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Estimation of Informal Economy: Figures for Developed and Underdeveloped Countries Around the World

Estimación de la economía informal: cifras para países desarrollados y subdesarrollados de todo el mundo

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Abstract

This paper estimates the size of the value added of the informal economy for 157 countries over 1991 to 2017 with the help of the MIMIC-method. The results show that OECD countries have by far the smallest informal economies, with sizes below 20 percent of official GDP. Moreover, informal economies are larger in Latin American and sub-Saharan African countries, averaging almost 38 and 39 percent of GDP, respectively. The average informal-economy size over all 157 countries and over 1991–2017 is 30.9 percent. The average decline in informal-economy size from 1991 to 2017 is a remarkable 6.8 percentage points. In addition, results of the size and development of undeclared or informal employment all over the world are shown. Except for Eastern Europe and Central Asia and Southern Africa, informal employment is above 50% of total employment and even over 88% in Southern Asia and Sub-Saharan Africa. Finally, some policy measures to reduce the informal economy and conclusions are given.

Keywords: Informal economy, multiple indicators–multiple causes (MIMIC), size of undeclared employment.

Resumen

Este artículo estima el tamaño del valor añadido de la economía informal para 157 países entre 1991 y 2017 con la ayuda del método MIMIC. Los resultados muestran que los países de la OCDE tienen, con mucho, las economías informales más pequeñas, con tamaños por debajo del 20 por ciento del PIB oficial. Y las economías informales son más grandes en los países de América Latina y África subsahariana, con un promedio de casi el 38 y el 39 por ciento del PIB, respectivamente. El tamaño medio de la economía informal en los 157 países considerados y durante el período 1991-2017 es del 30,9

por ciento. La disminución promedio del tamaño de la economía informal de 1991 a 2017 es de un notable 6,8 puntos porcentuales. También se muestran los resultados del tamaño y desarrollo del empleo no declarado o informal en todo el mundo. Excepto en Europa del Este, Asia Central y África Meridional, el empleo informal supera el 50% del empleo total e incluso supera el 88% en Asia Meridional y África Subsahariana. Finalmente, se ofrecen algunas actuaciones de política orientadas a reducir la economía informal y se extraen algunas conclusiones al respecto.

Palabras clave: economía informal, indicadores y causas múltiples (MIMIC), tamaño del empleo no declarado.

JEL Classification/ Clasificación JEL: O17, P37, C01, C13.

1. Introduction

There is an intensive debate in both policy and academic circles on definition, size, and key characteristics of the informal economy as well as informal or undeclared employment. Recent global developments, such as migration waves, climate change, and trade tensions, have triggered a renewed interest in the fields surrounding the informal economy and informal or undeclared employment[1].

And all of those, definition and measurement of the informal economy, has been a subject of controversy. A number of different names, such as the "hidden" economy, "gray" economy, "black" or "lack" economy, "cash" or "informal" economy, knows it. All these synonyms refer to some type of informal-economy activities and have been used frequently—and quite inconsistently. Feige (1979, 1996) argues that the informal economy comprises economic activities that circumvent costs and are excluded from the benefits and rights incorporated into laws and administrative rules covering property relationships, commercial licensing, labor contracts, torts, financial credit, and social systems. The following text defines the *informal* or *shadow economy* as all economic activities that are hidden from official authorities for monetary, regulatory, and institutional reasons. Monetary reasons include avoiding paying taxes and making social security contributions, and regulatory reasons include skirting governmental bureaucracy or the burden of regulatory frameworks, while institutional reasons include corruption, poor quality of political institutions, and weak rule of law. In this paper, the informal economy reflects mostly legal economic and productive activities that, if recorded, would contribute to national GDP; therefore, its definition in this study tries to exclude illegal or criminal activities and do-it-yourself or other household activities.[2]

Additionally to the difficulty associated with its definition, the size of the informal economy is also difficult to measure, as agents engaged in informal-economy activities try to remain undetected. The search for information about the extent of the informal economy and its development over time is

[1] Parts of Chapters 1 to 4 closely follow Medina and Schneider (2019).

[2] Of course, I am aware that there are overlapping areas, like prostitution, illegal construction firms, and corruption; see, for example, Dreher and Schneider (2009), Dreher, Katsogrannis, and McCorriston (2009), Williams and Schneider (2016), Schneider (2017), and Medina and Schneider (2018, 2019).

motivated by its political and economic relevance. Moreover, reliable data on total economic activity, including official and unofficial production of goods and services, are essential in the design of economic policies that respond to fluctuations in economic development over time and across space. Furthermore, the size of the informal economy is a core input for estimating the extent of tax evasion and thus for decisions on how to control it adequately.

In order to estimate the size of the informal economy, different methods have been proposed. Direct approaches, mostly based on surveys and samples, rely on voluntary replies or tax auditing and other compliance methods to measure the informal economy; the results are sensitive to how the survey questionnaire is formulated and therefore unlikely to capture all informal activities.

Indirect approaches, also called indicator approaches, use indirect information to estimate the size of the informal economy. For example, and may be the most famous indicator approach is the currency demand approach, which is shortly described in the next chapter.

More recently, the literature has relied on multiple indicator–multiple cause MIMIC) models, which explicitly consider causes and indicators of the informal economy and treat the latter as an unobserved component.3 Although widely used, MIMIC methods have been criticized, in particular, for (i) the use of GDP per capita and/or growth of GDP per capita as cause and indicator of the size of the informal economy, (ii) the fact that these models require an independent study for calibration, and (iii) some evidence that the coefficients may be sensitive to alternative specifications, as well as chosen countries and time span.4

The paper is organized as follows: Chapter 2 briefly discusses the methods used to measure the informal economy. Chapter 3 shortly presents the in this paper used MIMIC approach, and chapter 4 reports the econometric MIMIC estimation findings and the calculation of the results for the 157 countries over the period 1991 to 2017. In chapter 5 the size of informal and/or unregistered employment are shown for regions all over the world. In chapter 6, some policy measures to reduce the informal economy and informal employment are presented, and finally chapter 7 provides a summary and some conclusions.

2. Measuring the informal economy

From an economic perspective, it is assumed that individuals are rational calculators who weigh costs and benefits when considering breaking the law. Their decision to partly or completely participate in the informal economy is a choice overshadowed by uncertainty, as it involves a trade-off between gains,

[3] Examples of this growing literature include the seminal papers by Schneider and Enste (2000, 2002), Gerxhani (2003), Feld and Schneider (2010), Buehn and Schneider (2012), Hassan and Schneider (2016), Schneider (2017), and Medina and Schneider (2018, 2019).

[4] See Kirchgässner (2016), Feld and Schneider (2016), Breusch (2016), Feige (2016a, 2016b), Schneider (2016), Hashimzade and Heady (2016), and Medina and Schneider (2018, 2019) for recent debates and controversies.

if their activities are not discovered, and losses, if the activities are discovered and the individuals penalized. Informal economic activities *IE* thus negatively depend on the probability of detection *p* and potential fines *f* and positively on the opportunity costs of remaining formal *B*. The opportunity costs are positively determined by the burden of taxation *T* and high labor costs *W* (individual income generated in the informal economy is usually categorized as labor income rather than capital income) due to labor market regulations. Hence, the higher the tax burden and labor costs in a given country, the more incentives individuals in that country have to avoid these costs by working in the informal economy. The probability of detection *p* itself depends on enforcement actions *A* taken by the tax authority and on facilitating activities *F* individuals engage in to reduce the detection of informal-economic activities. This discussion suggests the following structural equation[5]:

$$IE = IE\left[\bar{p}\left(\overset{+}{A},\overset{-}{F}\right); \bar{f}; \overset{+}{B}\left(\overset{+}{T},\overset{+}{W}\right)\right]$$

Hence, informal-economic (IE) activities may be defined as those economic activities (and the income earned by engaging in them) that bypass government regulation, taxation, or observation. More narrowly, the informal economy includes monetary and nonmonetary transactions of a legal nature, and hence all productive economic activities that would generally be taxable were they reported to state (tax) authorities. Such activities are deliberately concealed from public authorities to avoid payment of income, value-added, or other taxes and making social security contributions or to avoid compliance with certain labor market laws and standards such as minimum wages, maximum working hours, and safety standards and administrative procedures. The informal economy thus focuses on productive economic activities that would normally be included in national accounts but remain underground because of tax or regulatory burdens.[6] Although such legal activities would contribute to a country's value added, national accounts do not capture them, because they are produced in illicit ways. Informal household economic activities such as do-it-yourself activities and neighborly help are typically excluded from the analysis of the informal economy.[7]

[5] In this paper a detailed discussion about the underlying theories is not done due to space reasons; compare here the famous and pioneering paper of Allingham and Sandmo (1972), for further literature see Schneider and Enste (2002) and Feld and Schneider (2010).

[6] Although classic crime activities such as drug dealing are independent of increasing taxes and the causal variables included in the empirical models are only imperfectly linked (or causal) to such activities, the footprints used to indicate informal-economic activities such as currency in circulation also apply to classic crime. Hence, macroeconomic informal-economy estimates do not typically distinguish legal from illegal underground activities; instead, they represent the whole informal-economy spectrum.

[7] From a social perspective, and maybe even from an economic one, soft forms of illicit employment such as moonlighting (e.g., construction work in private homes) and its contribution to aggregate value added may be assessed positively. For a discussion of these issues, see Thomas (1992) and Buehn, Karmann, and Schneider (2009).

Taking in account these considerations, a variety of methods have been used in the literature over the years to measure the size of the informal economy. These methods can be categorized as either direct or indirect (including the model-based ones)[8].

The common direct approaches to measuring the size of the informal economy rely on surveys and samples based on voluntary replies or tax auditing and other compliance methods. While providing great detail about the structure of the informal economy, the results are sensitive to the way the survey questionnaire is formulated and respondents' willingness to cooperate. Consequently, surveys are unlikely to capture all informal activities in an economy (see Isachsen and Strøm 1985; Witte 1987; Mogensen et al. 1995; and Feige 1996).

Alternatively, indirect approaches are mostly macroeconomic in nature. These are in part based on (i) the discrepancy between national expenditure and income statistics or (ii) the discrepancy between the official and actual labor force in a country, or else they follow one of several approaches that have been formulated: (iii) the "electricity consumption" approach of Kaufmann and Kaliberda (1996), (iv) the "monetary transaction" approach of Feige (1979), (v) the "currency demand" approach of Cagan (1958) and Tanzi(1980), as well as others, and (vi) the "multiple indicators–multiple causes" approach. Specifically:

1. Discrepancy between national expenditure and income statistics: This approach is based on the idea that if those working in the informal economy are able to hide their incomes for tax purposes but not their expenditures, then the difference between national income and national expenditure estimates can be used to approximate the size of the informal economy. It assumes that all the components of the expenditure side are measured without error and constructed so that they are statistically independent from income factors (see for example MacAfee 1980 and Yoo and Hyun 1998).
2. Discrepancy between official and actual labor force: According to this approach, if total labor force participation is assumed constant, a decline in official labor force participation in a country can be interpreted as an increase in the extent of the informal economy. Since fluctuation in the labor force participation rate might have many other explanations, however, such as the economy's position in the business cycle or individuals' difficulty in finding a job or education and retirement decisions, estimates of this kind represent weak indicators of the size of the informal economy (see for example Contini 1981; Del Boca 1981; and O'Neil 1983).
3. Electricity approach: Kaufmann and Kaliberda (1996) endorse the idea that electricity consumption is the single best physical indicator of overall (official and unofficial) economic activity in a country. Using findings that

[8] This section follows Schneider and Enste (2002), Feld and Schneider (2010), and Schneider (2017).

indicate the electricity–overall GDP elasticity is close to one, these authors suggest using the difference between growth of electricity consumption and growth of official GDP as a proxy for the growth of the informal economy in a country. This method is simple and appealing but has many drawbacks, including that (i) not all informal-economy activities require a significant amount of electricity (e.g., personal services) or the use of other energy sources (coal, gas, etc.), hence only part of informal-economy growth is captured; and (ii) electricity–overall GDP elasticity may vary substantially across countries and over time (see for example Del Boca and Forte 1982; Portes 1996; and Johnson, Kaufmann, and Shleifer 1997).

4. Transaction approach: Using Fischer's quantity equation, Money * Velocity = Prices * Transactions, and assuming a constant relationship between the money flows related to transactions and total (official and unofficial) value added—that is, that Prices * Transactions = k (official GDP + informal economy)—it is reasonable to derive the following equation: Money * Velocity = k (official GDP + informal economy). The stock of money in a country and official GDP estimates are known, and money velocity can be estimated. Thus, if the size of a country's informal economy as a percentage of its official economy is known for a benchmark year, the size of that country's informal economy can be calculated for the rest of the years in a sample. Although theoretically attractive, this method has several weaknesses, for instance: (i) the assumption that k is constant over time seems quite arbitrary, and (ii) other factors in an economy like the development and use of checks and credit cards can affect the desired amount of cash holdings and thus velocity (see for example Feige 1979; Boeschoten and Fase 1984; and Langfeldt 1984).
5. Currency demand approach: Assuming that informal transactions in a country take the form of cash payments, in order not to leave an observable trail for the authorities, an increase in the size of the country's informal economy will consequently increase the demand for currency. To isolate this "excess" demand for currency, Tanzi (1980) suggests using a time series approach in which currency demand is a function of conventional factors, such as the evolution of income, payment practices, and interest rates, and factors causing people to work in the informal economy, like the direct and indirect tax burden, government regulation. And the complexity of the tax system. However, there are a number of problems associated with this method and its assumptions: (i) the procedure Tanzi suggests may underestimate the size of the informal economy, because not all transactions in an economy take place using cash as means of exchange; (ii) increases in currency demand deposits may occur because of a slowdown in demand deposits rather than an increase in currency used in informal activities; (iii) it seems arbitrary to assume equal velocity of money in both formal and informal economies; and (iv) the assumption of no informal economy in a base year is arguable (see for example Cagan 1958; Gutmann 1977; Tanzi

1980, 1983, 1999; Kirchgässner 1983; Schneider 1997; and Johnson, Kaufmann and Zoido-Lobatón 1998a, 1998b).

6. Multiple indicators–multiple causes (MIMIC) approach: This method explicitly considers several causes, as well as various indicators of the informal economy, which is shortly presented in chapter 3. (Compare also Loayza 1996; see also Vuletin 2008; Dell'Anno and Schneider 2009; Dell'Anno 2007; Schneider 2010; Alm and Embaye 2013; Abdih and Medina 2013; Williams and Schneider 2016; and Medina, Jonelis, and Cangul 2017).

3. The MIMIC estimation procedure

Most of the methods described in the preceding section consider only one (either direct or indirect) indicator of the informal economy in a country, such as electricity consumption or money demand. However, more than one manifestation or symptom of the informal economy may exist and show up simultaneously.

Here, this paper uses the MIMIC approach, as it explicitly considers various causes and effects of a country's informal economy. The MIMIC model exploits the associations between observable causes and effects of the unobserved informal economy to estimate the size of the informal economy itself (see Loayza 1996). The model can be described by two equations:

$$y = \lambda IE + \varepsilon \tag{1}$$

$$IE = \gamma' x + \upsilon \tag{2}$$

where IE is the unobservable latent variable, $y' = (y_1, \ldots, y_p)$ is a vector of indicators for IE, $x' = (x_1, \ldots, x_q)$ is a vector of causes of IE, and are the (px1) and (qx1) vectors of the parameters, and and are the (px1) and scalar errors. Equation (1) relates the informal economy to its indicators, while equation (2) associates the informal economy with a set of observable causes. Assuming that the errors are normally distributed and mutually uncorrelated with $var(\upsilon) = \sigma_\upsilon^2$ and, $cov(\varepsilon) = \Theta_\varepsilon$, the model can be solved for the reduced form as a function of observable variables by combining equations (1) and (2):

$$y = \pi x + \mu \tag{3}$$

where , $\pi = \lambda\gamma'$, $\mu = \lambda\upsilon + \varepsilon$ and $cov(\mu) = \lambda\lambda'\sigma_\upsilon^2 + \Theta_\varepsilon$.

As y and *x* are data vectors, equation (3) can be estimated by maximum likelihood using the restrictions implied in both the coefficient matrix π and the covariance matrix of the errors μ.

Since the reduced form parameters of equation (3) remain unaltered when λ is multiplied by a scalar and $\gamma$and σ_υ^2 are divided by the same scalar, the

estimation of equations (1) and (2) requires a normalization of the parameters in equation (1), and a convenient way to achieve this is to constrain one element of $\lambda$to some pre-assigned value.

Since the estimation of λ and is obtained by constraining one element of λ to an arbitrary value, it is useful to standardize the regression coefficients

$\hat{\lambda}$ and $\hat{\gamma}$ as $\hat{\lambda}^s = \hat{\lambda}\left(\frac{\hat{\sigma}_{IE}}{\hat{\sigma}_y}\right)$ and $\hat{\gamma}^s = \hat{\gamma}\left(\frac{\hat{\sigma}_x}{\hat{\sigma}_{IE}}\right)$.

The standardized coefficient measures the expected change (in standard-deviation units) of the dependent variable due to a one-standard-deviation change in a given explanatory variable, when all other explanatory variables are held constant. Using the estimates of the vector and setting the error term to its mean value of 0, the predicted values for the informal economy can be estimated using equation (2). Then, by using information for one country from various independent studies regarding the specific size of the informal economy measured in percent of GDP, the ordinal within-sample predictions for the size of the informal economy can be converted into percentages of GDP[9].

4. Econometric Model MIMIC Applied to the informal economy estimation

4.1. Econometric MIMIC model outcomes

As explained in the previous section, the MIMIC model assumes specific causes and indicators that can be used to measure the size of a country's informal economy. The specialized literature highlights the tax burden or distortionary government policies, labor market rigidities, lack of institutional quality, and product and financial market rigidities as the main causes (see, for example, Schneider 2010; Feld and Larsen 2005, 2009; and Schneider and Enste 2000).

The model used in this paper covers a sample of 157 countries over the 1991–2017-time interval. The estimation relies on the following drivers of a country's informal economy: (i) a measure of tax burden on the economy, as everything else equal, a larger tax burden is likely to encourage economic agents to remain outside of the formal sector;[10] (ii) institutional quality, as weak

[9] Up to today, an intensive debate about the pros and cons of this method and especially its use to estimate the informal economy has been taken place. See the references in footnote 5 for such a debate.

[10] This paper uses two variables to proxy for these effects: (i) the share of government consumption in GDP and (ii) a fiscal freedom index produced by the Heritage Foundation. A larger government will be required to raise more taxes that distort economic activity and push economic agents from the formal to informal sector. The fiscal freedom index is equally weighted with scores from the top marginal tax rate on personal and corporate income, as well as the share of tax burden in GDP. High marginal rates on personal income will push workers toward the informal sector, just as high marginal rates on corporate income will encourage businesses to move activity to the informal sector. See also Medina and Schneider (2018).

institutions, such as lack of respect for the law or high levels of corruption, encourage informal activities; (iii) openness, proxies by trade openness, because as economies become more interconnected and trade more with their neighbors and other countries, it becomes harder to hide these activities from authorities; and (iv) unemployment, as lack of opportunities in the formal sector will force individuals to engage in informal economic activities.

The MIMIC model also uses measurable indicators, such as (i) currency as a fraction of broad money, as people engaged in the informal economy usually conduct their activities in cash; (ii) labor force participation, as a decline in official labor force participation could signal some individuals' giving up searching for work in the formal sector; and (iii) a measure of the size of the economy.

Tables 1 and 2 shows the results for the model (MIMIC) estimation and it presents six specifications over the period 1991–2017 for 157 countries (largest sample).[11] Table 1 provides the estimation results for all countries. All causal variables (trade openness, GDP per capita, unemployment, size of government, fiscal freedom, rule of law, control of corruption, and government stability) have the theoretically expected signs, and most are highly statistically significant. The indicator variables also have the theoretically expected signs and are highly statistically significant. The test statistics are satisfactory.

4.2. Size of the informal economy with MIMIC approach

Statistical Annex shows the most important results (summary statistics) for the 157 countries in the sample over the sample period 1991–2017. The mean value for the size of the informal economy of the 157 countries over the sample period is 30.9% of official GDP, and the median is 31.2%, so there is not a strong deviation between the two. The countries with the three largest informal economies are Bolivia at 62.9% of GDP, Georgia at 61.7%, and Nigeria at 56.8%; the countries with the three smallest are Switzerland at 6.4% of GDP, the United States at 7.6%, and Austria at 7.9%.

Figures 1 and 2 present some disaggregated results. Figure 1 depicts the size of the informal economy by region, as well as for member countries of the Organisation for Economic Co-operation and Development (OECD), in three subperiods of the overall survey period. Remarkably, the size of the informal economy shows a negative (falling) trend over time in all six regions and in OECD countries, meaning that the average size of the informal economy in each region and in OECD countries was considerably smaller in 2010–17 compared to 1991–99. The average decline from 1991 to 2017 was 6.8 percentage points. The OECD countries have by far the lowest average values over the full survey period, below 20 percent, and the sub-Saharan African countries

[11] For a detailed discussion of the econometric (MIMIC) results compare Medina and Schneider (2019).

Table 1. MIMIC model estimation outcomes: 1991–2017, all countries

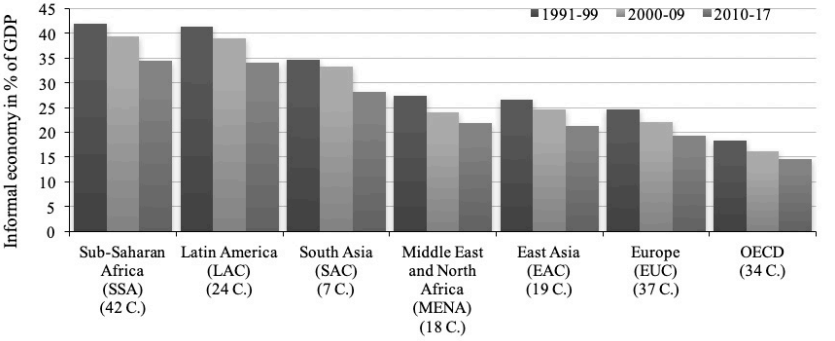
	(1)	(2)	(3)	(4)	(5)	(6)
Causes						
Trade Openness	-0.077***	-0.074***	-0.097***	-0.063**	-0.062**	-0.097***
GDP Per Capita	-0.299***	-0.304***	-0.347***	-0.244***	-0.256***	-0.290***
Unemployment Rate	0.002	0.004	0.026	-0.001	0.003	0.044*
Size of Government	0.110***	0.115***	0.140***			
Fiscal Freedom				-0.097***	-0.101***	-0.105***
Rule of Law	-0.043*			-0.057**		
Control of Corruption		-0.067***			-0.062***	
Government Stability			-0.045*			-0.038
Indicators						
Currency	1	1	1	1	1	1
Labor Force Participation Rate	-0.523***	-0.525***	-0.410***	-0.529***	-0.523***	-0.389***
GDP Per Capita Growth	-0.051	-0.100	-0.241***	0.088	0.048	-0.097*
Statistical Tests						
RMSEA	0.061	0.052	0.057	0.051	0.043	0.048
Chi-square (model vs. saturated)	87.902	66.165	89.216	61.262	46.931	58.653
Chi-square (baseline vs. saturated)	419.447	401.916	582.586	340.457	326.345	432.786
Observations	2106	2100	2450	1980	1979	2109

Note: RMSEA = root mean square error of approximation.
***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.
Source: Medina and Schneider (2019).

and Latin American countries have the highest, with average values above 36 percent. Figure 2 presents the results arranged by income group. Advanced economies have the smallest informal economies, on average, and low-income countries the largest.[12]

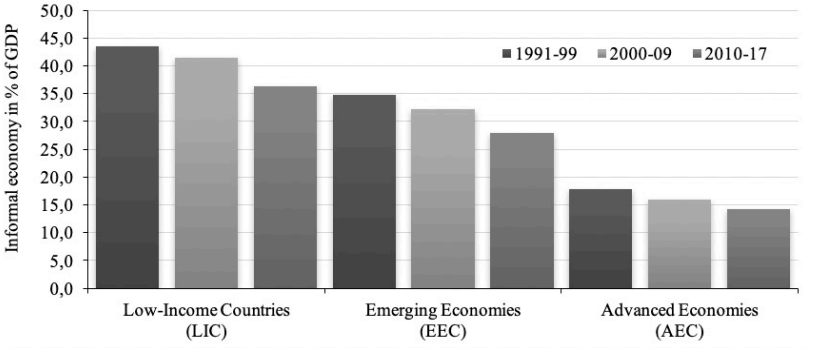
[12] Massive refugee inflows have affected many countries in recent years, especially in the Middle East. Unfortunately, our model does not capture this dimension and therefore could potentially underestimate the size of the informal economies in countries such as Jordan, Lebanon, and Turkey. For the same reason Syria's results should be viewed with caution. China's results should be taken with caution as well, as its economy is partly market and partly planned, and the results might therefore be capturing the informal economy only partly.

Figure 1. Average Size of Informal Economy by Region (*Percent of GDP*)



Note: Numbers in parentheses beneath each region name represent the number of countries from each regional grouping represented in the sample
Source: Medina and Schneider (2019).

Figure 2. Average Size of Informal Economy by Income-Level Grouping (Percent of GDP)



Source: Medina and Schneider (2019)

5. Informal Employment

Here, in this chapter some of the latest results about the worldwide development about informal or unregistered employment are presented. This chapter is based on the results of two recent international institutions studies: Bonnet and alter (2019) and OECD, (2019).

In order to better understand what this meant with informal employment in table 2 a classification of the components of the informal sector and informal labor force is given. Table 2 clearly demonstrates the various components of informal employment from own-account workers to members of producers' co-operatives or to family workers.

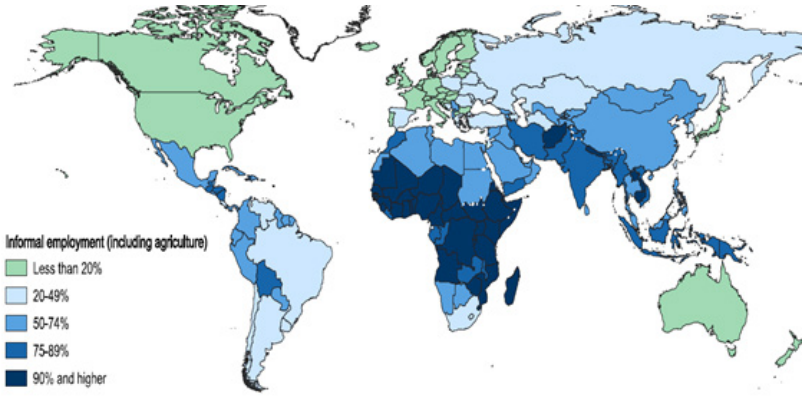
Table 3. Components of the informal sector and informal labor force

Production units by type	Jobs by status in employment								
	Own-account workers		Employers		Contributing family workers	Employees		Members of producers´ co-operatives	
	Informal	Formal	Informal	Formal	Informal	Informal	Formal	Informal	Formal
Formal sector enterprises									
Informal sector enterprises°									
House-holds*									

Notes: As defined by the 15th International Conference of Labour Statisticians (excluding households employing paid domestic workers).
* Households producing goods exclusively for their final use and households employing paid domestic workers.
Source: OECD, 2009: 29.

In figure 3, the share of informal employment (in % of total employment) all over the world is shown. The highest values/shares (over 90%) are in the southern hemisphere, and obviously the lowest are in northern hemisphere.

Figure 3. Informal Employment dominates in the Global South



Source: OECD/ILO (2019).

In table 3 the informal employment, in percent of total employment, according to regions and sex are presented. Informal employment as a share

of total employment is highest, at 92 per cent, in the countries of Sub-Saharan Africa (excluding Southern Africa) with Southern Africa it declines to 89 Southern Asia is next highest with 88 per cent of employment as informal followed by East and South-Eastern Asia (excluding China) at 77 per cent. In the Middle East and North Africa 68 per cent of employment is informal and in Latin America and the Caribbean 54 per cent is informal. Only in Eastern Europe and Central Asia does informal employment represent less than half (at 37 per cent) of total employment. The informal share of men is higher in Asia and Pacific, Middle East and North Africa, and Eastern Europe and Central Asia; in the other regions, the share of women is higher or equal with the one of men (East and South Eastern Asia (excluding China).

Table 4. Per Cent Informal Employment in Total and Non-Agricultural Employment by Sex and Geographic Region, excluding Developed Countries 2016*

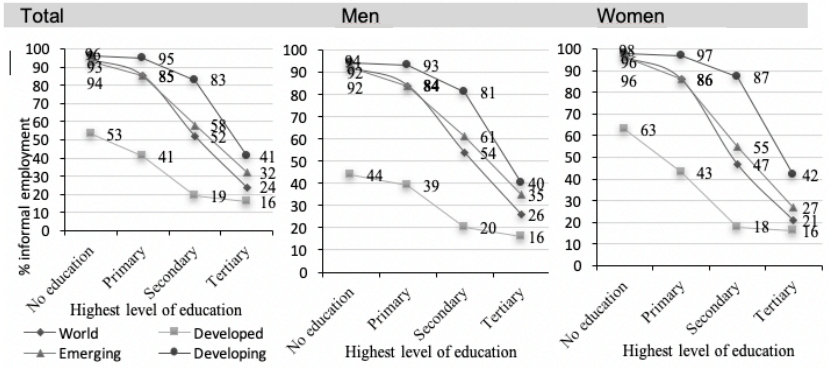
	Total employment		
	Total	Men	Women
Asia and the Pacific	71	74	67
Southern Asia	88	87	91
East and South-Eastern Asia (including China)	61	63	59
East and South-Eastern Asia (excluding China)	77	77	77
Sub-Saharan Africa	89	86	92
Southern Africa	40	38	42
Rest of sub-Saharan Africa	92	89	95
Latin America and the Caribbean	54	53	55
Middle East and North Africa	68	69	62
Eastern Europe and Central Asia	37	38	36

Note: Due to rounding, some totals may not correspond with the sum of the separate figures (informal employment in the informal sector, in the formal sector, in households).
*These data are for emerging and developing countries only, not for developed ones, in the regions.
Source: ILO (2018) calculation based on household survey micro datasets.

Everywhere and at all levels, global and regional, there is a clear relation between an increase in level of education of the labor force and a decrease in the share of informal employment, which is shown in figure 5.2. Globally, the rate of informal employment decreases with levels of education: from 94 per cent of those with no education, to 85 per cent among the labor force (workers) with primary education, to 52 per cent for those with secondary education, to 24 per cent for those with tertiary education. The differences in rates of informal employment by level of formal education are higher in

developing and emerging countries than in developed countries, which have a low incidence of informality. Additionally the decline in informal employment is somewhat steeper/faster considering women compared to men.

Figure 4. Share of Informal Employment in Total Employment by Education and Sex, 2016 (percent)



Source: ILO (2018) calculation based on national labour force or similar household survey data. See Appendix C.1 of ILO (2018) for some of the drivers or informality associated with level of education.

6. Policy measures and some remarks about the corona pandemic

6.1. General remark

In every country, the government faces the challenge to undertake policy measures, which reduce the informal economy and informal (informal) employment. However, the crucial question is: "Is this a blessing or a curse?" I would like to give the following answer:

1) If one assumes, that roughly 50% of all informal (informal) economy activities complement those of the official sector (i.e. those goods would not be produced in the official sector) the development of the total (official + informal economy) GDP is always higher than the "pure" official one.
2) A decline of the informal economy and informal employment will only increase the total welfare in every country if the policy maker succeeds in transferring the informal economic activities into the official economy.
3) Therefore, a policy maker has to favor and choose such policy measures that strongly increase the incentives to transfer the production and labor from the informal (black) to the official sector.

Only then the decline of the informal economy and of informal employment will be a blessing for the whole economy.

6.2. Some short remarks about the interaction of the informal economy with the official one

The informal and official one closely interact with each other. The informal economy positively and negatively influences (i) the tax system, (ii) the allocation, and economic policy decisions through biased figures. In order to develop effective policy measures to reduce the informal economy, these interactions should be taken into account.

6.3. Policy measures against the informal economy and informal employment

In this context, I would like to propose the following six policy measures in order to promote formalization of informal economy and employment:

1) Unemployment is either controllable by the government through economic policy in a traditional Keynesian sense; or the government can try to improve the country's competitiveness to increase foreign demand. If unemployment is reduced, both the informal economy and informal employment will shrink.
2) The impact of self-employment on the informal economy is only partly controllable by the government. A government can deregulate the economy or incentivize "to be your own entrepreneur", which would make easier self-employment and more attractive in the official economy, which would potentially reducing unemployment and the size of the informal economy and informal employment.
3) These two policies need to be accompanied with a strengthening of institutions and trust in public institutions to reduce the probability that self-employed shift reasonable proportions of their economic activities into the informal economy, which, if it happened, made government policies incentivizing self-employment less effective.
4) Besides these measures, policy makers should focus to reduce overall taxation (especially direct taxation on employment).
5) Equally important is the quality of institutions; i.e. creating democratic and transparent institutions with lesser regulatory burden, corruption and bureaucracy in order to be able to restore the trust and confidence of the people in the public institutions.
6) Reducing administrative burden on businesses by simplifying the procedures for obtaining licenses, accelerating the release of documents required for entrepreneurship, reducing bureaucratic barriers for such documents and increasing transparency of the whole process.

7. Final Remarks

With the help of the MIMIC-method this paper estimates the value added of the size of the informal economy for 157 countries over 1991 to 2017. The results clearly show that OECD countries have by far the smallest informal economies, with sizes below 20 percent of official GDP, and that informal

economies are larger in Latin American and sub-Saharan African countries, averaging almost 38 and 39 percent of GDP, respectively. The average informal-economy size over all 157 countries and over 1991–2017 is 30.9 percent. The average decline in informal-economy size from 1991 to 2017 is a remarkable 6.8 percentage points. Results of the size and development of undeclared or informal employment all over the world are also shown. Except for Eastern Europe and Central Asia and Southern Africa, informal employment is above 50% of total employment and even over 88% in Southern Asia and Sub-Saharan Africa.

1) And finally, we can see some policy measures to reduce the informal economy and employment.The size of the informal economy as well as informal employment are quite large in some regions (Latin America and the Caribbean and sub-Saharan Africa).
2) There is substantial heterogeneity within regions in informal-economy size.
3) Countries' informal sectors act as a safety net.
4) The informal sector has low productivity and keeps productivity low in a vicious cycle.
5) A balanced approach is needed for transitioning from the informal to the formal sector.

Additionally, here several preliminary remarks about the Corona Virus Pandemic crisis outcomes on informal economy an employment tendency are showed.

a) The Corona Pandemic has led to a world-wide lockdown of the national economies causing a severe recession with a sharp decline of the GNP and a strong increase of unemployment.
b) Due to this the informal (shadow) economy as well as informal employment will sharply increase, because quite often this is only way to earn some income and to avoid further poverty.
c) In the OECD countries I expect an increase of the shadowinformal economy between 9-12% and in developing countries between 12-18%. Globally such an increase will be the strongest over the last 40 Years!
    i) And all of these suggests some key policy recommendations to formalize the informal sector, like following options: Improve *governance,* a necessary condition.
    ii) Enhance *doing business* and *competitiveness* indicators, focusing on the indicators for which the gap is largest compared to countries with smaller informal sectors.
    iii) Improve the trust of people in public institutions.

Annex

Country	Average	Standard Deviation	Median	Min.	Max.
Albania	32.4	4.6	32.4	27.0	42.1
Algeria	32.3	3.7	32.7	25.5	37.9
Angola	44.5	5.9	45.5	35.2	52.7
Argentina	24.8	2.0	25.0	20.9	28.5
Armenia	42.2	4.3	43.2	34.5	48.7
Australia	12.2	1.6	12.2	9.4	15.2
Austria	7.9	0.9	7.8	6.4	9.1
Azerbaijan	53.4	6.7	54.6	42.4	64.9
Bahamas, The	28.5	3.0	27.8	24.6	34.2
Bahrain	17.3	2.3	16.9	13.9	20.3
Bangla-desh	33.1	3.6	35.0	25.9	36.9
Belarus	43.9	6.3	46.6	33.1	52.9
Belgium	18.4	1.8	18.3	15.5	20.9
Belize	46.2	4.4	45.0	41.0	56.9
Benin	49.4	4.0	50.0	40.0	56.2
Bhutan	25.6	3.3	26.5	19.0	29.6
Bolivia	62.9	6.3	65.1	50.7	70.5
Bosnia and Her-zegovina	32.4	2.9	31.9	26.9	39.5
Botswana	29.8	4.4	29.1	22.6	35.3
Brazil	36.7	4.3	38.5	28.2	41.5
Brunei Darussa-lam	28.8	3.3	30.1	21.5	32.9
Bulgaria	29.9	4.5	30.8	22.9	35.3
Burkina Faso	37.4	4.6	38.1	29.3	43.6
Burundi	37.0	2.5	36.6	32.7	41.5
Cambodia	49.4	4.4	49.6	40.1	57.9
Cameroon	30.9	2.8	31.1	26.4	35.0
Canada	13.3	1.6	13.2	11.1	16.6

Country	Average	Standard Deviation	Median	Min.	Max.
Cabo Verde	33.3	5.1	34.9	26.1	41.3
Central African R.	38.2	3.0	38.8	32.8	43.0
Chad	41.7	4.5	40.8	34.4	47.4
Chile	17.1	1.8	17.2	14.1	19.3
China	13.9	1.8	14.1	11.0	16.5
Colombia	33.5	4.8	36.1	25.2	40.1
Comoros	32.7	4.4	33.4	25.6	39.6
Congo, Dem. Rep. of	49.7	4.8	49.0	41.7	56.5
Congo, Rep. of	45.9	6.2	46.5	35.1	56.4
Costa Rica	23.5	1.2	23.7	21.2	26.0
Côte d'Ivoire	38.5	4.0	39.3	31.7	44.1
Croatia	27.5	3.9	26.6	21.6	34.4
Cyprus	28.2	2.9	27.5	23.1	34.5
Czech Republic	15.0	2.3	15.9	11.7	18.6
Denmark	13.4	1.5	13.3	10.9	15.8
Dominican Republic	31.1	1.9	31.7	27.5	34.7
Ecuador	33.6	2.7	34.1	29.2	37.5
Egypt	33.8	2.8	35.1	29.9	37.6
El Salva-dor	44.2	3.7	44.6	38.6	51.3
Equatorial Guinea	31.6	3.8	32.8	23.9	36.2
Estonia	24.1	3.3	23.7	19.3	29.1
Ethiopia	34.5	4.2	35.6	26.9	40.3
Fiji	29.7	3.4	30.0	23.4	35.2
Finland	12.1	1.4	11.5	9.7	14.7
France	12.9	1.4	12.6	10.1	15.3
Gabon	51.2	4.1	51.8	42.3	57.8
Gambia, The	45.0	1.8	45.1	41.6	48.9

Country	Average	Standard Deviation	Median	Min.	Max.
Georgia	61.7	6.1	62.8	50.4	69.1
Germany	11.4	1.5	11.2	8.7	13.3
Ghana	41.0	5.2	42.5	31.8	48.3
Greece	24.9	2.1	25.3	19.7	27.7
Guatemala	50.3	4.1	50.5	42.0	56.2
Guinea	36.1	2.7	37.5	30.7	40.0
Guinea-Bissau	34.8	4.0	36.8	26.9	40.2
Guyana	30.3	3.2	31.5	24.5	34.8
Haiti	53.8	4.8	54.7	46.7	62.7
Honduras	47.5	3.2	47.8	41.0	52.8
Hong Kong SAR, China	15.0	1.7	15.4	11.8	17.1
Hungary	23.5	3.5	22.6	18.9	30.1
Iceland	13.4	1.3	13.9	10.8	15.0
India	23.6	3.2	24.0	18.5	27.8
Indonesia	23.7	1.9	24.0	20.5	26.9
Iran, Islamic Republic of	17.1	2.3	17.0	13.2	20.5
Ireland	12.8	1.8	12.6	9.5	15.7
Israel	21.4	2.8	21.9	17.0	25.9
Italy	21.8	2.2	21.2	18.1	26.2
Jamaica	34.4	2.3	34.5	29.9	38.8
Japan	11.3	1.0	11.5	9.2	13.0
Jordan	17.3	2.2	17.7	14.1	19.9
Kazakhstan	40.0	4.8	41.6	31.1	45.9
Kenya	31.9	3.6	33.3	24.4	36.3
Korea, Republic of	26.0	2.4	26.4	21.8	29.4
Kuwait	18.6	2.2	19.2	14.5	22.5
Kyrgyz Republic	36.0	4.6	37.7	28.0	41.2
Lao People's D. Republic	29.7	3.0	30.7	23.7	33.8
Latvia	22.5	3.4	22.5	17.9	27.8
Lebanon	32.0	3.4	32.5	27.1	37.2
Lesotho	29.6	1.9	29.9	25.9	32.2
Liberia	41.8	2.6	41.5	38.2	47.0
Libya	34.2	4.6	36.3	22.5	39.4
Lithuania	25.7	4.1	25.3	19.7	31.6
Luxembourg	9.6	1.0	9.8	7.9	10.9
Madagascar	39.1	1.7	39.2	34.5	42.4
Malawi	35.8	3.4	34.9	29.7	43.4
Malaysia	31.0	2.7	31.1	26.9	37.2
Maldives	28.6	2.4	29.6	24.9	32.1
Mali	37.3	3.6	37.9	32.2	44.6
Malta	25.7	3.2	26.9	18.6	30.3
Mauritania	32.8	3.3	32.9	27.2	38.2
Mauritius	21.6	1.9	22.1	17.8	24.3
Mexico	30.5	2.7	30.1	26.6	35.8
Moldova	41.5	4.2	41.8	34.7	48.7
Mongolia	17.2	1.9	17.5	14.0	20.8
Morocco	33.6	3.4	34.3	28.3	38.8
Mozambique	38.0	4.2	39.2	30.0	46.4
Myanmar	47.0	4.7	48.4	36.4	52.7
Namibia	27.9	3.4	28.5	22.9	32.1
Nepal	36.4	2.4	36.8	31.1	40.8
Netherlands	9.9	1.0	9.8	8.4	11.5
New Zealand	11.2	0.9	11.3	9.5	13.2
Nicaragua	42.0	4.9	43.0	33.8	50.8
Niger	39.1	3.2	40.1	33.4	43.7

Country	Average	Standard Deviation	Median	Min.	Max.
Nigeria	56.8	4.4	57.8	47.6	64.0
Norway	12.6	1.5	12.7	9.4	14.8
Oman	17.7	2.6	18.4	12.6	20.7
Pakistan	34.2	2.7	34.3	30.1	39.3
Papua New Guinea	34.0	3.6	35.6	27.8	39.3
Paraguay	35.2	2.9	35.6	30.7	39.8
Peru	53.5	5.8	56.6	43.6	60.0
Philippines	40.8	3.7	41.0	34.9	45.8
Poland	24.4	3.5	25.3	19.4	29.9
Portugal	19.7	2.0	20.0	16.1	22.5
Qatar	17.8	2.8	17.8	13.1	22.0
Romania	28.9	3.7	30.1	23.0	34.4
Russian Federation	39.6	4.2	40.4	32.5	46.3
Rwanda	34.8	4.4	36.5	27.7	40.7
Saudi Arabia	16.3	2.3	16.8	12.2	19.4
Senegal	42.1	3.0	43.2	36.8	46.3
Sierra Leone	40.7	5.3	42.7	28.4	48.6
Singapore	11.7	1.4	11.8	9.4	13.9
Slovak Republic	15.8	2.4	15.3	12.6	19.8
Slovenia	23.0	2.7	23.1	18.3	27.9
Solomon Islands	30.7	3.8	30.8	24.5	36.1
South Africa	26.8	2.7	27.3	21.9	30.4
Spain	22.2	2.1	21.4	18.6	26.4
Sri Lanka	43.9	4.2	45.9	35.5	48.9
Suriname	37.8	4.6	38.5	30.3	45.0
Swaziland	40.6	2.9	40.5	35.2	44.9
Sweden	11.9	1.7	11.5	9.5	15.2
Switzerland	6.4	0.9	6.6	5.1	7.6
Syrian Arab Republic	19.3	1.2	19.3	16.1	21.7
Taiwan Province of China	29.8	4.8	28.7	22.8	37.8
Tajikistan	41.2	4.0	41.6	34.0	47.8
Tanzania	56.0	6.3	57.7	45.4	67.0
Thailand	49.6	4.2	50.2	41.9	55.4
Togo	33.4	3.0	33.8	28.7	39.3
Trinidad and Tobago	34.1	3.8	33.0	28.9	40.4
Tunisia	34.7	3.8	35.6	26.4	40.0
Turkey	30.4	2.9	30.6	25.8	35.2
Uganda	37.0	5.8	40.3	28.0	43.7
Ukraine	45.5	6.0	44.5	34.9	55.7
United Arab Emirates	25.7	3.3	26.1	20.7	30.4
United Kingdom	10.5	1.1	10.6	8.7	12.7
United States	7.6	1.0	7.8	5.7	9.5
Uruguay	43.0	3.9	43.4	36.3	48.4
Venezuela, Rep. Bol.	34.3	3.0	35.4	28.7	38.3
Vietnam	17.8	2.6	18.7	12.5	21.3
Yemen, Republic of	26.2	2.9	26.6	21.5	31.1
Zambia	45.4	6.4	48.6	32.5	55.7
Zimbabwe	53.9	4.7	54.0	46.0	60.1

Source: Medina and Schneider (2019).

References

Abdih, Y., and L. Medina. (2013). "Measuring the Informal Economy in the Caucasus and Central Asia." Working Paper 13/137, International Monetary Fund, Washington, DC.

Allingham, M.G. and Sandmo, A. (1972), "Income Tax Evasion: A Theoretical Analysis", Journal of Public Economics, vol. 1, no.:3/4, pp.323-338. https://doi.org/10.1016/0047-2727(72)90010-2

Alm, J., and A. Embaye. (2013). "Using Dynamic Panel Methods to Estimate Shadow Economies around the World, 1984–2006." Working Paper 1303, Department of Economics, Tulane University, New Orleans, LA. DOI: 10.1177/1091142113482353

Bonnet, F., Vanek, J., and Chen, M. (2019), "Women and Men in the Informal Economy: A Statistical Brief", ILO, Geneva, Switzerland.

Boeschoten, W. C., and M. M. G. Fase (1984). *The Volume of Payments and the Informal Economy in the Netherlands, 1965–1982*. Dordrecht, Netherlands: Nijhoff.

Breusch, T. (2016). "Estimating the Underground Economy using MIMIC Models." *Journal of Tax Administration* 2, no. 1: 1–29.

Buehn, A., A. Karmann, and F. Schneider. (2009). "Shadow Economy and Do-It-Yourself Activities: The German Case." *Journal of Institutional and Theoretical Economics* 165, no. 4: 701–22. DOI:10.1628/093245609789919658

Buehn, A., and F. Schneider. (2012). "Shadow Economies around the World: Novel Insights, Accepted Knowledge, and New Estimates." *International Tax and Public Finance* 19, no. 1: 139–71. DOI:10.1007/s10797-011-9187-7

Cagan, P. (1958). "The Demand for Currency Relative to the Total Money Supply." *Journal of Political Economy* 66: 302–28. https://doi.org/10.1086/258056

Contini, B. (1981). "Labor Market Segmentation and the Development of the Parallel Economy: The Italian Experience." *Oxford Economic Papers* 33: 401–12. https://doi.org/10.1093/oxfordjournals.oep.a041515

Del Boca, D. (1981). "Parallel Economy and Allocation of Time." *Micros (Quarterly Journal of Microeconomics)* 4: 13–18.

Del Boca, D., and F. Forte. (1982). "Recent Empirical Surveys and Theoretical Interpretations of the Parallel Economy in Italy." In *The Underground Economy in the United States and Abroad*, ed. V. Tanzi, 160–78. Lexington, MA: Lexington Books.

Dell'Anno R. (2007). "The Shadow Economy in Portugal: An Analysis with the MIMIC Approach." *Journal of Applied Economics* 10: 253–77. https://doi.org/10.1080/15140326.2007.12040490

Dell'Anno, R., and F. Schneider. (2009). "A Complex Approach to Estimate Shadow Economy: The Structural Equation Modelling." In *Coping with the Complexity of Economics*, ed. M. Faggnini and T. Looks, 110–30. Berlin: Springer. DOI: 10.1007/978-88-470-1083-3_7

Dreher, A., C. Kotsogiannis, and S. McCorriston. (2009). "How Do Institutions Affect Corruption and the Shadow Economy?" *International Tax and Public Finance* 16, no. 4: 773–96. DOI: 10.1007/s10797-008-9089-5

Dreher, A., and F. Schneider. (2009). "Corruption and the Shadow Economy: An Empirical Analysis." *Public Choice* 144, no. 2: 215–77. DOI: 10.1007/s11127-009-9513-0

Feige, E. L. (1979). "How Big Is the Irregular Economy?" *Challenge* 22, no. 5: 5–13. https://doi.org/10.1080/05775132.1979.11470559

Feige, E. L. (1996). "Overseas Holdings of U.S. Currency and the Underground Economy." In *Exploring the Underground Economy*, ed. S. Pozo, 5–62. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research. DOI: 10.17848/9780880994279.ch2

Feige, E. L. (2016a). "Reflections on the Meaning and Measurement of Unobserved Economies: What Do We Really Know about the 'Shadow Economy'?" *Journal of Tax Administration* 2, no. 1: 5–41.

Feige, E. L. (2016b). "Professor Schneider's Shadow Economy (SSE): What Do We Really Know? A Rejoinder." *Journal of Tax Administration* 2, no. 2: 93–107.

Feld, L.P., and C. Larsen. (2005). "Black Activities in Germany in 2001 and 2004: A Comparison Based on Survey Data." Study 12, Rockwool Foundation Research Unit, Copenhagen.

Feld, L. P., and C. Larsen. (2009). *Undeclared Work in Germany 2001–2007—Impact of Deterrence, Tax Policy, and Social Norms: An Analysis Based on Survey Data.* Berlin: Springer.

Feld, L. P., and F. Schneider. (2010). "Survey on the Shadow Economy and Undeclared Earnings in OECD Countries." *German Economic Review* 11, no. 2: 109–49. https://doi.org/10.1111/j.1468-0475.2009.00466.x

Feld, L. P., and F. Schneider. (2016). "Reply to Gebhard Kirchgaessner." *German Economic Review* 18, no. 1: 112–17. https://doi.org/10.1111/geer.12097

Gerxhani, K. (2003). "The Informal Sector in Developed and Less-Developed Countries: A Literature Survey." *Public Choice* 114, nos. 3–4: 295–318. DOI: 10.1023/B:PUCH.0000044287.88147.5e

Gutmann, P. M. (1977). "The Subterranean Economy." *Financial Analysts Journal* 34, no. 1: 24–27. https://doi.org/10.2469/faj.v33.n6.26

Hashimzade, N., and C. Heady. (2016). "Reflections on the Meaning and Measurement of Unobserved Economies: An Editorial Comment." *Journal of Tax Administration* 2, no. 2: 108.

Hassan, M., and F. Schneider. (2016). "Size and Development of the Shadow Economies of 157 Worldwide Countries: Updated and New Measures from 1999 to 2013." *Journal of Global Economics* 4, no. 3. doi: 10.4172/2375-4389.1000218.

Isachsen, A. J., and S. Strøm. (1985). "The Size and Growth of the Hidden Economy in Norway." *Review of Income and Wealth* 31, no. 1: 21–38. https://doi.org/10.1111/j.1475-4991.1985.tb00496.x

ILO (2018). *Women and men in the informal economy: a statistical picture*. Third edition. International Labour Office – Geneva:

Johnson, S., D. Kaufmann, and A. Shleifer. (1997). "The Unofficial Economy in Transition." *Brookings Papers on Economic Activity* 2:1997 (Fall): 159–239. DOI: https://doi.org/10.2307/2534688

Johnson, S., D. Kaufmann, and P. Zoido-Lobatón. (1998a). "Regulatory Discretion and the Unofficial Economy." *American Economic Review* 88, no. 2: 387–92.

Johnson, S., D. Kaufmann, and P. Zoido-Lobatón. (1998b). "Corruption, Public Finances and the Unofficial Economy." Policy Research Working Paper 2169, World Bank, Washington, DC.

Kaufmann, D. and A. Kaliberda, 1996, "Integrating the Unofficial Economy into the Dynamics of Post-Socialist Economies: A Framework of Analysis and Evidence", in B. Kaminski (ed.) Economic Transition in Russia and the New States of Eurasia. Armont, NY: M. E. Sharpe, Inc.

Kirchgässner, G. (1983). "Size and Development of the West German Shadow Economy, 1955–1980." *Zeitschrift für die Gesamte Staatswissenschaft* 139: 197–214.

Kirchgässner, G. (2016). "On Estimating the Size of the Shadow Economy." *German Economic Review* 18, no. 1: 99–111. https://doi.org/10.1111/geer.12094

Langfeldt, E. (1984). "The Unobserved Economy in the Federal Republic of Germany." In *The Unobserved Economy*, ed. E. L. Feige, 236–60. Cambridge, UK: Cambridge University Press.

Loayza, N. V. (1996). "The Economics of the Informal Sector: A Simple Model and Some Empirical Evidence from Latin America." *Carnegie-Rochester Conference Series on Public Policy* 45: 129–62. https://doi.org/10.1016/S0167-2231(96)00021-8

Medina, L., A. Jonelis, and M. Cangul. (2017). "The Informal Economy in Sub-Saharan Africa: Size and Determinants." Working Paper 17/156, International Monetary Fund, Washington, DC.

Medina, L., and F. Schneider. (2018). "Shadow Economies around the World: What Did We Learn over the Last 20 Years?" Working Paper 18/17, International Monetary Fund, Washington, DC.

Medina, L. and Schneider, F. (2019), "Shedding Light on the Shadow economy: A Global Database and the Interaction with the Official One", CESifo Working Papers 7981, Munich, December 2019.

Mogensen, G. V., H. K. Kvist, E. Kfrmendi, and S. Pedersen. (1995). "The Shadow Economy in Denmark 1994: Measurement and Results." Study 3, Rockwool Foundation Research Unit, Copenhagen.

OECD (2009). *Is informal normal? Towards More and Better Jobs in Developing Countries*. Paris.

OECD/ILO (2019). *Tackling Vulnerability in the Informal Economy.*, Development Centre Studies, OECD Publishing, Paris, https://doi.org/10.1787/939b7bcd-en.

O'Neill, D., 1983, "Growth of the Underground Economy 1950–81: Some Evidence from the Current Population Survey," Study for the Joint Economic Committee, 98:122; Washington: U.S. Congress, Joint Committee Print, U.S. Gov. Printing Office.

Portes, A. (1996). "The Informal Economy." In *Exploring the Underground Economy*, ed. S. Pozo, 147–65. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research. . https://doi.org/10.17848/ 9780880994279

Schneider, F. (2005). "Shadow Economies around the World: What Do We Really Know?" *European Journal of Political Economy* 21, no. 3: 598–642. https://doi.org/10.1016/j.ejpoleco.2004.10.002

Schneider, F. (2010). "The Influence of Public Institutions on the Shadow Economy: An Empirical Investigation for OECD Countries." *European Journal of Law and Economics* 6, no. 3: 441–68. https://doi.org/10.2202/1555-5879.1542

Schneider, F. (ed.). (2011). *Handbook on the Shadow Economy.* Cheltenham, UK: Edward Elgar.

Schneider, F. (2016). "Comment on Feige's Paper, 'Reflections on the Meaning and Measurement of Unobserved Economies: What Do We Really Know about the "Shadow Economy"?'" *Journal of Tax Administration* 2, no. 2: 82–92.

Schneider, F. (2017). "Estimating a Shadow Economy: Results, Methods, Problems, and Open Questions." *Open Economics* 2017, no. 1: 1–29. DOI 10.1515/openec-2017-0001

Schneider, F. (2021). "Informal (shadow) economy and undeclared employment around the world: some facts and figures", in S.M. Ruesga et alter. Dialogs on socioeconomy. Informality in Latin America. Valencia (Spain). Tirant lo Blanch: 43-75.

Schneider, F., and D. Enste. (2000). "Shadow Economies: Size, Causes and Consequences." *Journal of Economic Literature* 38, no. 1: 77–114. DOI: 10.1257/jel.38.1.77

Schneider, F., and D. Enste. (2002). *The Shadow Economy: Theoretical Approaches, Empirical Studies, and Political Implications.* Cambridge, UK: Cambridge University Press.

Tanzi, V. (1980). "The Underground Economy in the United States: Estimates and Implications." *Banca Nazionale del Lavoro* 135: 427–53.

Tanzi, V. (1983). "The Underground Economy in the United States: Annual Estimates, 1930–1980." *IMF Staff Papers* 30: 283–305. DOI: 10.2307/3867001

Tanzi, V. (1999). "Uses and Abuses of Estimates of the Underground Economy." *Economic Journal* 109, no. 3: 338–47.

Thomas, J. J. (1992). *Informal Economic Activity.* LSE Handbooks in Economics. London: Harvester Wheatsheaf.

Vuletin, G. J. (2008). "Measuring the Informal Economy in Latin America and the Caribbean." Working Paper 08/102, International Monetary Fund, Washington, DC.

Williams, C. C., and F. Schneider. (2016). *Measuring the Global Informal Economy: The Prevalence of Informal Work and Labour*. Cheltenham, UK: Edward Elgar.

Witte, A. D. (1987). "The Nature and Extent of Unreported Activity: A Survey Concentrating on Recent US Research." In *The Unofficial Economy: Consequences and Perspectives in Different Economic Systems*, ed. S. Alessandrini and B. Dallago. Aldershot, UK: Gower.