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Estimating the size of informal economy in Guatemala: An approximation by the monetary method

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Artículo de investigación científica y tecnológica

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Abstract

A measurement of the size of informal economy in Guatemala from 1960 to 2017 is proposed in this work throughout a monetary method. Thus, the variations of the monetary aggregates and the main variables that determine the movements of cash in the country are examined. It is estimated that the shadow economy in Guatemala has been on average 47 % over time from 1960 to 2017 with a standard deviation of 6 percentage points, without major structural changes. After the statistical analysis it is concluded that the Shadow Economy in Guatemala shows mean reversion and transitory shocks.

Keywords: shadow economy, currency demand approach, labor Economics

Introduction

Informal economy is a commercial activity widely studied in the literature under the name of informality, shadow economy, submerged, clandestine, irregular, hidden economy, among other names. The importance of its study underlies the fact that people who work in it leave the social contract by not paying direct taxes and operate underground to generate income that is mostly not reported in official measurements. This generates, among other things, less tax collection and therefore the weakening of social contracts (Olson, 1982), failures in official indicators and unfair competition to formal companies (Schneider & Enste, 2000), greater corruption in low-income countries (Dreher & Schneider, 2010), and erosion of the tax base and inflation (Mazhar & Màn, 2017).

There are other authors who consider informal economy as a positive phenomenon such as (De Soto *et al.*, 1989, 2000) who argue that informal economy is the heart of Peru's real economy, which should be allowed to open the doors to free market. Other authors emphasize that it is a source of work for many people who do not find a place in the formality. In fact, it is estimated that half of the world's economically active population works in this sector. Informality is generally not desired and most of the people involved would be willing to leave it if they had the opportunities; most of times people move to informality due to lack of schooling or specialized work experience (LaPorta & Shleifer, 2014).

Among the sources of the shadow economy we find papers dealing with the increase in the tax burden and social security costs (Tanzi, 1980, 1983); the rise in the regulation of the formal economy and unemployment (Schneider & Enste, 2000); high bureaucracy, corruption and weak legal systems (Johnson *et al.*, 1998); entrepreneurship avoiding high entry costs (Djankov *et al.*, 2002; Friedman *et al.*, 2000); weak institutions (Dreher *et al.*, 2009); historical variables and state characteristics (Portes & Haller, 2004) and inequality issues (Dell'Anno, 2016).

To be able to study the subject in greater depth, the size of this economy must first be measured in a sufficiently broad time series that encompasses the most important economic and social events. This is why the following study first builds a time series from 1960 to 2017 of GDP percentage generated by the informal economy in Guatemala using the monetary method.

The study is developed as follows. first, the topic of shadow economy is briefly summarized; then, the current situation of Guatemala and the measurements that have been made in the country are examined. After the basic monetary method used in the calculation of the shadow economy is presented; in Section 5 the equations and the variables used in the paper are displayed, while the Section 6 presents the results. Finally, Sections 7 and 8 provide conclusions and annexes, respectively.

Shadow Economy

There are many definitions of shadow economy. According to Feige (1979), irregular economics is any economic activity that is not reported or not included in the measurements of economic activity. It is one of the most used definitions in the literature and will be the definition used in this research.

The study developed by LaPorta and Shleifer (2014) mentions the characteristics about the informal economy that should be noted since they adequately describe the Latin American sphere: it is extremely large in poor countries, it is reduced as soon as a country develops, the companies that operate in this sector have very low productivity, very few of those companies get formal despite government incentives, they rarely grow over time, they are often run by entrepreneurs with low education and these companies do not contribute significantly to the economic growth of a country.

Schneider and Enste (2000) compile the main measurement methods for the submerged economy and identify two types. Direct methods: such as the survey and audits in fiscal matters; and indirect methods: such as the difference between the (Gross Domestic Product) GDP measured by the expenditure and income method, the discrepancy between the labor force in the official sector, the approximation through transactions, and finally, the measurement through models and the monetary method, which will be used in this study.

The Guatemalan case

Guatemala is a country with 16.3 million inhabitants[1] as of December 2018 and is the largest economy in Central America. Historically, the country has had stability in its main macroeconomic indicators, with an annual inflation rate of 3.5 +/- 1.5 in the last 5 years, together with a stable exchange rate. However, there are factors that negatively affect their growth including: chronic child malnutrition (46.5 % of children)[2], income inequality (Gini 2014: 48.3)[3] and the high percentage of people living below the poverty line (59.3 %)[4].

According to the first Survey on Employment and Income 2019 (ENEI) of the National Statistics Institute (INE), the unemployment rate totaled 2.5 %. However, 70 % of the Economically Active Occupied Population (EAOP) works in the informal sector, indicating lack of social security and stability in monthly income to these families. The same survey shows that most informal workers operate in agriculture, with incomes that do not cover the minimum wage.

[1] A 9% census omission was calculated, so 16,346,950 people are projected for 2018 when they were censored 14,901,286. Website: https://www.censopoblacion.gt/

[2] ENSMI 2014-2015

[3] World Bank Indicators https://datos.bancomundial.org

[4] ENCOVI 2014

There are several authors who have calculated the shadow economy in Guatemala. Medina and Schneider (2017) estimated a time series for 158 countries used in the MIMIC method[5] from 1991 to 2015. In the case of Guatemala, it is estimated that the informal economy measures on average 54.7 % with a standard deviation of 4.9; similar results to those found by Schneider (2004) which estimates that from 1999 to 2007 it is on average 50.5 % with a standard deviation of 1.3. These results are similar to those found on this investigation.

Currency demand approach

The currency demand approach or monetary method was developed by Cagan, (1958) to explain the variations between cash as a fraction of the money supply or also called the cash ratio; This ratio has great importance for economists and central bankers since it describes the behavior of individuals with respect to the holding of paper money, which influences demand deposits and bank reserve requirements. This is why Cagan inquires about the variables that can explain this variation. Among these factors, he shows how higher tax rates generate incentives for individuals to buy and sell products and services in the informal sector, where direct taxes are not paid.

A study by Isachsen and Str (1985) shows that in shadow economy, cash is mainly used, having a direct influence on the cash ratio. They conducted a survey in Norway in 1980, displaying that approximately 80 % of all transactions in the informal sector were paid in cash, since they are not registered in any official source contrary to credit cards or other forms of payment.

The monetary method has been evolving and has been one of the most used methods to measure the informal economy, considering that it has been adapted to the circumstances of the countries and many of the variables used were changed, however the main idea has not. Gutmann (1977), Feige (1979), Tanzi (1980, 1983), Schneider (1986, 1997), Hernandez (2009), Ardizzi *et al*. (2014), Goel *et al*. (2019) and others have used this method.

Tanzi (1980, 1983) presents annual estimates for the underground economy in the United States for the period 1930-80; in turn, he proposes a methodology for the calculation of the informal economy, which is also used in this research. This method assumes that the speed within the quantitative theory of money (1) is the same in the informal and formal economy. To correct this problem, the methodology proposed by Ahumada *et al.* (2007), where the speed is different in both sectors, is used. In the present study both measurements are used in order to compare the results.

5 MIMIC is a direct measurement method, which is based on using the main indicators and causes of informality to estimate their size

According to the original Tanzi equation and the submerged economy with the Ahumada correction,

$$MV = PT \quad (1)$$

Where M is quantity of money, V is the speed of money circulation, P is the price level and T is the level of production.

Some authors have criticized this method. Thus, for example, Thomas (1999) recognizes that the method of Tanzi have been a breakthrough for Cagan's original method, however he argues that economic theory is needed to support the method and that there are possibly variables omitted in those estimates. Nevertheless, this has not stopped current economists who continue to use this method to quantify hidden economic activities.

To explain the methodology used, we start with the traditional method. Equation (2) shows the cash demand function according to Cagan (1958),

$$C_0 = A(1+\theta)^{\alpha} Y_0^{\beta} exp(-\gamma i) \quad (2)$$

where C_o refer to the coins and currency in circulation; θ is the incentives to make monetary transactions in the submerged economy (Tax rate on GDP); Y_o is the nominal GDP observed; i is inflation, and $A, \alpha, \beta y \gamma A, \alpha, \beta y \gamma$ are positive parameters.

The equation shows that the amount of cash used in an economy is a function of the incentives that individuals have to go through the informal market (taxes) and real GDP. As incentives for transactions in the shadow economy increases, the use of cash increase.

Taking into account the previous equation, we can describe the cash as follows:

$$C_o=C_T=C_R+C_H \quad (3)$$

where C_T is the total coins and currency in circulation; C_R refer to the coins and currency in circulation used in registered transactions; and C_H to the coins and currency in circulation used in unregistered transactions.

Equation (3) indicates that the total cash (C_T) is equal to the amount of coins and currency in circulation (C_o), and this is used in registered transactions (C_R) within the formal economy and in unregistered (C_H) in the informal economy.

This relationship is different as the GDP measurement described in the equation (4):

$$Y_T=Y_o+Y_H=Y_R+Y_H \quad (4)$$

Where Y_T is total nominal GDP; Y_R is the registered nominal GDP; and Y_H is the nominal GDP generated by the hidden economy.

Therefore, coins and currency in circulation (C_o) include the coins and currency in circulation used in unregistered transactions (C_H); but the nominal GDP observed (Y_o) does not include the GDP generated by the hidden economy (Y_H). So, if it is replaced in the equation (2) that the incentives to make monetary transactions in the shadow economy (Tax rate on GDP) $\theta\theta$ are equal to zero. A projection of cash used in registered transactions can be obtained, resulting in equation (5):

$$\hat{C_R} = \hat{A}Y_0^{\hat{\beta}} exp(-\hat{\gamma}i)\hat{C_R} = \hat{A}Y_0^{\hat{\beta}} exp(-\hat{\gamma}i). \quad (5)$$

Then, with $\hat{C}_R$ can be found $\hat{C}_H$ through the equation (3) with the following difference:

$$\hat{C}_H = C_T - \hat{C}_R \quad (6)$$

If we assume that in the economy, speed of money is the same in informal activities and using again the equation (1) we obtain:

$$v_R = \frac{Y_R}{C_R} = \frac{Y_H}{C_H} \quad (7)$$

and hence:

$$\hat{Y}_H = \hat{v}_R \hat{C}_H \quad (8)$$

With equation (8) the traditional method is completed. The following section will explain the variables and the method used for the measurement.

Calculating the size of the Informal Economy for Guatemala

The method described by Shneider (2000) was used to calculate the size of shadow economy in Guatemala. It is based on the following equation:

$$ln(C/M_2)_t = \beta_0 + \beta_1 ln(1+TW)_t + \beta_2 ln(WS/Y)_t + \beta_3 lnR_t + \beta_4 ln(Y/N) + u_t \quad (9)$$

where C/M_2 is the cash ratio; *TW* is the tax rate per GDP; *WS/Y* is the proportion of wages and salaries in national GDP; R is the interest paid on savings deposits, and *Y/N* is the GDP per capita.

The level of cash used in the formal and informal economy and the calculation of the shadow economy per GDP, was calculated as in MacGàdigh *et al.* (2016). This result gives the variable "shadow" that represents the shadow economy as a percentage of GDP assuming that the speed in the economy is the same in formal and informal market. Then, applying the correction of Ahumada *et al.*, (2007) we get the variable: "shadow2" that assumes different speeds. This measurement is closer to others made by other authors.

The data collected in the following study came from official information published by the central banks through the Central American Monetary Council's website[6], added with other information obtained directly from the Bank from Guatemala[7].

[6] Website: http://www.secmca.org

[7] Website: https://www.banguat.gob.gt/

The information corresponds to annual historical statistics from 1960 to 2017. Table 1 shows the definition of the main variables.

Table 1

Variables

Variable	Description	Observations	Mean	Standard deviation	Minimum	Maximum
shadow	Shadow economy as a percentage of nominal GDP: Calculation according to monetary method (Tanzi 1980, 1983). Assuming that the speed of money is the same in the formal and informal economy.	58	0.37	0.07	0.21	0.49
shadow2	Shadow economy as a percentage of nominal GDP: Calculation according to the monetary method used in the Tanzi equation (1980, 1983). Applying the correction of Ahumada et al. 2007 In which different cash rates are assumed in the formal and informal economy.	58	0.47	0.06	0.31	0.58
year	Year: Refers to the value observed on December 31 of that year.	58	1,989	17	1,960	2,017
c	Cash: Coins and currency in circulation (Millions of Quetzales). The series from 1960 to 2000 were built based on the growth rates of banknotes and coins in circulation according to the EMFA. (http://www.secmca.org)	58	6,402	8,987	59	34,046
m1	M1: cash plus demand deposits (Millions of Quetzales). The series from 1960 to 2000 were constructed based on the growth rates of M1 according to the EMFA. (http://www.secmca.org)	58	17,199	25,264	109	90,463
m2	M2: M1 plus fixed term deposits of up to two years and available deposits with a forecast of up to three months (Millions of Quetzales). The series from 1960 to 2000 were built based on the growth rates of M2 according to the EMFA. (http://www.secmca.org)	58	37,500	56,442	133	211,151
m3	M3: M2 plus temporary transfers of money, participations in money market funds and securities that are not shares and due not exceeding two years (Millions of Quetzales). The serie from 1960 to 2000 was built based on the growth rates of M3 according to EMFA.	58	48,225	74,979	139	270,184
tw	Tax rate: Tax Revenue (Percentage of GDP). (http://www.secmca.org)	58	0.09	0.02	0.06	0.12
wsy	Consumption rate: Household consumption expenditure and ISFLSH base 2001 (percentage of GDP). Data from 1960 to 2000 were constructed based on growth rates of private consumption and GDP base 1958. (http://www.secmca.org)	58	0.84	0.02	0.80	0.90
r	Passive rate: Nominal passive interest rates at December 31 weighted average of the banking sector in national currency (180 days). Prior to February 1990 the rates were set by the Banco de Guatemala. (http://www.secmca.org and https://www.banguat.gob.gt/)	58	8.20	2.80	4.52	14.50
gdpr	Real GDP: GDP at constant base prices 2001 (Millions of Quetzales). Data from 1960 to 2000 were constructed based on the 1958 base GDP growth rates. (Http://www.secmca.org)	58	113,247	63,313	29,702	254,979
popu	Population: Individuals (millions) (http://www.secmca.org)	58	9.25	3.72	4.14	16.91

Note. This figure explains the variables and sources of information used in the econometry model. Source: Own.

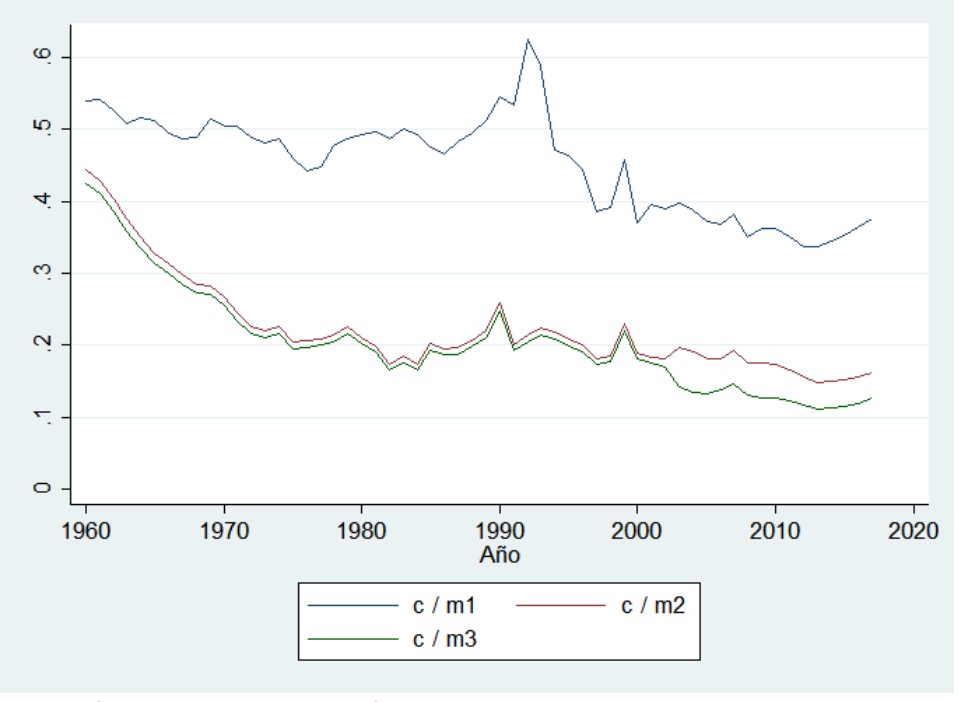
We start the next section by looking at the order of integration of the variables. However, instead of using standard unit root methods, we adopt a more general methodology based on fractional integration that allows for fractional degrees of differentiation (see *e.g.*, Gil-Alana and Robinson, 1997).

Results

Cash ratio show the relationship between the use of paper money and monetary aggregates. As we can see, they have a downward trend which is correlated with the real economic growth. An atypical variation is observed in the period between 1988 and 1995.

Figure 1

Evolution of Cash among Monetary Aggregates 1960-2017

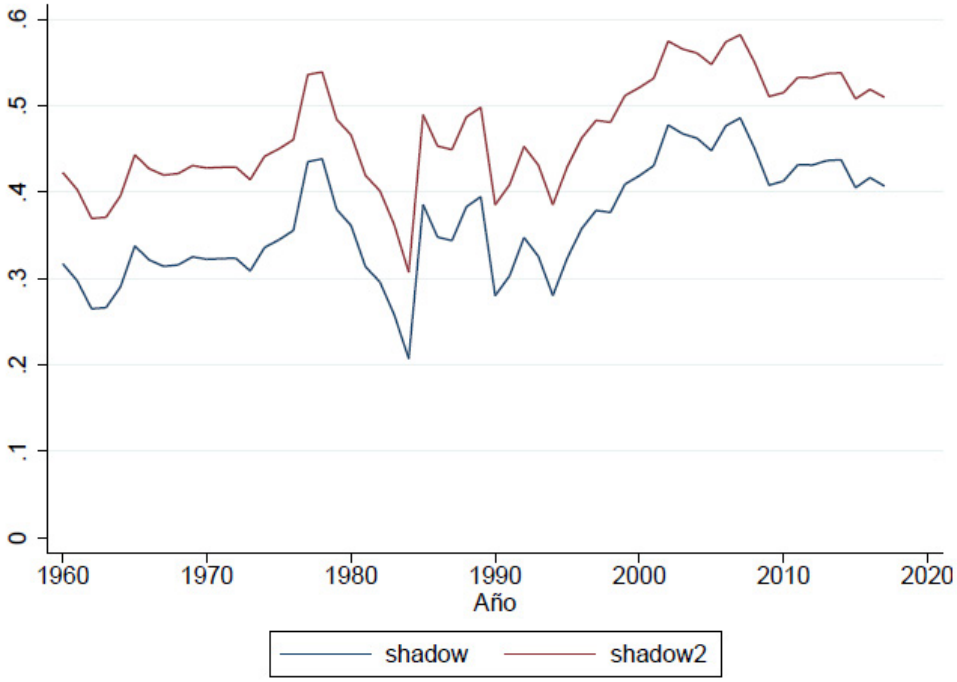


Note. This figure shows the evolution of monetary aggregates in the time series. Source: Own.

The relationship between the cash ratio and the growth of real GDP per capita is negative; this implies that the shadow economy is counter-cyclical, a result similar to that shown by Fernandez and Meza (2015), which found the same pattern in Mexico.

Figure 2

Evolution of Shadow Economy as a percentage of GDP 1960-2017



Note. This figure shows the evolution of the new variables in the time series. Source: Own.

It is estimated that the shadow economy in Guatemala has been on average 47 % of GDP from 1960 to 2017 with a standard deviation of 6 percentage points. In the last 20 years, from 1996 to 2017, the average is 53 % with a standard deviation of 3 percentage points, which shows a statistically significant change. This shows that the size of the submerged economy has increased during the last 20 years.

Table 2

Results Equation 9

Results from Ordinary Minimum Squares (OLS) of cash demand in Guatemala 1960-2017				
Regression number	(1)	(2)	(3)	(4)
Cash per M2	lncm2	lncm2	lncm2	lncm2
Tax rate (lntw1)	3.481* (1.660)	3.085 (1.540)	3.830* (1.495)	
Consumption rate (lnwsy)	1.123* (0.522)	0.861 (0.433)		
Passive Interest Rate (lnr)	0.0422 (0.0576)			
Real GDP per capita (lnyn)	-1.334*** (0.0856)	-1.343*** (0.0903)	-1.416*** (0.0978)	-1.227*** (0.0653)
Constant (_cons)	10.72*** (0.674)	10.87*** (0.717)	11.33*** (0.810)	9.908*** (0.613)
Observations	58	58	58	58
R-Square	0.8823	0.8808	0.8735	0.8532
D-Watson	0.8747169	0.8677614	0.8080484	0.6528284

Note. Results from OLS of cash demand in Guatemala using equation 9. Source: Own.

Across Tables 1-6 we focus on a regression model of the form:

$$y_t = b_0 + b_1 t + x_t; \qquad (1 - L)^d x_t = u_t, \qquad t = 0, 1, \ldots, \quad (10)$$

where yt is each of the two observed time series (Shadow.dat and Shadow2. dat); β0 and β1 are unknown coefficients referring respectively to an intercept and a linear time trend, and xt is I(d) so that ut is I(0) expressed in terms of a white noise process. Tables 2 and 3 refer to the case of white noise errors while Tables 3 and 4 refer to autocorrelated ut, using in this case a non-parametric approach due to Bloomfield (1973). In the two cases we display the estimated values of d (and the 95 % confidence bands of the non-rejection values of d using Robinson's (1994) tests, under the three standard cases of i) no deterministic terms (i.e., β0 = β1 = 0 in equation (2)), ii) an intercept (β1 = 0), and iii) an intercept with a linear time trend (β0 and β1 estimated from the data). Then, we select the appropriate model (marked in bold in the table) by looking at the corresponding t-values in the d-differenced regression.

Table 3

Estimated values of d under the assumption of uncorrelated errors

Series	No terms	With a constant	With a linear trend
Shadow	0.73 (0.52, 0.99)	0.67 (0.52, 0.97)	0.64 (0.40, 0.97)
Shadow2	0.79 (0.59, 1.03)	0.66 (0.50, 0.95)	0.62 (0.39, 0.94)

Note. The table shows the different values of d under the assumption of uncorrelated errors. Source: Own.

Table 4

Estimated coefficients in the selected model in Table 1

Series	d (95 % band)	Intercept (t-value)	Time trend (t-value)
Shadow	0.67 (0.52, 0.97)	0.3195 (9.94)	---
Shadow2	0.66 (0.50, 0.95)	0.4252 (13.53)	---

*: Evidence of mean reversion at the 95% level.

Note. The table shows the results of fractional cointegration coefficients in the selected model. Source: Own.

Starting with the case of uncorrelated errors the first thing we observe is that the time trend coefficient is insignificant in the two series, an intercept being sufficient to describe the deterministic part, and the estimated value of d is very similar in the two series, 0.67 for Shadow.dat and 0.66 for Shadow2.dat. Looking at the confidence band we observe that the values are significanlty smaller than 1 in the two series, implying mean reversion and transitory shocks.

Table 5

Estimated values of d under the assumption of uncorrelated errors

Series	No terms	With a constant	With a linear trend
Shadow	0.26 (0.07, 0.91)	0.40 (0.17, 0.76)	0.08 (-0.34, 0.66)
Shadow2	0.54 (0.05, 1.00)	0.39 (0.16, 0.74)	0.07 (-0.36, 0.70)

Note. This table shows the estimated values of d in equation 9. Source: Own.

Table 6

Estimated coefficients in the selected model in Table 3

Series	d (95 % band)	(t-value)	Time trend (t-vavvvalue)value)
Shadow	0.08 (-0.34, 0.66)	0.2868 (24.24)	0.0026 (7.82)
Shadow2	0.07 (-0.36, 0.70)	0.3929 (34.48)	0.0025 (7.82)

*: Evidence of mean reversion at the 95% level.

Note. This table shows estimated coefficients for equation 9. Source: Own.

If we allow for autocorrelation, the results, reported in Tables 3 and 4 are very different. First, the time trend is now required in the two cases, being the coefficient significantly positive in the two series. The estimated value of d is now slightly positive (0.08 for Shadow.dat andw 0.07 for Shadow2.dat) and the I(0) hypothesis (short memory) cannot be rejected. The discripeancy in the results for white noise and autocorrelated errors may be the competition in the latter case between the autocorrelation in ut and that from the differencing parameter in describing the degree of dependence. Nevertheless, something that is common in the two cases is that the two series display mean reversion and transitory shocks. This indicates that the Shadow Economy is structural in Guatemala, may vary in some seasons by external or internal shocks, but tends to converge.

Conclusions

It is estimated that the shadow economy in Guatemala has been on average 47 % of GDP from 1960 to 2017 with a standard deviation of 6 percentage points. The evolution of the shadow economy in Guatemala has been directly related to the economic cycles of the country. Thus, during boom periods it tends to rise while in a low, recession. In the last 20 years it has grown for the second estimate above 50 % and for the first 40 % of the economy registered, so it cannot be considered negligible. After the statistical analysis it is concluded that the Shadow Economy in Guatemala shows mean reversion and transitory shocks. Which means that it tends to converge to the same point in the long term.

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Results for Porse.dat

Table 1

Estimated values of d in the series of interest

Error type	No terms	With a constant	With a linear trend
White noise	0.78 (0.59, 1.03)	0.64 (0.49, 0.93)	**0.60 (0.37, 0.93)**
Autocorrelation	0.56 (0.05, 0.99)	0.38 (0.15, 0.73)	**0.06 (-0.35, 0.67)**

Note. Own elaboration with data of "Banco de Guatemala".

Table 2

Estimated coefficients in the selected model in Table 1

Error type	d (95% band)	Intercept (t-value)	Time trend (t-value)
White noise	0.60* (0.37, 0.93)	0.2315 (12.81)	0.0012 (1.71)
Autocorrelation	0.06* (-0.35, 0.67)	0.2238 (35.46)	0.0015 (7.81)

*: Evidence of mean reversion at the 95% level.

Note. Own elaboration with data of "Banco de Guatemala".

Results for the remaining series

Table 3

Estimated values of d in the series with white noise errors

Series	No terms	With a constant	With a linear trend
LNCM2	0.91 (0.77, 1.10)	0.77 (0.58, 1.01)	**0.83 (0.70, 1.01)**
LNR	0.92 (0.76, 1.16)	**0.88 (0.72, 1.16)**	0.87 (0.71, 1.16)
LNTW1	0.75 (0.55, 1.02)	**0.66 (0.50, 0.95)**	0.62 (0.39, 0.95)
LNWSY	0.90 (0.78, 1.08)	**0.98 (0.86, 1.13)**	0.98 (0.86, 1.13)
LNYN	0.94 (0.78, 1.17)	**1.52 (1.34, 1.77)**	1.49 (1.31, 1.75)
TW1	0.93 (0.77, 1.16)	**0.66 (0.50, 0.95)**	0.62 (0.40, 0.95)

Note. Own elaboration with data of "Banco de Guatemala".

Table 4

Estimated coefficients in the selected models in Table 3

Series	d (95% band)	Intercept (t-value)	Time trend (t-value)
LNCM2	0.83 (0.70, 1.01)	-0.8217 (-11.15)	-0.0173 (-3.24)
LNR	0.88 (0.72, 1.16)	1.9476 (12.79)	-----
LNTW1	0.66* (0.50, 0.95)	0.0796 (11.65)	-----
LNWSY	0.98 (0.86, 1.13)	-0.1246 (-11.85)	-----
LNYN	1.52 (1.34, 1.77)	8.8695 (542.42)	-----
TW1	0.66* (0.50, 0.95)	1.0829 (145.87)	-----

*: Evidence of mean reversion at the 95% level.
Note. Own elaboration with data of "Banco de Guatemala".

Table 5

Estimated values of d in the series with autocorrelated errors

Series	No terms	With a constant	With a linear trend
LNCM2	0.99 (0.10, 1.28)	0.72 (0.21, 1.23)	**0.91 (0.63, 1.19)**
LNR	0.79 (0.47, 1.15)	**0.63 (0.41, 0.89)**	0.61 (0.40, 0.90)
LNTW1	0.45 (0.05, 0.96)	0.39 (0.16, 0.74)	**0.07 (-0.29, 0.71)**
LNWSY	0.94 (0.69, 1.19)	**1.27 (0.99, 1.77)**	1.26 (0.99, 1.79)
LNYN	0.83 (0.50, 1.24)	1.31 (0.42, 1.79)	**1.24 (0.90, 1.75)**
TW1	0.81 (0.49, 1.21)	0.40 (0.16, 0.74)	**0.07 (-0.33, 0.73)**

Note. Own elaboration with data of "Banco de Guatemala".

Table 6

Estimated coefficients in the selected models in Table 5

Series	d (95% band)	Intercept (t-value)	Time trend (t-value)
LNCM2	0.91 (0.63, 1.19)	-0.8070 (-10.87)	-0.0174 (-2.47)
LNR	0.63* (0.41, 0.89)	1.9606 (15.78)	-----
LNTW1	0.07* (-0.29, 0.71)	0.0726 (26.33)	0.0005 (7.03)
LNWSY	1.27 (0.99, 1.77)	-0.1245 (-12.79)	-----
LNYN	1.24 (0.90, 1.75)	8.8617 (485.69)	0.0142 (2.45)
TW1	0.07* (-0.33, 0.73)	1.0752 (358.75)	0.0006 (7.08)

*: Evidence of mean reversion at the 95% level.
Note. Own elaboration with data of "Banco de Guatemala".