# Impact of informal economy indicators on unemployment rate and economic growth in the Republic of Kosovo and the Western Balkans

**Saranda Tafa**
*Kolegji AAB, Kosovo*

**Roberta Bajrami**
*Kolegji AAB, Kosovo*

## Abstract

The informal economy is a very important phenomenon which is present not only in developing countries but also in developed ones, thus attracting the attention not only of researchers and economists, but also of policy-makers. Moreover, the impact of the informal economy on the unemployment rate is indisputable, however what remains debatable is the extent and level of such an impact in developing countries.

The main purpose of this paper is to determine the impact of the informal economy on the unemployment rate and economic growth in the Republic of Kosovo and the Western Balkans for the period 2000 - 2018.

The methodology used in this paper is the indirect approach: MIMIC method (type of SEM). Causal variables include the business freedom index, economic freedom index, tax burden, unemployment rate and government size, while as indicative variables we have the currency (M0 / M1) which is defined according to the limitation of the MIMIC method as the indicator which is set to be fixed at the preliminary value, the labor force participation rate and the GDP growth rate per capita.

The results suggest that the informal economy has a significant positive impact on the unemployment rate and the GDP growth rate per capita. Regarding the correlation between the informal economy and other variables, the findings show that there is a positive correlation with the index of economic freedom and tax burden, while a significant negative correlation can be observed between the size of government in the Western Balkans for the period 2000 – 2018.

**Keywords:** informal economy, unemployment rate, economic growth, MIMIC method.

## Introduction

The link between the informal economy and unemployment remains one of the most important and debatable issues in the economic literature. In the recent years, policymakers's interest in developing this relationship has signficantly increased in developing countries as well as developed countries. The informal economy and the unemployment rate play an important role in developing and developed economies. Moreover, the authors Schneider (2008) and Smith et al., (1985) have made a tremendous contribution to the definition of the informal sector. Furthermore, Schneider (2008) points out that the informal sector anticipated all activities that are currently unregistered economies that contribute to the calculated or official GNP.

ISSN 2519-1284
Acces online at www.iipccl.org

*European Journal of Economics, Law and Social Sciences*
IIPCCL Publishing, Graz-Austria

*Vol. 5 No. 3*
*October, 2021*

Smith et al., (1985), on the other hand, define the informal sector as the production driven by the market for goods and services, either legal or illegal. Thus, economic activities and income from informal activities are described as total transactions that bypass or evade government regulation, taxation, and compliance. High unemployment rates correspond to higher levels of informal economy in GDP (Boeri and Garibaldi, 2002; Dell'Anno and Solomon, 2008; Dobre et al., 2010; Alexandru et al., 2010; Davidescu et al. ., 2015; Mauleón and Sardà, 2017). On the other hand, the increase in the number of unemployed people may lead to a decrease in the number of people involved in the informal sector (Tedds and Giles, 2002), while the informal economy has a positive correlation with the rate of GDP growth, which in turn is negatively related to unemployment (Saafi et al., 2015).

The main purpose of this paper is to analyze the impact of informal economy indicators on unemployment in the Republic of Kosovo.

Given the primary purpose of this paper, namely the research of the informal economy and its impact on the labor market in the case of the Republic of Kosovo, during the period 2000 - 2018, the research questions that this research aims to answer are:

1. Is there a significant relationship between the indicators of the informal economy and the unemployment rate in the Republic of Kosovo and other Western Balkan countries?

2. Does the informal economy have a significant effect on economic growth in the Republic of Kosovo and other Western Balkan countries?

In this case, the hypotheses of this research are:

H1: The informal economy has a significant positive impact on the unemployment rate in the Republic of Kosovo and other Western Balkan countries

H2: The informal economy has a significant positive impact on economic growth in the Republic of Kosovo and other Western Balkan countries

Compared to previous studies, none of the empirical studies to date has used a dynamic approach of modeling simultaneous equations to study the relationship between the shadow economy and unemployment in the case of the Republic of Kosovo and the Western Balkan countries.

## Literature review

Despite government regulations in developing and developed countries, there are large market transactions (mainly cash) in various activities and services which are not reported and declared to the government, constituting a phenomenon known as the underground economy (Fortin et al., 2009). Most governments restrict these activities through prosecution, punishment, and education, but changes in the form of such activities have been significant and present at all times (Jie et al., 2011).

Over the past decade, the recent interest in the relationship between the informal economy and the unemployment rate has prompted a thorough assessment of the nature of this relationship in various parts of the world. Existing literature shows that unemployment rate, reduction of working hours, tax burden, self-employment, quality of governance and economic growth may be the main factors in the expansion of shadow economy.

Fighting the hidden economy however is a double-edged sword. A government that has regulatory institutions with poor control over tolerating the informal economy, leads to significant losses of potential revenue and the qualitative and quantitative improvement of public services and goods. As extensive as the literature of informality may be, so are the factors that have been identified as determinants for the decision of the worker or employer to operate in the gray economy.

As many authors point out, it is important to understand whether workers get informal work because they need to or because they want to (Ruffer and Knight, 2007). According to Ruffer and Knight (2007), there are two opposing views regarding informal labor markets. First, according to one view, the informal sector mostly serves the function of absorbing the surplus of labor force. The degree of informality also depends on the skill level and demographics. Skills level is measured by education or engagement in the industry. Intuitively, it is expected that the low-skilled workforce to act more informally by considering compensation and other factors.

Research support this fact; for example, Hazans (2011), in his research on the degree of informality in Europe, finds that the overall average [degree of informality] is 14.5 percent for low-skilled workers, 8.4 percent for those with average skills, and 5.7 percent for those with high skills "

In later editions of the ILO Regional Employment Program for Latin America (PRE-ALC), employment in the informal sector was consistently referred to as "under unemployment" affecting workers who could not gain access to the modern economy (PREALC 1985; Garcia 1991). Eventually, the informal sector became known as the "excluded" sector in less developed economies in the ILO, PREALC, and World Bank studies on urban poverty and labor markets (Sethuraman 1981; Gerry 1978; Tokman 1978). The negative characterization of the ILO in the informal sector has been challenged by other researchers looking at the informal sector in exactly the opposite direction.

The alternative view is that informal activities are a sign of popular entrepreneurial dynamism, described by Hart (1990, p.158) as "people taking over the hands of some of the economic power that centralized agents sought to deny them.

A review of the recent literature, which tries to define informality, brings us to the frequent question of whether this concept should include both, "legal" and "illegal" activities. Legal activities iiclude unregistered business activities, which when caught can be formalized (after receiving the sentence) but not shut down; eg these activities can bring additional revenue to the budget. Illegal activities, on the other hand, include activities that should not exist; such as trafficking with human beings or drugs. These activities, when caught, cease to exist and do not bring additional revenue to the budget.

Smith (1994), for example, includes both types of activities in his definition of shadow economy. According to him, the definition includes "production of goods or services from the market, whether legal or illegal, which are not included in the official measurements of GDP." Although this definition is comprehensive and - at least at first glance - ideal, most authors say that while in a broader definition illegal activities are part of the shadow economy, a division between legal and illegal production within the sector is essential, in order not only to facilitate the measurement of these activi-

ISSN 2519-1284
Acces online at www.iipccl.org

European Journal of Economics, Law and Social Sciences
IIPCCL Publishing, Graz-Austria

Vol. 5 No. 3
October, 2021

ties, but also to make the figures drawn from this research more accurate and reliable. This critique is definitely valid, hence, this paper chooses a narrower conceptual framework. One of them is offered by Friedrich Schneider (2012), for example, who defines the shadow economy as "all the legal production of the market of goods and services, which is deliberately hidden from public authorities", thus, leaving out the so-called underground activities ", which include illegal activities and services, as well as household production.

Gërxhani (1999) notes that the motivation for informal employment can have economic and non-economic reasons, which are: insufficient economic development, heavy tax burden and complicated tax system, institutional legal framework and complicated and weak legal framework, inefficient enforcement mechanisms, high levels of corruption and bureaucratic incompetence by government agents, lack of trust in state institutions, "laissez-passer" access towards the informal sector, civil wars in some of these countries, and "the conflict between the established economic and social norms in the past and the reaction to the new reality in the present" (Gërxhani 1999, p. 15).

According to Bajada and Schneider (2018), the informal economy in developed countries develops in an illegal framework, where this sector is classified as either an unobserved economy or a black market, while in developing countries, this economy seems to be legitimate. In fact, the higher the tax burden, the greater the difference between labor costs in the formal economy and post-tax earnings, which increases the supply of labor in the informal sector (Johnson et al. 1998a, 1998b; Cebula, 1997; Dell'Anno and Solomon, 2008; Webb et al. 2013; Buehn and Schneider, 2012; Anderson, 2012). In addition, the increased additional costs that formal enterprises have to pay to recruit a worker compels people to work in the informal economy (Schneider and Enste, 2000; Thomas, 1992; Tanzi, 1999; Schneider, 2003, 2005; Dell') Anno, 2007; Dell'Anno et al., 2007; Buehn and Schneider, 2012). The tax burden proves to be one of the reasons for the increase in the size of the informal sector (Torgler and Schneider, 2007).

However, Schneider and Neck (1993) found that the relationship between the shadow economy and the tax burden does not necessarily have to be maintained. Moreover, some scholars such as Riebel (1983), De Gijbel (1984), Lemieux et al. (1994) and Enste (2003) suggested that reducing working hours pushes employees to spend some time working in the informal sector. On the other hand, Enste (2003) showed that early retirement increases the number of working hours in the shadow economy. Moreover, the higher the number of self-employed workers, the greater the activity in the underground economy (Feld and Schneider, 2010; Schneider and Williams, 2013).

According to Bordignon and Zanardi (1997), a high rate of self-employment leads to a parallel growth of the economy as long as these workers can cooperate with their clients to avoid indirect taxes. They discovered that larger enterprises find it easier to hire irregular workers because they have less internal and external control. Moreover, the quality of governance represents a key factor for the informal sector development (Johanson et al., 1997; Friedman et al., 2000; Dreher and Schneider, 2009; Dreher et al., 2007, 2009; Schneider, 2010; Buehn and Schneider, 2012; Teobaldelli, 2011; Teobaldelli

and Schneider, 2012; Amendola and Dell'Anno, 2010; Schneider, 2010; Buehn and Schneider, 2010; Schneider and Williams, 2013; Schneider, 2014).

Incentives for work in the informal sector may result in increased labor costs in the shadow economy and consequently these costs may be transferred to employees (Losby et al. 2002; Dreher et al., 2009; Johnson et al. 1998 and Friedman et al. 2000; Teobaldelli and Schneider, 2012). In fact, a high level of corruption can increase the size of the informal economy because formal enterprises will be taxed more, which leads to more informality in the economy.

Moreover, in their studies Bacchetta et al. (2009) and La Porta and Schleifer (2014) showed that the informal economy also negatively affects economic growth because the informal economy reduces global competition and reduces working conditions due to unfair competition by companies that use illegal sales or methods of work. This result appears to be consistent with those of Loayza (1999), Johnson et al. (1997) and Levenson and Maloney (1998) who showed that an increase in the size of the informal sector reduces a country's level of economic growth.

Regarding the relationship between the informal economy and the unemployment rate, the most important supporters of this approach are (Tanzi, 1999; Giles et Tedds, 2002; Dell'Anno et al. 2007; Feld and Schneider 2010; Tafenau et al., 2010 ; Anghelache et al., 2015) who reported different effects between these variables of interest. The link between the shadow economy and the unemployment rate remains one of the most important issues in the economic literature. The nature of this relationship is debatable (Tanzi, 1999; GilesandTedds, 2002; Dell'Anno et al., 2007). The literature makes it possible to determine the two expected signs of this relationship (positive or negative), due to unemployment which is negatively related to the growth of the formal economy (Okun Law) and the informal economy which tends to grow in line with growth of the formal economy. Then, an increase in the unemployment rate involves a decline in the informal economy (Giles and Tedds, 2002). Following this theoretical ambiguity, several authors, such as (Boeri and Garibaldi, 2002; Dell'Annoand Solomon, 2007; Dobre et al., 2010; Mauleón and Sardà, 2017) empirically explored this relationship and acknowledged that there is generally a positive relationship between the informal economy and unemployment.

Based on SVAR analysis in the US, Dell'Anno and Solomon (2007) showed that there is a positive short-term relationship between the unemployment rate and the informal economy. Similarly, Dobre et al., (2010) found the same results for U.S. data covering the period from 1980 to 2007 implying that the unemployment rate increases the informal economy. This means that an increase in the unemployment rate in the formal sector leads to an increase in the number of people working in the informal economy, which leads to an increase in the size of the informal economy.

In addition, Alexsandru et al., (2011) used the Toda-Yamamoto approach for the U.S. during the period of 1980 to 2009 and found the existence of a long-term relationship between variables and a one-sided causality moving from the unemployment rate to the informal economy. Regarding Italy, Boeri and Garibaldi (2002) showed a positive relationship between the unemployment rate and the informal economy.

Using causality through ARDL for Romania during the 2000-2010 period, Davidescu (2013) showed the existence of a long-term biased causality ranging from the

unemployment rate to the informal economy. A similar finding was suggested by Alexandru and Dobre (2013), who examined this relationship using data covering the first quarter of 2000 and the second quarter of 2010. Based on causality tests, these authors showed a one-sided causality ranging from unemployment to the informal economy. This result was consistent with that of a study conducted by Alexandru (2014).

For a comparative study of 162 countries, including developing countries, Eastern Europe, Central Asia, and OECD high-income countries from 1999 to 2006/2007, Schneider et al., (2010) found that there was no evidence of a significant relationship between unemployment and the informal economy. There is no impact of the informal economy on unemployment in developing and transition countries and OECD countries. These results can be explained as higher unemployment levels due to more regulated and thus less flexible labor markets, which significantly increases the size and trend of informal economies in OECD countries; while in less developed economies, the income of the underground economy guarantees the existence of households. Thus the informal sector stands as a source of food and maintenance for corruption in developing countries.

Moreover, Saafi et al., (2015a) conducted a comparative study of 32 developing and developed countries during the 1980-2009 period, using parametric and non-parametric techniques examined the dynamic link between unemployment and the informal economy. In particular, they found evidence of bilateral relations in Finland and Sweden showing that high levels of unemployment lead to high levels of informal economy and vice versa. Therefore, the one-sided causality that runs from unemployment to the economy has been found in parallel in the United States, Jamaica and Venezuela, implying that a faster unemployment rate favors a larger share of the informal economy in GDP.

Regarding the case of Tunisia, Saafi et al., (2015b) used two different methodologies (a linear approach of Toda-Yamamoto causality, 1995 and a non-linear method of causality of Kyrtsou-Labys, 2006) during the period between 1980 and 2009. Using both of these tests, they found a one-sided causality ranging from unemployment to the informal economy, there is no "opposite cause" from the informal economy to the unemployment rate. Overall, there is a considerable gap between some theoretical studies and many existing empirical studies. Moreover, the outcomes of the two axes are not completely convergent.
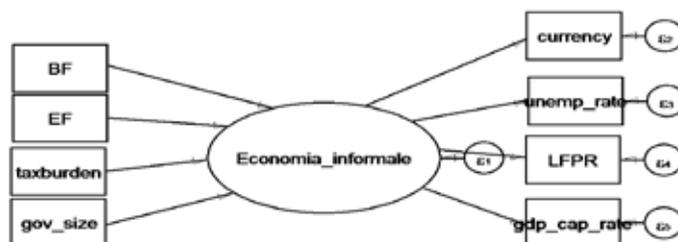
## Methodology and data

In order to determine the impact of the informal economy on the unemployment rate in the case of the Republic of Kosovo and other Western Balkan countries, for the period 2000 - 2018, it was initially necessary to determine the informal economy which is a latent indicator, respectively unknown and observed. In this regard, in this doctoral thesis the method of MIMIC is applied (Multiple Indicators, Multiple Causes) as one of the most indirect methods applied in determining the informal economy of a country.

As explained in the part of the methods applied to determine the informal economy,

ISSN 2519-1284
Acces online at www.iipccl.org

*European Journal of Economics, Law and Social Sciences*
IIPCCL Publishing, Graz-Austria

*Vol. 5 No. 3*
*October, 2021*

the MIMIC method represents one of the types of SEM - the model of structural equations, in which we have a latent variable (in this case the informal economy), causal variables and indicators. Furthermore, what I want to make clear is that when using the MIMIC method, there is no clear separation between the causal variables, which directly affect (lead) the informal economy, and the indicator variables, which reflect the activities of the informal economy. In other words, a warning for the MIMIC method is that, unfortunately, there is no clear separation (or theoretically oriented guiding rule) between indicators and causal variables. For example, when the economy is in a recession with high unemployment, people have a stronger incentive to work in the informal economy; this can be seen as a causal variable, but GDP per capita and other measures are also used as indicator variables, which reflect the activity of the informal economy. Therefore, we recognize that there is some arbitrariness as to whether or not a particular variable should be used as a cause or indicator. In this paper, I have tried to be consistent, so for example since the countries under analysis are all Western Balkans, we can consider that they are homogeneous so unlike many studies that use GDP per capita as one of the causal variables , in this model the same is not included in the causal variolas. Therefore, as an indicator variable, this study uses the GDP growth rate per capita, as well as the labor force participation rate and the currency variable - the M0 / M1 ratio. Furthermore, taking into account the MIMIC method where the rule of identification is that an indicator variable should be fixed at a preliminary value, in this regard the currency variable (ratio M0 / M1) is chosen.

Once we have the coefficients from the MIMIC model, we can derive the MIMIC index using the given structural equation which in this case s the relationship between the shadow economy (latent variable) and its important causal variables:

The model includes causal variables and indicative variables. The index of business freedom, the index of economic freedom, the tax burden, the unemployment rate and the size of government were included as causal variables, while the currency (M0 / M1), labor force participation rate and growth rate of GDP per capita were included as indicative variables.

Figure 7.1. MIMIC models.



**Empirical results**

In order to determine the impact of the informal economy on the unemployment rate in the case of the Republic of Kosovo and other Western Balkan countries, for

ISSN 2519-1284
Acces online at www.iipccl.org

*European Journal of Economics, Law and Social Sciences*
IIPCCL Publishing, Graz-Austria

*Vol. 5 No. 3*
*October, 2021*

the period 2000 - 2018, it was initially necessary to determine the informal economy, which is a latent indicator, respectively unknown and unobserved. In this regard, for this paper the applied the method of MIMIC (Multiple Indicators, Multiple Causes) as one of the most indirect methods applied in determining the informal economy of a country.

Graph 1. Unemployment rate in the Republic of Kosovo, during the period 2006 - 2018.

During the 2006-2008 period, we see a higher unemployment rate that can be observed during the respective period of time analyzed, which then starts to decline and begins to decrease continuously. Moreover, from the beginning of the respective time period until its end, there is a double reduction of the unemployment rate in the Republic of Kosovo.

Table 1 Descriptive statistics.

| VARIABLE | NUMBER OF OBSERVATIONS | AVERAGE VALUE | STANDARD DEVIATION | MINIMUM VALUE | MAXIMUM VALUE |
|---|---|---|---|---|---|
| BF | 104 | 59.99481 | 11.65053 | 40 | 82.9 |
| EF | 102 | 67.82691 | 4.468358 | 58.7 | 76.73511 |
| taxburden | 104 | 85.46471 | 6.505117 | 66.1 | 93.65 |
| unemp_rate | 110 | 25.2067 | 9.684867 | 12.34 | 57 |
| gov_size | 112 | 7.236231 | .7811208 | 5.631466 | 8.63351 |
| D_taxes | 112 | 18.60647 | 11.79504 | 3.126433 | 27.97504 |
| inf | 113 | 5.483979 | 11.68587 | -9.35153 | 86.82626 |
| GDP_cap | 114 | 4126.831 | 1768.669 | 860.1052 | 8771.688 |
| gdp_cap_ rate | 114 | 4.026058 | 3.929311 | -6.039929 | 29.94779 |
| currency | 114 | .9575313 | .3572115 | .0319497 | 2.978861 |
| LFPR | 114 | 60.77733 | 4.191518 | 51.364 | 67.723 |

Source: author calculations.

The following table presents the descriptive statistics of the variables included in the empirical analysis, in which case we can observe the number of observations, the average value, the standard deviation, their maximum and minimum value. In terms of the total number of observations, there are 114 observations, but not all indicators are available for all the countries for all annual time series 2000 – 2018

Table 5.1. Estimated results of the MIMIC model for six Western Balkan countries (Kosovo, Albania, Northern Macedonia, Serbia, Montenegro and Bosnia and Herzegovina).

| INDEPENDENT VARIABLES | THE MIMIC MODEL |
|---|---|
| **Causal Variables** | |
| BF | -.2066468 (-1.83)* |

ISSN 2519-1284
Acces online at www.iipccl.org

European Journal of Economics, Law and Social Sciences
IIPCCL Publishing, Graz-Austria

Vol. 5 No. 3
October, 2021

| | |
|---|---|
| EF | .2229824 (2.41)** |
| Tax burden | -.0792847 (-0.79) |
| Direct taxation | |
| Government size | -.6639378 (-5.06)*** |
| Inflation | |
| **Indicative variables** | |
| Currency (M0/M1) | 1 |
| Unemployment rate | .1584711 (4.84) *** |
| Shkalla e participimit të fuqisë punëtore | -.4162144 (-5.27) *** |
| GDP growth rate per capita | .3447493 (5.72) *** |
| **Statistical tests** | |
| RMSEA (p-value) | 1.090 (0.000) |
| Chi-square (p-value) | 2015.11 (0.000) |
| Number of observations | 99 |
| Note: Absolute statistics of z in parentheses. ***, **, * indicate the significance levels of 1.5 and 10%. According to MIMIC models identification rule, an indicator must be fixed at an apriori value. | |

Source: author calculations.

From the results presented by the MIMIC model, we can see that the informal economy has a significant positive impact on the unemployment rate in the Western Balkans for the 2000 - 2018 period. Moreover, with the growth of 1% of the informal economy, the rate of unemployment will increase by 0.3%. Such findings highlight the need to accept H1: The informal economy has a significant positive impact on the unemployment rate in the Republic of Kosovo and other Western Balkan countries. From the results presented by the MIMIC model, we can see that the informal economy has a significant positive impact on the unemployment rate in the Western Balkans for the period 2000 - 2018. Moreover, with the growth of 1% of the informal economy, the rate of unemployment will rise by 0.3%. This result has further strengthened our confidence in Hypothesis 1 which states that 'The informal economy has a significant positive impact on the unemployment rate in the Republic of Kosovo and other Western Balkan countries'.

The results also highlight the existence of a negative impact of the informal economy on the labor force participation rate, whereas with an increase of 1% in the informal economy, the labor force participation rate will decrease by 0.4%.

On the other hand, we can see the significant positive impact of the informal economy on the GDP growth rate per capita in the case of the Western Balkan countries. Such results confirms Hypothesis 2 which states that 'Informal economy has a significant positive impact on the GDP growth rate per capita in the Republic of Kosovo and other Western Balkan countries'.

## Conclusion

The main purpose of this paper is to determine the informal economy in the Republic of Kosovo and other countries of the Western Balkans for the 2000 – 2018 period, as well as to determine the impact of the informal economy on the unemployment rate in these countries.

From the MIMIC model, which in fact represents the basic model for interpreting the results in terms of the impact of the informal economy on the unemployment rate. Causal variables include the business freedom index, the economic freedom index, the tax burden and the size of government and indicator variable we have the currency (M0 / M1) which is defined according to the limitation of the MIMIC method as the indicator that is defined to be fixed in the previous value, unemployment rate, labor force participation rate and GDP growth rate per capita. From the results we emphasize that the informal economy has a significant positive impact on the unemployment rate in the Western Balkans for the 2000 – 2018 period. Moreover, with 1% increase of the informal economy, the unemployment rate will increase by 0.3%. Such findings confrm H1: The informal economy has a significant positive impact on the unemployment rate in the Republic of Kosovo and other Western Balkan countries.

On the other hand, we can see the significant positive impact of the informal economy on the GDP growth rate per capita, with the growth of 1% of the informal economy, the GDP growth rate per capita will increase by 0.3%. Such results confirm H2: Informal economy has a significant positive impact on the GDP growth rate per capita in the Republic of Kosovo and other Western Balkan countries.

To eliminate or minimize the informcal economy, government and policy-makers need to think about several issues: The level of tax and social security burden; License and permit applications; Legislation regarding the entry and exit of businesses; Economic freedom of the country; Institutional capacity and law enforcement; Lack of wider public control over public administration and institutions; and Corruption.

## References

Adair, P., 2004. Informal economies and social transformation in Romania. Vol. 5. LIT Verlag Munster.

Adair, P., 2012. The Non-Observed economy in the European Union countries (eu-15): a comparative analysis of estimates. In: Tax Evasion and the Shadow Economy. Edward Elgar Publishing, pp. 89–126.

Aigner, D. J., Schneider, F., Ghosh, D., 1986. Me and my shadow: estimating the size of the US underground economy from time series data. Department of Economics, University of Southern California.

Amin, A., 1987. Role of the informal sector in economic development-some evidence from Dhaka, Bangladesh, the. International Labour Review 126, 611.

Arabpour, A., Tata, M., 2008. Estimating the parameters of a fuzzy linear regression model. Iranian Journal of Fuzzy Systems 5 (2), 1–19.

Bajada, C., Schneider, F., 2005. The shadow economies of the asia-pacific. Pacific Economic Review 10 (3), 379–401.

Bardossy, A., 1990. Note on fuzzy regression. Fuzzy Sets and Systems 37 (1), 65–75.

Bordignon, M., Zanardi, A., 1997. Tax evasion in Italy. Giornaledeglieconomisti e annali di economia, 169–210. References 269

Bovi, M., Dell'Anno, R., 2010. The changing nature of the OECD shadow economy. Journal of Evolutionary economics 20 (1), 19–48.

Buehn, A., Schneider, F., 2009. Corruption and the shadow economy: A structural equation model approach. Forschungsinst. zur Zukunft der Arbeit.

Buehn, A., Schneider, F., 2013. Shadow economies in highly developed OECD countries: What are the driving forces? (Working paper no. 1317). URL http://www.econ.jku.at/papers/2013/wp1317.pdf

Dell'Anno R. (2007), The Shadow Economy in Portugal: An Analysis with the MIMIC Approach, *Journal of Applied Economics*, 10, pp. 253–277.

Dell'Anno, R. and F. Schneider (2009), A complex approach to estimate shadow economy: the structural equation modelling, in M. Faggnini and T. Looks (eds.), *Coping with the Complexity of Economics*, Springer, Berlin, pp. 110–30.

Dell'Anno, R., 2007. The shadow economy in Portugal: an analysis with the MIMIC approach. Journal of Applied Economics 10 (2), 253–277.

Dell'Anno, R., Gomez-Antonio, M., Pardo, A., 2007. The shadow economy in three Mediter- ´ ranean countries: France, Spain and Greece. a MIMIC approach. Empirical Economics 33 (1), 51–84.

Dell'Anno, R., Schneider, F., 2009. A complex approach to estimate shadow economy: the structural equation modelling. In: Coping with the Complexity of Economics. Springer, pp. 111–130.

Dell'Anno, Roberto (2008) "What is the Relationship between Unofficial and Official Economy? An analysis in Latin American Countries", European Journal of Economics, Finance and Administrative Sciences, Issue 12 (2008): 185-203.

Dreher, A. and F. Schneider (2009), Corruption and the Shadow Economy: An Empirical Analysis, *Public Choice*, 144/2, pp. 215–277.

Dreher, A., Kotsogiannis, C., McCorriston, S., 2009. How do institutions affect corruption and the shadow economy? International Tax and Public Finance 16 (6), 773–796.

Dreher, A., Schneider, F., 2010. Corruption and the shadow economy: an empirical analysis. Public Choice 144 (1-2), 215–238.

FEIGE, E.L. (1990), Defining and Estimating Underground and Informal Economies: The New Institutional Economics Approach, World Development,

Finlayson, J. A., Peacock, K., 2002. How big is the "hidden" economy? Policy Perspectives 9 (3).

Friedman, E., Johnson, S., Kaufmann, D., Zoido-Lobaton, P., 2000. Dodging the grabbing hand: the determinants of unofficial activity in 69 countries. Journal of public economics 76 (3), 459–493.

Friedman, M., 1957. A Theory of the Consumption. princeton university press Princeton, NJ.

Giles, D. E., 1999. Measuring the hidden economy: Implications for econometric modelling. The Economic Journal 109 (456), 370–380.

Giles, D. E., 2000. Modelling the hidden economy and the tax-gap in New Zealand. In: Advances in Public Economics. Springer, pp. 71–90.

Hart, Keith. 1973. "Informal Income Opportunities and Urban Employment in Ghana." Paper presented at the Conferenceon Urban Unemployment in Africa. Institute of Development Studies, University of Sussex, September 1971. Subsequently published in 1973 in revised form in Journal of Modern African Studies 11: 61-89.

Maloney, W.F. (1999), "Does informality imply segmentation in urban labor markets? Evidence from sectoral transitions in Mexico", WorldBank Economic Review, vol. 13, No. 2, Washington, D.C., WorldBank.

Schneider, F., Buehn, A., 2012. Shadow economies in highly developed OECD countries: What are the driving forces? URL papers.ssrn.com/sol3/papers.cfm?abstract_id=2161228

Schneider, F., Buehn, A., Montenegro, C. E., 2010. Shadow economies all over the world: New estimates for 162 countries from 1999 to 2007. World Bank Policy Research Working Paper Series, Vol. References 279.

Schneider, F., Enste, D. H., 2013. The shadow economy: An international survey. Cambridge University Press.

Smith, P. 1994. Assessing the Sizeof the UndergroundEconomy: The CanadianStatisticalPerspectives. CanadianEconomicObserver, CatalogueNo. 11–010, 3.16– 33.

Tanzi, V., 1999. Uses and abuses of estimates of the underground economy. The Economic Journal 109 (456), 338–347.

Tedds, L., Giles, D., 2002. Taxes and the Canadian underground economy. Taxes and the Canadian underground economy, Toronto: Canadian Tax Foundation.

Torgler, B., Schneider, F. And Schaltegger, C. 2010. Local Autonomy, Tax Morale, And The Shadow Economy. n UNDP. 2012. Human Development Report. [report] Prishtina: UNDP.

Loayza, N. V., 1996. The economics of the informal sector: a simple model and some empirical evidence from Latin America. In: Carnegie-Rochester Conference Series on Public Policy. Vol. 45. Elsevier, pp. 129–162.