

THE SIZE AND TREND OF THE SHADOW ECONOMY OF GHANA

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Abstract

This study investigates the actual size and trend of the shadow economy in Ghana using the Multiple Indicator and Multiple Causes model. Results from the study show that direct tax rate, the size of government, unemployment rate, GDP per capita and total tax rates are the main causes of the shadow economy. An increase in direct taxes by a unit leads to an increase in the shadow economy by 0.4 units. Growth in the size of government by a unit leads to an increase in shadow economic activities by 0.48 units. A percentage point increase in unemployment leads to an increase in the shadow economy by 0.18 units. It declines by 0.006 units in the case of GDP per capita. The actual size of the shadow economy in Ghana stands around 32% of total economic activities in 2013.

Keywords: Shadow Economy, MIMIC model, Ghana, Economy

1. INTRODUCTION

Activities in most economies are often more than the estimated official figures show. Several are unregistered and unrecorded businesses which exist for various reasons. These businesses and activities which form the underground economy are more characteristic of developing economies. In Africa as a whole and Ghana as a developing country, the underground economy is estimated unofficially to be very large as a result of the high number of these shadow activities. Shadow economy can be defined as the production of goods and services which escape official detection in the estimation of a country's gross domestic product. In other words, all market-based legal production of goods and services that are deliberately concealed from public authorities as a means of avoiding payment of income, value added or other taxes, avoiding payment of social security contributions, avoiding having to meet certain legal labor market standards, such as minimum wages, maximum working hours, safety standards.

Comprehensive literature on the shadow economy has been written by several researches for example, Schneider and Enste (2000), and Feld and Schneider (2009). The subject area still remains largely controversial as there are disagreements about the definition of shadow economic activities, estimation procedures, and the use of their estimates in economic and policy analysis.

Though there are indications of the presence of shadow economic activities little is known about its size and development in developing countries like Ghana. The period 1983-20013 was chosen as it has the most comprehensive data available and the sample size quite large enough to ensure efficient results from data analysis. The study attempts to use the technique by Schneider and Buehn (2009) and Schneider and Enste (2000). The goal of this paper is twofold: (i) to undertake the challenging task of estimating the size and trend of the shadow economy for Ghana and (ii) to provide some insights about the main causes of the shadow economy.

The MIMIC (Multiple Indicators Multiple Causes) estimation method will be used thus creating a unique data set that allows for estimation of the actual size and trend in the shadow economy. Though these unreported businesses contribute largely to economic growth and development through the creation of employment, generation of income for workers and production of output, a country loses several benefits from the existence of such an economy. The shadow economy is far smaller in advanced countries as compared to the developing world. Unfortunately, it is very difficult to get accurate information about such activities, including the goods and labor involved, because individuals do not wish to be identified.

2. LITERATURE REVIEW

2.1 *Main causes of the shadow economy*

2.1.1 *Tax and social security contribution burdens*

It has been established in most researches and studies that the overall tax and social security contribution burdens rank among the main causes of shadow economies. Taxes affect several labor choices and stimulate the amount of labor supplied in a shadow economy. The bigger the difference between the total cost of labor in the official economy and the after-tax earnings, the greater the incentive to avoid this difference and to work in the shadow economy. This factor is very key in determining the size and trend of the shadow economy. Schneider (2007) and Johnson, Kaufmann and Zoido-Lobaton (1998a, 1998b) in their studies found statistically significant evidence for the influence of taxation on the shadow economy. The direct tax burden has an influence, together with the intensity of regulation. Average direct tax rate, average total tax rate (indirect and direct tax rate), and marginal tax rates—have an expected positive effect on currency demand. These findings are supported by studies by Kirchgaessner (1983, 1984) and by Klovland (1984).

This study uses the following variables as a proxy for tax and social security burdens:

1. Share of direct taxes. This is calculated as a ratio of direct taxes to overall taxation. An increase in direct taxes leads to an increase in the shadow economy hence a positive relationship is expected.
2. Size of government. This is measured as the general government final consumption expenditures as a percentage of GDP. It includes government current expenditure for goods and services. Increasing size of government leads increasing shadow economic activities.

2.1.2 *Intensity of regulations*

Intensity of regulations in an official economy limits the freedom of choice of individuals and businesses in such economies. Several of these regulations exist in economies which include regulations in the labor market, barriers to trade and labor market restriction to foreigners. Johnson, Kaufmann, and Zoido-Lobaton (1998b) find significant overall empirical evidence of the influence of labor regulations on the shadow economy; Regulations tend to increase the labor costs in the official economy. But since most of these costs can be shifted to the employees, these costs provide another incentive to work in the shadow economy, where they can be avoided.

This was supported by Johnson, Kaufmann, and Shleifer (1997). Their study predicted that countries with more general regulation of their economies tend to have a higher share of the unofficial economy in total GDP. Johnson, Kaufmann, and Zoido-Lobaton (1998b) concluded that it is the enforcement of regulation which is the key factor for the burden levied on firms and individuals, and not the overall extent of regulation.

Friedman et al. (2000) reached a similar conclusion. Intensity of regulation is significantly correlated with the share of the unofficial economy and the estimated sign of the relationship is unambiguously positive: more regulation is associated with a larger shadow economy. These findings show that governments should put more emphasis on improving enforcement of laws and regulations, rather than increasing their number. Some governments, however, prefer this policy option (more regulations and laws), when trying to reduce the shadow economy, mostly because it leads to an increase in power for the bureaucrats, to a higher rate of employment in the public sector, is easier to implement, is easily perceived and thus positively rewarded by the public.

To measure the intensity of regulation or the impact of regulation on the decision of whether to work in the official or unofficial economy, this study uses business freedom as the variable. It measures the time and efforts of business activity. It ranges from 0 to 100, where 0 is least business freedom and 100 maximum business freedom (positive sign expected).

2.1.3 Public sector services

The quality of services provided by the public sector plays a crucial role in the size and nature of the shadow economy. Poor or deteriorating public sector services and infrastructure tend to push businesses and individuals into the shadow economy.

The effectiveness of government was used as a measure of the quality of public services. Perceptions of the quality of services, the degree of autonomy from political pressure and credibility in policy formulation and implementation were considered. The index ranges between -2.5 and +2.5. Higher scores correspond to better outcomes and vice versa. Better public service corresponds to lower shadow economic activities.

2.1.4 The official economy

The state of the official economy also plays a key role in influencing the decisions of people as to whether to work or not to work in the shadow economy. This is proved by studies by (Bajada and Schneider, 2005; Schneider and Enste, 2006; Feld and Schneider, 2009). A booming official economy provides a lot of opportunities to earn relatively good salary. The opposite however occurs in the case of recession. In such cases income losses will be compensated by massive participation in shadow economic activities. The study will use the following variables as measures of the official economy:

1. GDP per capita. The study used GDP per capita based on purchasing power parity (PPP), measured in constant 2005 US\$. Increasing GDP per capita leads to decreasing shadow economic activities.
2. Unemployment rate: The higher the unemployment rate the higher the shadow economy. This is due to the fact that unemployed individuals will take to shadow economic activities as a means of survival.

2.2 Indicators of the shadow economy

The study uses monetary indicators and labor market indicators as the main characteristics of the shadow economy.

2.2.1 Monetary indicators

To avoid leaving traces of their transactions, people engaged in shadow economic activities primarily use cash. Hence, most of these activities are reflected in an additional use of cash (or currency). To take this into account, the study used the ratio of M0 over M1 as indicator where M0 corresponds to the currency outside the banks and M1, defined as M0 plus deposits.

2.2.2 Labor market indicators

Shadow economic activities are also reflected in labor market indicators. The study uses labor force participation as an indicator for measuring shadow economic activities. Labor force participation rate is a proportion of the population that is economically active. Labor participation rate tends to be low in a shadow economy.

2.2.3 State of the official economy

Also, shadow economy activities are reflected in the state of the official economy. The study uses the annual growth rate of the GDP per capita as an indicator variable. GDP per capita is gross domestic product converted to international dollars using purchasing power parity rates, divided by the population. Declining growth in GDP per capita is signal for growing shadow economic activities.

3. THE AIM(S) AND OBJECTIVE

The main objective of the study is to investigate the actual size and trend of the unofficial or the shadow economy in Ghana. The factors that cause such a phenomenon will also be assessed and policy alternatives proposed based on the findings of the study.

4. THE METHODOLOGY

The study used the Multiple Indicator and Multiple Cause (MIMIC) model for this analysis. It has two components: the structural equation model and the measurement model. The structural equation model estimates the relationship between the causal variables and the latent variable which is the shadow economy. The measurement model on the other hand estimates the impact of the causal variables on each indicator variable.

The data for this analysis was obtained from the World Bank country indicators and the International Financial Statistics. The first step in the MIMIC model estimation is to confirm the hypothesized relationships between the shadow economy (the latent variable) and its causes and indicators. Once the relationships are identified and the parameters estimated, the MIMIC model results are used to calculate the MIMIC index. The structure of the MIMIC model is displayed in figure 1.

Figure 1 The structure of the MIMIC model

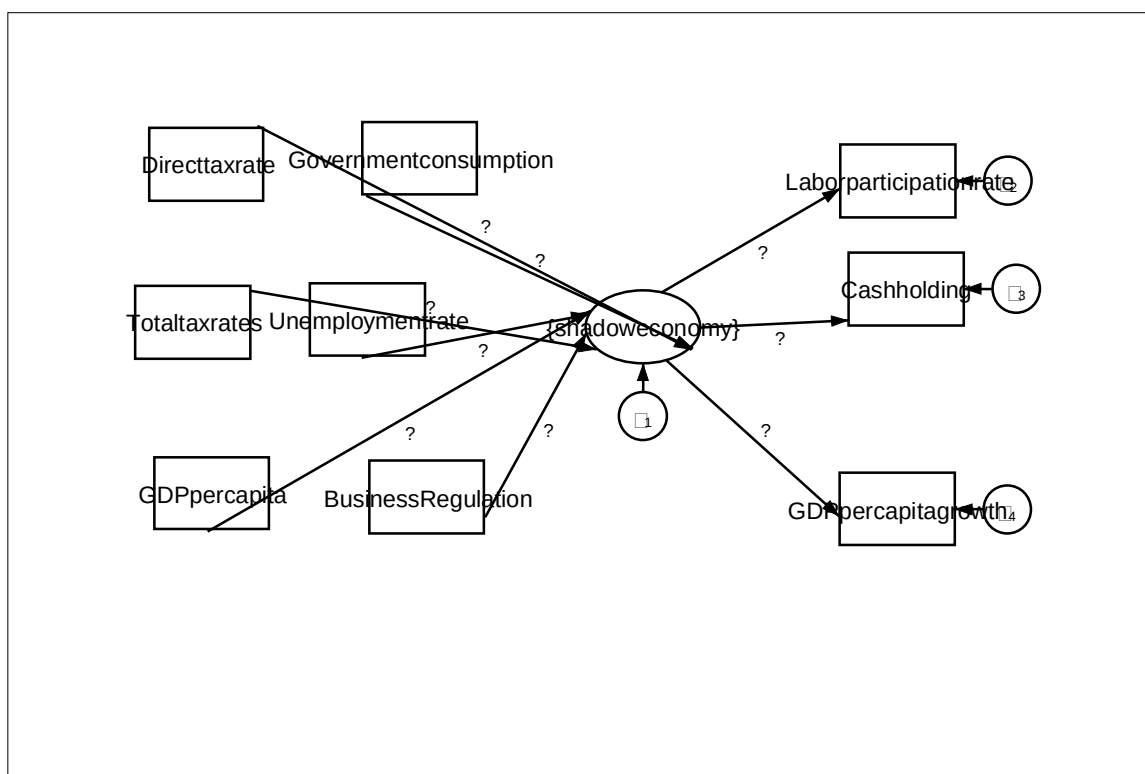
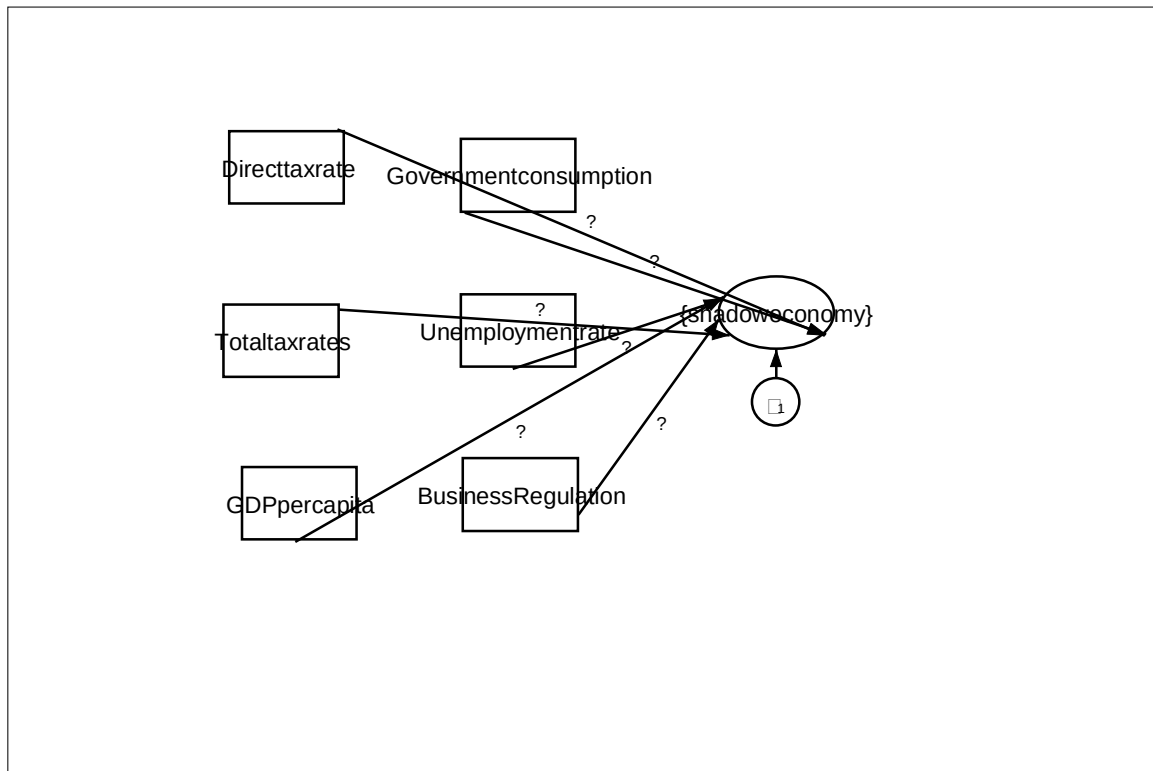


Figure 1 shows the structure of the MIMIC model. The latent variable which is represented by the shadow economy in the diagram is caused by six factors as stated above. Three indicator variables are used to determine the presence of shadow economic activities: Labor force participation rate, growth in GDP per capita and the amount of cash holdings by households.

4.1 Structural equation model

The structural equation model for the analysis is given below in Figure 2. It estimates the relationship between the causal variables and the latent variable (shadow economy). As discussed in the literature above, the causal variables include: direct taxes, government final consumption expenditure, total tax rates, unemployment rate, business regulation and growth in GDP per Capita. The hypothesized signs of the coefficients are stated below

Figure 2 The structure of the SEM



Equation 1 shows the relationship between each of the causal variables and the amount of shadow economic activities in Ghana.

$$n_t = \alpha_1 * \text{Direct Taxes} + \alpha_2 * \text{Government Final Consumption Expenditure} + \alpha_3 * \text{Total Tax Rates} + \alpha_4 * \text{Unemployment Rate} + \alpha_5 * \text{Business Regulation} + \alpha_6 * \text{GDP per Capita} + \varepsilon_t \dots \dots \dots (1)$$

Where n_t = latent variable or the shadow economy

Where $\alpha_1 \geq 0, \alpha_2 \geq 0, \alpha_3 \geq 0, \alpha_4 \geq 0, \alpha_5 \leq 0, \alpha_6 \leq 0$

4.2 The measurement model

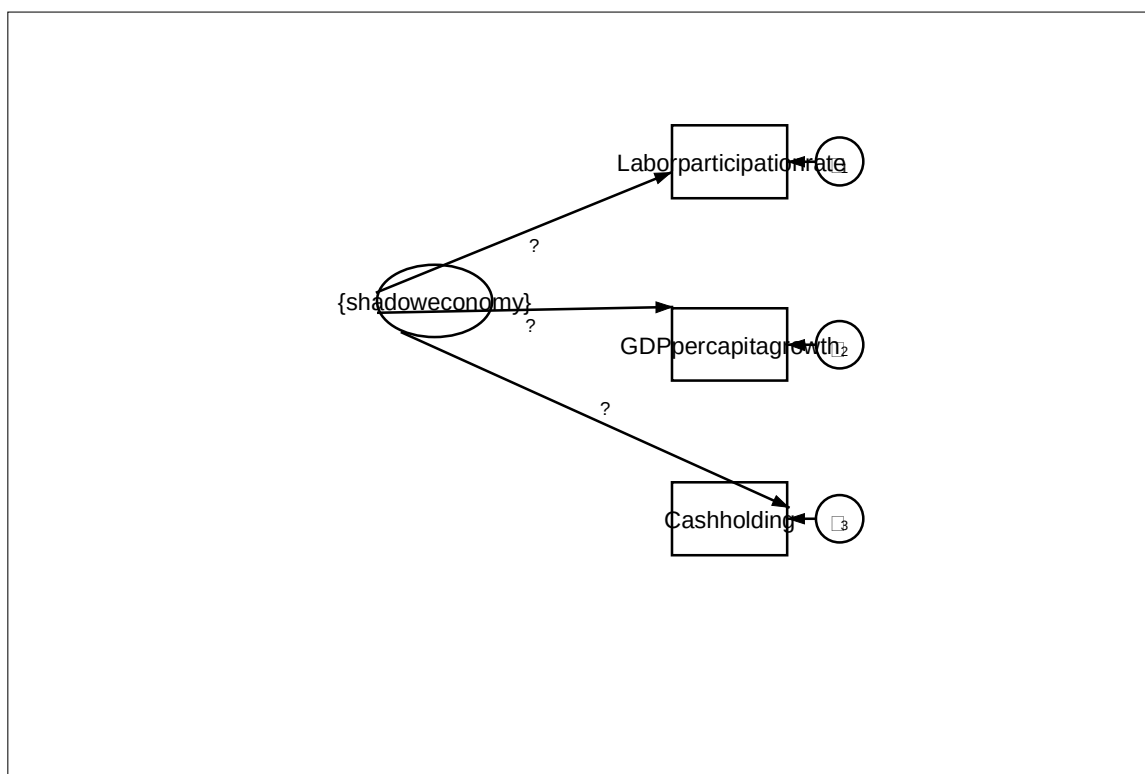
The measurement model is given by the function

$$y = \alpha n_t + \varepsilon \dots \dots \dots (2)$$

Where $y = (y_1, y_2 \dots y_n)$ is a $(1 \times n)$ vector of the indicator variables. α represents the regression coefficients and ε is a $(1 \times n)$ vector of white noise.

Three indicator variables are assumed by the study: the level of labor force participation, the level of cash holdings in the economy (monetary) and the level of per capita GDP growth. The measurement model seeks to estimate the given relationship between the shadow economy and indicator variables. If a significant relationship is established from the model results it confirms the presence of the shadow economy. The given relationship will be estimated by a set of coefficients which define the extent to which the indicator variables represent reality in the shadow economy. Figure 3 shows the structure of the measurement model.

Figure 3 The measurement model



5. DATA ANALYSIS

The Structural Equation model (SEM) and the measurement model were estimated using structural equation and multivariate analysis. The results from the analysis is given in the table below. Using the results from Table 1, all the causal factors of the shadow economy were statistically significant except for business regulation. This is decided using the P values from the estimated results. A significance level of 5% was assumed for the analysis.

All the indicator variables were also statistically significant thus indicating the presence of shadow economic activities.

5.1 Mimic model estimation results (SEM)

Table 1 Structural Equation Model

Shadow Economy	Coefficient	Std.Error	Z statistic	P value
Direct Taxes	0.401	0.208	1.93	0.054
Government Final Consumption Exp.	0.482	0.183	2.64	0.008
Unemployment Rate	0.186	0.080	2.31	0.021
Business Regulation	-1.341	1.830	-0.73	0.463
GDP per Capita	-0.006	0.002	-2.78	0.005
Total Tax Rates	1.202	0.356	3.38	0.001
Measurement				

Labor Participation Rate				
Shadow Economy				
Constant	34.57	17.45	1.98	0.048
GDP Per Capita Growth Rate				
Shadow Economy	-0.448	0.253	-1.77	0.077
Constant	18.454	11.121	1.66	0.097
Monetary				
Shadow Economy	-1739.081	553.0342	-3.14	0.002
Constant	70283.72	33537.22	2.10	0.036
Observations	RMSE	R-sq	F	P- value
30	622.996	0.996	306.499	0.0000

5.1.1 Interpretation

Equation 1 represents the estimated mathematical relationship between the shadow economy, the causal variables and the indicator variables. A unit increase in direct taxes within the Ghanaian economy increases the shadow economy by 0.4 units. This is similar in the case of government final consumption expenditure, unemployment, and total tax rate where the shadow economy grows by 0.48, 0.18, and 1.2 respectively. It decreases by 0.005 units for every increase in GDP per capita.

$$n_t = 0.4 * \text{Direct Taxes} + 0.48 * \text{Gov. Final Consumption. Exp.} + 0.18 * \text{Unemployment Rate} - 0.006 * \text{GDP per Capita} + 1.2 * \text{Total Tax Rate} \dots \dots \dots (2)$$

5.1.2 Multivariate analysis

The extent to which the indicator variables demonstrate the presence of a shadow economy was determined using multivariate analysis. The estimated relationship is shown in the subsequent tables below. Using the R squares from table 2 it shows that about 64% of variation in labor force participation is determined by the observed variables. 49% of growth in GDP per capita and 48% of cash holdings are determined by the observed variables.

Table 2

Equation	Obs	Parms	RMSE	R-sq	F	P
Labor Force Participation	30	6	1.37	0.64	8.47	0.00
GDP per Capita Growth	30	6	2.35	0.49	4.63	0.00
Cash Holdings by Public	30	6	5815.09	0.48	4.43	0.00

Labor force participation is significantly influenced by the extent of government final consumption expenditure, total tax rates, unemployment rate, the level of GDP per capita, and the quality of business administration. Direct taxes and business regulations proved insignificant in affecting labor decisions. The various relationships and coefficients are shown in table 3.

Table 3 Labour Force Participation

Labor Force Participation	Coefficient	Std.Err.	t	P
Government Final Consumption Exp.	-0.56	0.13	-4.21	0.00
Total tax rate	0.93	0.20	4.56	0.00
Unemployment rate	0.08	0.05	1.86	0.08
GDP per capita	0.01	0.00	4.83	0.00
Quality of Public Admin.	-33.89	17.73	-1.91	0.07
Constant	69.96	18.61	3.76	0.01

It is established from the table that government final consumption expenditure is the only significant variable in determining or influencing the level of growth in GDP per capita. This is in line with economic theory where government spending forms a core component of GDP estimation. This is illustrated in table 4 below.

Table 4 Growth in GDP per Capita

	Coefficient	Std.Err.	t	P
GDP per capita growth				
Government Final Consumption Exp.	0.57	0.23	2.52	0.02
Total Tax Rates	0.13	0.35	0.37	0.71
Unemployment_	0.08	0.09	0.98	0.34
GDP per Capita	0.00	0.00	1.2	0.32
Quality of Public Admin.	-23.17	30.38	-0.76	0.45
Constant	14.29	31.89	0.45	0.66

All variables were statistically significant in affecting the level of cash holdings in an economy except for the level of unemployment, business regulation and direct taxes. This is illustrated in table 5.

Table 5 Cash Holdings by Public

MS	Coefficient	Std.Err.	t	P
Government Final Consumption Exp.	1792.56	564.04	3.18	0.004
Total Tax Rates	-1931.17	864.40	-2.23	0.035
Unemployment_	-276.22	193.45	-1.43	0.166
GDP per Capita	-17.94	6.98	-2.57	0.017
Quality of Public Admin.	219234.2	75146.3	2.92	0.008
Constant	-173647.7	78880.06	-2.20	0.038

5.2 *Size and trend in shadow economic activities*

The actual size and trend in shadow economic activities was estimated using the MIMIC index. The results are displayed in table 6 and figure 4.

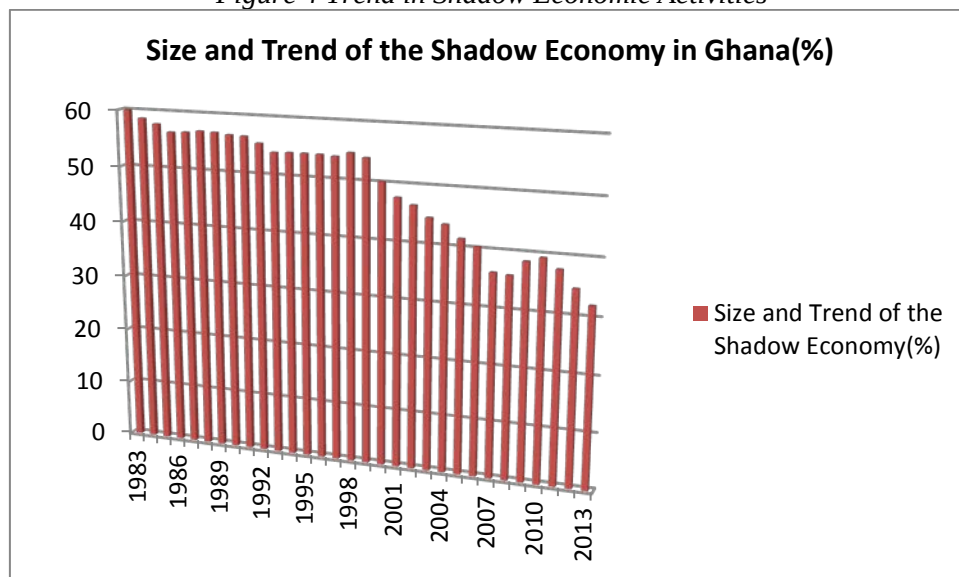
$$\text{MIMIC index} = \frac{\text{shadow economy in current year}}{\text{shadow economy in base year (1983)}} * \text{exogenous shadow economy} \dots (3)$$

Table 6 Size and Trend in the Shadow Economy in Ghana.

Year	Size of Shadow Economy	Year	Size of Shadow Economy
1983	60	1999	54.05
1984	58.62	2000	50.21
1985	57.74	2001	47.70
1986	56.44	2002	46.58
1987	56.59	2003	44.66
1988	56.92	2004	43.74
1989	56.83	2005	41.52
1990	56.58	2006	40.41
1991	56.48	2007	36.25
1992	55.41	2008	36.01
1993	53.99	2009	38.59
1994	54.12	2010	39.43
1995	54.15	2011	37.71
1996	54.13	2012	34.72
1997	53.97	2013	32.11
1998	54.75		

Source: Author generated from World Bank Data

Figure 4 Trend in Shadow Economic Activities



Source: Author Generated from World Bank Data

Generally figure 4 shows a declining trend in shadow economic activities in Ghana since 1983. Currently the level of the shadow economy is estimated to be about 32%. This size is still high though

there is a significant decrease from its initial size in 1983 which was 60%. The declining trend witnessed is as a result of decreasing tax rates and direct taxes. The high presence of shadow economic activities is however accounted for by the high level of unemployment and the low levels of GDP per capita. The effect of the global economic crises could be observed in 2007 beyond which there was a sudden sharp rise in shadow economic activities. This is supported by the fact that recession tends to decrease wages or earnings which serves as an incentive to partake in other underground activities to supplement the decreased economic earnings.

6. Conclusion

Shadow economic activities are strongly persistent and prevalent within the Ghanaian economy. Given the high level of growth that has been experienced over the last five years, one would expect a significant decline in shadow economic activities but this has not been the case. It gives credence to the fact that the country's economic growth is not economically and socially inclusive. Poverty levels are still high with increasing level of inequality. With a slowly improving public sector institutions, the pace of decline in shadow economic activities would also be slow. Several small scale businesses are difficult to track thus making the idea of regulation a fiasco. The tax burden is generally on few individuals and companies that officially comply with the national tax system. This thus serves as a huge disincentive for other businesses to declare their economic activities. Though the level of underground activities has declined the figure is still high given the repercussions. The country loses a great deal of revenue through these undeclared activities and the pace of decline is not encouraging.

The global economic crises affected the steady decline that was experienced between 1983 and 2007. Shadow economic activities expectedly assumed an upward trend during periods of the crises. The situation seems to have been stabilized in 2010 and the steady decline resumed. The current level of 32% in 2013 is quite high and drastic measures should be taken to improve the situation.

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