

Estimating the Size of the Underground Economy in Kenya

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Abstract

The underground economy comprises economic activities not accounted for in national income statistics and is, therefore, difficult to measure. The difficulty arises because this economy comprises a host of traditional and modern; monetary and non-monetary; and legal and illegal activities. Some are invisible, hidden and illegal. Others are visible but difficult to trace, locate or identify because they are mobile and/or lack proper records. Measurement problems are also compounded by its continued evolution, adapting to changes in the policy and technology environments. However, knowledge of its size is important for policy relevance and revision; avoiding threat to revenue generation; easing tax burden on the formal sector; encouraging fair competition; exercising control for illegal activities; and expanding the tax base. Direct and indirect approaches have been used elsewhere to estimate its size. Direct approaches include: sample survey and tax audit/compliance, and indirect approaches comprise national accounting statistics, labour force statistics, transactions, currency demand, physical inputs such as electricity, and multiple indicators multiple causes (MIMIC) models. Using the currency demand model, which assumes that most transactions are undertaken on cash basis, and secondary data between 1970 and 2005, the study found that the size of the underground economy in Kenya is significant. It averaged 20 per cent of GDP between 1995 and 2005. Besides, tapping it could expand tax base by about 4 per cent of GDP. In 2005, this would have generated nearly Ksh 55 billion. The study recommends greater innovations such as use of debit and credit cards and ATMs; improvement in data capture; continuation of reform efforts such as use of presumptive tax; reduction in bureaucracy in business licensing; recognize tax contributions by awarding certificates; and further work to isolate legitimate and illegitimate activities to inform reform efforts.

Abbreviations and Acronyms

| | |
|-------|---|
| ADF | Augmented Dickey Fuller |
| ATM | Automatic Teller Machine |
| ETR | Electronic Tax Register |
| GDP | Gross Domestic Product |
| GNI | Gross National Income |
| KRA | Kenya Revenue Authority |
| MIMIC | Multiple Indicators Multiple Causes Models |
| OECD | Organization for Economic Cooperation and Development |
| OLS | Ordinary Least Squares |
| PP | Phillip and Peron |
| SMEs | Small Medium Enterprises |
| VAT | Value Added Tax |

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1. Introduction

The recent trend towards democratization and market-based systems was meant to improve the lives of millions worldwide. Many countries have increased political participation, achieved macroeconomic stabilization and restored growth. Despite these achievements, millions of people in emerging democracies are excluded from the political and economic system and live in poverty. A glaring symptom of this exclusion is the growing number of entrepreneurs engaged in business activities outside the formal sector. These entrepreneurs, commonly associated with the “underground economy”, may produce legitimate products without proper permits or legal status because they avoid burdensome taxation and excessive rules and regulations for registration and licensing that characterize the formal economy. However, some activities in the underground economy may be illegal and/or criminal, such as selling drugs.

In Kenya, the sector has registered tremendous growth, particularly after the country embarked on economic reforms in general and public sector personnel retrenchment programmes in particular. The importance of the sector is quite noticeable as a source of livelihood to many. It is, therefore, in the government interest to legitimize and provide a supportive environment for legitimate activities of the sector. Indeed, in the Economic Recovery Strategy for Wealth and Employment Creation, the informal sector was expected to play a key role in employment creation.¹ The bulk of employment creation was to come from small and micro enterprises (SMEs), the majority of which are informal. During the recovery period, a total of 2,636,130 jobs were expected to be created, out of which only 12 per cent would be from the formal sector and the rest from SMEs (ERSWEC, 2003).

In this regard, and with the current worldwide trend to capture informal activities into the national accounts, the Kenya Revenue Authority (KRA) in its second corporate plan (2003-2006) embarked on broadening the tax base and widening the net by capturing the informal sector. Therefore, during the 2004/05 fiscal year budget, the government took cognizance of the importance of the informal sector and extended tax administration reforms by introducing electronic tax registers (ETRs) to small traders. The ETRs enhance the informal sector’s

¹ One of the core aims of the Recovery Strategy was to achieve economic growth rates that are consistent with the creation of 500,000 jobs annually.

ability to bear its fiscal responsibility and discourage businesses from splitting their operations into smaller units to avoid taxation.²

There are various reasons why the size of the underground economy should be of interest. First, if majority of economic activities are undertaken outside the formal economy, official socio-economic indicators such as GDP per capita and employment, among others, may be biased. Second, the existence of a growing share of unofficial economic activities may be an indicator of reactions by economic agents to unfavourable government policies, especially those that lead to excessive fiscal burden. Third, the informal sector may also have implications for the formal sector, especially where substantial income generated through it is spent in the official economy. Fourth, most activities of the underground economy are not taxed and, therefore, undermine taxation efforts. Lastly, where these activities are 'illegal,' they may have important implications for security and the rule of law, warranting public policy response.

The overall objective of this study, therefore, is to explore the importance of the underground economy in Kenya in terms of its size and tax potential. The specific objectives include:

- Empirically estimate the size of the underground economy.
- Estimate the tax potential, tax leakage/evasion.
- Based on the findings, provide policy recommendations.

The rest of the paper is organized as follows: section two considers the various conceptual definitions of the sector. In section three, the various estimation approaches are reviewed as used in other countries while section four provides a discussion of the methodology adopted to estimate the size of the underground economy in Kenya and its tax potential. The empirical results are discussed in section five, and section six provides the main conclusions and recommendations.

² It has been observed that medium-size businesses with annual turnover of Ksh 3.6 million, the minimum (threshold) for VAT registration, were splitting their business to avoid paying tax.

2. Conceptual Definitions of the Underground Economy

Attempts aimed at estimating the size of the underground economy must naturally first grapple with its definition. The connotation of the term “underground economy” commonly implies the existence of concealed, hidden, masked or obscured activities from direct observation and recording by government authorities. Though the concept of underground economy has been used in many forums, the definition adopted depends on the goal of the study or objectives pursued by organizations/institutions dealing with it. The most commonly used terms in literature include unofficial, informal, hidden, invisible, shadow, parallel, second, unrecorded, subterranean, black, moonlighting, unmeasured, irregular, and unobserved, among others.

In reality, it is usually difficult to classify an economic entity as belonging to either the underground or measured economy because an economic entity can belong to both simultaneously. The varying definitions, therefore, comprise economic activities that are both legal and illegal. Schneider and Ernste (2000: 79) and Mirus and Smith (1994) provide a classification of activities of the underground economy, as shown also in Table 2.1, which should not be identified with illegality criterion alone.

One common aspect about the majority of the activities is that they are not recorded in the system of national accounts. Majority of them take place “off the books” and out of the spectrum of the tax authority for various reasons such as illegality, their small sizes thus falling outside the tax threshold, non-existence or poor documentation of their economic activities, constraints on the part of the tax authority to reach them, and unwillingness to declare income.

The phenomenon of underground economy is not peculiar to any part of the world; it is global. Although it is difficult to estimate, efforts have been made by economists and statisticians to gauge how large it could be. It is claimed that the underground economy is large and growing in almost all countries (Maurin *et al.*, 2003)³ In many countries in Central and South America, its output constitutes a quarter to a third

³ According to Schneider and Enste (2002), in Nigeria, Egypt and Thailand output of the underground economy forms almost 75 per cent of GDP.

Table 2.1: Classification of underground economy activities

| Activity status | Monetary transactions | Non-monetary transactions |
|---------------------------|--|--|
| Legal activities | <ul style="list-style-type: none"> • Tax evasion • Unreported income (profits, rental income, and tips among others) • Wages, salaries, and assets from unreported work related to legal goods and services; house helps; watchmen • Under invoicing • Tax avoidance • Employee discounts • Fringe benefits | <ul style="list-style-type: none"> • Tax evasion • Barter of legal goods and services • Tax avoidance • All do it yourself and other unpaid help |
| Illegal activities | <ul style="list-style-type: none"> • Trade in stolen goods • Drug dealing and manufacturing • Gambling and racketeering • Prostitution • Money laundering • Counterfeiting • Smuggling • Fraud | <ul style="list-style-type: none"> • Barter of drugs • Theft for own use • Production of drugs for own use • Child labour |

Source: Adapted from Schneider and Enste (2000) and Mirus and Smith (1994)

of the official GDP and its output is smallest in those countries with comparatively small public sectors such as Japan, Switzerland and the US, which also enjoy a high tax morality (Maurin *et al.*, 2003). The size of the informal economy in Kenya is estimated at 34.3 per cent as compared to 58.3 per cent for Tanzania and 43.1 per cent for Uganda in the year 1999/2000 (Schneider, 2002).

In Kenya, the underground economy is equally large and growing, despite the absence of reliable information. Part of it is commonly referred to as the informal sector, and is defined as comprising official statistics of micro and small scale activities that are semi-organized, unregulated, use simple labour-intensive technology that may or may not have licenses from concerned authorities, and are not registered with the registrar of companies. Specifically, the government defines it as consisting of “... those activities mainly undertaken by artisans, traders and other operators in work-sites such as open yards, market stalls, undeveloped plots, residential houses and pavements” (Government of Kenya, 2003). As an indication of its large and growing size, the sector creates the most jobs (an estimated 77% in 2005) and contributes up to

about 18.4 per cent of the country's official GDP (Central Bureau of Statistics, K-REP and ICEG, 1999).

It is important to note, however, that the government's definition of the sector is not all encompassing. It basically recognizes the legal economic activities transacted in monetary terms and not captured by official government statistics. The underground economy goes beyond this and contributes much more to total output in addition to what is thought or revealed by official government statistics (Ouma, 2002). It also includes barter trade and illegal trade of any kind basically left out of the government definition of the informal sector.

For this study, therefore, the underground economy comprises of legal and illegal; visible and invisible; monetary and non-monetary economic activities of the traditional and modern (public and formal private) sectors.

3. Approaches and Challenges in Estimating the Underground Economy

Income from legal underground economic activities would generally be taxable were they to be reported to or reached by the tax authority and fall within the tax threshold. Proprietors in illegal underground activities do not pay tax because it is tantamount to exposing their illegal activities. Some could be willing to pay tax, but they cannot dare. They would rather evade or avoid paying tax for this reason and perpetually remain obscure. They will, therefore, for all intent and purposes, remain secluded and out of the reach of the tax authority.

Illegal activities such as prostitution, smuggling of goods outside and inside the country, counterfeiting, illegal foreign exchange dealings, money laundering, drug dealings among others are also included in this definition.

Such a broad definition of the underground economy that includes: traditional and modern activities, monetary and non-monetary activities, and legal and illegal activities points to the difficulty of measuring this sector. Some of the sector's activities are difficult to measure because they are invisible, hidden and illegal and, therefore, unreported. Other activities are visible but difficult to trace, locate or identify because they are mobile and lack proper book keeping records. The difficulties in measurement of the sector are further compounded by the fact that the sector keeps on evolving all the time, adapting to changes in the changing policy environment, taxation, regulatory framework, and new technology that create more activities that would be categorized to fall in the sector. Nonetheless, attempts must be made to estimate it and improve the relevance and impact of policy initiatives.

Although definitions of the sector pose measurement problems, estimate of the size of the underground economy as a percentage of GDP has tended to depend on the definition and methodology adopted. In the past two or so decades, several authors such as Guttman, 1977; Tanzi, 1983; Feige, 1989; Giles, 1998; Schneider and Enste, 2000; and Giles and Tedds, 2002 considered various methods of estimating the underground economy. The approaches followed in various studies can be categorized as direct, indirect and MIMIC models as described in Table 3.1.

Table 3.1: Ways of measuring the shadow economy

| Method | Main features |
|--|---|
| 1. Direct approaches | |
| Sample survey | Estimates size of shadow economy from survey data |
| Tax audit/ Compliance | Estimates size of shadow economy from audit measurements of undeclared taxable income |
| 2. Indirect approaches | |
| National accounting statistics | Estimates size of shadow economy on basis of the discrepancy between income and expenditure statistics in national accounting or in individual data. |
| Labour force statistics | Estimates growth in shadow economy on basis of decline in labour participation in the official economy, assuming the labour force has a constant participation rate overall |
| Transactions | Uses data on the overall volume of monetary transactions in the economy to calculate total nominal (unofficial plus official) GDP, then estimates size of shadow economy by subtracting official GDP from total nominal GDP |
| Currency demand | Estimates size of shadow economy from the demand for cash, assuming shadow transactions are undertaken in cash and that an increase in the shadow economy will raise demand for cash |
| Physical inputs (electricity consumption) | Estimates growth of shadow economy from electricity consumption, assuming that electricity consumption is the single best physical indicator of overall economic activity. Subtracts the growth rate of official GDP from the growth rate of total electricity consumption and attributes the difference to the growth of the shadow economy |
| 3. Multiple Indicators Multiple Causes (MIMIC) Models^b | |
| Latent variable approach | Estimates the size of the shadow economy as a function of observed variables that are assumed to influence the shadow economy—for example, the burden of taxation, the burden of government regulation—and of variables where shadow economic activities leave traces, like cash, official working time, unemployment, among others. Advantageous method because it considers multiple causes and effects simultaneously. |
| <p>^aFor a detailed description of the different methods, see Schneider and Enste (2000), “Shadow Economies: Size, Causes, and Consequences,” <i>The Journal of Economic Literature</i>, 38/1, pp 77-114.</p> <p>^bThe MIMIC model was introduced into literature by Zellner (1970) but applied in the estimation of the size of underground economy first in 1983 by Weck (1983), Frey and Weck (1983a, 1983b) and Frey <i>et al.</i> (1984).</p> | |

Though several techniques are available as shown in Table 2, there is no “best” estimation method. Each approach has its strengths and weaknesses, and yields its own insights and results. The direct approaches, also referred to as micro approaches, rely on the correctness of the information collected through well-designed field surveys and samples based on voluntary replies or tax auditing. The reliability of the results from the approaches depends on the respondent’s answers. If the respondent chooses not to give correct or all the information, then the approaches arrive at misleading conclusions. Additionally, conducting a nation-wide survey is an expensive undertaking. On tax audits, the accuracy of information submitted in the annual income return forms to the revenue collection bodies such as the KRA may mislead on the size of the underground economy as there is weak supervision and guidance on the process of filling the tax returns. In most cases, taxpayers just fill the forms to fulfill the legal requirement and, hence, may not provide adequate information to measure or estimate the size of the underground economy.

The indirect approaches of estimating the size of the underground economy are macro in nature. The approaches employ economic indicators that give information about the emergence and development of the underground economy over time. These approaches have a major advantage in that they do not require collaboration of individuals in the hidden economy, who may have an interest in hiding what they have. Of the five indirect approaches outlined in Table 2, the currency demand method is the most widely applied technique because it allows for econometric analysis that helps in explaining its growth.

In Malawi, Chipeta (2002) defining the underground economy as the second economy, made use of two alternative monetary techniques to estimate its size, namely: Guttman (1977) and Tanzi (1980) methodologies. The estimations are based on the assumption that the activities in the second economy are the direct result of high taxes and that currency is mainly used for carrying out such transactions or sorting wealth. The study concluded that Malawi has a large second economy and the rate of growth of the second economy GDP exceeded the rate of growth of the official economy GDP.

The MIMIC approach explicitly considers multiple causes and multiple indicators of the effects of the underground economy over time. This approach utilizes econometric analysis to explore the statistical characteristics of the unobserved variables and observed indicators. The

structural equations specify causal relationships among the unobserved variables, in this case the underground economy. The MIMIC model treats hidden output as unobservable 'latent' variable and uses several (measurable) causal variables and indicator variables. The approach assumes that the underground economy is influenced by a set of indicators, thus capturing the structural dependence of the underground economy on variables that may be useful in predicting its movement and size in the future. Though this is the most comprehensive measurement of the size of the underground economy, it has more data demands.

Giles (1998) adopted the MIMIC structural model to measure the size of the hidden economy in New Zealand. The causal variables included measures of the average and marginal tax rates, inflation, real income and the degree of regulation in the economy. The latter include changes in the male labour force participation rate and in the cash/money supply ratio. In order to obtain a benchmark for converting the index into dollar units, they estimated a demand for cash model. The study concluded that the hidden economy is large, growing and at least partially sensitive to fiscal instruments in most countries. The results suggest that the hidden economy follows the phases of the business cycle in New Zealand.

Using 76 developing, transition and Organization for Economic Cooperation and Development (OECD) countries, Schneider and Enste (2000) defined underground economy as a shadow economy and used the three approaches—direct, indirect and MIMIC—to measure its size. The average size was estimated at about 12 per cent of GDP for OECD, 23 per cent for transition, and 39 per cent for developing countries. Using larger sample size of 84 countries and more recent data, Schneider and Enste (2002) updated their 2000 study and concluded that the average size of underground economies varies from 14 to 16 per cent of GDP for OECD, 21 to 30 per cent for transition, and 35 to 44 per cent for developing countries.

4. Methodology

On the basis of data considerations, the current study uses the currency model, which utilizes secondary macroeconomic data as opposed to the latent approach that requires micro-data from a field survey.

Currency Demand Approach

This approach involves two stages of estimation:

- (1) comparing the difference between the level of currency when the direct and indirect tax burden (and government regulations) are held at their lowest level and the development of currency with the current (much higher) burden of taxation; and
- (2) assuming the same velocity for currency in the shadow economy, as for money (as measured by M₁) in the legitimate economy, compute and compare the estimated size of underground economy to the official GDP.

Economic theory identifies three major motives underlying the demand for currency by various economic agents: the transactions motive, that is demand for money to meet day to day payments; the precautionary motive to meet unforeseen contingencies; and the speculative motive, due to uncertainties in holding interest bearing assets. Arguing that people hold money for its purchasing power, economists have concluded that the demand for money is a demand for real balances. The real money demand remains unchanged as prices increase, holding other determinants (interest rate, real income and real wealth) constant. When nominal money demand increases with increase in prices, there is said to be money illusion. Based on the three motives, theories of demand for money define money in both narrow and broad terms. The narrow definition of M₁ focuses on currency in circulation and checkable or demand deposits. This definition of money is more relevant when referring to transactions and precautionary motives. On the other hand, the broad definition of M₂ and M₃ encompasses the speculative motive. The currency demand model focuses on the transaction demand for money.

The model was first developed by Cagan (1958) and a variant provided by Tanzi (1983) by extending the simple currency demand model of Cagan (1958) and Guttman (1977) to capture the influences of other

factors on currency demand to ensure that the extra currency can really be attributed to the working of the hidden economy. Tanzi, like Cagan and Guttman, also assumed that underground (or hidden) transactions are predominantly undertaken in form of cash payments, because such activities leave no observable traces for the revenue authorities. It is argued that an increase in the underground economy may reveal itself in the increase in demand for currency. The increase in currency that is unexplained by the conventional or normal fundamental factors (interest rate, income, rate of inflation, and technological change, among others) is attributed to factors motivating participation in the underground economy such as tax pressures. The basic regression equation proposed by Tanzi is presented as:

$$\ln(C/M_2)_t = \beta_0 + \beta_1 \ln(1+TW)_t + \beta_2 \ln(WS)_t + \beta_3 \ln(R)_t + \beta_4 \ln(Y/N)_t + \varepsilon_t, \dots \dots \dots 1$$

Where $\beta_1 > 0, \beta_2 > 0, \beta_3 < 0, \beta_4 < 0$ and \ln denotes the natural logarithm; C/M_2 is the ratio of cash holdings to current and deposit accounts; TW is a weighted average tax rate (to proxy changes in the size of the hidden economy); WS is the proportion of wages and salaries in national income (to capture changing payment and money holding patterns); R is the interest rate paid on savings deposits (to capture the opportunity cost of holding cash); and Y/N is the per capita income.

However, this approach has been criticized (Thomas, 1999; and, Feige, 1996) in that:

- (i) not all transactions in the underground economy are paid in cash;
- (ii) the use of the ratio of currency to current deposits has been criticized in that increases in currency-demand deposit ratio may be largely due to a slowdown in demand deposits rather than an increase in currency caused by activities in the underground economy; and,
- (iii) most studies consider only one particular factor—tax burden—as the cause of the underground economy, yet other factors such as burdensome laws and regulations are also important.

Further, the Tanzi approach does not take into account the recent developments in financial innovations.

In this study, we modify the Tanzi approach by taking cognizant of the recent developments in financial innovations. Since the liberalization of the financial markets in the early 1990s, the Kenyan banking industry has experienced tremendous changes in financial innovation and

technological growth. There has been extensive expansion of the bank branches for some banks while others have reduced their branches but intensified technological advancement and computerized banking. The introduction of Automatic Teller Machines (ATMs) may have reduced the demand for currency holdings.⁴ We introduce a financial innovation variable (F), measured as the ratio of broad money to narrow money.

To estimate the size of the underground economy, our currency demand function is specified as follows:

$$\ln(C)_t = \beta_0 + \beta_1 \ln(GNI)_t + \beta_2 \ln(T)_t + \beta_3 \ln(R)_t + \beta_4 \ln F + \varepsilon_t, \dots (2)$$

Where $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 < 0$, $\beta_4 < 0$, and RC represents real currency in circulation, RGNI is real gross disposable national income, T is the tax effort, R is the rate of interest, and F is a measure for financial innovation.

Definition of data

The dataset comprise of annual observations from 1970 to 2005 and are taken from the Central Bank of Kenya and the Central Bureau of Statistics databases. Real currency holding (RC) is measured by nominal currency deflated by the implicit GDP deflator; RGNI is measured at 1982 prices; tax effort (TAX) is measured as direct income taxes plus trade taxes as a share of GDP; interest rate (R) is measured as the 91-day treasury bills rate; and financial innovation (F) is measured as the ratio of broad money to narrow money.

⁴According to the transactions demand model by Baumol (1952), improvements in banking services reduce the demand for currency. The development of new financial products leads to new ways of borrowing and lending. Hence, it includes the development of new financial products such as credit cards, debit cards, interest bearing cheque accounts, and money market funds.

5. Estimated Currency Demand in Kenya

Unit Root Tests

Prior to estimations, diagnostic testing of the time series data was conducted. It is well known that if the time series is not stationary, the distributions of the conventional test statistics are not as those derived under the assumption of stationarity. Thus, the first step is to determine the order of integration of each of the variables in the system. The procedure followed in this paper is the one proposed by Augmented Dickey and Fuller (ADF) (1986) and Phillip and Peron (1988). The ADF and Philip-Peron (PP) tests use different methods to control higher-order serial correlation in the series. The ADF test makes a parametric correction for higher-order correlation by assuming that the series follows an AR(p) process.

All the variables exhibit the presence of a unit root at 5 per cent level of significance. However, a similar test at first difference of variables reveals no evidence of a unit root. This means that the variables are non-stationary in levels but become stationary after the first differencing.

Empirical Results

The error correction model for the currency demand was estimated using the ordinary least squares (OLS) estimation techniques. The empirical results reported in Table 5.2 show that all variables carry the expected signs and significantly influence currency demand, except for the 91-day Treasury bill rates. Financial innovations variable is positively associated with currency demand. This can be explained by the fact that in a developing economy, financial innovation may be associated with monetization of the economy.

The results reported in Table 5.1 indicate that the overall explanatory power of the model is strong, with adjusted- R^2 of 97.7 per cent. The coefficients indicate that in the long-run, the demand for currency is driven by growth in income levels in the country, the financial innovations taking place in the banking industry and the tax levels.

Table 5.2: Empirical results of the estimated model

| Dependent variable: Real currency demand outside the banks | | | |
|--|-------------|-----------------------|------------|
| Variable | Coefficient | t-ratio | p-value |
| Log (RGNI _t) | 0.76482 | 4.853 | 0.000 |
| Log (TAX _t) | 0.24712 | 2.694 | 0.012 |
| Log (R _t) | -0.01490 | -1.183 | 0.247 |
| Log (F _t) | 0.33877 | 2.421 | 0.022 |
| Log (RC _{t-1}) | 0.33698 | 2.294 | 0.030 |
| R-squared | 0.980974 | Akaike info criterion | 53.55413 |
| Adjusted R-squared | 0.976583 | Schwarz criterion | 1.63925 |
| S.E. of regression | 0.053794 | F-statistic | 0.351539 |
| Durbin-Watson stat | 0.075240 | Sum squared residual | -2.8214763 |
| | | Log likelihood | 223.42 |

6. Estimating the Size of the Underground Economy

The demand for currency holdings to money is estimated using real gross national disposable income, treasury bill rates; average effective income tax rate; previous levels of currency holdings and financial innovation, as independent variables. The estimate of currency holdings in the hypothesis of zero income tax is then used to estimate the “excessive” currency holdings due to the existence of the underground economy. The size of the underground economy is then calculated simply by multiplying the excessive currency by the velocity of money prevailing in the (regular) economy.

Thus, we begin by solving the currency demand model that estimated the currency in the hands of the public at the time (t) given observed average tax rates.

$$\text{LRC} = (-4.28 + 0.336*\text{LRC}(-1) + 0.765*\text{LRGNI} + 0.338*\text{F} + 0.247*\text{LTAX} - 0.014*\text{LR} + \text{LCPI})\dots\dots\dots(3)$$

A corresponding series of legal currency holding can be estimated by eliminating the tax variable in the fitted equation. The process of computing the amount of currency held in the underground economy involves two steps: the first solved to obtain values for the total amount of cash circulating in the economy over the period 1973-2005 denoted by C_t , while in the second step, the total tax is set equal to zero and the system solved again to yield the estimated value of “hidden” currency, denoted by C_{wt} . The sum of currency held by persons participating in the underground economy is thus given by:

$$C_H = C_t^* - C_{wt}^*$$

That is, currency demand with tax, less currency demand without tax. It is expected that in the absence of tax variable, the currency holding by the public would be lower because there is less incentive to demand cash for payment of goods and services for purposes of evading taxes.

Assuming that the velocity of this “hidden” money is the same as that of visible money, an estimate of the hidden economy is obtained by

multiplying hidden money by the velocity of money.⁵ The velocity of money is obtained by dividing GNI by legal money supply:

$$V = \text{GDP}/(M2)$$

Thus, the estimate of the hidden economy is derived as:

$$\text{GDP}_H = C_H * V$$

Using the computed estimates of the size of economic activities in the underground economy, we proceed to estimate the potential tax that can be collected from such activities. The assumption is that the government can be able to collect an equal proportion in the underground as does in the official economy. The potential tax is given by

$$\text{PTAX}_H = \text{GDP}_H * \text{Total tax revenue}/\text{GDP}$$

The estimates of the size of the underground and tax potential are given in Table 6.1. The estimated nominal currency in the underground economy reveals a significantly large underground economy that, though it influences the overall economic activities, may not be captured by the tax authority. Between 1975 and 2005, the size of the underground economy whose transactions could be captured through the banking system averaged 20 per cent. The size of the underground economy has been fluctuating, with the highest proportion recorded in 1990s when hidden activities accounted for an average of 26 per cent of GDP.

The potential tax accruable from this economy averaged about 4 per cent of GDP. This implies that the tax authority has the potential to expand the tax base by close to 4 per cent of GDP. This would have increased tax collection by more than Ksh 54 billion in 2005.

Figure 6.1 shows that though the size of the underground economy has been on an upward trend, the potential tax remained below 5 per cent except in the mid 1990s. An interesting observation is the cycle

⁵ This is the speed with which money circulates, or turnover in the economy. It is calculated as the annual national income: average money stock in the period. It can be viewed in terms of either spending (transactions velocity) or income (income velocity). The transactions velocity of money is measured by how many times during a year (or some other period) a monetary unit (same Kenya shilling) is spent, and is calculated by dividing total sales volume by total money supply in circulation.

growth in the size of the underground economy. One observes a decline in the size of the underground economy during the electioneering year suggesting that perhaps monies previously circulating in this economy are released into the official economy and used for political campaigns. The decline is accompanied by a huge jump in monies in the underground economy immediately after the elections are over. This phenomenon makes the demand for currency in the economy unstable.

Figure 6.1: Estimates of the underground economy and potential tax as shares of GDP

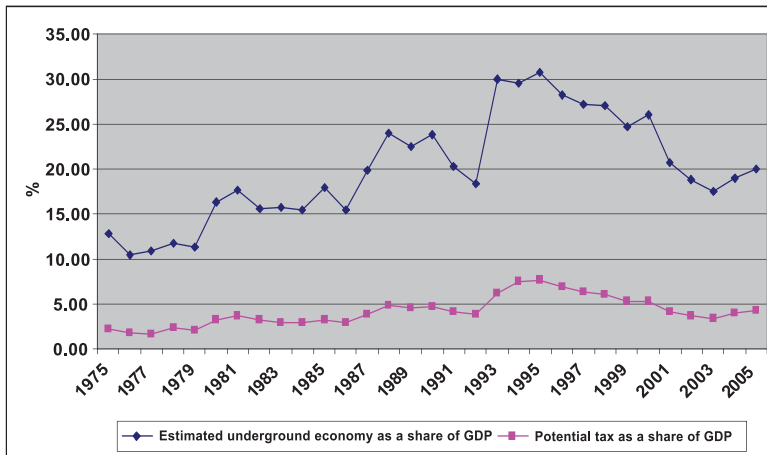


Table 6.1: Estimates of the size of underground economy in Kenya (Ksh millions)

| | Estimated Real Currency | Estimated Nominal Currency (Official Economy) | Estimated Nominal Currency (Hidden economy) | Money velocity | Potential GDP Hidden economy | Tax potential (Hidden economy) | Potential GDP Hidden economy % of GDP | Tax potential (Hidden economy) % of GDP |
|------|-------------------------|---|---|----------------|------------------------------|--------------------------------|---------------------------------------|---|
| 1975 | 1169.10 | 660.82 | 508.28 | 5.49 | 2789.97 | 474.59 | 12.82 | 2.18 |
| 1976 | 1229.79 | 705.90 | 523.88 | 5.27 | 2760.83 | 451.70 | 10.51 | 1.72 |
| 1977 | 1726.52 | 928.47 | 798.06 | 4.58 | 3656.28 | 559.47 | 10.86 | 1.66 |
| 1978 | 2071.17 | 1135.68 | 935.49 | 4.60 | 4301.59 | 843.63 | 11.73 | 2.30 |
| 1979 | 2311.44 | 1280.57 | 1030.86 | 4.45 | 4588.41 | 852.75 | 11.28 | 2.10 |
| 1980 | 2959.50 | 1606.35 | 1353.15 | 5.56 | 7518.38 | 1515.05 | 16.36 | 3.30 |
| 1981 | 3629.53 | 1967.94 | 1661.59 | 5.66 | 9399.13 | 1944.52 | 17.67 | 3.66 |
| 1982 | 4015.16 | 2226.90 | 1788.26 | 5.32 | 9514.95 | 1939.97 | 15.60 | 3.18 |
| 1983 | 4295.58 | 2414.42 | 1881.16 | 5.83 | 10963.49 | 2056.58 | 15.78 | 2.96 |
| 1984 | 4652.76 | 2646.65 | 2006.11 | 5.97 | 11982.30 | 2262.23 | 15.46 | 2.92 |
| 1985 | 5457.64 | 3060.49 | 2397.15 | 6.61 | 15834.99 | 2901.69 | 17.90 | 3.28 |
| 1986 | 6272.05 | 3535.34 | 2736.72 | 5.79 | 15843.91 | 3037.29 | 15.49 | 2.97 |
| 1987 | 7571.00 | 4245.07 | 3325.93 | 6.72 | 22358.81 | 4380.89 | 19.79 | 3.88 |
| 1988 | 9440.00 | 5318.27 | 4121.73 | 7.55 | 31107.94 | 6366.75 | 24.00 | 4.91 |
| 1989 | 10823.36 | 6078.31 | 4745.05 | 7.05 | 33447.94 | 6786.35 | 22.44 | 4.55 |
| 1990 | 13246.81 | 7505.22 | 5741.59 | 6.95 | 39915.95 | 7850.76 | 23.82 | 4.69 |
| 1991 | 13673.12 | 8001.66 | 5671.46 | 6.81 | 38619.38 | 7884.22 | 20.24 | 4.13 |
| 1992 | 17621.90 | 10037.71 | 7584.19 | 5.54 | 41998.28 | 8624.74 | 18.42 | 3.78 |
| 1993 | 30926.17 | 16097.51 | 14828.65 | 5.74 | 85121.14 | 17481.21 | 30.00 | 6.16 |
| 1994 | 33730.84 | 17466.17 | 16264.67 | 6.14 | 99903.98 | 25594.64 | 29.55 | 7.57 |
| 1995 | 37741.13 | 19660.68 | 18080.45 | 6.71 | 121280.92 | 30279.93 | 30.80 | 7.69 |
| 1996 | 38815.06 | 20851.22 | 17963.85 | 7.06 | 126833.26 | 31186.84 | 28.21 | 6.94 |
| 1997 | 43755.58 | 23573.45 | 20182.13 | 7.22 | 145742.12 | 33609.74 | 27.18 | 6.27 |
| 1998 | 46118.98 | 25115.39 | 21003.58 | 7.65 | 160715.10 | 35615.40 | 27.08 | 6.00 |
| 1999 | 50119.04 | 27890.93 | 22228.11 | 7.09 | 157609.17 | 33820.15 | 24.66 | 5.29 |
| 2000 | 57261.51 | 32323.90 | 24937.61 | 7.16 | 178648.73 | 35988.33 | 26.04 | 5.24 |
| 2001 | 62089.01 | 36207.28 | 25881.73 | 7.24 | 187407.71 | 37401.67 | 20.67 | 4.12 |
| 2002 | 66152.87 | 39192.85 | 26960.02 | 6.30 | 169904.49 | 32687.31 | 18.76 | 3.61 |
| 2003 | 78326.11 | 44932.58 | 33393.52 | 5.31 | 177421.23 | 34218.50 | 17.55 | 3.38 |
| 2004 | 89542.11 | 50431.92 | 39110.18 | 5.56 | 217519.27 | 45137.31 | 19.03 | 3.95 |
| 2005 | 104638.09 | 58208.10 | 46429.99 | 5.58 | 258878.03 | 54946.13 | 20.05 | 4.26 |

7. Conclusions and Policy Implications

7.1 Conclusions

The main objective of this study was to estimate the size of the underground economy in Kenya and assess the potential tax accruable from the activities in this economy. This was conducted using a currency demand model that applied time series data between 1970 to 2005. The finding of the study revealed that the size of the underground economy has grown over time to an average of about 20 per cent of GDP. This estimate is exclusive of the informal sector activities whose transaction can be captured through the banking system.

The existence of a sizeable underground economy suggests that the tax authority has the potential to expand the tax base and increase revenue collection. In addition, there is scope to make entrepreneurs operating in the underground economy bear their fiscal responsibility and, therefore, enhance social services provision.

The results suggest that the political climate influences underground economic activities. For instance, during periods of intense political campaigns such as the general elections, a massive flow of income from underground economic activities finds its way into the formal economy, consequently reducing its size.

7.2 Policy Implications

- (i) The results suggest that there is scope of increasing tax revenue by further capturing underground economic activities. Such measures as the use of advance tax (as in the case for “Matatus”) can contribute to more revenue. Such efforts to bring more underground economic activities into the tax bracket should be continued.
- (ii) To expand tax and the revenue bases further, ongoing efforts to reduce bureaucracy in business licensing in the form of a “one-stop-shop” need to be speeded up to formalize activities that end up in the underground economy as a result and enable them take up their fiscal responsibility.
- (iii) There is need to improve data capture within the national accounting system.

7.3 Further Research

Different techniques of measuring the underground economy result in different estimates. Additional work needs to be undertaken in future using other techniques such as tax auditing, MIMICs, and sample surveys among others, to get a better understanding of the underground economy.

More work needs to be done to identify favourable, non-stringent taxation measures for underground economic activities of the majority micro, small and medium enterprises that dominate the sector.

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