The Shadow Economy in Croatia

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Content

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THE SHADOW ECONOMY IN CROATIA

ABSTRACT

The shadow economy is a global phenomenon, regardless of the state of development of the country. However, the volume differs from country to country. Although there are different definitions of the shadow economy, it can be considered as unregistered economic activities that would contribute to the officially accounted gross national product if these activities were recorded. The paper presents the results of past papers that examine the causes and effects of the shadow economy, which they show that a strong presence of the shadow economy has been identified in Croatia, whose volume of shadow economy often tops charts in the European Union. According to some research estimates, it is calculated that the shadow economy comprises around a quarter of GDP and more. The main goal of this research is to examine the connection between the shadow economy and employment, unemployment, employee earnings and economic performance in Croatia. Correlation and multiple regression analysis were used to estimate the correlation of the mentioned variables and the shadow economy. Constrained by the availability of comparable data, the analysis covered the period from 2000 to 2019. The missing data in the panel were imputed using Fully Conditional Specification, where each incomplete variable is imputed by a separate model. Results unexpectedly showed that the growth of the shadow economy in Croatia is related to the growth of wages and GDP per capita, which can be explained by the negative migration balance in Croatia.It was determined that less workload of workers during the working week is associated with a higher level of the shadow economy.The expected increase in the shadow economy is associated with a decline in GDP growth.The result is indicative that a higher number of working hours in a working week is associated with lower gross and net wages and GDP per capita. The increase in employment is related to the lower level of the shadow economy, but also a higher share of the unemployed in the total population leads to a reduction in the shadow economy.

Keywords*: shadoweconomy, employment, unemployment, Croatia, wages, growth.*

1. Introduction

Previous literature has provided a number of definitions of the shadow economy, what it contains and methodsof its measurements. According to Feige (1990), the shadow economy

includes the illegal economy - production and distribution of goods and services prohibited by law, undeclared economy - undeclared income for tax evasion, unregistered (unrecorded economy) - activities not reported to official statistics, but should be, informal economy - activities that violate administrative rules governing property rights, employment contracts, credit agreements, social security system. According to the above, part of the mentioned activities are the resultof illegal activities, but in the scope of measurement, part of the shadow economy is related to legal, economic activities. Using the definitions of his predecessors (Lippert and Walker, 1997), Schneider (2003) summarizes the definition of the shadow economy and says that the shadow economy includes undeclared income from the production of legal goods and services paid for or replaced by barter - therefore, all economic activities that would be taxable if they were reported to the state (tax) authorities.Feige (2005) gives a more extensivedefinition of the shadow economy and considers that the shadow (informal, black, unreported) economy comprises economic activities that circumvent costs and are excluded from the benefits and rights incorporated in the laws and administrative rules covering property relationships, commercial licensing, labour contracts, torts, financial credit, and social systems.The most commonly used definition of the shadow economy (Frey and Pommerehne, 1984; Lubell, 1991; Feige, 1994) is that the shadow economy encompasses all unregistered economic activities that contribute to officially calculated GDP. In short, according to Medina and Schneider (2018), the shadow economy includes all economic activities which are hidden from official authorities for monetary, regulatory, and institutional reasons.

The shadow economy causes can be categorized into three groups: economic, policy-related, and regulatory and institutional factors. Among the key factors is access to financing, political stability, public services provision, tax burden, labour market regulations and institutional quality Wu and Schneider (2019).

In this paper, based on the estimated level of the shadow economy according to Kelmanson et al. (2019) examined will be the correlation between the shadow economy and employment, unemployment, hours at work, the level of employee wages and economic performance in general. The multiple regression model examined the relationship between these variables in Croatia from 2000 to 2019. The imputation of missing data was performed.

It is assumed that the level of employment and the shadow economy do not go in the same direction, unlike unemployment. It is also assumed that GDP per capita and GDP growth are negatively related to the shadow economy level. The results are not unambiguous.

It is also assumed that higher wages in legal activities lead to a reduction of the shadow economy. The results did not confirm this assumption. Although a shorter working week leads to a better quality of life for workers, the assumption in this paper is that a shorter working week leads to an increase in work in the shadow zone, i.e. undeclared work. Primarily that would be the case in countries where wages are as low as in Croatia. The results confirmed this assumption.

2. Theoretical background and approaches to calculating the shadow economy

Previousresearch (Karajić, 2002; Gerxhani, 2003; Schneider, 2003; Lovrinčević, et al., 2006; Williams and Schneider (2016); Dybka et al., 2017; Medina and Schneider, 2018; Wu and Schneider, 2019) are showed that the shadow economy leads to erosion of the economy because it includes unacceptable activities such as production and distribution of prohibited products, prostitution, smuggling, usury (colloquially called "loan sharks“ in contemporary language),

theft, reduces the state budget and local community budget, prevents measurement of real economic activities, threatens property rights of individuals and businesses, workers' rights and social security of citizens. The study Federal Program for Financing Development in Bosnia and Herzegovina (2008, 7) lists the negative aspects of the shadow economy: reduction of public revenues, difficult functioning of public revenues, endangers the standard of state budget users, accelerates social stratification, reduces the authority of political power, increases business indiscipline, encourages the construction of the mafia, endangers the legal order, increases the competitiveness of the illegal sector in relation to the legal, leads to irrational use of resources.

In addition to the negative, numerous studies have shown the positive aspects of the shadow economy by having an expansive fiscal policy that has a positive effect on the overall economy (Adam and Ginsburgh, 1985), develop the market (Asea, 1996), increases consumption (Bhattacharyya, 1999; 2000), improve the welfare of workers in the absence of work in the formal sector and help the economy to maintain an untapped reservoir of labour supply (Wu and Schneider, 2019). The authors also emphasize the positive social dimension of the shadow economy, which acts as a social shock absorber, especially in transition countries. When suppressing the shadow economy, should be careful because, as Wu and Schneider (2019, 21) point out, if the long-run trend of the shadow economy can be reversed with economic development, then it is key to be aware of the current state of the economy and remain alert to the policy effectiveness. If the economy is less-developed or experiences a catch-up phase, its shadow economy is expected to go through a downsizing process. In this period, the authorities can harness the trend to attract more firms and workers out of the shadow economy by promoting financial development, containing inflation, stabilizing the political situation, and expanding educational spending. By contrast, when the economy has reached the threshold of GDP per capita and starts to show the positive relationship between GDP per capita and the shadow economy, the authorities should put additional efforts to make working in the formal sector more beneficial, for example, by reducing labour market rigidities to improve market efficiency and simplifying tax compliance procedures with recent technology innovations. According to the Federal Program for Financing Development (2008, 5), the spread of the shadow economy is not only the responsibility of citizens and businesses but primarily of the authorities who must understand that paying public revenues (taxes) does not only pay tribute to the authorities through public institutions. According to the results obtained by Bovi (2002, 17), if a country is relatively corrupt, its hidden economy is large even if its regulations and tax burdens are not particularly heavy. On the contrary, if institutions were very efficient and uncorrupt, high tax rates and onerous regulations would not be correlated with the shadow economy. According to Bovi (2002, 18), countries with the largest unofficial economy do not necessarily have the highest tax burdens. Also, according to him, the variables, which are influencedbytheauthorities, canlead to twokindsofbalance. One is characterized by good institutions, light regulations, little black economy, wide tax base and considerable tax revenue; the other is characterized by bad institutions, intrusive regulations, sizeable black economy, narrow tax base and reduced tax revenue. Radman-Funarić (2013; 2018), Borozan and Radman-Funarić (2016), Štulhofer and Rimac (2002), Štulhofer (2004) presented their results on the connection between corruption, non-compliance with norms and distrust in institutions with economic effects in Croatia.

When calculating the shadow economy in previous research, different calculation methods have been used (Schneider, 2002), such as direct approaches (official state statistics, Gyomai and van de Ven, 2014; Medina and Schneider, 2018), indirect approaches (Madžarević-Šujster and Mikulić, 2002; Bovi, 2002; Wu and Schneider, 2019), and a model approach is based on the

Multiple Indicator, Multiple Causes (MIMIC, different approaches to causes variables and indicator variables of the shadow economy) (Hassan and Schneider, 2016; Medina and Schneider, 2018; Kelmansonetal., 2019; Franić, 2019), differentstatisticalmodels (Medina and Schneider, 2018) and different combinations of the macro method of currency demand analysis (CDA), Predictive Mean Matching Method (PMM) and MIMIC estimates (Dybka et al. ., 2017; Medina and Schneider, 2018). In recent research, the most commonly used model for estimating the shadow economy is MIMIC estimates (macro MIMIC, adjusted MIMIC). The so-called macro approaches provide upper bound estimates as they include crime activities, do-it-yourself activities and voluntary activities in the shadow economy because these are at least partly performed for the same reasons as "pure" shadow economy activities. Gyomai and van de Ven (2014) say that MIMIC estimates on average are three times as large as the estimates for the non-observed economy in the System of National Accounts. According to Medina and Schneider, 2018, 27), a promising approach is the structured hybrid approach by Dybka et al. (2017), who contribute to the CDA and MIMIC method in a new way avoiding many econometric problems. The result is that they achieve much lower sized shadow economy estimates. In his research, Schneider (2003) uses the DYMIMIC model (dynamic multiple-indicators multiple-causes), which consists of two parts: the measurement model links unnoticed variables with observed indicators, and the model of structural equations determines the cause-and-effect relationships of unnoticed variables. According to Medina and Schneider (2018, 12), the MIMIC model is a theory-based approach to confirm the influence of a set of exogenous causal variables on the latent variable (shadow economy) and also the effect of the shadow economy on macroeconomic indicator variables. Exogenous variables are considered as drivers of the shadow economy; fiscal freedom (tax burden on the economy), institutions (the rule of law and control of corruption because of lack of respect for the law or high corruption which encourages informal economic activity), unemployment, trade openness (as international trade increases, harder to hide it), GDP per capita, size of government, government stability. Latent variables are indicators of the shadow economy; currency (people engaged in the informal economy usually conduct their activities in cash), labour force participation (the official employment rate), GDP per capita growth.

The Medina and Schneider (2018) study in 158 countries in the period from 1991 to 2015 showed a strong statistically significant influence between the shadow economy and all analyzed causes (Trade Openness, GDP per capita, Unemployment Rate, Size of Government, Fiscal Freedom, Rule of Law, Control of Corruption, Government stability and Initiators (Currency, Labor Force Participation Rate, Growth of GDP per capita). The results showed, in the analysis of all 158 countries, group of 105 developing countries and 26 advanced countries, that the unemployment rate positively affects the shadow economy, although not large, and GDP per capita, as a cause, negatively affects the shadow economy, especially in advanced countries.The shadow economy negatively affects GDP per capita growth, as an indicator, in all countries, especially in developing countries, while in advanced countries, this impact is positive.Similar results were obtained by Hassan and Schneider (2016), researching the size and development of the shadow economies of 157 worldwide countries from 1999 to 2013, Wu and Schneider (2019) in the period from 1996 to 2015 and Kelmanson et al. (2019) in 47 European countries for the period of 1999–2016, using the MIMIC model.

Overall, the results of previous research (Schneider, 2003; Medina and Schneider, 2018) indicate that the most important drivers of the volume and growth of the shadow economy are the increased burden of taxes and contributions, as well as increasing state regulation activities. The shadow economy is a complex phenomenon, and it exists in both industrially developed and underdeveloped industrial societies. The results of extensive research by Johnson et al.

(1997) confirmed that countries with higher statutory economic determinations generally have a higher share of the informal economy in GDP. An increase of one rank in the regulatory index (ranging from 1 to 5, where 5 means the most regulations), along with other unchanged conditions, leads to an increase of 8.1% in the share of the shadow economy in GDP per capita, according to Friedman et al. (1999) this increase is 10%. Simultaneously, the escape into the shadow economy results from an extensive range of legal regulations, not a quality implementation of legal regulations.

Franić (2019) survey Undeclared Economy in Croatia during the 2004–2017 Period: Quarterly Estimates Using the MIMIC Method indicate that despite Croatia being one of the most active in the EU when it comes to combating the undeclared economy, not much is known about the effectiveness of these measure since joining the EU.Results show that the undeclared economy remained stable with value added ranging from HRK 24.1 billion to HRK 26.9 billion, accounting for 7.8% of total GDP in 2017. That indicates a growing trend, which indicates the inefficiency of political approaches in the fight against undeclared economies.In his research, Franić (2019) found that increased unemployment leads to a decrease in the undeclared economy and assumes that the reason for this is that employed individuals are the main stakeholders.

3. Shadow economy estimation

According to the results obtained by Schneider (2003), during 2000-2001, the shadow economy averaged 38% of added value and employed 30.2% of the total labour force in 22 transition countries and constituted 16.7% of official GDP and 15.3% of employees in 21 OECD countries. Greece (28.5%), Italy (27.0%) and Portugal (22.5%) had the largest share of the shadow economy in official GDP. Germany, with a share of 16.3%, Ireland with 15.7% and France with 15.0%, were in the middle. The USA had the lowest share (8.7%), followed by Switzerland (9.4%) and Austria (10.6%). The share of the shadow economy in the nine transition countries of Central and Eastern Europe increased from 23.4% of official GDP in the period 1990-1993 to 29.2% in the period 2000-2001. In the period 2000-2001, the largest share of the shadow economy in the official GDP had Macedonia (45.1%), Bulgaria (36.4%) and Romania (33.4%). The Slovak Republic (18.3%) and the Czech Republic (18.4%) had the lowest shares. From 1990 to the beginning of the century, the share of the shadow economy in GDP in 22 transition countries increased by 9.9%, and the increase in OECD countries was 3.5% (an increase from 13.2% to 16.7%).

Observing 158 countries of the world, according to the research of Medina and Schneider (2018), the level of shadow economy ranges from 34.51% (1991) to 31.57% (2015), with a decrease of just under 30% in some years of the period. According to the results of Hassan and Schneider (2016), the estimated average level of the shadow economy in Advanced Economies is 20.5% in 2013, and according to Schneider (2015), the estimation gave a lower result, 15.8%. According to Kelmanson et al. (2019), the shadow economy level in advanced economies in 2016 was 20.7%, and it is above 40% of GDP in most of the CIS countries and even higher in some cases.

There is no ideal or leading method to measure the shadow economy, each having some conceptual or practical strengths and weaknesses (Wu and Schneider, 2019, 6). Depending on the assessment methods and the level of the shadow economy estimate is different. Using a unique CDA-MIMIC model with different statistical methods (three different regression analyzes), Dybka et al. (2017) came up with different results. For Croatia in 2015, these three

regressions showed that the share of the shadow economy in GDP was 13.4%, 14.4%, 8.2%, while, according to the Statistical Offices, the shadow economy in Croatia took part of6.9% in official GDP. Medina and Schneider (2018) compared the results using the Predictive Mean Matching Method (PMM, developed by Rubin 1987), according to which the size of the shadow economy in Croatia is 18.7%, and according to MIMIC estimates 28.8%, both average over 1991-2015. According to the results of a survey (Švec, 2009, 441) conducted for the period from 2002 to 2007, using data from the Croatia Bureau of Statistics, Croatia ranks seventh among EU countries in terms of unofficial employment. It was also noticed that by increasing the number of employees in the official economy, the number of employees in the informal economy also increases, i.e. a certain number of people participate in both economies simultaneously. According to Hassan and Schneider (2016, 7) estimated shadow economy in Croatia is 28.94% of the GDP average from 1999 to 2013. In 2016 according to the results of Wu and Schneider (2019, 26), it was 35.00% according to Wu and Schneider (2019, 26).

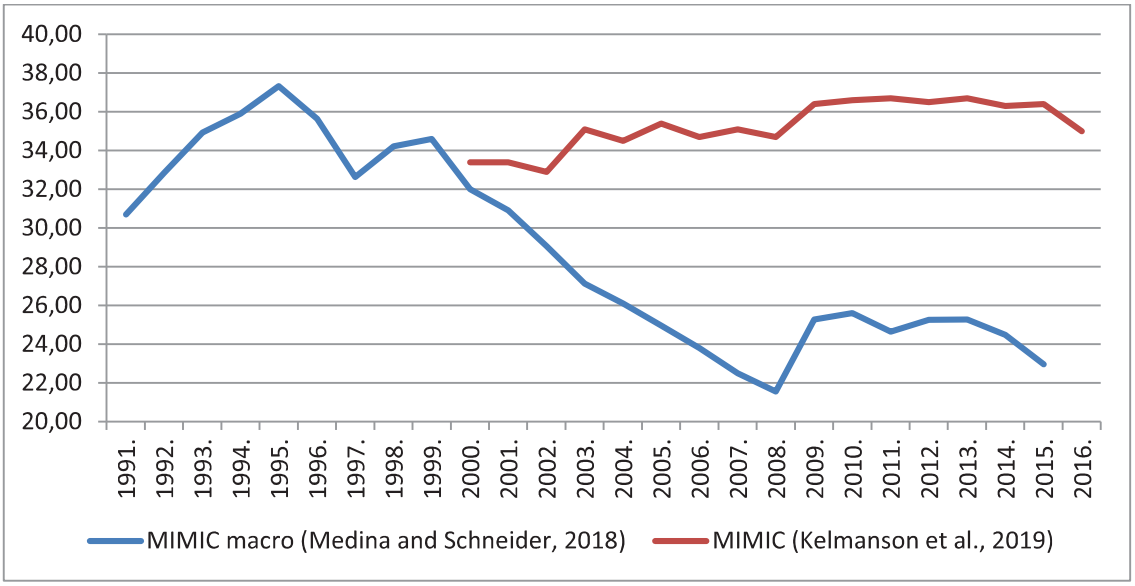
The data of Lovrinčević et al. (2006, 52) that in Croatia in 2002, according to Eurostat data, the size of the shadow economy was 15.8% of GDP and the average of all other methods was 34%, which is 2.15 times more than the Eurostat estimate. Part of the results obtained is shown in Table 1 and Figure 1.

Table 1: Size of the shadow economy in Croatia - estimated by different methods

Average 1990-1993	Average 1994-1995	1998	2000/2001	2002	2013	2015
23.5[1]	28.5[1]					
24.6[2]			32.4[2]			
		32.9[3]				
					31.61[4]	
	36.62[5]	34.22[5]	31,46[5]	29.6[5]	25.28[5]	22.96[5]
						14.92[6]
			33.4[7]	32.9[7]	36.7[7]	36.4[7]
						6.9[8]
				15.8[9]		

Source: Authors according to:[1]Method of physical input (electrical energy) using values (Johnson, Kaufmann and Shleifer, 1997), [2]DYMIMIC (Schneider, 2003), [3]Lacko (1998),[4]MIMICHassan and Schneider (2016) [5]MIMIC macro (Medina and Schneider, 2018), [6]MIMIC adjusted (Medina and Schneider, 2018), [7]MIMIC (Kelmanson et al., 2019), [8]Statistical offices (Medina and Schneider, 2018), 9 Eurostat (2014).

Figure 1: Size of the shadow economy in Croatia from 1991 to 2016



Source: Authors according to Medina and Schneider (2018) and Kelmanson et al. (2019)

4. Data and methodology

Guided by the previously presented research and theoretical contribution, this paper assumes the correlation and causal link between the informal economy and employment, unemployment, employee wage levels, and general economic performance. Hassan and Schneider (2016), Medina and Schneider (2018, 12) and Kelmanson et al. (2019) explained the causal relation between the shadow economy and variables using causes variables and indicator variables of the shadow economy. This paper examines the correlation between the shadow economy and these variables and uses a multiple regression model to examine their relation in Croatia from 2000 to 2019. The paper also examines the relation between hours at work, net and gross earnings with shadow economics, which has not been examined in previous research.

Data of the shadow economy level in Croatia are taken from the research of Wu and Schneider (2019, 25-26) obtained by the authors using the MIMIC method, which Kelmanson et al. (2019), despite its weakness, considered appeal due to broad coverage and the internal consistency of the dataset. The available data on the level of the shadow economy refers to the period from 2000 to 2016. For independent variables (Table 1), data from 2000 to 2019 were used. Data on employment and unemployment from 20 to 64 years, number of usual weekly hours of work and GDP growth were obtained from Eurostat, net earnings and gross were obtained from Croatia Bureau of Statistics and GDP per capita from The World Bank (World Bank, 2020).

The limitation is insufficient data on the average number of usual weekly hours of work in the main job and average monthly gross earnings for 2000 and 2001 and insufficient data on the shadow economy from 2017 to 2019. Insufficient data were compensated by conducting the imputation of missing data.

Table 2: Variables in the study

Abbreviations	Variable name	Measure unit
Dependent variable		
SE	Shadoweconomyestimate	%
Independent variable		
TE	TE - Total employment (resident population concept - LFS) from 20 to 64 years - Percentage of the total population	%
TUE	TUE - Total unemployment – annual data [UNE_RT_A] from 20 to 64 years - Percentage of the total population	%
WHW	The average number of usual weekly hours of work in the main job, by sex, professional status, full-time/part-time and economic activity - Weekly hours of work	Hours
NE	Average monthly paid off net earnings per person in paid employment in legal entities	kuna (HRK)
GE	Average monthly gross earnings per person in paid employment in legal entities	kuna (HRK)
GDPpc	GDP per capita current	US$
GDP growth rate	Real GDP growth rate - volume - Percentage change on the previous year	%

Source: Authors

In thefirststepof the analysis, Pearson correlation coefficients were calculated that examine the correlations of the shadow economy with the variables employment, unemployment, weekly workload, employee earnings, and economic performance at the national level. The second part is multiple regression analysis, where the shadow economy is a dependent variable, and other variables presented are independent. Precisely due to this limitation, the lack of available data for 2002 and 2019, before regression analysis, imputation of missing data such as Medina and Schneider, 2018 was performed using the MICE algorithm (van Buuren, 2012), which creates multiple imputations, i.e. replacement values, a total of seven measurements. Which allowed the research to cover the period from 2000 to 2019. The formulas for the multiple regressions can be expressed as

$$SE = a + \beta_1 TE + \beta_2 TUE + \beta_3 WHW + \beta_4 NE + \beta_5 GE + \beta_6 GDPpc + \beta_7 GDPgrowth + e$$

SEis a dependent variable, and others are independent variables, e is the error term involved in using the linear model to predict the value of Y, a is the intercept of the slope, and β is the coefficient of the independent variable (Kamki, 2016).

5. Results and discussion

The results of the correlation analysis are shown in Table 3.

Table 3: Correlation matrix

	Shadow econ	Employment	Unemployment	Hours at work	Net earnings	Gross earnings
Shadow econ	1.00					
Employment	0.22					
Unemployment	0.08	-0.89***				
Hours at work	-0.64*	-0.29	-0.02			
Net earnings	0.85***	0.63**	-0.35	-0.89***		
Gross earnings	0.79***	0.51*	-0.21	-0.85***	0.98***	
GDPpc	0.77***	0.81***	-0.42	-0.61**	0.88***	0.87***
GDPgrowth	-0.66**	-0.10	-0.03	0.27	-0.38	-0.52*

Note: Significance $^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$

Source: Authors

Unexpectedly, the correlation analysis showed a statistically significant strong positive connection of the shadow economy with net earnings ($r = 0.85$, $p <0.01$) and gross earnings ($r = 0.79$, $p <0.01$) and GDPpc ($r = 0.77$, $p <0.01$). Thus the growth of the shadow economy is linked to the growth of wages and GDP per capita. The results related to GDP per capita contradict the results obtained by Wu and Schneider (2019). There was no statistically significant correlation between the shadow economy and employment and unemployment per capita. However, employment is positively related to net earnings ($p <0.1$) and gross earnings ($p <0.05$).

Unsurprisingly, the result shows a statistically significant strong negative correlation between the shadow economy and the average number of usual weekly work hours ($r = -0.64$; $p <0.1$). That is, less workload of workers during the workweek is associated with a higher level of the shadow economy. The results can be explained by the free time that allows undeclared work to be done outside working hours. The expected increase in the shadow economy is associated with a decrease in GDP growth ($r = -0.66$; $p <0.05$).

Indicative is the result that the number of working hours in a working week is statistically significantly strongly negatively related to the level of gross and net wages and GDP per capita. The reason for this can be found in the official reduction of weekly working hours with a simultaneous increase in salaries in the legal sector, which may be the result of realized but unregistered overtime work, which is a challenge for further research.

Table 4: Multiple Regression Results

	Dependent variable
	Shadow_econ
Independent variable:	
Employment	**-0.428*****
	(0.145)
Unemployment	**-0.403****
	(0.159)
Hours_at_work	-0.190
	(0.767)

	Dependent variable
Net_earnings	**0.001***
	(0.001)
Gross_earnings	-0.001
	(0.001)
GDP_growth	**-0.231*****
	(0.062)
Constant	70.432*
	(35.076)
R^2	0.613
Adjusted R^2	0.484
Residual Std. Error	0.820 (df = 18)
F Statistic	4.749*** (df = 6; 18)

Note: Significance*p<0.1, **p <0.05, ***p<0.01. Standard errors are reportedinparentheses.
Source: Authors

Adjusted R^2 shows that model is high effect sizes (0,484) and explains changes in the outcome variable. Regression model is statistically significant (F Statistic 4.749, df = 6; 18).

Regression analysis provided several statistically significant results. It showed that in Croatia, the share of employees in the total population has a negative impact on the shadow economy, i.e. an increase in employment is expected to lead to a decrease in the shadow economy, which is in line with the results of Medina and Schneider (2018), although in their work the Labor Force Participation Rate is an indicator variable. However, it was found that the share of the unemployed in the total population also negatively affects the shadow economy, i.e. the result shows that increasing unemployment leads to a decrease intheshadoweconomy. The same resultisgivenintheFranić (2019) study,andoppositearetheresultsof Hassan and Schneider (2016) and Medina and Schneider (2018).

GDP growth is connectedto the decrease in the shadow economy. Although in this analysis, GDP growth is not treated as an indicator of the shadow economy, and it is not the result of structural equations modelled on Kelmanson et al. (2019) and Wu and Schneider (2019), expectedly there is a negative correlation between GDP growth and the level of the shadow economy, which is in balance with their research.

Previous research (Radman-Funarić, 2020) showed that the migration balance in Croatia from 2009 to 2018 has a frequent negative sign with an average annual increase in the negative migration balance, which may explain the differentsign of the GDP per capita ratio ($r = 0.77$, $p < 0.01$) and GDP growth ($r = -0.66$, $p < 0.05$; $\beta = -0.231$, $p < 0.01$) with shadow economy. The negative migration balance in Croatia may also explain the differences compared to previous research. Specifically, even with the smallest increase in GDP in the case of population emigration, GDP per capita increases, which creates the image that the shadow economy and GDP have the same trend. The negative migration balance in Croatia can also explain the opposite effect of unemployment on the shadow economy ($\beta = -0.403$, $p < 0.05$).

6. Conclusion

So far, theresearch on the level of the shadow economy has been conducted using various methods that prevent the best comparison. Each of them contains weaknesses but also convenient elements. Despite the wide range of results obtained by researchers, there are many common points of view. In particular, the shadow economy indicators are trade openness, GDP per capita, unemployment rate, government size, fiscal freedom, the rule of law, control of corruption, government stability and initiators are currency, labour force participation rate, GDP growth.

The results unexpectedly showed that the growth of the shadow economy in Croatia isstrongelypositiverelated to thegrowthofnet andgrossearningsand GDP per capita. The negative migration balance may explain this result. Due to the emigration of the population in Croatia, even with the smallest increase in GDP in the case of GDP per capita increases, which creates the image that the shadow economy and GDP are going in the same direction. It was found that less workload of workers during the workweek is associated with a higher level of the shadow economy. The results can be explained by the free time that allows undeclared work to be done outside of working hours. The expected increase in the shadow economy is associated with a decline in GDP growth. The result is indicative that a higher number of working hours in a working week is associated with lower gross and net wages and GDP per capita. The reason for this can be found in the official reduction of weekly working hours with a simultaneous increase in salaries in the legal sector, which may be the result of realized but unregistered overtime work, which is a challenge for further research. The expected increase in employment is connected to the lower level of the shadow economy. However, it was found that a higher share of the unemployed in the total population leads to a decrease in the shadow economy. However, according to the results in Croatia, the reduction of the shadow economy is related to GDP growth.

Considering the results of these and previous research, it follows that with the aim of economic and social development that taking harsh measures with a view to dramatically reducing or even to eradicating the shadow economy is not a first-best solution and the appropriateness of the policy depends on the level of economic development. As suggested by previous researchers, Croatia's development policy should go in the direction of creating a convenient business environment, free of corruption and a large number of tax regulations, with the aim of greater participation in the formal sector. A greater range of available relevant data important to such research will contribute to the increase for further research and developemet of statistical methods. Ad herence to social norms, improved human capital, education about the negative effects of the shadow economy would, undoubtedly, lead to a reduction of the shadow economy to the benefit of all participants in society.

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