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157 Countries Worldwide: Updated and New Measures
from 1999 to 2013**

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ABSTRACT

Size and Development of the Shadow Economies of 157 Countries Worldwide: Updated and New Measures from 1999 to 2013

This paper is a first attempt to study the size and development of the shadow economies of 157 countries over 1999 to 2013. Using a MIMIC model, we find that higher tax and regulatory burden, unemployment and self-employment rates are drivers of the shadow economy, meaning that an increase of these causal variables increases the shadow economy. Our result also confirms previous findings of Friedrich Schneider, Andreas Buehn and Claudia Montenegro (2010). The estimated average of informality of 157 countries around the world, including developing, eastern European, central Asian and high income OECD countries averaged over 1999 to 2013 is 33.77% of official GDP. A critical discussion about the size of these macro-estimates comes to the conclusion that most likely the “true” shadow economy of these countries is only 69% of their estimated macro-MIMIC-values.

JEL Classification: C51, C82, E26, E41, H11, H26

Keywords: shadow economies of 157 countries, quality of institutions, tax and regulatory burden, MIMIC model

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1. Introduction

There are many studies that investigated the dynamic nature of the shadow economy, yet there is no unified definition of the shadow economy. Generally, the shadow economy is known by different names such as the hidden, grey, black or informal economy. However, all these synonyms refer to some type of shadow economic activities. The shadow economy includes all of the economic activities that are deliberately hidden from official authorities for various reasons. Such reasons vary from being monetary, regulatory to institutional ones. Monetary reasons include avoiding paying taxes and/or social security contributions, regulatory reasons include avoiding governmental bureaucracy or the burden of regulatory framework while institutional reasons include corruption, low quality of political institutions and weak rule of law.

Given the purpose of our study, the shadow economy reflects mostly the legal economic and productive activities that, if recorded, should contribute to the national GDP. Therefore, the definition of the shadow economy in our study tries to avoid illegal or criminal activities, Do-it-Yourself, charitable or household activities.¹ Whether we succeed in doing this is an open question, because the traditional drivers of a shadow economy (e.g. tax and regulatory burden, unemployment, etc.) are quite often also responsible for some crime activities (e.g. smuggling) and do-it-yourself actions. Although the shadow economy is unobserved and it is very challenging to reach a unified definition, but it is important to define the shadow economy in focus of the current study in order to correctly model the unobserved economy by including the variables that lead and reflect the existence of the shadow economy. As our goal is to estimate the size of the shadow economy in a roughly comparable way over countries, we focus mainly on the major macroeconomic variables that affect the motivation of the individuals to participate in market-based informal activities.

The existence of the shadow economy in a country leads to diverse effects that influence the official economic and social life of a country. The shadow economy creates inefficiencies in the labor market, is a source of resource allocation distortions, leads to biases in official indicators such as an upward bias of unemployment rate and/or creates a vicious cycle of continuous increases in the tax base. However, the shadow economy is not necessarily seen as a foe to the overall economy. Individuals spend their income earned in the shadow economy later in the formal economy leading to stimulating effects. For instance, two thirds of the income earned in the shadow economy is later spent in the formal economy (Schneider and Enste, 2002, Schneider, 2010, Williams and Schneider, 2016). In developing countries, companies are able to either buy or manufacture secondary inputs in the shadow economy which then helps the overall economy by creating some jobs that would otherwise would be not be available. Also, individuals can buy cheaper goods or services from the shadow economy. Last but not least, the shadow economy is the safe harbor in times of turmoil and recession acting like an employer of last resort.

The purpose of our study is twofold: First, to estimate the size of the shadow economy of 157 countries all over the world measured as percentage of GDP by using a MIMIC model from 1999 to

¹ Of course, we are aware that there are overlapping areas, like prostitution, illegal construction firms, compare e.g. Williams and Schneider (2016).

2013. Second, a critical discussion about the size of the macro-estimates of these shadow economies follows suggesting a correction factor in order to reach the “true” size. To our knowledge this has not been done before.

Our paper is organized as follows: In section 2, the MIMIC model as well as the theoretical background of the exogenous variables is explained. The MIMIC estimation of the size of the shadow economy is shown in section 3. Section 4 shows the results and implications including a critical discussion about the size of the shadow economy from these macro estimates. Finally, section 5 concludes.

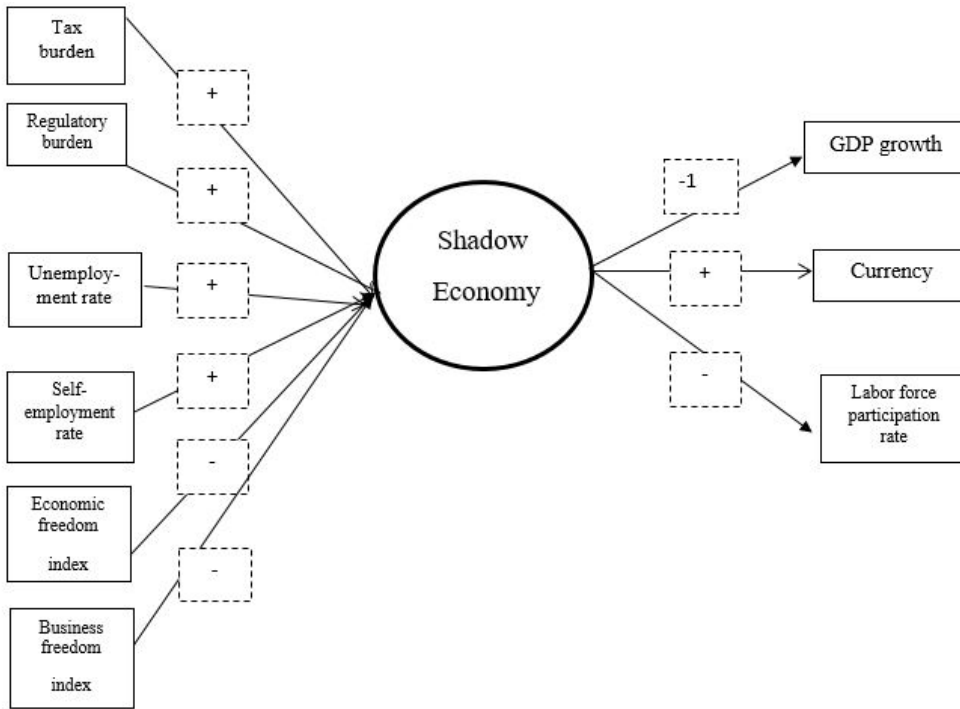
2. Measuring the Shadow economy

There are different methods that can be applied to measure the size and the development of the shadow economy over time. These methods include direct methods such as survey methods, indirect methods known as the indicator approaches and lastly the model as latent approach which is a statistical method such as the MIMIC model.²

The MIMIC model is a special type of structural equation modelling (SEM) that is widely applied in psychometrics and social science research and is based on the statistical theory of unobserved variables developed in the 1970s by Zellner (1970) and Joreskog and Goldberger (1975). The MIMIC model is a theory-based approach to confirm the influence of a set of exogenous causal variables on the latent variable (shadow economy), and also the effect of the shadow economy on macroeconomic indicator variables (Farzanegan, 2009). At first, it is important to establish a theoretical model explaining the relationship between the exogenous variables and the latent variable. Therefore, the MIMIC model is considered to be a confirmatory rather than an explanatory method (Schneider et al., 2010, Feld and Schneider, 2010). The hypothesized path of the relationships between the observed variables and the latent shadow economy based on our theoretical considerations is being visualized in the following figure 2.1.

² As there is available a huge literature about the various methods to measure a shadow economy, a detailed preview about it as well as the problems using these methods (including the MIMIC method) are not discussed here. See e.g. Schneider and Enste (2002), Feld and Schneider (2010), Schneider, Büehn and Montenegro (2010), Schneider (2010, 2015), Schneider and Williams (2013), Williams and Schneider (2016).

Figure 2.1: Hypothesized MIMIC path for estimating the shadow economy.



Source: Authors

The pioneers to apply the MIMIC model to measure the size of the shadow economy in 17 OECD countries were Frey and Week-Hannemann (1984). Following them, various scholars like Tafenau et al. (2010); Tedds (2005); Schneider et al. (2010); Dell’Anno (2007); Hassan and Schneider (2016), Buehn and Farzanegan (2012), Farzanegan (2009); Chaudhuri et al. (2006) applied the MIMIC model to measure the size of the shadow economy.

Formally, the MIMIC model has two parts: the structural model and the measurement model. The structural model shows that the latent variable η is linearly determined by a set of exogenous causal variables which can be illustrated as follows:

$$\eta = \gamma' \chi + \varsigma \quad (1)$$

where χ is a vector of causal variables, γ is a vector of scalars, η is the latent variable (shadow economy) and ς is a structural disturbance term.

The measurement model links the shadow economy with the set of selected indicators is specified by:

$$y = \lambda \eta + \varepsilon \quad (2)$$

where y is a vector of indicator variables, λ is a vector of loading factors to represent the magnitude of the expected change for a unit change in the latent variable η . The ε is the measurement error term.

The MIMIC model takes into account simultaneously different causes and indicators that directly influence the development of the size of the shadow economy over time. In the following, some theoretical considerations of the different cause and indicator variables are being made.

2.1 Causal variables³

i. Tax burden

It is widely accepted in the literature that the most important cause leading to the proliferation of the shadow economy is the tax burden. The higher the overall tax burden, the stronger are the incentives to operate informally in order to avoid paying the taxes. However, it is important to note that in countries where the tax base is large, the shadow economy may not be large and this can be explained by the good institutional framework that such a country enjoys⁴. As a result of this phenomenon, we include in our model institutional quality variables such as economic freedom, and business freedom indices. A statistically significant and positive effect of the tax burden on the development of the shadow economy is found by various studies including Tanzi (1999), Alanon and Go‘mez (2005), Schneider (2010), Buehn (2012), Hassan and Schneider (2016). In our MIMIC model, tax burden is proxied by total tax revenues as percentage of GDP.

Hypothesis 1: The higher the tax burden, the larger the size of the shadow economy is, *ceteris paribus*.

ii. Regulatory burden

Intensive regulation leads to bureaucracy, limits business freedom, and decreases entrepreneurship entry, thus leads to higher motivation to participate in the shadow economy. Buehn and Schneider (2008), Johanson et al. (2008), Loayza et al. (2006) concluded that the regulatory burden leads to larger sizes of shadow economy. In our MIMIC model, regulatory burden is proxied by total government spending as percentage of GDP.

Hypothesis 2: The more intensive the regulatory burden is, the larger the size of the shadow economy is, *ceteris paribus*.

iii. Unemployment rate

Unemployment has an ambiguous effect on the development of the shadow economy. On one side, some authors including Schneider et al. (2010) and Dell’Anno et al. (2007) found out that higher unemployment rate pushes individuals to operate in the shadow economy to find jobs. On the other side, it is argued that when the overall economy is in steady recession and unemployment continuously increases, unemployment does not play a major role affecting the size of the shadow economy. For instance, in Egypt, unemployment does not affect the development of the shadow economy over time because the availability of jobs in both the informal and formal economy is limited as there is a continuous contraction of the overall economy and unemployment rate is steadily high

³ We are aware that there are more causal variables than the five included here, but due to lack of data we could include only the following five.

⁴ The explanation is the following: When taxpayers/voters get a high quality of goods and services from the state, they are willing to pay the taxes for these publicity provided goods and services.

(Hassan and Schneider, 2016). However, we assume that in general unemployment creates incentives to work in the shadow economy. In the MIMIC model, unemployment rate is measured by the total unemployment as percentage of labor force.

Hypothesis 3: The higher the unemployment, the larger the size of the shadow economy is, *ceteris paribus*.

iv. Self-employment rate

It is highly accepted that self-employment has a positive and significant effect on the size of the shadow economy as being concluded by various authors like Dell'Anno et al. (2007), Tedds (2005) and Hassan and Schneider (2016). It is expected that the self-employed are highly motivated to avoid complying with tax regulations because they have a great number of legal and "illegal" tax deductions. Also, they enjoy direct business relationships with the customers, which allows them to bargain with their customers to reach a "tax saving" agreement. Last, the self-employed are more likely to employ irregular and informal employees because they have weak and lesser auditing controls relative to bigger and formal organizations. In our model, self-employment is measured by total self-employed as percentage of total employed.

Hypothesis 4: The higher the self-employment rate, the larger the size of the shadow economy is, *ceteris paribus*.

v. Institutional Quality

In addition to the macroeconomic variables, it is critical to examine the effect of the quality of institutions on the size and development of the shadow economy. Various authors have studied the quality of public institutions as a determining variable of the shadow economy. Based on different studies, Schneider (2010), Razmi et al. (2013) and Hassan and Schneider (2016) concluded that the quality of institutions significantly affect people's motivations to participate in the shadow economy.

It is expected that efficient regulation and good rule of law, freedom to startup a new business, secured property rights and enforceable contracts increase the benefits to remain in the official economy and increases the costs of informality. However, corruption, bureaucracy and regulatory burden act as a barrier to conduct and open a new business in the formal economy pushing individuals to operate in the shadow economy.

As a proxy of institutional quality in our model, we use the economic freedom index and the business freedom index provided by Heritage foundation. These indices range from a scale of 0 to 100 with 100 equaling the freest environment.

Hypothesis 5: The higher the economic freedom index, the smaller the size of the shadow economy is, *ceteris paribus*.

Hypothesis 6: The higher the business freedom index, the smaller the size of the shadow economy is, *ceteris paribus*.

vi. A Problem

Considering these causal factors as main driving forces for the shadow economy, the following problem arises:

All these causal factors, but especially

- (i) tax burden,
- (ii) regulation and
- (iii) unemployment

are major driving forces for smuggling, do-it-yourself activities⁵ and neighbours help, too.

This means, that in the MIMIC and currency demand estimations these activities are (at least partly) included; hence, these estimations are considerably higher than the “true” shadow economy estimates.

2.2 Indicator variables

After considering the different causes that affect the size of the shadow economy, the MIMIC model requires the specification of different indicators that reflect the existence of the shadow economy.

i. Formal economy

It is widely accepted that there is a negative relationship between the shadow economy and the formal economy as the shadow economy absorbs resources and human capital from the formal economy creating a contraction in the formal economy. Several scholars including Schneider et al. (2010), Loayza (1996), Buehn and Schneider (2008), Schneider and Williams (2013), Buehn and Farzanegan (2012) as well as Hassan and Schneider (2016) found a negative and significant relationship between the shadow economy and formal economy. In our empirical model, the formal economy is proxied by GDP growth. Since that the shadow economy is not directly measured, GDP growth is our reference variable in our MIMIC model and is assigned the value of -1.

Hypothesis 7: The larger the size of the shadow economy, the lower the official GDP growth is, *ceteris paribus*.

⁵ The amount of do-it-yourself activities has been measured for Germany by Buehn, Karmann and Schneider (2009) using also the MIMIC approach. In 1970 do-it-yourself activities reached 4.2% of GDP and 5% in 2005; including bought material. The major causal driver for do-it-yourself activities was unemployment.

ii. Currency/cash outside banks

The shadow economy is expected to be reflected in an economy by the increase in the currency in circulation because individuals who participate in informal activities prefer to pay for their informal activities in cash rather than with credit/debit cards, checks or bank transactions in order to avoid any evidence of trace by the official authorities. Studies by various scholars such as Alanon and Go´mez-Antonio (2005), Buehn (2012), Dell’Anno et al. (2007), Schneider et al. (2010) and Hassan and Schneider (2016) concluded that there is a significant and positive relationship between size of the shadow economy and currency held by the public. Therefore, in the MIMIC model, currency is proxied by the ratio of M1 over M2.

Hypothesis 8: The larger the size of the shadow economy, the larger the money held by the public is, <i>ceteris paribus</i>

iii. Labor force participation rate

There is a controversy of whether changes in the participation rate of registered labor reflect changes in the shadow economy. On one hand, the shadow economy does not only absorb resources from the formal economy, as human capital shifts to the shadow economy and hence reduces human resources from formal economy to the informal economy. Several authors, including Bajada and Schneider (2005), Dell’Anno et al. (2007) and Schneider et al. (2010) included labor force rate as an indicator to mirror the existence of the shadow economy. Therefore, we expect that there is negative relationship between labor force and the shadow economy. On the other hand, it is counter argued that a decline in labor force participation rate does not truly reflect the informal shadow economic activities because the registered official labor force does not totally withdraw itself from the formal economy and thus might conduct informal activities during holidays, after working hours, or on weekends. Dell’Anno (2007) found evidence of a positive significant relationship between shadow economy and labor force participation for the case of Portugal.

In our model, labor force participation rate is measured by the total of workforce as percentage of total population. If we find that there is a negative relationship, then registered official labor shifts from the formal economy to the informal economy, but based on our estimations, labor force participation rate is a weak indicator of the shadow economy.

Hypothesis 9: The larger the size of the shadow economy, the lower the official labor force participation rate is, <i>ceteris paribus</i>

3. Estimation of the size of the shadow economy

After establishing an economic theoretical model explaining the expected relationship between the latent variable and the observed variables as being shown in figure 2.1, the MIMIC model tests these theoretical considerations and may confirm the hypothesized relationships between the latent variable η (shadow economy) and its causes and indicators. The Maximum Likelihood method (ML) will be applied to estimate the parameters of the MIMIC model. Then, the time series index of the size of the shadow economy is estimated. This time series MIMIC index based on equation (1) is calculated by multiplying the coefficients of the significant causal variables with the respective time series. The MIMIC model produces only an index of the trend of the size of the shadow economy; meaning that it only tells us about the changes in the ratio of the size of the shadow economy from year to year. Thus an additional step is required to calibrate this index in order to calculate the size of the shadow economy as percentage of GDP. This step is called the benchmarking⁶ step which requires an exogenous estimate of the size of the shadow economy at a certain point in time. For our case, the exogenous size of the shadow economy for the different countries in our sample is extracted from Schneider et al., 2010.

It is important to note that in the MIMIC model estimation we need to fix an indicator variable in the measurement equation (2) (Bollen, 1989). This is required in order to have a reference variable to set a unit of measurement (i.e. as percentage of GDP) for the shadow economy because it is, by nature, unobserved. In our MIMIC estimations, the reference variable is the GDP growth in percentage points and the associated sign to our reference variable is -1. The strategy to determine the sign of the reference variable is called ‘reductio ad absurdum’ which is based on our theoretical assumptions and theory regarding the expected relationship between the exogenous variables and the unobserved shadow economy (Dell’Anno et al., 2007).

In our MIMIC estimations, we use annual data⁷ from 1999 to 2013 for the 157 countries in our sample. As being presented in table 3.1, various MIMIC specifications have been run in order to estimate the magnitude and the effect of different causal variables on the size of the shadow economy for the 157 countries all over the world.

As being indicated in tables 3.1 and 3.2, the GDP growth is our reference variable and is assigned the value of -1 in all the specifications. We started with a general specification testing for significance of all of the causal variables. Considering the result of our MIMIC estimations in table 3.1 we clearly see that the tax burden has a positive (theoretically expected) sign and is statistically significant at the 5% confidence level. The regulatory burden variable (size of government) has also the theoretically expected sign and is highly statistically significant at the 1% confidence level. The estimated

⁶ The benchmarking procedure and the MIMIC methodology are explained in the appendix (A1 and A2)

⁷ Variables and sources are defined in the appendix table (A.1)

coefficient of the unemployment rate is also highly statistically significant and has the expected positive sign. The economic freedom index has the expected negative sign and is at the 10% confidence level statistically significant. The business freedom index is not statistically significant. Considering the indicators, GDP growth and currency rate have the expected sign and are highly statistically significant, the labor force participation rate is found to be insignificant and thus a weak indicator for the shadow economy.

While in specifications MIMIC2 and MIMIC3 in table 3.1, the insignificant business freedom index was being removed in order to be able to determine the most important variables that lead to the existence as well as the development of the shadow economy in the different countries in our sample. The calibration of the size of the shadow economy is based on specification MIMIC2 including four causal variables and three indicators that reflect the existence and lead to the proliferation of the shadow economy. The choice of MIMIC specification 2 (4-1-3) is based on the better fit statistics when being compared to MIMIC specification 3 (4-1-2).

Table 3.1: MIMIC estimation of the size of the shadow economy from 1999 to 2013, yearly data

Variables/spec	MIMIC 1 5-1-3	MIMIC 2 4-1-3	MIMIC 3 4-1-2
Causes			
Tax burden	0.15** (2.07)	0.15** (2.07)	0.15* (2.06)
Regulatory burden	0.29*** (2.74)	0.29*** (2.74)	0.29*** (2.73)
Unemployment rate (first difference)	0.53*** (2.87)	0.53*** (2.87)	0.52*** (2.86)
Economic Freedom Index (first difference)	-0.09* (-1.90)	-0.10* (-1.97)	-0.09** (-1.93)
Business freedom Index (first difference)	-0.007 (-0.19)	—	—
Indicators			
GDP growth	-1*** (-2.62)	-1*** (-2.97)	-1*** (2.55)
Currency (first difference)	0.09** (2.49)	0.09** (2.49)	0.09*** (2.55)
Labor force rate (first difference)	-0.02 (-0.54)	-0.02 (-0.55)	—
Chi ² (pvalue)	12.12 (0.2770)	11.46 (0.1768)	5.44 (0.1423)
GFI	0.94	0.94	0.97
CFI	0.988	0.972	0.985
CD	0.461	0.460	0.438
RMSEA	0.010	0.014	0.019
Degrees of freedom	35	27	20
Number of observations	2,198	2,198	2,198
Number of countries	157	157	157

Notes: Absolute z-statistics are reported in parenthesis. *, **, *** denote significance at 10, 5 and 1% significance levels. Goodness of fit index (GFI): values closer to 0.90 reflect a perfect fit. CFI: when the comparative fit index is closer to one, it indicates a good model fit. SRMR: The values less than 0.08 indicate a good model fit. Coefficient of Determination (CD): A perfect fit corresponds to a CD=1 (Kline, 2011). Degrees of freedom=0.5(p+q)(p+q+1)-t, where p:number of causes, q=number of indicators, t=number of free parameters. Source: Own calculations

Furthermore, we have estimated other MIMIC specifications for a reduced sample of 117 countries that included self-employment as an additional causal variable to our set of causal variables in order to have an additional view and understanding of the major determinants of the shadow economy. As being indicated in table 3.2, we have also run different MIMIC specifications starting with a general specification including all the six causal variables until we reached the best MIMIC specification indicating the significant causal variables that influence the development of the size of the shadow economy. If we consider again first the causal variables, we see again that the tax burden, regulatory burden and unemployment rate have the expected positive sign and are statistically significant, at

least at the 5% confidence level. Moreover, the self-employment rate has the expected positive sign and is statistically significant at the 5% confidence level as well as the economic freedom index.

Table 3.2: MIMIC estimation of the size of the shadow economy from 1999 to 2013, yearly data for the reduced sample

Variables/specification	MIMIC 1 6-1-2	MIMIC 2 5-1-2	MIMIC 3 4-1-2
Causes			
Tax burden	0.08* (1.70)	0.08* (1.70)	0.07* (1.70)
Regulatory burden	0.26*** (3.04)	0.26*** (3.04)	0.24*** (2.82)
Unemployment rate (first difference)	0.43*** (3.27)	0.43*** (3.27)	0.41*** (3.03)
Self-employment rate (first difference)	0.12** (2.20)	0.10** (2.20)	0.10** (2.14)
Economic Freedom Index (first difference)	-0.06* (-1.66)	-0.06* (-1.74)	—
Business freedom Index (first difference)	-0.01 (-0.38)	—	—
Indicators			
GDP growth	-1*** (-3.34)	-1*** (-3.33)	-1*** (-3.08)
Currency	0.11*** (2.79)	0.11** (2.79)	0.10*** (2.59)
Fit statistics			
Chi ² (pvalue)	9.93 (0.0773)	9.66 (0.0465)	3.44 (0.3282)
GFI	0.96	0.96	0.98
CFI	0.975	0.973	0.995
CD	0.325	0.324	0.283
RMSEA	0.025	0.029	0.010
Degrees of freedom	35	27	20
Number of observations	1,638	1,638	1,638
Number of countries	117	117	117

Notes: Absolute z-statistics are reported in parenthesis. *, **, *** denote significance at 10, 5 and 1% significance levels. Goodness of fit index (GFI): values closer to 0.90 reflect a perfect fit. CFI: when the comparative fit index is closer to one, it indicates a good model fit. SRMR: The values less than 0.08 indicate a good model fit. Coefficient of Determination (CD): A perfect fit corresponds to a CD=1 (Kline, 2011). Degrees of freedom=0.5(p+q)(p+q+1)-t, where p:number of causes, q=number of indicators, t=number of free parameters. Source: Own calculations.

To summarize, the signs associated with the causal and indicator variables are as expected and the most significant variables leading to the existence and the development of the shadow economy are

1. Tax burden,
2. Regulatory burden,
3. Unemployment rate,
4. Self-employment rate, and
5. Economic freedom index.

4. Results and Implications

4.1 MIMIC Estimation Results

With reference to the MIMIC specification MIMIC 3 (4-1-2) in table 3.1, we are able to estimate the size of the shadow economy from 1999 to 2013. The ranking of the size of the shadow economy of the 157 countries from smallest to largest is presented in table 4.1. While the sizes of the shadow economy for the smaller sample based on MIMIC specification MIMIC 2 (5-1-2) are being shown in table 4.2. If we first consider the results of table 4.1., we clearly see that Switzerland has an average shadow economy of 9.09% (rank 1), followed by United States with 9.2%, followed by Austria with 9.8% and the largest shadow economy has Bolivia with an average value of 72.19%, followed by Honduras by with 86.2% and Guatemala with 67.87%.

If we consider table 4.2., the sample shrinks to 117 countries but here we could include the causal variable “self-employment”. Singapore has with an average value of 7.24% the lowest one, followed by Switzerland with 9.03% and the United States with 9.35%. Bolivia has the highest one with 69.9%, followed by Honduras with 68.74% and by Tanzania with 66.73%. We are aware that the size and development of the shadow economy is quite high for some countries, but we would argue that for developing countries we estimate a parallel economy and that in these estimations factors are included, which we will discuss in 4.2. Of course, in order to undertake a detailed investigation about the size a study country by country should be undertaken. One should be aware that when estimating so many countries in one sample, it is not possible to take into consideration the distinct differences in the institutions and economic development of all these countries.

Table 4.1: Ranking of 157 countries according to the size of the shadow economy

No	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
1	Switzerland	8.80	9.21	9.13	9.12	10.05	9.65	9.16	8.75	8.44	8.47	9.42	8.79	8.87	9.18	9.35	9.09
2	United States	8.80	8.90	9.03	9.39	8.99	8.51	8.43	8.68	9.36	10.50	10.58	10.45	8.95	8.63	8.29	9.17
3	Austria	10.00	9.28	10.03	9.97	9.99	9.90	9.67	9.31	9.23	9.83	10.11	10.05	9.75	10.18	10.13	9.83
4	Luxembourg	10.00	9.37	10.00	10.91	11.33	11.23	11.56	10.20	10.26	10.38	11.16	10.85	10.63	11.63	13.47	10.87
5	Qatar	18.70	15.67	15.56	13.97	13.34	12.87	12.62	12.22	10.99	8.97	12.18	10.24	9.77	10.06	10.45	12.51
6	Macao SAR, China	13.30	12.30	12.82	12.66	12.73	11.50	11.38	10.84	12.36	14.03	14.29	14.51	14.50	14.72	12.64	12.97
7	Bahrain	18.60	14.72	15.40	15.67	15.16	14.48	12.67	11.00	9.89	9.04	10.11	10.58	10.94	14.57	13.59	13.09
8	New Zealand	13.00	12.35	12.23	12.24	12.37	12.45	13.10	13.96	13.85	15.24	14.93	14.32	13.91	13.76	13.13	13.39
9	Singapore	13.30	14.13	15.64	15.41	14.31	12.49	12.01	12.39	12.45	14.16	13.46	13.35	11.95	12.61	13.44	13.41
10	China	13.20	13.19	14.77	13.81	13.46	13.01	13.11	13.37	13.85	13.24	13.57	13.71	13.11	13.92	13.79	13.54
11	United Kingdom	12.80	12.33	12.89	12.94	13.50	13.55	13.74	13.99	14.00	15.03	15.08	15.26	14.43	13.84	13.26	13.78
12	Japan	11.40	11.72	12.59	13.61	12.92	13.52	12.87	12.65	13.89	14.56	15.53	15.34	15.44	15.50	15.56	13.81
13	Australia	14.40	14.15	14.68	14.36	14.24	14.10	14.26	14.20	14.04	14.53	14.32	14.28	13.79	14.28	14.82	14.30
14	Kuwait	20.10	16.12	18.21	19.78	17.31	15.98	11.52	9.87	10.60	10.13	15.09	14.26	13.13	13.00	12.58	14.51
15	Netherlands	13.30	12.60	12.90	13.94	14.88	14.50	14.39	13.94	14.12	14.38	16.18	16.56	16.01	16.21	16.38	14.69
16	France	15.70	14.32	14.44	15.09	15.63	15.41	15.77	15.17	14.79	15.10	16.37	14.86	14.43	14.98	15.03	15.14
17	Oman	19.10	16.20	16.30	18.14	16.14	15.90	15.40	14.42	13.69	10.45	14.80	13.44	12.92	15.03	16.07	15.20
18	Germany	16.40	15.74	15.27	16.57	17.40	16.78	16.45	14.31	13.94	14.66	16.27	15.65	15.18	15.91	15.96	15.77
19	Canada	16.30	15.48	15.40	16.20	16.48	15.18	15.35	15.36	16.19	16.55	17.56	17.45	15.85	16.66	16.58	16.17
20	Iceland	16.00	15.91	16.04	16.72	17.05	16.66	16.28	16.95	16.60	17.36	17.53	17.57	16.71	15.42	15.76	16.57
21	Ireland	16.10	14.33	14.18	15.88	16.20	16.47	16.26	16.66	17.55	20.17	21.14	20.22	17.77	16.65	15.56	17.01
22	Vietnam	15.80	14.87	14.55	14.49	14.53	15.60	14.39	14.65	16.21	15.98	16.37	22.80	21.41	21.78	24.14	17.17
23	Saudi Arabia	18.70	19.13	21.48	19.17	19.33	18.08	15.82	16.68	15.99	13.19	16.55	16.16	15.23	16.52	17.73	17.32
24	Iran, Islamic Rep.	19.10	20.85	20.02	16.99	12.45	17.17	16.04	21.89	14.54	16.81	21.12	20.10	16.94	16.84	16.71	17.84
25	Jordan	19.40	21.76	20.44	19.43	17.91	18.01	17.94	20.04	18.34	17.52	17.38	16.60	17.06	17.58	16.14	18.37
26	Sweden	19.60	17.87	17.86	18.13	19.45	19.33	19.25	18.43	18.26	18.54	19.90	18.84	18.53	18.65	18.95	18.77
27	Finland	18.40	18.08	16.70	17.70	18.70	18.66	18.90	17.73	17.43	18.79	20.32	20.09	19.47	20.44	20.68	18.81
28	Czech Republic	19.30	18.87	18.02	20.36	20.60	20.18	19.73	17.23	16.76	18.00	19.66	19.99	18.58	18.48	18.47	18.95
29	Denmark	18.40	17.65	17.85	18.07	18.37	18.70	17.88	17.82	18.47	19.38	21.39	21.51	20.05	20.15	19.91	19.04
30	Chile	19.90	18.22	18.54	18.21	19.19	17.75	18.26	18.25	20.05	21.15	20.34	20.59	19.19	19.81	19.74	19.28
31	Indonesia	19.70	22.01	20.40	19.44	20.24	22.69	19.30	19.31	16.17	16.99	18.56	17.33	19.39	19.25	20.25	19.40
32	Norway	19.20	19.06	20.57	21.22	21.05	20.83	19.80	18.23	18.69	18.99	20.56	20.99	20.43	20.52	19.92	20.01
33	Hong Kong SAR, China	17.00	15.16	20.65	24.34	24.26	21.56	19.49	19.38	19.50	21.75	22.04	22.58	19.93	21.81	23.66	20.87
34	Israel	22.70	23.01	23.33	24.00	23.90	21.63	20.65	20.28	20.04	19.94	19.39	19.80	19.56	19.82	20.45	21.23
35	Mongolia	18.40	20.84	23.41	21.64	22.08	24.41	21.62	23.53	23.07	23.51	21.44	21.41	19.76	18.44	21.35	21.66
36	India	23.20	23.77	21.47	20.71	21.54	21.20	20.67	22.18	21.04	21.72	22.43	22.22	20.71	22.25	21.24	21.76
37	Slovak Republic	18.90	19.24	18.00	26.56	21.98	21.14	19.29	19.08	22.14	27.00	26.47	24.77	23.52	23.71	19.85	22.11
38	Mauritius	23.30	21.55	21.09	21.52	25.18	24.63	24.12	22.90	19.13	19.77	22.86	23.46	24.11	23.23	23.89	22.72

No	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
39	Belgium	22.70	20.81	22.32	22.75	23.76	23.16	22.90	21.82	21.70	23.22	23.91	23.79	23.45	24.56	25.34	23.08
40	Eritrea	38.10	32.53	27.57	26.33	29.20	25.11	24.53	20.74	20.65	20.89	18.38	19.84	18.17	12.74	12.78	23.17
41	Angola	48.80	42.24	26.90	19.51	21.69	16.49	16.98	18.90	18.27	20.74	19.84	18.11	19.43	18.14	23.30	23.29
42	Maldives	30.30	34.63	25.29	25.12	22.69	24.71	24.73	24.71	22.86	20.12	18.94	18.33	19.93	19.23	18.32	23.33
43	Spain	23.00	18.87	19.60	20.59	22.54	21.47	22.17	21.57	24.99	28.85	30.40	30.86	28.59	27.62	28.11	24.61
44	Chad	45.80	43.78	40.30	35.82	32.13	26.39	22.92	21.02	18.66	16.80	14.55	13.30	14.74	16.05	15.72	25.20
45	Portugal	23.00	23.26	23.99	25.49	26.02	25.74	26.45	25.37	24.12	25.29	26.02	26.94	27.30	25.97	26.42	25.43
46	Hungary	25.40	23.49	24.30	25.64	27.10	26.42	26.18	25.76	25.47	26.84	28.97	27.94	25.20	24.37	23.88	25.80
47	Botswana	33.90	31.54	29.01	29.64	27.29	26.93	22.43	20.98	22.96	25.89	25.46	21.71	22.33	23.79	25.11	25.93
48	United Arab Emirates	26.30	23.27	27.35	30.53	27.85	31.58	26.28	24.96	22.05	22.05	30.47	25.11	23.90	21.27	28.41	26.09
49	Argentina	25.20	27.84	29.29	26.10	24.51	17.96	19.73	20.06	22.00	24.08	27.64	28.06	28.85	35.08	36.10	26.17
50	Latvia	30.80	28.53	26.71	26.11	26.20	23.95	23.59	22.64	24.35	33.94	34.75	31.07	24.29	20.96	19.92	26.52
51	Bahamas, The	26.30	25.73	26.68	27.80	27.62	26.26	22.69	22.85	22.78	28.41	30.70	31.71	25.99	26.03	29.11	26.71
52	Malta	27.40	27.16	28.48	31.03	30.70	31.70	30.06	32.53	32.46	21.83	22.42	21.84	21.29	21.50	21.62	26.80
53	Poland	27.70	32.78	31.20	28.80	29.42	26.36	23.37	22.00	21.46	24.18	27.49	28.48	27.76	26.87	26.62	26.97
54	Equatorial Guinea	32.70	23.65	18.18	28.51	17.76	20.32	17.35	20.67	18.26	19.85	35.16	38.12	37.43	40.84	42.48	27.42
55	Slovenia	27.30	26.95	25.96	27.70	28.00	27.03	26.90	25.86	25.16	26.28	28.14	29.01	29.48	29.97	29.49	27.55
56	Estonia	33.00	33.14	23.17	24.70	24.96	25.41	22.48	19.69	21.08	35.64	43.86	37.82	24.96	21.70	22.94	27.64
57	Italy	27.80	25.55	26.00	26.35	26.73	27.03	26.75	28.47	27.48	29.16	31.58	30.22	31.22	32.02	32.01	28.56
58	Lithuania	33.80	35.38	28.75	28.93	25.07	25.49	24.79	24.87	26.41	34.52	39.13	34.36	26.00	21.85	21.95	28.75
59	Croatia	33.80	36.71	30.34	27.09	23.01	25.92	25.91	24.26	25.48	26.06	29.83	30.34	31.66	32.10	31.61	28.94
60	Namibia	31.40	30.74	28.98	26.79	26.71	27.79	27.37	26.17	32.72	33.92	31.99	25.77	21.42	30.25	33.54	29.04
61	South Africa	28.40	28.49	29.29	28.43	27.10	27.37	28.48	27.88	28.73	30.38	31.00	31.58	30.71	30.06	30.62	29.23
62	Yemen, Rep.	27.70	27.68	26.91	23.79	24.82	25.22	22.63	26.27	25.16	27.87	31.34	36.13	37.68	37.02	38.92	29.28
63	Guinea-Bissau	40.40	46.21	37.24	37.30	36.89	32.24	29.03	27.52	26.09	20.47	21.19	24.70	21.46	20.70	18.00	29.30
64	Kenya	33.70	32.53	34.89	35.71	33.56	29.04	31.12	24.86	25.97	27.73	27.06	26.07	25.58	25.32	26.37	29.30
65	Colombia	39.40	32.45	29.91	27.95	28.15	27.28	28.06	26.30	28.76	28.45	31.30	29.36	29.16	29.18	29.85	29.70
66	Fiji	32.90	32.55	33.61	32.24	30.66	28.27	28.84	36.39	34.93	32.31	28.23	26.99	24.71	26.26	25.52	30.29
67	Suriname	39.70	40.48	34.45	27.86	30.66	28.15	24.95	25.11	30.04	32.07	30.52	29.36	27.52	33.37	30.44	30.98
68	Trinidad and Tobago	34.70	26.77	30.39	29.63	28.16	25.58	28.25	31.63	27.43	30.16	36.13	35.61	32.74	33.80	34.10	31.01
69	Mexico	30.80	31.05	31.34	30.82	31.47	30.49	30.92	29.79	29.13	32.72	35.07	31.97	30.42	32.91	31.51	31.36
70	Togo	34.40	35.38	33.14	28.70	29.85	29.44	29.81	31.55	27.19	29.35	31.03	28.55	28.25	34.86	39.14	31.38
71	Costa Rica	26.10	26.14	30.17	31.62	30.53	29.89	28.74	27.57	28.91	32.97	34.87	37.16	34.44	35.45	36.73	31.42
72	Pakistan	37.00	30.74	30.47	31.11	31.52	28.27	26.59	26.25	29.41	31.63	31.87	34.87	31.31	34.28	36.05	31.43
73	Central African Republic	42.80	41.91	37.15	37.32	29.81	32.46	31.68	25.17	25.66	26.67	26.33	28.60	26.71	27.32	34.66	31.62
74	Lebanon	34.10	34.82	31.45	36.49	34.98	32.92	31.98	32.89	28.66	29.67	29.32	28.50	29.43	28.33	32.16	31.71
75	Cyprus	29.20	28.64	27.77	29.61	33.11	33.18	34.26	34.35	36.42	37.26	29.34	29.75	30.59	32.64	33.79	31.99
76	Korea, Rep.	28.30	25.57	27.84	29.15	31.36	31.66	32.64	32.30	33.81	35.12	36.24	33.49	34.36	34.15	34.77	32.05
77	Greece	28.50	28.11	27.61	30.02	28.80	28.17	29.46	28.47	29.85	30.65	35.72	37.62	42.34	43.67	39.39	32.56

No	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
78	Algeria	34.20	39.30	34.84	30.87	28.47	24.58	25.66	30.22	30.05	36.89	35.21	37.79	46.42	29.80	27.24	32.77
79	Romania	34.30	35.30	35.01	31.56	37.12	32.61	33.98	30.16	30.80	33.13	35.29	33.50	31.90	32.13	30.65	33.16
80	Venezuela, RB	33.80	29.92	39.16	36.64	35.39	32.03	26.08	26.68	29.03	34.72	50.10	37.89	32.50	32.98	31.64	33.91
81	Lesotho	31.70	33.62	32.26	36.12	31.78	35.11	31.36	34.04	32.94	30.65	32.59	39.05	37.53	36.51	33.35	33.91
82	Macedonia, FYR	39.00	31.68	41.52	41.19	39.25	39.33	31.84	29.32	30.06	32.12	32.75	30.21	32.66	30.73	29.93	34.11
83	Serbia	34.30	33.04	35.59	39.17	41.52	39.07	36.53	32.19	28.51	29.44	31.58	37.35	34.74	32.42	27.95	34.23
84	Bhutan	29.60	37.77	35.99	34.91	35.10	35.09	37.03	36.49	32.15	32.68	35.48	32.44	31.75	33.04	34.60	34.28
85	Bulgaria	36.00	42.52	37.56	31.63	31.86	31.65	32.49	33.15	33.11	34.42	35.97	37.30	33.99	33.59	35.55	34.72
86	Cameroon	33.30	31.70	32.63	31.81	30.70	32.03	30.98	30.49	33.39	34.44	44.69	37.62	45.22	37.43	37.40	34.92
87	Papua New Guinea	35.50	33.53	35.84	32.90	33.28	33.60	34.09	34.27	34.75	35.16	35.58	38.71	37.27	33.89	35.84	34.95
88	Montenegro	34.30	36.79	40.18	40.34	39.93	37.57	39.72	38.20	31.00	33.70	32.52	31.82	33.50	31.35	28.75	35.31
89	Malaysia	32.20	31.65	40.70	39.41	36.45	36.72	32.27	32.75	31.98	34.00	36.49	34.08	35.34	38.41	37.35	35.32
90	Cabo Verde	36.50	37.30	37.15	36.96	36.39	39.01	38.70	39.83	36.84	36.06	35.66	39.02	37.11	22.44	20.98	35.33
91	Bosnia and Herzegovina	34.30	30.24	38.06	36.87	36.69	36.99	38.82	34.96	34.71	32.37	36.08	37.13	39.44	38.41	36.45	36.10
92	Ecuador	34.20	35.05	36.27	34.72	29.81	29.89	30.44	29.63	32.96	36.98	45.16	43.80	42.49	45.57	47.21	36.94
93	Morocco	36.50	35.77	34.89	36.96	35.12	36.79	39.11	37.76	34.76	38.34	37.10	36.57	38.76	40.69	40.72	37.32
94	Turkey	32.70	29.51	38.50	43.00	38.64	34.65	36.08	32.63	38.26	41.27	43.30	40.56	36.70	41.38	32.70	37.33
95	Egypt, Arab Rep.	35.50	41.03	37.40	37.31	38.15	39.02	38.22	38.43	32.97	31.85	37.37	38.39	39.39	39.53	39.35	37.59
96	Philippines	43.80	45.74	44.43	38.38	38.51	31.70	34.05	29.63	36.81	35.45	36.31	36.56	36.20	39.15	38.72	37.69
97	Malawi	39.90	39.48	42.04	37.51	36.72	34.41	36.09	34.58	33.76	36.20	39.34	35.59	41.01	40.58	44.07	38.09
98	Dominican Republic	32.40	37.39	41.48	42.65	37.28	36.75	33.79	31.17	35.27	39.60	36.02	39.40	38.43	46.14	43.54	38.09
99	Timor-Leste	35.50	40.99	41.35	39.72	36.60	35.40	33.70	35.44	35.09	33.52	39.89	41.35	42.44	41.62	42.20	38.32
100	Rwanda	40.50	34.47	41.50	36.12	38.95	30.05	46.90	44.94	41.61	36.07	37.42	35.73	34.87	37.50	38.55	38.35
101	Bangladesh	36.00	38.69	33.14	38.10	43.97	39.27	41.25	31.10	47.17	44.73	34.46	34.45	37.12	40.31	42.61	38.83
102	Swaziland	43.50	42.35	40.46	40.13	37.80	37.65	37.70	35.25	36.51	35.10	40.69	46.54	41.29	43.17	36.33	39.63
103	Tunisia	38.70	38.24	39.10	39.65	39.73	38.21	39.10	36.56	36.07	40.25	40.89	44.50	43.60	43.64	39.45	39.85
104	Guyana	33.40	41.38	42.77	44.01	48.78	46.45	45.23	37.67	37.03	41.29	40.05	40.26	31.94	33.65	34.30	39.88
105	Zambia	49.30	50.33	49.21	46.00	44.88	42.73	40.42	37.60	37.05	35.37	32.20	31.66	34.02	33.19	36.65	40.04
106	Mauritania	35.50	36.39	36.40	44.00	46.87	45.23	45.29	40.60	45.06	39.51	40.39	39.14	33.12	36.79	39.04	40.22
107	Jamaica	36.40	36.31	36.25	35.60	33.45	34.72	37.75	38.37	42.16	45.72	47.55	45.30	44.45	46.72	45.17	40.40
108	Brazil	40.80	39.40	40.31	43.15	39.97	41.56	40.88	41.55	41.72	41.00	41.08	40.54	38.02	37.52	41.18	40.58
109	Paraguay	38.00	43.28	48.36	37.37	36.80	29.03	39.02	35.26	35.44	36.19	43.92	41.47	41.51	49.98	53.73	40.62
110	Barbados	33.80	32.24	34.62	37.72	45.13	41.94	39.16	34.54	42.23	45.03	47.12	48.22	49.26	41.05	39.94	40.80
111	Niger	41.70	37.47	32.69	35.10	38.05	43.69	43.05	42.83	42.86	42.47	44.51	44.74	40.83	41.46	41.20	40.84
112	Cote d'Ivoire	41.40	43.70	38.68	39.03	43.45	43.37	43.57	42.12	42.57	41.02	39.20	39.26	32.67	44.36	41.04	41.03
113	Nepal	37.20	43.23	36.62	34.57	34.92	36.71	38.50	35.45	39.90	43.69	48.71	47.56	48.06	49.87	49.38	41.62
114	Kyrgyz Republic	41.40	41.00	44.15	44.44	36.43	35.90	39.19	38.58	41.91	41.82	42.56	42.57	43.16	47.93	44.82	41.72
115	Albania	35.70	27.77	32.64	39.03	40.10	39.04	42.15	41.06	42.58	45.28	46.97	47.21	49.51	50.78	51.96	42.12
116	Madagascar	40.10	44.33	44.85	36.95	36.07	34.95	38.02	44.58	56.10	46.81	41.02	43.65	44.69	42.70	44.82	42.64

No	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
117	Russian Federation	36.00	33.71	38.92	42.19	41.34	40.05	44.45	43.14	44.65	48.46	49.51	45.64	42.38	44.94	46.37	42.78
118	Comoros	39.30	35.82	42.84	42.54	38.75	37.56	37.47	38.92	38.61	45.65	47.44	46.86	51.01	52.96	46.11	42.79
119	Mozambique	36.00	31.76	35.03	36.02	36.82	41.49	42.35	42.28	39.67	42.68	46.56	48.10	50.56	53.54	63.09	43.06
120	Uganda	43.50	50.51	48.16	52.61	50.92	40.01	49.16	47.32	47.49	41.59	36.22	36.24	45.79	31.76	32.80	43.61
121	Ghana	42.00	40.96	39.82	38.30	40.75	41.90	52.85	34.12	39.97	38.55	39.74	36.44	55.49	61.09	57.01	43.93
122	Mali	42.50	40.63	40.51	42.95	48.71	48.26	44.55	47.32	45.49	44.49	45.22	45.13	44.85	44.82	46.61	44.80
123	Solomon Islands	31.70	35.08	34.57	31.09	30.23	36.63	43.26	45.88	48.50	51.18	53.54	57.13	57.02	60.57	66.23	45.51
124	Congo, Rep.	49.50	41.58	45.61	58.27	54.62	50.68	41.71	45.97	52.55	38.11	42.61	38.92	34.74	46.14	42.47	45.57
125	Armenia	46.60	48.25	56.59	55.03	53.63	39.92	43.99	37.28	35.12	30.62	41.99	50.74	50.54	44.82	48.47	45.57
126	Kazakhstan	43.80	39.50	43.33	42.67	47.04	52.78	37.52	35.83	42.97	42.60	49.84	47.37	50.91	56.58	55.69	45.90
127	Belarus	48.30	45.01	53.02	48.35	52.08	49.61	51.44	51.84	52.62	51.03	45.71	41.66	37.35	36.71	37.67	46.83
128	Georgia	34.00	16.65	22.46	28.76	26.80	38.91	49.97	41.84	61.11	78.74	74.47	61.46	57.13	57.27	53.20	46.85
129	Azerbaijan	61.00	62.81	51.10	36.29	42.10	46.32	44.41	49.68	46.34	43.94	46.76	45.43	43.32	46.23	46.54	47.48
130	Burundi	39.10	33.56	35.27	34.42	39.16	42.37	42.32	43.99	58.79	62.07	57.54	64.44	56.88	52.74	49.74	47.49
131	Guinea	39.70	40.97	41.11	49.96	43.21	39.52	40.13	49.89	39.53	48.80	50.24	67.98	57.10	56.29	53.60	47.87
132	Sri Lanka	45.20	45.66	45.53	56.06	52.93	52.08	52.45	60.20	56.72	62.60	66.31	52.49	36.45	27.62	18.44	48.72
133	Cambodia	50.40	49.71	42.75	48.72	46.21	41.66	34.77	31.84	48.85	54.75	57.06	58.51	57.23	58.26	57.48	49.21
134	Burkina Faso	41.30	47.00	56.34	46.58	46.28	49.02	46.44	50.72	55.47	49.92	48.10	48.68	48.72	51.53	52.60	49.25
135	Nicaragua	45.70	47.92	46.53	45.30	50.63	52.29	48.75	49.25	51.28	53.19	54.25	53.97	49.09	44.49	46.49	49.27
136	Nigeria	46.00	56.21	55.41	37.84	32.86	37.08	43.47	40.52	51.28	74.29	79.42	47.77	48.03	46.42	42.94	49.30
137	Senegal	45.00	48.59	40.08	43.77	45.28	51.10	49.52	49.07	48.86	48.43	52.87	55.27	52.45	57.01	52.58	49.33
138	Congo, Dem. Rep.	34.00	9.82	21.76	34.32	29.71	38.23	42.75	56.04	53.89	51.87	67.53	60.72	81.85	78.47	89.20	50.01
139	Lao PDR	30.90	31.19	39.01	34.17	35.83	40.23	44.18	45.66	50.79	58.83	64.98	59.73	62.95	74.05	80.41	50.19
140	El Salvador	46.50	45.37	51.45	47.40	48.12	48.06	47.16	51.14	47.80	51.10	51.62	54.26	52.77	54.12	58.60	50.37
141	Belize	45.20	37.07	40.53	48.20	51.11	50.08	48.85	48.37	51.32	55.78	58.05	62.45	56.81	55.80	52.81	50.83
142	Tajikistan	43.50	34.28	38.50	40.55	41.53	48.47	60.72	51.83	48.49	52.96	63.57	64.12	69.77	53.03	63.76	51.67
143	Ukraine	52.70	52.57	48.52	47.09	47.09	44.92	50.23	52.76	53.88	52.77	60.07	59.49	53.60	54.24	53.53	52.23
144	Sierra Leone	48.60	62.06	56.55	61.02	54.49	48.09	47.31	49.27	43.62	48.42	54.14	52.95	51.53	52.80	54.74	52.37
145	Uruguay	50.50	50.81	48.34	48.36	48.27	52.99	55.01	56.55	48.70	49.55	52.68	53.62	55.34	56.70	58.35	52.38
146	Gabon	46.20	42.21	60.74	56.87	58.12	56.81	51.01	49.83	53.02	49.00	56.03	50.32	45.69	57.82	53.43	52.47
147	Haiti	54.80	58.21	58.29	60.49	54.23	48.56	54.43	55.38	51.32	52.53	48.41	44.97	46.75	50.87	54.73	52.93
148	Moldova	36.00	25.40	40.49	51.57	53.85	49.79	49.41	58.98	55.58	62.37	72.20	70.66	61.45	62.37	55.80	53.73
149	Liberia	44.20	43.57	41.16	31.39	33.50	54.90	54.60	51.91	62.21	76.93	64.90	67.76	70.76	76.84	82.04	57.11
150	Thailand	53.40	52.18	49.50	51.46	54.73	55.66	58.27	55.64	56.97	60.21	60.67	60.49	63.07	63.68	68.70	57.64
151	Peru	60.10	57.33	57.88	61.68	59.73	58.15	61.91	61.23	57.28	58.91	59.49	55.47	57.06	62.23	61.90	59.36
152	Benin	51.20	50.55	53.65	55.12	59.64	58.05	59.24	58.42	60.49	65.63	67.85	68.71	65.74	67.39	66.52	60.55
153	Gambia, The	46.10	52.83	52.57	52.82	54.57	54.68	51.35	52.19	59.54	74.62	81.35	79.77	78.65	64.30	64.80	61.34
154	Tanzania	58.60	63.70	57.32	55.30	65.01	66.60	76.27	69.43	76.46	63.86	70.58	65.35	65.93	66.78	68.24	65.96
155	Guatemala	51.60	53.98	69.76	78.31	74.69	70.03	61.02	63.47	65.42	71.00	73.33	72.35	68.53	70.86	70.82	67.68
156	Honduras	50.30	57.28	63.34	65.52	67.53	72.43	64.83	60.49	71.07	76.41	81.45	78.60	71.67	69.22	72.41	68.17

No	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
157	Bolivia	67.00	72.33	71.70	76.91	73.86	73.83	78.62	70.98	67.20	64.20	75.55	81.20	76.92	68.17	66.04	72.30
	Time Average	33.02	32.56	33.04	33.22	33.01	32.63	32.67	32.18	33.00	34.41	36.28	35.71	34.90	35.21	35.45	33.82

Table 4.2: Ranking of 117 countries according to the size of the shadow economy including self-employment as causal variable

No.	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
1	Switzerland	8.80	8.96	9.02	9.23	10.05	9.65	9.01	8.67	8.33	8.33	9.31	8.74	8.82	9.14	9.31	9.03
2	United States	8.80	8.84	9.12	9.63	9.26	8.76	8.56	8.76	9.46	10.83	11.08	10.84	9.19	8.78	8.37	9.35
3	Austria	10.00	9.27	9.93	9.89	9.93	9.86	9.71	9.41	9.21	9.85	10.22	10.14	9.77	10.18	10.19	9.84
4	Luxembourg	10.00	9.21	9.99	10.93	11.61	11.43	11.65	10.13	10.17	10.46	11.36	11.07	10.75	11.80	13.11	10.91
5	Macao SAR, China	13.30	12.12	12.54	12.21	12.13	10.49	10.27	9.51	10.70	12.15	12.63	12.40	11.93	12.12	10.47	11.67
6	Bahrain	18.60	14.77	15.41	15.75	15.32	14.33	12.78	11.24	10.09	9.24	10.50	10.91	11.32	14.41	13.58	13.22
7	New Zealand	13.00	12.14	12.05	12.10	12.24	12.31	12.96	13.77	13.84	15.35	15.13	14.66	14.23	13.90	13.18	13.39
8	Japan	11.40	11.59	12.44	13.38	12.73	13.20	12.54	12.29	13.36	14.08	15.07	14.83	14.92	14.98	15.04	13.46
9	Singapore	13.3	14.3	16	16	14.9	12.9	12.3	12.6	12.6	14.4	13.6	13.6	12.1	12.7	13.5	13.65
10	United Kingdom	12.80	12.24	12.91	13.14	13.81	13.88	14.09	14.31	14.30	15.40	15.74	15.83	14.84	14.23	13.59	14.07
11	Australia	14.40	13.99	14.44	14.19	14.00	13.82	13.97	13.89	13.78	14.34	14.34	14.42	13.82	14.30	14.80	14.17
12	Netherlands	13.30	12.54	12.95	14.11	15.17	14.78	14.57	14.17	14.27	14.67	16.74	17.08	16.58	16.80	17.05	14.98
13	France	15.70	13.99	14.24	15.13	15.80	15.58	15.88	15.22	14.83	15.22	16.71	15.65	15.16	15.62	15.66	15.36
14	Vietnam	15.80	13.83	13.71	13.48	13.31	12.32	11.32	12.19	15.52	15.29	15.67	20.49	19.04	19.57	21.73	15.55
15	Germany	16.40	15.72	15.46	16.74	17.58	17.03	16.55	14.36	13.73	14.50	16.23	15.69	15.15	15.80	15.93	15.79
16	Canada	16.30	15.25	15.43	16.32	16.58	15.29	15.37	15.47	16.25	16.93	18.15	17.94	16.28	17.00	16.98	16.37
17	Iceland	16.00	15.94	16.23	16.77	17.15	16.60	16.47	16.97	16.57	17.59	18.20	18.20	17.13	15.82	16.12	16.78
18	Ireland	16.10	13.91	14.22	16.17	16.52	16.70	16.42	16.80	17.91	21.26	22.64	21.49	18.59	17.22	15.92	17.46
19	Iran	19.10	21.50	20.68	17.62	13.23	17.67	16.82	22.13	14.38	16.64	20.72	20.16	16.82	16.40	16.54	18.03
20	Jordan	19.40	21.92	20.47	19.29	17.31	17.45	16.96	19.28	17.34	17.35	17.37	16.55	17.28	17.72	16.09	18.12
21	Chile	19.90	17.85	18.33	18.37	19.08	17.39	17.23	16.76	18.50	20.52	20.34	20.21	18.30	19.19	19.42	18.76
22	Sweden	19.60	17.64	17.86	18.38	19.73	19.60	19.40	18.50	18.19	18.76	20.30	19.12	18.73	18.93	19.36	18.94
23	Finland	18.40	17.74	16.70	17.72	18.75	18.74	18.96	17.88	17.55	19.16	21.08	20.81	19.93	20.94	21.28	19.04
24	Denmark	18.40	17.54	17.90	18.29	18.60	18.78	17.81	17.77	18.24	19.46	21.73	21.84	20.22	20.19	19.85	19.11
25	Hong Kong SAR, China	17.00	14.47	19.71	23.09	23.09	19.91	17.39	16.93	16.95	19.74	20.15	20.23	17.65	19.38	21.04	19.12
26	Czech Republic	19.30	18.98	18.17	20.58	20.95	20.29	19.59	17.27	16.72	18.14	20.22	20.52	18.94	18.57	18.60	19.12
27	Norway	19.20	18.48	20.08	20.89	20.89	20.41	19.20	17.51	17.98	18.30	20.38	20.60	19.90	20.03	19.77	19.58
28	Indonesia	19.70	22.55	21.80	21.33	21.98	23.88	19.91	20.04	17.23	18.05	19.31	16.61	17.40	17.93	19.36	19.80
29	Mongolia	18.40	20.30	22.81	21.63	21.23	22.96	19.27	20.91	20.46	21.76	19.69	19.40	17.33	16.87	19.48	20.17
30	Slovak Republic	18.90	22.12	19.63	18.34	24.16	20.34	19.32	17.46	17.03	20.38	25.27	24.66	22.63	21.29	21.55	20.87
31	Israel	22.70	22.61	23.17	24.04	23.87	21.44	20.35	19.93	19.72	20.00	19.47	19.70	19.41	19.87	20.58	21.12
32	India	23.20	23.50	21.62	20.70	21.25	20.79	20.31	21.19	20.07	20.98	21.57	21.11	19.92	21.52	20.96	21.25
33	Maldives	30.30	34.90	25.50	25.38	22.69	24.65	24.37	24.28	22.16	19.30	16.00	15.32	16.36	18.17	17.76	22.48
34	Mauritius	23.30	21.19	21.06	21.73	25.69	25.26	24.69	22.98	18.97	19.47	22.55	23.18	23.99	22.93	23.88	22.72
35	Belgium	22.70	20.21	22.12	23.03	24.14	23.43	23.14	22.08	21.79	23.48	24.53	24.34	23.94	25.14	26.11	23.35
36	Argentina	25.20	28.12	29.62	25.36	22.76	15.64	17.69	18.22	20.32	22.83	26.70	26.77	27.41	33.33	34.67	24.98

No.	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
37	Spain	23.00	18.13	19.09	20.31	22.48	21.44	22.02	21.46	25.11	29.82	32.05	32.06	29.99	28.93	29.30	25.01
38	Portugal	23.00	23.33	24.32	25.99	26.22	26.09	26.57	25.58	24.13	25.52	26.60	27.38	27.63	26.23	26.70	25.69
39	United Arab Emirates	26.30	23.78	27.40	30.14	27.61	30.06	25.43	23.83	21.93	21.86	31.35	25.79	23.58	21.12	25.51	25.71
40	Hungary	25.40	23.56	24.56	26.03	27.48	26.63	26.52	26.03	25.36	26.76	28.86	27.85	25.16	24.13	23.55	25.86
41	Latvia	30.80	27.90	26.34	25.74	25.97	23.56	22.75	21.63	23.70	34.14	35.11	31.43	24.02	20.33	19.57	26.20
42	Poland	27.70	33.76	32.28	29.28	29.39	26.12	22.90	21.15	20.31	23.71	27.79	29.11	28.05	27.01	26.86	27.03
43	Malta	27.40	26.97	28.60	30.95	30.67	31.24	29.39	31.73	31.30	23.62	24.29	23.69	22.95	23.25	23.35	27.29
44	Estonia	33.00	32.19	23.42	24.93	25.47	25.58	22.31	19.62	21.39	35.44	43.20	37.60	25.22	21.82	23.40	27.64
45	Slovenia	27.30	26.45	26.01	27.77	28.12	27.24	27.50	26.08	24.99	26.57	29.44	30.72	30.61	30.94	30.64	28.02
46	Lithuania	33.80	35.55	28.98	28.52	24.21	24.21	23.01	23.18	24.48	33.24	39.09	34.58	25.73	21.52	21.75	28.12
47	Bahamas, The	26.30	25.08	27.18	28.72	28.88	27.06	23.20	23.41	23.46	30.70	33.80	34.33	28.80	29.17	32.66	28.18
48	Croatia	33.80	36.86	29.93	26.67	22.34	25.64	25.26	23.35	24.46	25.40	30.22	30.97	32.08	31.86	31.20	28.67
49	Italy	27.80	25.48	26.04	26.52	27.15	27.42	27.19	28.51	27.65	29.56	32.28	30.97	31.88	32.54	32.76	28.92
50	Namibia	31.40	30.39	28.46	25.85	26.22	26.79	26.59	25.22	33.08	34.11	32.99	27.30	21.89	30.01	33.56	28.92
51	South Africa	28.40	28.66	29.39	28.62	27.47	27.31	28.14	27.05	27.60	29.61	30.96	31.78	30.94	30.14	30.53	29.11
52	Yemen, Rep.	27.70	27.78	26.97	24.18	23.38	23.07	20.67	25.95	25.79	28.67	32.11	36.73	38.66	38.70	41.00	29.42
53	Colombia	39.40	35.79	32.39	28.21	27.91	26.32	27.25	24.62	28.13	28.45	32.31	29.57	28.44	28.16	28.85	29.72
54	Trinidad and Tobago	34.70	25.94	30.07	29.62	27.41	24.66	26.60	29.56	25.91	28.11	36.15	35.22	31.74	32.32	32.40	30.03
55	Fiji	32.90	32.71	33.86	32.48	30.76	28.44	29.34	38.00	36.35	32.88	28.61	26.70	24.40	25.93	25.28	30.58
56	Mexico	30.80	29.76	30.84	30.96	31.50	29.79	29.85	28.64	28.35	32.35	35.21	32.31	30.58	32.25	31.19	30.96
57	Lebanon	34.10	35.00	32.16	36.03	34.45	31.82	31.20	32.29	27.97	28.32	27.58	26.96	28.08	27.02	31.42	30.96
58	Algeria	34.20	37.61	33.47	29.05	27.50	22.69	23.79	26.60	28.18	33.60	33.03	35.07	43.82	31.51	29.39	31.30
59	Costa Rica	26.10	26.74	30.86	32.19	30.60	29.20	28.28	26.28	27.83	32.26	34.95	37.33	34.44	36.33	37.62	31.40
60	Korea, Rep.	28.30	24.38	27.14	28.71	30.67	31.39	32.36	32.15	33.35	34.89	36.25	33.43	34.41	34.43	35.00	31.79
61	Pakistan	37.00	31.34	29.05	29.92	30.79	28.89	27.23	27.69	30.65	32.68	33.75	35.69	32.22	35.20	36.90	31.93
62	Cyprus	29.20	27.98	26.85	28.88	32.87	32.98	33.24	33.00	34.10	35.83	30.86	31.30	32.27	34.83	36.35	32.04
63	Greece	28.50	27.42	27.22	29.52	28.71	28.20	29.51	28.72	30.02	31.19	37.09	39.39	43.97	45.06	28.50	32.20
64	Romania	34.30	35.64	34.02	29.81	35.74	31.37	32.90	29.89	29.84	32.71	36.10	33.64	31.44	31.06	29.88	32.56
65	Venezuela, RB	33.80	30.13	39.87	37.42	35.42	29.99	22.80	24.09	27.90	35.63	49.94	38.97	32.32	30.49	28.12	33.13
66	Bulgaria	36.00	42.87	37.97	31.93	31.55	30.47	30.98	31.26	31.23	32.98	35.34	36.67	33.43	32.65	34.82	34.01
67	Bhutan	29.60	37.39	35.90	34.58	34.73	35.15	37.05	36.69	33.33	33.63	34.95	31.67	31.10	33.10	33.02	34.13
68	Macedonia, FYR	39.00	31.93	43.03	42.14	38.59	39.09	31.71	29.60	29.45	31.65	33.04	30.49	32.52	30.94	29.95	34.21
69	Bosnia and Herzegovina	34.30	30.91	36.78	35.85	35.47	35.33	36.83	32.60	31.94	29.83	33.92	34.76	37.27	35.84	33.86	34.37
70	Cameroon	33.30	31.74	33.16	33.04	31.86	34.13	32.63	31.73	32.48	33.65	40.78	37.41	43.03	38.35	38.39	35.05
71	Malaysia	32.20	31.22	39.27	38.74	37.00	37.22	32.84	32.76	32.45	33.93	36.96	34.17	35.83	39.02	39.33	35.53
72	Turkey	32.70	27.87	37.04	42.13	36.13	31.91	32.60	30.28	36.13	40.27	42.54	39.02	34.06	38.87	40.75	36.15
73	Serbia	34.30	33.90	37.06	41.46	44.32	41.71	38.45	33.43	30.64	31.70	34.59	39.52	37.21	34.30	29.78	36.16
74	Ecuador	34.20	39.11	38.21	33.82	29.51	28.61	30.08	27.93	31.39	35.76	43.28	42.33	40.44	44.01	45.88	36.30

No.	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
75	Philippines	43.80	45.78	44.76	38.48	37.43	29.80	32.03	27.87	34.93	33.30	35.08	34.96	34.34	37.47	37.07	36.47
76	Montenegro	34.30	37.38	41.71	42.07	41.87	39.60	42.49	40.99	32.21	35.33	33.75	33.19	34.88	33.15	30.51	36.90
77	Morocco	36.50	35.74	35.08	37.47	36.18	37.85	37.97	35.91	32.90	36.33	36.34	35.79	38.47	40.60	40.64	36.92
78	Bangladesh	36.00	39.29	38.12	48.34	53.04	45.80	38.18	26.54	38.58	37.45	25.24	24.82	27.41	35.85	39.45	36.94
79	Egypt, Arab Rep.	35.50	41.05	37.87	38.61	40.29	39.51	37.31	37.04	32.17	31.63	35.61	38.23	39.08	40.51	39.70	37.61
80	Paraguay	38.00	44.20	49.41	37.44	36.32	25.54	36.42	32.07	32.99	34.00	41.30	38.87	38.47	47.34	49.39	38.78
81	Zambia	49.30	50.15	48.90	45.66	44.26	42.57	40.63	37.99	36.70	34.88	31.28	30.70	32.92	32.57	36.21	39.65
82	Tunisia	38.70	38.40	39.24	40.73	40.21	38.06	37.88	35.88	35.77	39.76	40.94	44.77	43.32	42.95	38.79	39.69
83	Brazil	40.80	41.52	41.70	43.56	39.30	39.42	38.42	39.18	39.83	39.77	40.25	39.67	36.91	36.79	40.22	39.82
84	Jamaica	36.40	36.19	35.48	34.79	32.44	33.20	36.91	36.79	41.91	45.91	48.45	45.44	44.86	47.05	45.47	40.09
85	Kyrgyz Republic	41.40	41.28	43.90	43.21	34.85	33.80	37.32	36.73	37.90	37.91	39.60	40.63	41.62	48.20	46.51	40.32
86	Albania	35.70	27.05	32.79	39.43	40.42	39.16	41.85	40.58	39.55	41.85	42.26	45.99	48.89	49.83	49.20	40.97
87	Cote d'Ivoire	41.40	43.64	38.77	38.98	44.15	44.25	44.22	42.26	42.21	40.22	39.04	38.90	33.18	44.34	40.59	41.08
88	Barbados	33.80	31.88	34.73	38.62	46.84	42.91	39.63	34.55	42.78	46.50	49.50	50.02	50.90	41.56	40.55	41.65
89	Russian Federation	36.00	31.50	36.73	41.26	41.42	40.11	43.34	42.16	43.58	47.78	50.39	45.94	41.74	44.76	46.75	42.23
90	Kazakhstan	43.80	38.61	41.82	39.29	42.52	48.06	36.20	33.81	40.81	39.62	46.64	44.05	45.80	50.97	48.97	42.73
91	Uganda	43.50	50.69	49.61	53.90	51.69	39.11	47.91	46.01	47.29	39.05	33.89	33.93	45.03	31.86	33.86	43.16
92	Mali	42.50	40.64	40.15	42.46	48.08	47.40	44.05	45.22	43.79	42.90	44.43	44.28	43.92	43.57	45.65	43.93
93	Armenia	46.60	52.30	60.98	58.48	56.41	41.79	45.96	36.75	30.76	21.59	36.46	48.31	50.94	43.63	46.51	45.16
94	Madagascar	40.10	46.56	47.67	40.27	38.67	35.88	41.11	47.47	60.37	48.45	45.53	48.79	48.28	44.38	46.32	45.32
95	Azerbaijan	61.00	63.30	49.82	33.95	39.30	43.14	37.96	42.94	40.78	43.61	49.05	46.71	41.36	43.52	45.01	45.43
96	Cambodia	50.40	49.35	44.02	51.26	50.82	42.43	34.06	25.16	41.85	44.12	49.78	53.59	50.98	52.58	51.98	46.16
97	Lao PDR	30.90	30.84	36.97	32.84	34.02	37.06	40.90	41.88	46.35	53.74	57.70	52.14	54.87	67.58	75.96	46.25
98	Burundi	39.10	32.95	34.62	33.52	38.61	41.82	41.57	43.26	58.53	62.98	58.70	66.45	57.72	52.64	48.96	47.43
99	Georgia	34.00	20.77	26.16	31.15	29.06	41.38	52.51	42.44	63.96	80.99	76.42	61.57	55.66	56.12	52.29	48.30
100	Guinea	39.70	40.81	41.20	50.13	43.86	39.28	39.83	49.80	38.98	49.07	53.94	72.15	57.98	56.02	53.94	48.45
101	Senegal	45.00	48.43	39.19	43.21	44.64	51.19	49.00	48.28	48.46	47.51	52.05	54.43	52.51	57.50	52.30	48.91
102	Nicaragua	45.70	48.98	47.60	48.54	52.47	52.91	46.40	47.24	49.19	51.91	56.03	55.07	49.45	41.09	41.15	48.92
103	El Salvador	46.50	48.84	52.60	46.67	46.23	47.55	45.40	49.33	44.36	49.41	52.28	53.98	52.43	52.83	57.01	49.70
104	Belize	45.20	34.35	38.51	47.53	50.64	49.61	47.96	47.00	49.85	55.13	57.47	61.64	56.25	54.47	50.68	49.75
105	Tajikistan	43.50	34.38	38.35	39.80	40.13	48.63	61.14	50.21	45.61	49.47	61.26	60.06	66.38	48.17	59.95	49.80
106	Sri Lanka	45.20	46.15	46.31	57.88	55.15	53.67	55.73	64.45	61.15	66.11	71.91	56.70	38.24	27.94	17.47	50.94
107	Uruguay	50.50	51.77	50.23	48.65	47.62	49.97	54.18	55.10	47.20	47.06	50.34	52.48	53.94	56.07	57.80	51.53
108	Ukraine	52.70	53.79	49.70	47.28	48.47	46.34	50.69	51.59	52.12	50.54	58.97	59.07	51.43	52.30	51.48	51.76
109	Moldova	36.00	28.04	44.49	55.48	56.46	50.01	49.49	60.60	55.47	63.68	75.84	74.47	64.99	66.13	59.56	56.05
110	Thailand	53.40	47.32	47.13	50.61	52.01	52.95	55.61	54.68	56.45	59.05	60.76	60.25	63.03	64.93	70.13	56.55
111	Liberia	44.20	42.96	40.09	28.41	30.93	56.45	56.16	52.86	65.05	82.64	68.40	69.06	72.58	79.90	85.64	58.36
112	Peru	60.10	58.44	60.23	64.43	63.41	59.75	60.70	57.55	53.59	55.66	58.22	53.62	54.02	59.39	60.43	58.64
113	Benin	51.20	50.26	52.62	54.18	59.47	58.13	58.91	58.25	59.60	64.58	68.63	68.86	66.42	68.29	67.98	60.49

No.	Countryname	Size of the shadow economy															
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
114	Tanzania	58.60	63.78	57.43	56.49	67.02	70.22	79.95	73.82	81.30	67.23	75.68	65.94	63.31	59.86	60.29	66.73
115	Guatemala	51.6	55.9	76.2	84.8	79	68.7	55.4	57.1	59.7	66.1	68.2	71.3	71.2	74.6	72.3	67.46
116	Honduras	50.30	56.62	64.10	67.20	68.54	70.21	63.94	60.07	71.60	77.21	84.81	81.73	72.71	69.38	72.62	68.74
117	Bolivia	67.00	70.59	71.51	74.54	71.96	72.28	78.37	69.43	64.09	59.48	70.74	75.50	72.63	65.63	65.32	69.94
	Time Average	31.59	31.25	31.94	32.30	32.40	31.66	31.45	30.78	31.56	33.39	35.65	35.24	33.91	33.99	34.12	32.75

4.2 A Critical Discussion of the Macro - MIMIC Estimates

As it has been shortly and critically discussed in chapter 2, the macro estimates using the MIMIC and/or currency demand approach leads to quite high estimates of the shadow economy. One reason for this is macro shadow economy DIY (do-it-yourself) activities, neighbours and friends help and criminal activities (like smuggling, etc.), which are (at least partly) included. We now try to consider this criticism and undertake an attempt to “correct” these macro estimates. In table 4.3 such an attempt is undertaken for Estonia and Germany.

Table 4.3: Decomposition of the shadow economy activities in the Baltic countries: Example: Estonia and Germany

Kinds of shadow economy activities (rough estimates!)	Estonia		Germany	
	Size in % of official GDP average 2009-2015	Proportion of total shadow economy	Size in % of official GDP average 2009-2015	Proportion of total shadow economy
Total shadow economy (estimated by the MIMIC and calibrated by the currency demand procedures)	28.0	100%	16.2	100%
Material for shadow economy and DIY-activities	6.0	21%	3.1	19.1%
Illegal activities (smuggling etc.)	2.0	7%	1.2	7.4%
Do-it-yourself activities and neighbours help ¹⁾	2.0	7%	1.5	9.2%
Sum (2) and (4)	10.0	35%	5.8	35.7%
“Corrected” shadow economy, but legal activities (position (1) minus position (5))	18.0	65%	8.8	54.3%

1) Without legally bought material which is included in (2)

Source: Own calculations, Linz, September 2016.

We argue that these corrections are rough approximations, but have a valid basis. First, we deduct legally bought material for shadow economy activities and do-it-yourself ones, this is done in line (2), varying between 19.1% and 21% of the macro estimates of the shadow economy activities (100%). Next, we subtract illegal activities (smuggling, drug dealing, etc.) which vary around 7% of the total shadow economy activities, this is done in line (3). Finally, we deduct the do-it-yourself activities and neighbours and friends help in line (4), varying between 7% and 9% between Estonia and Germany. If we sum up these factors roughly 65% of the shadow economy size remains which should more accurately reflect the “true” size.

In table 4.4 we show the averages for the shadow economies of the 157 large countries and of the 117 small sample countries, where we could include the self-employment variable in the MIMIC estimates. We also include the adjusted shadow economy values for both country samples. Table 4.4 clearly shows that including the self-employment variable has only a minor effect on the size of the shadow economy. Only to the low countries we have greater differences in the size of the shadow economy: Serbia with self-employed average value 36.16% instead of 30.34% without self-employment; Singapore with self-employed 13.65% and without 13.44%.

Table 4.4: Summary table without and with adjustments

No.	Countryname	Shadow economies				
		Averages based on MIMIC 4-1-2	Averages based on MIMIC 5-1-2 (incl. self-employ.)	Differences	Adjusted averages based on MIMIC 4-1-2	Adjusted averages based on MIMIC 5-1-2 (incl. self-empl.)
1	Albania	42.12	40.97	1.15	27.38	26.63
2	Algeria	32.77	31.30	1.47	21.30	20.35
3	Argentina	26.17	24.98	1.19	17.01	16.23
4	Armenia	45.57	45.16	0.41	29.62	29.36
5	Australia	14.30	14.17	0.13	9.29	9.21
6	Austria	9.83	9.84	-0.01	6.39	6.39
7	Azerbaijan	47.48	45.43	2.06	30.87	29.53
8	Bahamas, The	26.71	28.18	-1.47	17.36	18.32
9	Bahrain	13.09	13.22	-0.12	8.51	8.59
10	Bangladesh	38.83	36.94	1.88	25.24	24.01
11	Barbados	40.80	41.65	-0.85	26.52	27.07
12	Belgium	23.08	23.35	-0.27	15.00	15.18
13	Belize	50.83	49.75	1.08	33.04	32.34
14	Benin	60.55	60.49	0.06	39.36	39.32
15	Bhutan	34.28	34.13	0.15	22.28	22.18
16	Bolivia	72.30	69.94	2.36	47.00	45.46
17	Bosnia and Herzegovina	36.10	34.37	1.73	23.47	22.34
18	Brazil	40.58	39.82	0.76	26.38	25.88
19	Bulgaria	34.72	34.01	0.71	22.57	22.11
20	Burundi	47.49	47.43	0.06	30.87	30.83
21	Cambodia	49.21	46.16	3.06	31.99	30.00
22	Cameroon	34.92	35.05	-0.12	22.70	22.78
23	Canada	16.17	16.37	-0.20	10.51	10.64
24	Chile	19.28	18.76	0.52	12.53	12.19
25	Colombia	29.70	29.72	-0.02	19.31	19.32
26	Costa Rica	31.42	31.40	0.02	20.42	20.41
27	Cote d'Ivoire	41.03	41.08	-0.05	26.67	26.70
28	Croatia	28.94	28.67	0.27	18.81	18.64
29	Cyprus	31.99	32.04	-0.04	20.80	20.82
30	Czech Republic	18.95	19.12	-0.17	12.32	12.43
31	Denmark	19.04	19.11	-0.07	12.38	12.42
32	Ecuador	36.94	36.30	0.64	24.01	23.60
33	Egypt, Arab Rep.	37.59	37.61	-0.01	24.44	24.45
34	El Salvador	50.37	49.70	0.67	32.74	32.30
35	Estonia	27.64	27.64	0.00	17.96	17.97
36	Fiji	30.29	30.58	-0.28	19.69	19.87
37	Finland	18.81	19.04	-0.23	12.22	12.38

No.	Countryname	Shadow economies				
		Averages based on MIMIC 4-1-2	Averages based on MIMIC 5-1-2 (incl. self-employm.)	Differences	Adjusted averages based on MIMIC 4-1-2	Adjusted averages based on MIMIC 5-1-2 (incl. self-empl.)
38	France	15.14	15.36	-0.22	9.84	9.98
39	Georgia	46.85	48.30	-1.45	30.45	31.39
40	Germany	15.77	15.79	-0.03	10.25	10.26
41	Greece	32.56	32.20	0.36	21.16	20.93
42	Guatemala	67.68	67.46	0.21	43.99	43.85
43	Guinea	47.87	48.45	-0.58	31.12	31.49
44	Honduras	68.17	68.74	-0.57	44.31	44.68
45	Hong Kong SAR, China	20.87	19.12	1.76	13.57	12.43
46	Hungary	25.80	25.86	-0.06	16.77	16.81
47	Iceland	16.57	16.78	-0.21	10.77	10.91
48	India	21.76	21.25	0.51	14.14	13.81
49	Indonesia	19.40	19.80	-0.40	12.61	12.87
50	Iran, Islamic Rep.	17.84	18.03	-0.19	11.59	11.72
51	Ireland	17.01	17.46	-0.45	11.06	11.35
52	Israel	21.23	21.12	0.11	13.80	13.73
53	Italy	28.56	28.92	-0.36	18.56	18.80
54	Jamaica	40.40	40.09	0.31	26.26	26.06
55	Japan	13.81	13.46	0.35	8.97	8.75
56	Jordan	18.37	18.12	0.25	11.94	11.78
57	Kazakhstan	45.90	42.73	3.16	29.83	27.78
58	Korea, Rep.	32.05	31.79	0.26	20.83	20.66
59	Kyrgyz Republic	41.72	40.32	1.40	27.12	26.21
60	Lao PDR	50.19	46.25	3.94	32.63	30.06
61	Latvia	26.52	26.20	0.32	17.24	17.03
62	Lebanon	31.71	30.96	0.75	20.61	20.12
63	Liberia	57.11	58.36	-1.24	37.12	37.93
64	Lithuania	28.75	28.12	0.63	18.69	18.28
65	Luxembourg	10.87	10.91	-0.04	7.06	7.09
66	Macao SAR, China	12.97	11.67	1.31	8.43	7.58
67	Macedonia, FYR	34.11	34.21	-0.10	22.17	22.24
68	Madagascar	42.64	45.32	-2.68	27.72	29.46
69	Malaysia	35.32	35.53	-0.21	22.96	23.09
70	Maldives	23.33	22.48	0.85	15.16	14.61
71	Mali	44.80	43.93	0.87	29.12	28.56
72	Malta	26.80	27.29	-0.49	17.42	17.74
73	Mauritius	22.72	22.72	-0.01	14.77	14.77
74	Mexico	31.36	30.96	0.40	20.38	20.12

No.	Countryname	Shadow economies				
		Averages based on MIMIC 4-1-2	Averages based on MIMIC 5-1-2 (incl. self-employm.)	Differences	Adjusted averages based on MIMIC 4-1-2	Adjusted averages based on MIMIC 5-1-2 (incl. self-empl.)
75	Moldova	53.73	56.05	-2.32	34.92	36.43
76	Mongolia	21.66	20.17	1.49	14.08	13.11
77	Montenegro	35.31	36.90	-1.58	22.95	23.98
78	Morocco	37.32	36.92	0.41	24.26	24.00
79	Namibia	29.04	28.92	0.11	18.87	18.80
80	Netherlands	14.69	14.98	-0.30	9.55	9.74
81	New Zealand	13.39	13.39	0.00	8.70	8.70
82	Nicaragua	49.27	48.92	0.36	32.03	31.80
83	Norway	20.01	19.58	0.43	13.00	12.72
84	Pakistan	31.43	31.93	-0.51	20.43	20.76
85	Paraguay	40.62	38.78	1.84	26.41	25.21
86	Peru	59.36	58.64	0.72	38.58	38.11
87	Philippines	37.69	36.47	1.22	24.50	23.71
88	Poland	26.97	27.03	-0.06	17.53	17.57
89	Portugal	25.43	25.69	-0.26	16.53	16.70
90	Romania	33.16	32.56	0.61	21.56	21.16
91	Russian Federation	42.78	42.23	0.55	27.81	27.45
92	Senegal	49.33	48.91	0.41	32.06	31.79
93	Serbia	34.23	36.16	-1.93	22.25	23.50
94	Singapore	13.41	13.65	-0.24	8.71	8.87
95	Slovak Republic	22.11	20.87	1.24	14.37	13.57
96	Slovenia	27.55	28.02	-0.48	17.91	18.22
97	South Africa	29.23	29.11	0.13	19.00	18.92
98	Spain	24.61	25.01	-0.40	16.00	16.26
99	Sri Lanka	48.72	50.94	-2.22	31.67	33.11
100	Sweden	18.77	18.94	-0.17	12.20	12.31
101	Switzerland	9.09	9.03	0.07	5.91	5.87
102	Tajikistan	51.67	49.80	1.87	33.59	32.37
103	Tanzania	65.96	66.73	-0.76	42.88	43.37
104	Thailand	57.64	56.55	1.09	37.47	36.76
105	Trinidad and Tobago	31.01	30.03	0.98	20.15	19.52
106	Tunisia	39.85	39.69	0.15	25.90	25.80
107	Turkey	37.33	36.15	1.17	24.26	23.50
108	Uganda	43.61	43.16	0.45	28.34	28.05
109	Ukraine	52.23	51.76	0.47	33.95	33.65
110	United Arab Emirates	26.09	25.71	0.38	16.96	16.71
111	United Kingdom	13.78	14.07	-0.30	8.95	9.15

No.	Countryname	Shadow economies				
		Averages based on MIMIC 4-1-2	Averages based on MIMIC 5-1-2 (incl. self-employm.)	Differences	Adjusted averages based on MIMIC 4-1-2	Adjusted averages based on MIMIC 5-1-2 (incl. self-empl.)
112	United States	9.17	9.35	-0.19	5.96	6.08
113	Uruguay	52.38	51.53	0.86	34.05	33.49
114	Venezuela, RB	33.91	33.13	0.78	22.04	21.53
115	Vietnam	17.17	15.55	1.62	11.16	10.11
116	Yemen, Rep.	29.28	29.42	-0.15	19.03	19.13
117	Zambia	40.04	39.65	0.39	26.03	25.77
	Averages	33.03	32.75	0.28	21.47	21.29

5. Summary and Conclusions

For the first time, our paper presents estimations of the shadow economy for 157 countries including developing, eastern European, central Asian and high income OECD countries over 1999 to 2013 using the MIMIC estimation method. According to our estimate the average size of the shadow economy (as a percentage of official GDP) of the 157 countries averaged over 1999 to 2013, too, is 33.77%; for the 117 countries including self-employment 32.75%. We also find that an increased burden of taxation combined with labor market regulations and institutional quality are driving forces of the shadow economy.

We are aware that these macro sizes of the shadow economy are quite high. Due to this and for the first time we tried to “correct” these macro estimates by subtracting legally bought material for shadow economy and do-it-yourself activities, illegal activities and do-it-yourself activities, all three are included in the macro estimates by the MIMIC and/or currency demand approach. Our first calculations lead to an average reduction of the macro estimates of the shadow economy by 35% which to our opinion is a plausible, let us repeat, this is a first attempt and a rough calculation, where much more research is needed. The knowledge/insights with respect to the size of the shadow economy of 157 countries lead to the following three conclusions:

The **first** conclusion from these results is that from all countries investigated, shadow economy has reached a large size of an unweighted average of the shadow economy of 33,77% of official GDP for 157 countries from 1999 to 2007. Considering the development over time we have no clear pattern, except that in most countries the shadow economies strongly rose in 2009 and 2010 due to the worth economic and financial crises in 2008/2009. The same holds for the development of the size fo the shadow economies after 2009.

The **second** conclusion is that the shadow economy is present to an important extent in all types of economies (developing, transition and highly developed countries). People engage in shadow economy activities for very different reason. However, the most important are government actions like taxation and regulations.

The **third** conclusion is that there are large regional disparities in the level of informality. At the top level of informality there is South-America and Africa. At the lowest level of informality are highly developed OECD countries.

Considering these three conclusions, it is obvious that every government has to undertake an incentive oriented economic policy in order to make the work in the official economy more attractive. Successful implementation of such policy may lead to stabilization or even reduction of the size of the shadow economy over time.

Finally, even of the 30 years of intensive research, the size, causes and consequences of the shadow economy are still controversially debated in the literature and further research is necessary to improve our understanding about the shadow economy. Especially the question what is the “correct” size of a shadow economy is a controversial topic. We make a first attempt in this paper to tackle this question and to demonstrate that the macro size, obtained by MIMIC and/or currency demand method has to be corrected by legally bought material, crime activities and do-it-yourself activities.

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7. Appendix

A1 Benchmarking procedure

An additional final step is required to calculate the size of the shadow economy in a meaningful way, hence as percentage of GDP. This last step is called a benchmarking procedure. There are different benchmarking procedures that are applied to calibrate the index, but there is no agreement on which procedure is superior to the other⁸. This additional step requires that a prior estimation of the size of the shadow economy to be available. Thus, the exogenous estimation of the relative size of the shadow economy at the base year (=1999) for the countries in the sample are extracted from Schneider et al. (2010). The following benchmarking procedure⁹ is applied to calibrate the ordinal estimates into cardinal values and convert this index to % units (real values).

$$\eta_t = \frac{\tilde{\eta}_t}{\tilde{\eta}_{base\ year}} \eta * base\ year \quad (1)$$

where $\tilde{\eta}_t$ denotes the value of the MIMIC index at time t according to the structural equation (1), $\tilde{\eta}_{base\ year}$ is the value of the MIMIC index in the base year which is in our model is 1999, $\eta * base\ year$ is the exogenous (prior) estimation of the size of the shadow economy in the base year (=1999).

Based on the application of this benchmarking procedure, we are able to calculate the final estimates of the size of the shadow economy as percentage of GDP for the given period of our study and to reach a trend of the development of the shadow economy for our sample from 1999 to 2013.

A2 MIMIC Methodology⁸

The MIMIC model has the advantage over the other methods because various observable and measurable causes and indicators are considered at the same time regarding this complex and unrecorded nature of the shadow economy. For the estimation of the size of the shadow economy for our sample, Maximum Likelihood method in STATA 14 software is being used. We used the Satorra-Bentler as a special option with the ML estimation to improve the chi-square statistic of goodness of fit in case of non-normal time-series (Satorra and Bentler, 1994). The Satorra-Bentler gives us the same parameters as the default ML estimation. Available upon request is a detailed documentation of the variables used in the MIMIC model estimations.

⁸ For further details on the different benchmarking procedures, see Dell'Anno and Schneider (2009).

⁸ For a detailed explanation of the MIMIC methodology and its assumptions, refer to Hassan and Schneider (2016).

TABLE A3: List and Sources of the Variables used

Variables	Source	Definition
Total tax revenues as % of GDP	World Bank Indicators 2016	Overall taxes, including all forms of direct and indirect taxation at all levels of government, as a percentage of GDP.
Government expenditures as % of GDP	World Bank Indicators 2016	Government expenditures, including consumption and transfers, as a percentage of GDP.
Unemployment-rate (15-64)	World Bank Indicators 2016	The share of the labor force that is without work but available for and seeking employment.
Self-Employment rate as % of total employed	World Bank Indicators 2016	Workers who, working on their own account or with one or a few partners or in cooperative, hold the type of jobs defined as a "self-employment jobs." i.e. jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced. Self-employed workers include four sub-categories of employers, own-account workers, members of producers' cooperatives, and contributing family workers.
Economic Freedom Index	Heritage Foundation 2016	Based on 10 quantitative and qualitative factors, grouped into four broad categories: Rule of Law, Limited Government, Regulatory Efficiency and Open Markets. Each of the ten economic freedoms within these categories is graded on a scale of 0 to 100. A country's overall score is derived by averaging these ten economic freedoms, with equal weight being given to each.

Variables	Source	Definition
Business Freedom Index	Heritage Foundation 2016	A quantitative measure of the ability to start, operate, and close a business that represents the overall burden of regulation as well as the efficiency of government in the regulatory process. The business freedom score for each country is a number between 0 and 100, with 100 equaling the freest business environment.
GDP growth rate	World Bank Indicators 2016	Annual percentage growth rate of GDP at market prices based on constant local currency.
M1 over M2	World Bank Indicators 2016	The sum of currency outside banks and demand deposits other than those of central government (M1) as proportional to the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government (M2).
Labor force participation rate	World Bank Indicators 2016	The proportion of the population ages 15-64 that is economically active: all people who supply labor for the production of goods and services during a specified period.

Note: Missing values were replaced by extrapolated figures if possible. Source: Authors

Table A4: Tables of the size of the shadow economy according to country groups

Table A4.1: The size of the shadow economies of 35 High Income OECD countries

No	countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
1	Australia	14.4	14.15	14.68	14.36	14.24	14.10	14.26	14.20	14.04	14.53	14.32	14.28	13.79	14.28	14.82	14.30
2	Austria	10	9.28	10.03	9.97	9.99	9.90	9.67	9.31	9.23	9.83	10.11	10.05	9.75	10.18	10.13	9.83
3	Bahamas, The	26.3	25.73	26.68	27.80	27.62	26.26	22.69	22.85	22.78	28.41	30.70	31.71	25.99	26.03	29.11	26.71
4	Belgium	22.7	20.81	22.32	22.75	23.76	23.16	22.90	21.82	21.70	23.22	23.91	23.79	23.45	24.56	25.34	23.08
5	Canada	16.3	15.48	15.40	16.20	16.48	15.18	15.35	15.36	16.19	16.55	17.56	17.45	15.85	16.66	16.58	16.17
6	Chile	19.9	18.22	18.54	18.21	19.19	17.75	18.26	18.25	20.05	21.15	20.34	20.59	19.19	19.81	19.74	19.28
7	Cyprus	29.2	28.64	27.77	29.61	33.11	33.18	34.26	34.35	36.42	37.26	29.34	29.75	30.59	32.64	33.79	31.99
8	Czech Republic	19.3	18.87	18.02	20.36	20.60	20.18	19.73	17.23	16.76	18.00	19.66	19.99	18.58	18.48	18.47	18.95
9	Denmark	18.4	17.65	17.85	18.07	18.37	18.70	17.88	17.82	18.47	19.38	21.39	21.51	20.05	20.15	19.91	19.04
10	Estonia	33	33.14	23.17	24.70	24.96	25.41	22.48	19.69	21.08	35.64	43.86	37.82	24.96	21.70	22.94	27.64
11	Finland	18.4	18.08	16.70	17.70	18.70	18.66	18.90	17.73	17.43	18.79	20.32	20.09	19.47	20.44	20.68	18.81
12	France	15.7	14.32	14.44	15.09	15.63	15.41	15.77	15.17	14.79	15.10	16.37	14.86	14.43	14.98	15.03	15.14
13	Germany	16.4	15.74	15.27	16.57	17.40	16.78	16.45	14.31	13.94	14.66	16.27	15.65	15.18	15.91	15.96	15.77
14	Greece	28.5	28.11	27.61	30.02	28.80	28.17	29.46	28.47	29.85	30.65	35.72	37.62	42.34	43.67	39.39	32.56
15	Hungary	25.4	23.49	24.30	25.64	27.10	26.42	26.18	25.76	25.47	26.84	28.97	27.94	25.20	24.37	23.88	25.80
16	Iceland	16	15.91	16.04	16.72	17.05	16.66	16.28	16.95	16.60	17.36	17.53	17.57	16.71	15.42	15.76	16.57
17	Ireland	16.1	14.33	14.18	15.88	16.20	16.47	16.26	16.66	17.55	20.17	21.14	20.22	17.77	16.65	15.56	17.01
18	Israel	22.7	23.01	23.33	24.00	23.90	21.63	20.65	20.28	20.04	19.94	19.39	19.80	19.56	19.82	20.45	21.23
19	Italy	27.8	25.55	26.00	26.35	26.73	27.03	26.75	28.47	27.48	29.16	31.58	30.22	31.22	32.02	32.01	28.56
20	Japan	11.4	11.72	12.59	13.61	12.92	13.52	12.87	12.65	13.89	14.56	15.53	15.34	15.44	15.50	15.56	13.81
21	Korea, Rep.	28.3	25.57	27.84	29.15	31.36	31.66	32.64	32.30	33.81	35.12	36.24	33.49	34.36	34.15	34.77	32.05
22	Luxembourg	10	9.37	10.00	10.91	11.33	11.23	11.56	10.20	10.26	10.38	11.16	10.85	10.63	11.63	13.47	10.87
23	Malta	27.4	27.16	28.48	31.03	30.70	31.70	30.06	32.53	32.46	21.83	22.42	21.84	21.29	21.50	21.62	26.80
24	Netherlands	13.3	12.60	12.90	13.94	14.88	14.50	14.39	13.94	14.12	14.38	16.18	16.56	16.01	16.21	16.38	14.69
25	New Zealand	13	12.35	12.23	12.24	12.37	12.45	13.10	13.96	13.85	15.24	14.93	14.32	13.91	13.76	13.13	13.39
26	Norway	19.2	19.06	20.57	21.22	21.05	20.83	19.80	18.23	18.69	18.99	20.56	20.99	20.43	20.52	19.92	20.01
27	Poland	27.7	32.78	31.20	28.80	29.42	26.36	23.37	22.00	21.46	24.18	27.49	28.48	27.76	26.87	26.62	26.97
28	Portugal	23	23.26	23.99	25.49	26.02	25.74	26.45	25.37	24.12	25.29	26.02	26.94	27.30	25.97	26.42	25.43
29	Slovak Republic	18.9	19.24	18.00	26.56	21.98	21.14	19.29	19.08	22.14	27.00	26.47	24.77	23.52	23.71	19.85	22.11
30	Slovenia	27.3	26.95	25.96	27.70	28.00	27.03	26.90	25.86	25.16	26.28	28.14	29.01	29.48	29.97	29.49	27.55
31	Spain	23	18.87	19.60	20.59	22.54	21.47	22.17	21.57	24.99	28.85	30.40	30.86	28.59	27.62	28.11	24.61
32	Sweden	19.6	17.87	17.86	18.13	19.45	19.33	19.25	18.43	18.26	18.54	19.90	18.84	18.53	18.65	18.95	18.77
33	Switzerland	8.8	9.21	9.13	9.12	10.05	9.65	9.16	8.75	8.44	8.47	9.42	8.79	8.87	9.18	9.35	9.09
34	United Kingdom	12.8	12.33	12.89	12.94	13.50	13.55	13.74	13.99	14.00	15.03	15.08	15.26	14.43	13.84	13.26	13.78
35	United States	8.8	8.90	9.03	9.39	8.99	8.51	8.43	8.68	9.36	10.50	10.58	10.45	8.95	8.63	8.29	9.17
	Time Average	19.69	19.08	18.99	20.02	20.41	19.99	19.64	19.21	19.57	20.89	21.97	21.65	20.67	20.73	20.71	20.21

Table A4.2: The size of the shadow economies of 101 Developing countries

No	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
1	Algeria	34.20	39.30	34.84	30.87	28.47	24.58	25.66	30.22	30.05	36.89	35.21	37.79	46.42	29.80	27.24	32.77
2	Angola	48.8	42.24	26.90	19.51	21.69	16.49	16.98	18.90	18.27	20.74	19.84	18.11	19.43	18.14	23.30	23.29
3	Argentina	25.2	27.84	29.29	26.10	24.51	17.96	19.73	20.06	22.00	24.08	27.64	28.06	28.85	35.08	36.10	26.17
4	Bahrain	18.6	14.72	15.40	15.67	15.16	14.48	12.67	11.00	9.89	9.04	10.11	10.58	10.94	14.57	13.59	13.09
5	Bangladesh	36	38.69	33.14	38.10	43.97	39.27	41.25	31.10	47.17	44.73	34.46	34.45	37.12	40.31	42.61	38.83
6	Barbados	33.8	32.24	34.62	37.72	45.13	41.94	39.16	34.54	42.23	45.03	47.12	48.22	49.26	41.05	39.94	40.80
7	Belize	45.2	37.07	40.53	48.20	51.11	50.08	48.85	48.37	51.32	55.78	58.05	62.45	56.81	55.80	52.81	50.83
8	Benin	51.2	50.55	53.65	55.12	59.64	58.05	59.24	58.42	60.49	65.63	67.85	68.71	65.74	67.39	66.52	60.55
9	Bhutan	29.6	37.77	35.99	34.91	35.10	35.09	37.03	36.49	32.15	32.68	35.48	32.44	31.75	33.04	34.60	34.28
10	Bolivia	67	72.33	71.70	76.91	73.86	73.83	78.62	70.98	67.20	64.20	75.55	81.20	76.92	68.17	66.04	72.30
11	Botswana	33.9	31.54	29.01	29.64	27.29	26.93	22.43	20.98	22.96	25.89	25.46	21.71	22.33	23.79	25.11	25.93
12	Brazil	40.8	39.40	40.31	43.15	39.97	41.56	40.88	41.55	41.72	41.00	41.08	40.54	38.02	37.52	41.18	40.58
13	Burkina Faso	41.3	47.00	56.34	46.58	46.28	49.02	46.44	50.72	55.47	49.92	48.10	48.68	48.72	51.53	52.60	49.25
14	Burundi	39.1	33.56	35.27	34.42	39.16	42.37	42.32	43.99	58.79	62.07	57.54	64.44	56.88	52.74	49.74	47.49
15	Cabo Verde	36.5	37.30	37.15	36.96	36.39	39.01	38.70	39.83	36.84	36.06	35.66	39.02	37.11	22.44	20.98	35.33
16	Cambodia	50.4	49.71	42.75	48.72	46.21	41.66	34.77	31.84	48.85	54.75	57.06	58.51	57.23	58.26	57.48	49.21
17	Cameroon	33.3	31.70	32.63	31.81	30.70	32.03	30.98	30.49	33.39	34.44	44.69	37.62	45.22	37.43	37.40	34.92
18	Central African Republic	42.8	41.91	37.15	37.32	29.81	32.46	31.68	25.17	25.66	26.67	26.33	28.60	26.71	27.32	34.66	31.62
19	Chad	45.8	43.78	40.30	35.82	32.13	26.39	22.92	21.02	18.66	16.80	14.55	13.30	14.74	16.05	15.72	25.20
20	China	13.2	13.19	14.77	13.81	13.46	13.01	13.11	13.37	13.85	13.24	13.57	13.71	13.11	13.92	13.79	13.54
21	Colombia	39.4	32.45	29.91	27.95	28.15	27.28	28.06	26.30	28.76	28.45	31.30	29.36	29.16	29.18	29.85	29.70
22	Comoros	39.3	35.82	42.84	42.54	38.75	37.56	37.47	38.92	38.61	45.65	47.44	46.86	51.01	52.96	46.11	42.79
23	Congo, Dem. Rep.	34	9.82	21.76	34.32	29.71	38.23	42.75	56.04	53.89	51.87	67.53	60.72	81.85	78.47	89.20	50.01
24	Congo, Rep.	49.5	41.58	45.61	58.27	54.62	50.68	41.71	45.97	52.55	38.11	42.61	38.92	34.74	46.14	42.47	45.57
25	Costa Rica	26.1	26.14	30.17	31.62	30.53	29.89	28.74	27.57	28.91	32.97	34.87	37.16	34.44	35.45	36.73	31.42
26	Cote d'Ivoire	41.4	43.70	38.68	39.03	43.45	43.37	43.57	42.12	42.57	41.02	39.20	39.26	32.67	44.36	41.04	41.03
27	Dominican Republic	32.4	37.39	41.48	42.65	37.28	36.75	33.79	31.17	35.27	39.60	36.02	39.40	38.43	46.14	43.54	38.09
28	Ecuador	34.2	35.05	36.27	34.72	29.81	29.89	30.44	29.63	32.96	36.98	45.16	43.80	42.49	45.57	47.21	36.94
29	Egypt, Arab Rep.	35.5	41.03	37.40	37.31	38.15	39.02	38.22	38.43	32.97	31.85	37.37	38.39	39.39	39.53	39.35	37.59
30	El Salvador	46.5	45.37	51.45	47.40	48.12	48.06	47.16	51.14	47.80	51.10	51.62	54.26	52.77	54.12	58.60	50.37
31	Equatorial Guinea	32.7	23.65	18.18	28.51	17.76	20.32	17.35	20.67	18.26	19.85	35.16	38.12	37.43	40.84	42.48	27.42
32	Eritrea	38.1	32.53	27.57	26.33	29.20	25.11	24.53	20.74	20.65	20.89	18.38	19.84	18.17	12.74	12.78	23.17
33	Fiji	32.9	32.55	33.61	32.24	30.66	28.27	28.84	36.39	34.93	32.31	28.23	26.99	24.71	26.26	25.52	30.29
34	Gabon	46.2	42.21	60.74	56.87	58.12	56.81	51.01	49.83	53.02	49.00	56.03	50.32	45.69	57.82	53.43	52.47
35	Gambia, The	46.1	52.83	52.57	52.82	54.57	54.68	51.35	52.19	59.54	74.62	81.35	79.77	78.65	64.30	64.80	61.34
36	Ghana	42	40.96	39.82	38.30	40.75	41.90	52.85	34.12	39.97	38.55	39.74	36.44	55.49	61.09	57.01	43.93
37	Guatemala	51.6	53.98	69.76	78.31	74.69	70.03	61.02	63.47	65.42	71.00	73.33	72.35	68.53	70.86	70.82	67.68
38	Guinea	39.7	40.97	41.11	49.96	43.21	39.52	40.13	49.89	39.53	48.80	50.24	67.98	57.10	56.29	53.60	47.87

No	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
39	Guinea-Bissau	40.4	46.21	37.24	37.30	36.89	32.24	29.03	27.52	26.09	20.47	21.19	24.70	21.46	20.70	18.00	29.30
40	Guyana	33.4	41.38	42.77	44.01	48.78	46.45	45.23	37.67	37.03	41.29	40.05	40.26	31.94	33.65	34.30	39.88
41	Haiti	54.8	58.21	58.29	60.49	54.23	48.56	54.43	55.38	51.32	52.53	48.41	44.97	46.75	50.87	54.73	52.93
42	Honduras	50.3	57.28	63.34	65.52	67.53	72.43	64.83	60.49	71.07	76.41	81.45	78.60	71.67	69.22	72.41	68.17
43	Hong Kong SAR, China	17	15.16	20.65	24.34	24.26	21.56	19.49	19.38	19.50	21.75	22.04	22.58	19.93	21.81	23.66	20.87
44	India	23.2	23.77	21.47	20.71	21.54	21.20	20.67	22.18	21.04	21.72	22.43	22.22	20.71	22.25	21.24	21.76
45	Indonesia	19.7	22.01	20.40	19.44	20.24	22.69	19.30	19.31	16.17	16.99	18.56	17.33	19.39	19.25	20.25	19.40
46	Iran, Islamic Rep.	19.1	20.85	20.02	16.99	12.45	17.17	16.04	21.89	14.54	16.81	21.12	20.10	16.94	16.84	16.71	17.84
47	Jamaica	36.4	36.31	36.25	35.60	33.45	34.72	37.75	38.37	42.16	45.72	47.55	45.30	44.45	46.72	45.17	40.40
48	Jordan	19.4	21.76	20.44	19.43	17.91	18.01	17.94	20.04	18.34	17.52	17.38	16.60	17.06	17.58	16.14	18.37
49	Kenya	33.7	32.53	34.89	35.71	33.56	29.04	31.12	24.86	25.97	27.73	27.06	26.07	25.58	25.32	26.37	29.30
50	Kuwait	20.1	16.12	18.21	19.78	17.31	15.98	11.52	9.87	10.60	10.13	15.09	14.26	13.13	13.00	12.58	14.51
51	Lao PDR	30.9	31.19	39.01	34.17	35.83	40.23	44.18	45.66	50.79	58.83	64.98	59.73	62.95	74.05	80.41	50.19
52	Lebanon	34.10	34.82	31.45	36.49	34.98	32.92	31.98	32.89	28.66	29.67	29.32	28.50	29.43	28.33	32.16	31.71
53	Lesotho	31.7	33.62	32.26	36.12	31.78	35.11	31.36	34.04	32.94	30.65	32.59	39.05	37.53	36.51	33.35	33.91
54	Liberia	44.2	43.57	41.16	31.39	33.50	54.90	54.60	51.91	62.21	76.93	64.90	67.76	70.76	76.84	82.04	57.11
55	Macao SAR, China	13.3	12.30	12.82	12.66	12.73	11.50	11.38	10.84	12.36	14.03	14.29	14.51	14.50	14.72	12.64	12.97
56	Madagascar	40.1	44.33	44.85	36.95	36.07	34.95	38.02	44.58	56.10	46.81	41.02	43.65	44.69	42.70	44.82	42.64
57	Malawi	39.9	39.48	42.04	37.51	36.72	34.41	36.09	34.58	33.76	36.20	39.34	35.59	41.01	40.58	44.07	38.09
58	Malaysia	32.2	31.65	40.70	39.41	36.45	36.72	32.27	32.75	31.98	34.00	36.49	34.08	35.34	38.41	37.35	35.32
59	Maldives	30.3	34.63	25.29	25.12	22.69	24.71	24.73	24.71	22.86	20.12	18.94	18.33	19.93	19.23	18.32	23.33
60	Mali	42.5	40.63	40.51	42.95	48.71	48.26	44.55	47.32	45.49	44.49	45.22	45.13	44.85	44.82	46.61	44.80
61	Mauritania	35.5	36.39	36.40	44.00	46.87	45.23	45.29	40.60	45.06	39.51	40.39	39.14	33.12	36.79	39.04	40.22
62	Mauritius	23.3	21.55	21.09	21.52	25.18	24.63	24.12	22.90	19.13	19.77	22.86	23.46	24.11	23.23	23.89	22.72
63	Mexico	30.8	31.05	31.34	30.82	31.47	30.49	30.92	29.79	29.13	32.72	35.07	31.97	30.42	32.91	31.51	31.36
64	Morocco	36.5	35.77	34.89	36.96	35.12	36.79	39.11	37.76	34.76	38.34	37.10	36.57	38.76	40.69	40.72	37.32
65	Mozambique	36	31.76	35.03	36.02	36.82	41.49	42.35	42.28	39.67	42.68	46.56	48.10	50.56	53.54	63.09	43.06
66	Namibia	31.4	30.74	28.98	26.79	26.71	27.79	27.37	26.17	32.72	33.92	31.99	25.77	21.42	30.25	33.54	29.04
67	Nepal	37.2	43.23	36.62	34.57	34.92	36.71	38.50	35.45	39.90	43.69	48.71	47.56	48.06	49.87	49.38	41.62
68	Nicaragua	45.7	47.92	46.53	45.30	50.63	52.29	48.75	49.25	51.28	53.19	54.25	53.97	49.09	44.49	46.49	49.27
69	Niger	41.7	37.47	32.69	35.10	38.05	43.69	43.05	42.83	42.86	42.47	44.51	44.74	40.83	41.46	41.20	40.84
70	Nigeria	46	56.21	55.41	37.84	32.86	37.08	43.47	40.52	51.28	74.29	79.42	47.77	48.03	46.42	42.94	49.30
71	Oman	19.1	16.20	16.30	18.14	16.14	15.90	15.40	14.42	13.69	10.45	14.80	13.44	12.92	15.03	16.07	15.20
72	Pakistan	37	30.74	30.47	31.11	31.52	28.27	26.59	26.25	29.41	31.63	31.87	34.87	31.31	34.28	36.05	31.43
73	Papua New Guinea	35.5	33.53	35.84	32.90	33.28	33.60	34.09	34.27	34.75	35.16	35.58	38.71	37.27	33.89	35.84	34.95
74	Paraguay	38	43.28	48.36	37.37	36.80	29.03	39.02	35.26	35.44	36.19	43.92	41.47	41.51	49.98	53.73	40.62
75	Peru	60.1	57.33	57.88	61.68	59.73	58.15	61.91	61.23	57.28	58.91	59.49	55.47	57.06	62.23	61.90	59.36
76	Philippines	43.8	45.74	44.43	38.38	38.51	31.70	34.05	29.63	36.81	35.45	36.31	36.56	36.20	39.15	38.72	37.69
77	Qatar	18.7	15.67	15.56	13.97	13.34	12.87	12.62	12.22	10.99	8.97	12.18	10.24	9.77	10.06	10.45	12.51
78	Rwanda	40.5	34.47	41.50	36.12	38.95	30.05	46.90	44.94	41.61	36.07	37.42	35.73	34.87	37.50	38.55	38.35

No	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
79	Saudi Arabia	18.7	19.13	21.48	19.17	19.33	18.08	15.82	16.68	15.99	13.19	16.55	16.16	15.23	16.52	17.73	17.32
80	Senegal	45	48.59	40.08	43.77	45.28	51.10	49.52	49.07	48.86	48.43	52.87	55.27	52.45	57.01	52.58	49.33
81	Sierra Leone	48.6	62.06	56.55	61.02	54.49	48.09	47.31	49.27	43.62	48.42	54.14	52.95	51.53	52.80	54.74	52.37
82	Singapore	13.3	14.13	15.64	15.41	14.31	12.49	12.01	12.39	12.45	14.16	13.46	13.35	11.95	12.61	13.44	13.41
83	Solomon Islands	31.7	35.08	34.57	31.09	30.23	36.63	43.26	45.88	48.50	51.18	53.54	57.13	57.02	60.57	66.23	45.51
84	South Africa	28.4	28.49	29.29	28.43	27.10	27.37	28.48	27.88	28.73	30.38	31.00	31.58	30.71	30.06	30.62	29.23
85	Sri Lanka	45.2	45.66	45.53	56.06	52.93	52.08	52.45	60.20	56.72	62.60	66.31	52.49	36.45	27.62	18.44	48.72
86	Suriname	39.7	40.48	34.45	27.86	30.66	28.15	24.95	25.11	30.04	32.07	30.52	29.36	27.52	33.37	30.44	30.98
87	Swaziland	43.5	42.35	40.46	40.13	37.80	37.65	37.70	35.25	36.51	35.10	40.69	46.54	41.29	43.17	36.33	39.63
88	Tanzania	58.6	63.70	57.32	55.30	65.01	66.60	76.27	69.43	76.46	63.86	70.58	65.35	65.93	66.78	68.24	65.96
89	Thailand	53.4	52.18	49.50	51.46	54.73	55.66	58.27	55.64	56.97	60.21	60.67	60.49	63.07	63.68	68.70	57.64
90	Timor-Leste	35.5	40.99	41.35	39.72	36.60	35.40	33.70	35.44	35.09	33.52	39.89	41.35	42.44	41.62	42.20	38.32
91	Togo	34.4	35.38	33.14	28.70	29.85	29.44	29.81	31.55	27.19	29.35	31.03	28.55	28.25	34.86	39.14	31.38
92	Trinidad and Tobago	34.7	26.77	30.39	29.63	28.16	25.58	28.25	31.63	27.43	30.16	36.13	35.61	32.74	33.80	34.10	31.01
93	Tunisia	38.7	38.24	39.10	39.65	39.73	38.21	39.10	36.56	36.07	40.25	40.89	44.50	43.60	43.64	39.45	39.85
94	Turkey	32.7	29.51	38.50	43.00	38.64	34.65	36.08	32.63	38.26	41.27	43.30	40.56	36.70	41.38	32.70	37.33
95	Uganda	43.50	50.51	48.16	52.61	50.92	40.01	49.16	47.32	47.49	41.59	36.22	36.24	45.79	31.76	32.80	43.61
96	United Arab Emirates	26.3	23.27	27.35	30.53	27.85	31.58	26.28	24.96	22.05	22.05	30.47	25.11	23.90	21.27	28.41	26.09
97	Uruguay	50.5	50.81	48.34	48.36	48.27	52.99	55.01	56.55	48.70	49.55	52.68	53.62	55.34	56.70	58.35	52.38
98	Venezuela, RB	33.8	29.92	39.16	36.64	35.39	32.03	26.08	26.68	29.03	34.72	50.10	37.89	32.50	32.98	31.64	33.91
99	Vietnam	15.8	14.87	14.55	14.49	14.53	15.60	14.39	14.65	16.21	15.98	16.37	22.80	21.41	21.78	24.14	17.17
100	Yemen, Rep.	27.7	27.68	26.91	23.79	24.82	25.22	22.63	26.27	25.16	27.87	31.34	36.13	37.68	37.02	38.92	29.28
101	Zambia	49.3	50.33	49.21	46.00	44.88	42.73	40.42	37.60	37.05	35.37	32.20	31.66	34.02	33.19	36.65	40.04
	Time Average	36.50	36.50	36.78	36.77	36.27	35.85	35.84	35.49	36.47	37.70	39.64	39.09	38.50	39.17	39.59	37.34

Table A4.3: Size of the shadow economies of 21 Transition countries

No.	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Aver.
1	Albania	35.70	27.77	32.64	39.03	40.10	39.04	42.15	41.06	42.58	45.28	46.97	47.21	49.51	50.78	51.96	42.12
2	Armenia	46.6	48.25	56.59	55.03	53.63	39.92	43.99	37.28	35.12	30.62	41.99	50.74	50.54	44.82	48.47	45.57
3	Azerbaijan	61	62.81	51.10	36.29	42.10	46.32	44.41	49.68	46.34	43.94	46.76	45.43	43.32	46.23	46.54	47.48
4	Belarus	48.3	45.01	53.02	48.35	52.08	49.61	51.44	51.84	52.62	51.03	45.71	41.66	37.35	36.71	37.67	46.83
5	Bosnia and Herzegovina	34.3	30.24	38.06	36.87	36.69	36.99	38.82	34.96	34.71	32.37	36.08	37.13	39.44	38.41	36.45	36.10
6	Bulgaria	36	42.52	37.56	31.63	31.86	31.65	32.49	33.15	33.11	34.42	35.97	37.30	33.99	33.59	35.55	34.72
7	Croatia	33.8	36.71	30.34	27.09	23.01	25.92	25.91	24.26	25.48	26.06	29.83	30.34	31.66	32.10	31.61	28.94
8	Georgia	34	16.65	22.46	28.76	26.80	38.91	49.97	41.84	61.11	78.74	74.47	61.46	57.13	57.27	53.20	46.85
9	Kazakhstan	43.8	39.50	43.33	42.67	47.04	52.78	37.52	35.83	42.97	42.60	49.84	47.37	50.91	56.58	55.69	45.90
10	Kyrgyz Republic	41.4	41.00	44.15	44.44	36.43	35.90	39.19	38.58	41.91	41.82	42.56	42.57	43.16	47.93	44.82	41.72
11	Latvia	30.8	28.53	26.71	26.11	26.20	23.95	23.59	22.64	24.35	33.94	34.75	31.07	24.29	20.96	19.92	26.52
12	Lithuania	33.8	35.38	28.75	28.93	25.07	25.49	24.79	24.87	26.41	34.52	39.13	34.36	26.00	21.85	21.95	28.75
13	Macedonia, FYR	39	31.68	41.52	41.19	39.25	39.33	31.84	29.32	30.06	32.12	32.75	30.21	32.66	30.73	29.93	34.11
14	Moldova	36	25.40	40.49	51.57	53.85	49.79	49.41	58.98	55.58	62.37	72.20	70.66	61.45	62.37	55.80	53.73
15	Mongolia	18.4	20.84	23.41	21.64	22.08	24.41	21.62	23.53	23.07	23.51	21.44	21.41	19.76	18.44	21.35	21.66
16	Montenegro	34.3	36.79	40.18	40.34	39.93	37.57	39.72	38.20	31.00	33.70	32.52	31.82	33.50	31.35	28.75	35.31
17	Romania	34.3	35.30	35.01	31.56	37.12	32.61	33.98	30.16	30.80	33.13	35.29	33.50	31.90	32.13	30.65	33.16
18	Russian Federation	36	33.71	38.92	42.19	41.34	40.05	44.45	43.14	44.65	48.46	49.51	45.64	42.38	44.94	46.37	42.78
19	Serbia	34.3	33.04	35.59	39.17	41.52	39.07	36.53	32.19	28.51	29.44	31.58	37.35	34.74	32.42	27.95	34.23
20	Tajikistan	43.5	34.28	38.50	40.55	41.53	48.47	60.72	51.83	48.49	52.96	63.57	64.12	69.77	53.03	63.76	51.67
21	Ukraine	52.7	52.57	48.52	47.09	47.09	44.92	50.23	52.76	53.88	52.77	60.07	59.49	53.60	54.24	53.53	52.23
	Time Average	38.48	36.09	38.42	38.12	38.32	38.22	39.18	37.91	38.70	41.14	43.95	42.90	41.29	40.33	40.09	39.54

Table A5: Size of the shadow economies of 157 countries in Alphabetical order

No.	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
1	Albania	35.70	27.77	32.64	39.03	40.10	39.04	42.15	41.06	42.58	45.28	46.97	47.21	49.51	50.78	51.96	42.12
2	Algeria	34.20	39.30	34.84	30.87	28.47	24.58	25.66	30.22	30.05	36.89	35.21	37.79	46.42	29.80	27.24	32.77
3	Angola	48.8	42.24	26.90	19.51	21.69	16.49	16.98	18.90	18.27	20.74	19.84	18.11	19.43	18.14	23.30	23.29
4	Argentina	25.2	27.84	29.29	26.10	24.51	17.96	19.73	20.06	22.00	24.08	27.64	28.06	28.85	35.08	36.10	26.17
5	Armenia	46.6	48.25	56.59	55.03	53.63	39.92	43.99	37.28	35.12	30.62	41.99	50.74	50.54	44.82	48.47	45.57
6	Australia	14.4	14.15	14.68	14.36	14.24	14.10	14.26	14.20	14.04	14.53	14.32	14.28	13.79	14.28	14.82	14.30
7	Austria	10	9.28	10.03	9.97	9.99	9.90	9.67	9.31	9.23	9.83	10.11	10.05	9.75	10.18	10.13	9.83
8	Azerbaijan	61	62.81	51.10	36.29	42.10	46.32	44.41	49.68	46.34	43.94	46.76	45.43	43.32	46.23	46.54	47.48
9	Bahamas, The	26.3	25.73	26.68	27.80	27.62	26.26	22.69	22.85	22.78	28.41	30.70	31.71	25.99	26.03	29.11	26.71
10	Bahrain	18.6	14.72	15.40	15.67	15.16	14.48	12.67	11.00	9.89	9.04	10.11	10.58	10.94	14.57	13.59	13.09
11	Bangladesh	36	38.69	33.14	38.10	43.97	39.27	41.25	31.10	47.17	44.73	34.46	34.45	37.12	40.31	42.61	38.83
12	Barbados	33.8	32.24	34.62	37.72	45.13	41.94	39.16	34.54	42.23	45.03	47.12	48.22	49.26	41.05	39.94	40.80
13	Belarus	48.3	45.01	53.02	48.35	52.08	49.61	51.44	51.84	52.62	51.03	45.71	41.66	37.35	36.71	37.67	46.83
14	Belgium	22.7	20.81	22.32	22.75	23.76	23.16	22.90	21.82	21.70	23.22	23.91	23.79	23.45	24.56	25.34	23.08
15	Belize	45.2	37.07	40.53	48.20	51.11	50.08	48.85	48.37	51.32	55.78	58.05	62.45	56.81	55.80	52.81	50.83
16	Benin	51.2	50.55	53.65	55.12	59.64	58.05	59.24	58.42	60.49	65.63	67.85	68.71	65.74	67.39	66.52	60.55
17	Bhutan	29.6	37.77	35.99	34.91	35.10	35.09	37.03	36.49	32.15	32.68	35.48	32.44	31.75	33.04	34.60	34.28
18	Bolivia	67	72.33	71.70	76.91	73.86	73.83	78.62	70.98	67.20	64.20	75.55	81.20	76.92	68.17	66.04	72.30
19	Bosnia and Herzegovina	34.3	30.24	38.06	36.87	36.69	36.99	38.82	34.96	34.71	32.37	36.08	37.13	39.44	38.41	36.45	36.10
20	Botswana	33.9	31.54	29.01	29.64	27.29	26.93	22.43	20.98	22.96	25.89	25.46	21.71	22.33	23.79	25.11	25.93
21	Brazil	40.8	39.40	40.31	43.15	39.97	41.56	40.88	41.55	41.72	41.00	41.08	40.54	38.02	37.52	41.18	40.58
22	Bulgaria	36	42.52	37.56	31.63	31.86	31.65	32.49	33.15	33.11	34.42	35.97	37.30	33.99	33.59	35.55	34.72
23	Burkina Faso	41.3	47.00	56.34	46.58	46.28	49.02	46.44	50.72	55.47	49.92	48.10	48.68	48.72	51.53	52.60	49.25
24	Burundi	39.1	33.56	35.27	34.42	39.16	42.37	42.32	43.99	58.79	62.07	57.54	64.44	56.88	52.74	49.74	47.49
25	Cabo Verde	36.5	37.30	37.15	36.96	36.39	39.01	38.70	39.83	36.84	36.06	35.66	39.02	37.11	22.44	20.98	35.33
26	Cambodia	50.4	49.71	42.75	48.72	46.21	41.66	34.77	31.84	48.85	54.75	57.06	58.51	57.23	58.26	57.48	49.21
27	Cameroon	33.3	31.70	32.63	31.81	30.70	32.03	30.98	30.49	33.39	34.44	44.69	37.62	45.22	37.43	37.40	34.92
28	Canada	16.3	15.48	15.40	16.20	16.48	15.18	15.35	15.36	16.19	16.55	17.56	17.45	15.85	16.66	16.58	16.17
29	Central African Republic	42.8	41.91	37.15	37.32	29.81	32.46	31.68	25.17	25.66	26.67	26.33	28.60	26.71	27.32	34.66	31.62
30	Chad	45.8	43.78	40.30	35.82	32.13	26.39	22.92	21.02	18.66	16.80	14.55	13.30	14.74	16.05	15.72	25.20
31	Chile	19.9	18.22	18.54	18.21	19.19	17.75	18.26	18.25	20.05	21.15	20.34	20.59	19.19	19.81	19.74	19.28
32	China	13.2	13.19	14.77	13.81	13.46	13.01	13.11	13.37	13.85	13.24	13.57	13.71	13.11	13.92	13.79	13.54
33	Colombia	39.4	32.45	29.91	27.95	28.15	27.28	28.06	26.30	28.76	28.45	31.30	29.36	29.16	29.18	29.85	29.70
34	Comoros	39.3	35.82	42.84	42.54	38.75	37.56	37.47	38.92	38.61	45.65	47.44	46.86	51.01	52.96	46.11	42.79
35	Congo, Dem. Rep.	34	9.82	21.76	34.32	29.71	38.23	42.75	56.04	53.89	51.87	67.53	60.72	81.85	78.47	89.20	50.01
36	Congo, Rep.	49.5	41.58	45.61	58.27	54.62	50.68	41.71	45.97	52.55	38.11	42.61	38.92	34.74	46.14	42.47	45.57
37	Costa Rica	26.1	26.14	30.17	31.62	30.53	29.89	28.74	27.57	28.91	32.97	34.87	37.16	34.44	35.45	36.73	31.42
38	Cote d'Ivoire	41.4	43.70	38.68	39.03	43.45	43.37	43.57	42.12	42.57	41.02	39.20	39.26	32.67	44.36	41.04	41.03

No.	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
39	Croatia	33.8	36.71	30.34	27.09	23.01	25.92	25.91	24.26	25.48	26.06	29.83	30.34	31.66	32.10	31.61	28.94
40	Cyprus	29.2	28.64	27.77	29.61	33.11	33.18	34.26	34.35	36.42	37.26	29.34	29.75	30.59	32.64	33.79	31.99
41	Czech Republic	19.3	18.87	18.02	20.36	20.60	20.18	19.73	17.23	16.76	18.00	19.66	19.99	18.58	18.48	18.47	18.95
42	Denmark	18.4	17.65	17.85	18.07	18.37	18.70	17.88	17.82	18.47	19.38	21.39	21.51	20.05	20.15	19.91	19.04
43	Dominican Republic	32.4	37.39	41.48	42.65	37.28	36.75	33.79	31.17	35.27	39.60	36.02	39.40	38.43	46.14	43.54	38.09
44	Ecuador	34.2	35.05	36.27	34.72	29.81	29.89	30.44	29.63	32.96	36.98	45.16	43.80	42.49	45.57	47.21	36.94
45	Egypt, Arab Rep.	35.5	41.03	37.40	37.31	38.15	39.02	38.22	38.43	32.97	31.85	37.37	38.39	39.39	39.53	39.35	37.59
46	El Salvador	46.5	45.37	51.45	47.40	48.12	48.06	47.16	51.14	47.80	51.10	51.62	54.26	52.77	54.12	58.60	50.37
47	Equatorial Guinea	32.7	23.65	18.18	28.51	17.76	20.32	17.35	20.67	18.26	19.85	35.16	38.12	37.43	40.84	42.48	27.42
48	Eritrea	38.1	32.53	27.57	26.33	29.20	25.11	24.53	20.74	20.65	20.89	18.38	19.84	18.17	12.74	12.78	23.17
49	Estonia	33	33.14	23.17	24.70	24.96	25.41	22.48	19.69	21.08	35.64	43.86	37.82	24.96	21.70	22.94	27.64
50	Fiji	32.9	32.55	33.61	32.24	30.66	28.27	28.84	36.39	34.93	32.31	28.23	26.99	24.71	26.26	25.52	30.29
51	Finland	18.4	18.08	16.70	17.70	18.70	18.66	18.90	17.73	17.43	18.79	20.32	20.09	19.47	20.44	20.68	18.81
52	France	15.7	14.32	14.44	15.09	15.63	15.41	15.77	15.17	14.79	15.10	16.37	14.86	14.43	14.98	15.03	15.14
53	Gabon	46.2	42.21	60.74	56.87	58.12	56.81	51.01	49.83	53.02	49.00	56.03	50.32	45.69	57.82	53.43	52.47
54	Gambia, The	46.1	52.83	52.57	52.82	54.57	54.68	51.35	52.19	59.54	74.62	81.35	79.77	78.65	64.30	64.80	61.34
55	Georgia	34	16.65	22.46	28.76	26.80	38.91	49.97	41.84	61.11	78.74	74.47	61.46	57.13	57.27	53.20	46.85
56	Germany	16.4	15.74	15.27	16.57	17.40	16.78	16.45	14.31	13.94	14.66	16.27	15.65	15.18	15.91	15.96	15.77
57	Ghana	42	40.96	39.82	38.30	40.75	41.90	52.85	34.12	39.97	38.55	39.74	36.44	55.49	61.09	57.01	43.93
58	Greece	28.5	28.11	27.61	30.02	28.80	28.17	29.46	28.47	29.85	30.65	35.72	37.62	42.34	43.67	39.39	32.56
59	Guatemala	51.6	53.98	69.76	78.31	74.69	70.03	61.02	63.47	65.42	71.00	73.33	72.35	68.53	70.86	70.82	67.68
60	Guinea	39.7	40.97	41.11	49.96	43.21	39.52	40.13	49.89	39.53	48.80	50.24	67.98	57.10	56.29	53.60	47.87
61	Guinea-Bissau	40.4	46.21	37.24	37.30	36.89	32.24	29.03	27.52	26.09	20.47	21.19	24.70	21.46	20.70	18.00	29.30
62	Guyana	33.4	41.38	42.77	44.01	48.78	46.45	45.23	37.67	37.03	41.29	40.05	40.26	31.94	33.65	34.30	39.88
63	Haiti	54.8	58.21	58.29	60.49	54.23	48.56	54.43	55.38	51.32	52.53	48.41	44.97	46.75	50.87	54.73	52.93
64	Honduras	50.3	57.28	63.34	65.52	67.53	72.43	64.83	60.49	71.07	76.41	81.45	78.60	71.67	69.22	72.41	68.17
65	Hong Kong SAR, China	17	15.16	20.65	24.34	24.26	21.56	19.49	19.38	19.50	21.75	22.04	22.58	19.93	21.81	23.66	20.87
66	Hungary	25.4	23.49	24.30	25.64	27.10	26.42	26.18	25.76	25.47	26.84	28.97	27.94	25.20	24.37	23.88	25.80
67	Iceland	16	15.91	16.04	16.72	17.05	16.66	16.28	16.95	16.60	17.36	17.53	17.57	16.71	15.42	15.76	16.57
68	India	23.2	23.77	21.47	20.71	21.54	21.20	20.67	22.18	21.04	21.72	22.43	22.22	20.71	22.25	21.24	21.76
69	Indonesia	19.7	22.01	20.40	19.44	20.24	22.69	19.30	19.31	16.17	16.99	18.56	17.33	19.39	19.25	20.25	19.40
70	Iran, Islamic Rep.	19.1	20.85	20.02	16.99	12.45	17.17	16.04	21.89	14.54	16.81	21.12	20.10	16.94	16.84	16.71	17.84
71	Ireland	16.1	14.33	14.18	15.88	16.20	16.47	16.26	16.66	17.55	20.17	21.14	20.22	17.77	16.65	15.56	17.01
72	Israel	22.7	23.01	23.33	24.00	23.90	21.63	20.65	20.28	20.04	19.94	19.39	19.80	19.56	19.82	20.45	21.23
73	Italy	27.8	25.55	26.00	26.35	26.73	27.03	26.75	28.47	27.48	29.16	31.58	30.22	31.22	32.02	32.01	28.56
74	Jamaica	36.4	36.31	36.25	35.60	33.45	34.72	37.75	38.37	42.16	45.72	47.55	45.30	44.45	46.72	45.17	40.40
75	Japan	11.4	11.72	12.59	13.61	12.92	13.52	12.87	12.65	13.89	14.56	15.53	15.34	15.44	15.50	15.56	13.81
76	Jordan	19.4	21.76	20.44	19.43	17.91	18.01	17.94	20.04	18.34	17.52	17.38	16.60	17.06	17.58	16.14	18.37
77	Kazakhstan	43.8	39.50	43.33	42.67	47.04	52.78	37.52	35.83	42.97	42.60	49.84	47.37	50.91	56.58	55.69	45.90

No.	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
78	Kenya	33.7	32.53	34.89	35.71	33.56	29.04	31.12	24.86	25.97	27.73	27.06	26.07	25.58	25.32	26.37	29.30
79	Korea, Rep.	28.3	25.57	27.84	29.15	31.36	31.66	32.64	32.30	33.81	35.12	36.24	33.49	34.36	34.15	34.77	32.05
80	Kuwait	20.1	16.12	18.21	19.78	17.31	15.98	11.52	9.87	10.60	10.13	15.09	14.26	13.13	13.00	12.58	14.51
81	Kyrgyz Republic	41.4	41.00	44.15	44.44	36.43	35.90	39.19	38.58	41.91	41.82	42.56	42.57	43.16	47.93	44.82	41.72
82	Lao PDR	30.9	31.19	39.01	34.17	35.83	40.23	44.18	45.66	50.79	58.83	64.98	59.73	62.95	74.05	80.41	50.19
83	Latvia	30.8	28.53	26.71	26.11	26.20	23.95	23.59	22.64	24.35	33.94	34.75	31.07	24.29	20.96	19.92	26.52
84	Lebanon	34.10	34.82	31.45	36.49	34.98	32.92	31.98	32.89	28.66	29.67	29.32	28.50	29.43	28.33	32.16	31.71
85	Lesotho	31.7	33.62	32.26	36.12	31.78	35.11	31.36	34.04	32.94	30.65	32.59	39.05	37.53	36.51	33.35	33.91
86	Liberia	44.2	43.57	41.16	31.39	33.50	54.90	54.60	51.91	62.21	76.93	64.90	67.76	70.76	76.84	82.04	57.11
87	Lithuania	33.8	35.38	28.75	28.93	25.07	25.49	24.79	24.87	26.41	34.52	39.13	34.36	26.00	21.85	21.95	28.75
88	Luxembourg	10	9.37	10.00	10.91	11.33	11.23	11.56	10.20	10.26	10.38	11.16	10.85	10.63	11.63	13.47	10.87
89	Macao SAR, China	13.3	12.30	12.82	12.66	12.73	11.50	11.38	10.84	12.36	14.03	14.29	14.51	14.50	14.72	12.64	12.97
90	Macedonia, FYR	39	31.68	41.52	41.19	39.25	39.33	31.84	29.32	30.06	32.12	32.75	30.21	32.66	30.73	29.93	34.11
91	Madagascar	40.1	44.33	44.85	36.95	36.07	34.95	38.02	44.58	56.10	46.81	41.02	43.65	44.69	42.70	44.82	42.64
92	Malawi	39.9	39.48	42.04	37.51	36.72	34.41	36.09	34.58	33.76	36.20	39.34	35.59	41.01	40.58	44.07	38.09
93	Malaysia	32.2	31.65	40.70	39.41	36.45	36.72	32.27	32.75	31.98	34.00	36.49	34.08	35.34	38.41	37.35	35.32
94	Maldives	30.3	34.63	25.29	25.12	22.69	24.71	24.73	24.71	22.86	20.12	18.94	18.33	19.93	19.23	18.32	23.33
95	Mali	42.5	40.63	40.51	42.95	48.71	48.26	44.55	47.32	45.49	44.49	45.22	45.13	44.85	44.82	46.61	44.80
96	Malta	27.4	27.16	28.48	31.03	30.70	31.70	30.06	32.53	32.46	21.83	22.42	21.84	21.29	21.50	21.62	26.80
97	Mauritania	35.5	36.39	36.40	44.00	46.87	45.23	45.29	40.60	45.06	39.51	40.39	39.14	33.12	36.79	39.04	40.22
98	Mauritius	23.3	21.55	21.09	21.52	25.18	24.63	24.12	22.90	19.13	19.77	22.86	23.46	24.11	23.23	23.89	22.72
99	Mexico	30.8	31.05	31.34	30.82	31.47	30.49	30.92	29.79	29.13	32.72	35.07	31.97	30.42	32.91	31.51	31.36
100	Moldova	36	25.40	40.49	51.57	53.85	49.79	49.41	58.98	55.58	62.37	72.20	70.66	61.45	62.37	55.80	53.73
101	Mongolia	18.4	20.84	23.41	21.64	22.08	24.41	21.62	23.53	23.07	23.51	21.44	21.41	19.76	18.44	21.35	21.66
102	Montenegro	34.3	36.79	40.18	40.34	39.93	37.57	39.72	38.20	31.00	33.70	32.52	31.82	33.50	31.35	28.75	35.31
103	Morocco	36.5	35.77	34.89	36.96	35.12	36.79	39.11	37.76	34.76	38.34	37.10	36.57	38.76	40.69	40.72	37.32
104	Mozambique	36	31.76	35.03	36.02	36.82	41.49	42.35	42.28	39.67	42.68	46.56	48.10	50.56	53.54	63.09	43.06
105	Namibia	31.4	30.74	28.98	26.79	26.71	27.79	27.37	26.17	32.72	33.92	31.99	25.77	21.42	30.25	33.54	29.04
106	Nepal	37.2	43.23	36.62	34.57	34.92	36.71	38.50	35.45	39.90	43.69	48.71	47.56	48.06	49.87	49.38	41.62
107	Netherlands	13.3	12.60	12.90	13.94	14.88	14.50	14.39	13.94	14.12	14.38	16.18	16.56	16.01	16.21	16.38	14.69
108	New Zealand	13	12.35	12.23	12.24	12.37	12.45	13.10	13.96	13.85	15.24	14.93	14.32	13.91	13.76	13.13	13.39
109	Nicaragua	45.7	47.92	46.53	45.30	50.63	52.29	48.75	49.25	51.28	53.19	54.25	53.97	49.09	44.49	46.49	49.27
110	Niger	41.7	37.47	32.69	35.10	38.05	43.69	43.05	42.83	42.86	42.47	44.51	44.74	40.83	41.46	41.20	40.84
111	Nigeria	46	56.21	55.41	37.84	32.86	37.08	43.47	40.52	51.28	74.29	79.42	47.77	48.03	46.42	42.94	49.30
112	Norway	19.2	19.06	20.57	21.22	21.05	20.83	19.80	18.23	18.69	18.99	20.56	20.99	20.43	20.52	19.92	20.01
113	Oman	19.1	16.20	16.30	18.14	16.14	15.90	15.40	14.42	13.69	10.45	14.80	13.44	12.92	15.03	16.07	15.20
114	Pakistan	37	30.74	30.47	31.11	31.52	28.27	26.59	26.25	29.41	31.63	31.87	34.87	31.31	34.28	36.05	31.43
115	Papua New Guinea	35.5	33.53	35.84	32.90	33.28	33.60	34.09	34.27	34.75	35.16	35.58	38.71	37.27	33.89	35.84	34.95
116	Paraguay	38	43.28	48.36	37.37	36.80	29.03	39.02	35.26	35.44	36.19	43.92	41.47	41.51	49.98	53.73	40.62
117	Peru	60.1	57.33	57.88	61.68	59.73	58.15	61.91	61.23	57.28	58.91	59.49	55.47	57.06	62.23	61.90	59.36

No.	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
118	Philippines	43.8	45.74	44.43	38.38	38.51	31.70	34.05	29.63	36.81	35.45	36.31	36.56	36.20	39.15	38.72	37.69
119	Poland	27.7	32.78	31.20	28.80	29.42	26.36	23.37	22.00	21.46	24.18	27.49	28.48	27.76	26.87	26.62	26.97
120	Portugal	23	23.26	23.99	25.49	26.02	25.74	26.45	25.37	24.12	25.29	26.02	26.94	27.30	25.97	26.42	25.43
121	Qatar	18.7	15.67	15.56	13.97	13.34	12.87	12.62	12.22	10.99	8.97	12.18	10.24	9.77	10.06	10.45	12.51
122	Romania	34.3	35.30	35.01	31.56	37.12	32.61	33.98	30.16	30.80	33.13	35.29	33.50	31.90	32.13	30.65	33.16
123	Russian Federation	36	33.71	38.92	42.19	41.34	40.05	44.45	43.14	44.65	48.46	49.51	45.64	42.38	44.94	46.37	42.78
124	Rwanda	40.5	34.47	41.50	36.12	38.95	30.05	46.90	44.94	41.61	36.07	37.42	35.73	34.87	37.50	38.55	38.35
125	Saudi Arabia	18.7	19.13	21.48	19.17	19.33	18.08	15.82	16.68	15.99	13.19	16.55	16.16	15.23	16.52	17.73	17.32
126	Senegal	45	48.59	40.08	43.77	45.28	51.10	49.52	49.07	48.86	48.43	52.87	55.27	52.45	57.01	52.58	49.33
127	Serbia	34.3	33.04	35.59	39.17	41.52	39.07	36.53	32.19	28.51	29.44	31.58	37.35	34.74	32.42	27.95	34.23
128	Sierra Leone	48.6	62.06	56.55	61.02	54.49	48.09	47.31	49.27	43.62	48.42	54.14	52.95	51.53	52.80	54.74	52.37
129	Singapore	13.3	14.13	15.64	15.41	14.31	12.49	12.01	12.39	12.45	14.16	13.46	13.35	11.95	12.61	13.44	13.41
130	Slovak Republic	18.9	19.24	18.00	26.56	21.98	21.14	19.29	19.08	22.14	27.00	26.47	24.77	23.52	23.71	19.85	22.11
131	Slovenia	27.3	26.95	25.96	27.70	28.00	27.03	26.90	25.86	25.16	26.28	28.14	29.01	29.48	29.97	29.49	27.55
132	Solomon Islands	31.7	35.08	34.57	31.09	30.23	36.63	43.26	45.88	48.50	51.18	53.54	57.13	57.02	60.57	66.23	45.51
133	South Africa	28.4	28.49	29.29	28.43	27.10	27.37	28.48	27.88	28.73	30.38	31.00	31.58	30.71	30.06	30.62	29.23
134	Spain	23	18.87	19.60	20.59	22.54	21.47	22.17	21.57	24.99	28.85	30.40	30.86	28.59	27.62	28.11	24.61
135	Sri Lanka	45.2	45.66	45.53	56.06	52.93	52.08	52.45	60.20	56.72	62.60	66.31	52.49	36.45	27.62	18.44	48.72
136	Suriname	39.7	40.48	34.45	27.86	30.66	28.15	24.95	25.11	30.04	32.07	30.52	29.36	27.52	33.37	30.44	30.98
137	Swaziland	43.5	42.35	40.46	40.13	37.80	37.65	37.70	35.25	36.51	35.10	40.69	46.54	41.29	43.17	36.33	39.63
138	Sweden	19.6	17.87	17.86	18.13	19.45	19.33	19.25	18.43	18.26	18.54	19.90	18.84	18.53	18.65	18.95	18.77
139	Switzerland	8.8	9.21	9.13	9.12	10.05	9.65	9.16	8.75	8.44	8.47	9.42	8.79	8.87	9.18	9.35	9.09
140	Tajikistan	43.5	34.28	38.50	40.55	41.53	48.47	60.72	51.83	48.49	52.96	63.57	64.12	69.77	53.03	63.76	51.67
141	Tanzania	58.6	63.70	57.32	55.30	65.01	66.60	76.27	69.43	76.46	63.86	70.58	65.35	65.93	66.78	68.24	65.96
142	Thailand	53.4	52.18	49.50	51.46	54.73	55.66	58.27	55.64	56.97	60.21	60.67	60.49	63.07	63.68	68.70	57.64
143	Timor-Leste	35.5	40.99	41.35	39.72	36.60	35.40	33.70	35.44	35.09	33.52	39.89	41.35	42.44	41.62	42.20	38.32
144	Togo	34.4	35.38	33.14	28.70	29.85	29.44	29.81	31.55	27.19	29.35	31.03	28.55	28.25	34.86	39.14	31.38
145	Trinidad and Tobago	34.7	26.77	30.39	29.63	28.16	25.58	28.25	31.63	27.43	30.16	36.13	35.61	32.74	33.80	34.10	31.01
146	Tunisia	38.7	38.24	39.10	39.65	39.73	38.21	39.10	36.56	36.07	40.25	40.89	44.50	43.60	43.64	39.45	39.85
147	Turkey	32.7	29.51	38.50	43.00	38.64	34.65	36.08	32.63	38.26	41.27	43.30	40.56	36.70	41.38	32.70	37.33
148	Uganda	43.50	50.51	48.16	52.61	50.92	40.01	49.16	47.32	47.49	41.59	36.22	36.24	45.79	31.76	32.80	43.61
149	Ukraine	52.7	52.57	48.52	47.09	47.09	44.92	50.23	52.76	53.88	52.77	60.07	59.49	53.60	54.24	53.53	52.23
150	United Arab Emirates	26.3	23.27	27.35	30.53	27.85	31.58	26.28	24.96	22.05	22.05	30.47	25.11	23.90	21.27	28.41	26.09
151	United Kingdom	12.8	12.33	12.89	12.94	13.50	13.55	13.74	13.99	14.00	15.03	15.08	15.26	14.43	13.84	13.26	13.78
152	United States	8.8	8.90	9.03	9.39	8.99	8.51	8.43	8.68	9.36	10.50	10.58	10.45	8.95	8.63	8.29	9.17
153	Uruguay	50.5	50.81	48.34	48.36	48.27	52.99	55.01	56.55	48.70	49.55	52.68	53.62	55.34	56.70	58.35	52.38
154	Venezuela, RB	33.8	29.92	39.16	36.64	35.39	32.03	26.08	26.68	29.03	34.72	50.10	37.89	32.50	32.98	31.64	33.91
155	Vietnam	15.8	14.87	14.55	14.49	14.53	15.60	14.39	14.65	16.21	15.98	16.37	22.80	21.41	21.78	24.14	17.17
156	Yemen, Rep.	27.7	27.68	26.91	23.79	24.82	25.22	22.63	26.27	25.16	27.87	31.34	36.13	37.68	37.02	38.92	29.28

No.	Countryname	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Averages
157	Zambia	49.3	50.33	49.21	46.00	44.88	42.73	40.42	37.60	37.05	35.37	32.20	31.66	34.02	33.19	36.65	40.04
	Time Average	33.02	32.56	33.04	33.22	33.01	32.63	32.67	32.18	33.00	34.41	36.28	35.71	34.90	35.21	35.45	33.82