficit, tax effectiveness is becoming a growing necessity. By 2019, all the countries of Europe except Norway had become net debtors. It should be borne in mind that despite the ongoing process of economic convergence

in Europe, the countries' budget policies have remained widely different. Only a few states have adopted restricted budget policies, yet almost all states face the problem of debt. This is an essential issue whenever the level of shadow economy should be reduced in the context of higher social budget spending.

Figure 5. Tax efficiency among selected OECD countries in 2019 (%)



Source: own work based on the data presented in Figures 2 and 4.

In 2019, the highest level of tax effectiveness was noticed in Germany, where it reached 71%. It was also rather high in France, Finland, Belgium, Sweden, Norway, Poland, the UK, and Portugal, ranging between 60% and 65%. Relatively low tax effectiveness was determined in the Netherlands, Iceland, and South Korea (42%–45%). The lowest tax effectiveness was detected in Mexico (41%). Countries with high tax effectiveness have more chances to reduce shadow economy.

Summary

Based on the literature review, it should be stated that minor attention was put to tax efficiency, calculated as the ratio of social budget expenditure to total tax revenue in the context of shadow economy performance. Tax effectiveness becomes a very important factor in terms of shadow economy. The reason is that nearly all countries face the problem of state debt, which means that all budget spending must be carried out carefully. Shadow economy appears in any country and has a great impact on legal activity. Shadow economy generally inhibits development and affects adversely innovation, creativity, and entrepreneurship. However, there are some researchers who advocate for the shadow economy motion. They point out that shadow economy is just a sphere where some individuals can earn money and spend it in a legal way [Schneider, 2014]. But based on these empirical findings it should be

admitted that a higher level of social spending reduces shadow economy significantly. It is not an obvious observation since a high level of corruption can easily violate social spending. It can be redesigned straightforwardly for narrowed social circles, strictly connected with decision-makers. The other groups of society, non-decision-makers, generally choose the activity in the shadow economy framework. Considering the current results, it is justified to conclude that far more research is needed to discover the role of social budget disbursement in limiting shadow economy. Social expenses from the state budget play a fundamental role in development, improvement of human capital, and in the formation of business environment. Thus, more studies are needed, especially into the range and scope of social budget spending. We need to find out what types of social expenses are strictly associated with categories of shadow economy. We would emphasise that this paper as well as the research problem is devoted to the issue of public social spending only. It would be interesting to discover the relationship between private social expenses and shadow economy, too. In the course of this study, the three research hypotheses were confirmed. There is a strong positive correlation between shadow economy and tax burdens, and there is a positive correlation between the level of tax burdens and social budget expenditure. The third hypothesis as the most innovative one, and this study proved that there is a strong negative correlation between social budget spending and shadow economy. In reference to that we would admit that further studies need to be devoted to tax morale and shadow economy performance. However, it may be expected that shadow economy influences tax morality in a depraved way, but it is not known to what extent.

References

1. Anand, S., Ravallion, M. (1993, winter). Human Development in Poor Countries: On the Role of Private Incomes and Public Services. *Journal of Economic Perspectives*, pp. 133–150.
2. Andrews, D., Caldera Sanchex, C., Johannson, A. (2011). *Towards a better understanding of the informal economy*. Paris: OECD working paper ECO/WKP (2011) 42.
3. Auerbach, A. (1985). The Theory of Excess Burden and Optimal Taxation. In: A. Auerbach, M. Feldstein (Eds.). *Handbook of Public Economics,* vol. 1. Amsterdam: North-Holland.
4. Bacon, F. (1885). *History of the Regin of King Henry VII.* Cambridge: Cambridge University Press.
5. Biskup, M. (1970). *Nicolai Copernici. Locationes Mansorum*. Desertorum. Olsztyn: Institutum Olstiniense Nomini Albert Ketrzyński Sacrum.
6. Blaug, M. (2007). The Fundamental Theorems of Modern Welfare Economics, Historically Contemplated. *History of Political Economy*, 39, p. 2.
7. Bloomberg Professional Services. Retrieved from: https://www.bloomberg.com/professional/solution/content-and-data/ (accessed: 18–20.02 2020).
8. Bruno, B., Faginni, M. (2017). Education, R&D, and social progress. *Eurasian Economics Review*, 7, pp. 33–48.
9. Chen, H., Schneider, F. (2018). *Size and Causes of Shadow Economy in China over 1978–2016: Based on the Currency Demand Method*. Report 1. Beijing: Beijing University.

10. Dabla-Norris, E., Gradstein, M., Inchauste, G. (2008). What causes firms to hide output? The determinants of informality. *Journal of Development Economics*, 85(1), pp. 1–27.
11. Delavallade, C. (2006). Corruption and distribution of public spending in developing countries. *Journal of Economics and Finance*, 30(2), pp. 222–239.
12. Dizaji, S., Farzanegan, M., Naghavi, A. (2016). Political institutions and government spending behavior: theory and evidence from Iran. *International Tax and Public Finance*, 23, pp. 522–549.
13. Eilat, Y, Zinnes, C. (2000). *The evolution of the shadow economy in transition countries: consequences for economic growth and donor assistance*. CAER II Discussion Paper, No. 83, 3–70.
14. Farahani, M., Subramanian, S.V., Canning, D. (2010). Effects of state-level public spending on health on the mortality probability in India. *Health Economics*, 19(11), pp. 1361–1376, https://doi.org/10.1002/hec.1557
15. Fonseca, M., Shaun, B. (2015). *Does Using Behavioural Prompts in Pre Populated Tax Forms Affect Compliance? Results from an Artefactual Field Experiment with Real Taxpayers*. 015–15. TARC.
16. Gebregziabher, F., Niño-Zarazúa, M. (2011). *Social spending and aggregate welfare in developing and transition economies.* World Institute for Development. Economics Research.
17. Gentry, W. (1999). *Optimal Taxation*. *The Encyclopedia of Taxation and Tax Policy*. Washington: Urban Institute Press..
18. Golias, P. (2013). *The shadow economy and how to fight against it.* Institute for Economic and Social Reforms.
19. Hasseldine, J. (2007). *Study Into: 'Best Practice' in Tax Administration.* National Audit Office.
20. Jajkowicz, O., Drobiszova, A. (2015). The Effect of Corruption on Government Expenditure and Allocation in OECD countries. *Acta Universitates Agriculture Et Silviculture Brunensis*, 63(4), pp. 1251–1259.
21. Kelmanson, B., Kirabaeva, K., Medina, L., Mircheva, B., Weiss, J. (2019). *Explaining the shadow economy in Europe: size, causes and policy options*. IMF Working Paper WP/19/278, International Monetary Fund, European Department.
22. Kopczuk, W., Slemrod, J. (2006). Putting Firms into Optimal Tax Theory. *American Economic Review*, 96(2), pp. 130–143.
23. Kleven, H. (2014, fall). How Can Scandinavians Tax So Much? *Journal of Economic Perspectives*, 28(4), pp. 77–98.
24. Malaczewska, P. (2013). Useful Government Expenditure Influence on Shadow Economy. *Quantitative Methods in Economics*, XIV(2), pp. 61–69.
25. Mankiw, G. (2018). *Macroeconomics.* Tenth edition. New York: Worth Publishers.
26. Mankiw, N.G., Weinzierl, M., Yagan, D. (2009, May). *Optimal Taxation in Theory and Practice*. Working Paper.
27. Mauro, P. (1996). *The Effects of Corruption on Growth, Investment, and Government Expenditure.* IMF Working paper.
28. Mirrlees, J.A. (1971). An Exploration in the Theory of Optimal Income Taxation. *Review of Economic Studies*, 38, pp. 175–208.
29. Moene, K.O., Wallerstein, M. (2001). Targeting and political support for welfare spending. *Economics of Governance*, 2, pp. 33–54.

30. OECD Social Expenditure Database. Retrieved from: https://www.google.com/search?q=30.+OECD+Social+Expenditure+Database (accessed: 04.03.2020).
31. Perry, G. (Ed.). (2007). *Informality: Exit and exclusion*. Washington: World Bank Publications.
32. Prado, M. (2011). Government policy in the formal and informal sectors. *European Economic Review*, 55, pp. 1027–1176.
33. Prammer, D. (2011). Quality of taxation and the crisis: Tax shifts from a growth perspective. *Taxation Papers*, 29, Directorate General Taxation and Customs Union, European Commission, pp. 28–54.
34. Ramsey, F. (1927*).* A Contribution to the Theory of Taxation. *Economic Journal*, 37, pp. 41–67.
35. Schneider, F. (2014). *The shadow economy: an essay*. Department of Economics, Johannes Kepler University of Linz, pp. 1–23.
36. Seade, J.K. (1977). On the Shape of Optimal Tax Schedules. *Journal of Public Economics*, 7, pp. 203–235.
37. Slemrod, J. (1990). Optimal Taxation and Optimal Tax Systems. *Journal of Economic Perspectives*, 4, pp. 157–178.
38. Sørensen, P. (2010). The theory of optimal taxation: New developments and policy relevance. *Nationaløkonomisk Tidsskrift*, 148, pp. 212–244.
39. Stern, N.H. (1987). The Theory of Optimal Commodity and Income Taxation: An Introduction. In: D. Newbery, N. Stern (Eds.), *The Theory of Taxation for Developing Countries* (pp. 24–49). Oxford: Oxford University Press.
40. Trebica, B. (2014). The Size of Underground Economy in Albania. *Academic Journal of Interdisciplinary Studies*, 3(4) Rome, Italy: MCSER Publishing.
41. Wilk, R., Cliggett, L. (2011). *Ekonomie i kultury. Podstawy antropologii ekonomicznej*. Kraków: Wydawnictwo Uniwersytetu Jagiellońskiego.
42. Wolf, A. (2004). Education and economic performance: Simplistic theories and their policy consequences. *Oxford Review of Economic Policy*, 20(2), pp. 315–332.