

THE EVOLUTION OF THE INFORMAL ECONOMY AND ITS IMPLICATIONS FOR TAX POLICY IN ZAMBIA

by
Sydney chauwa Phiri

A dissertation submitted in partial fulfilment of the requirements for the degree of
Master of Arts in Economics

The University of Zambia
Lusaka
2013

Declaration

I Sydney Chauwa Phiri declare that this dissertation

- a) Represents my own work.
- b) Has not been previously submitted for a degree at this or any other University and;
- c) Does not incorporate any published work or material from another dissertation.

Signed: _____

Date: _____

All rights reserved, No part of this dissertation may be reproduced or stored in any form or by any means without prior permission in writing from the author or the University of Zambia.

© 2012 by Sydney Chauwa Phiri

APPROVAL

This dissertation of Sydney Chauwa Phiri has been approved as fulfilling the requirements for the award of the degree of Master of Arts in Economics by the University of Zambia.

Signed:

Date:

.....

.....

.....

.....

.....

.....

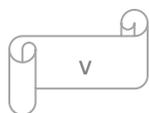
Abstract

Despite the introduction of taxation into Zambia's largest employer- the informal economy- the contributions of these taxes to domestic revenues have been insignificant since their inception in 2004. This poor performance has led civil society organisations and even Government to call for more taxation of informality than currently exists. No estimates on the tax potential of the informal economy are available and so, it is difficult to tell whether this underperformance is largely due to ineffective taxation or rather, that that scope for taxation of informality is not considerable. With paucity of literature on the informal economy's tax potential, there exists no evidential basis for future tax policy regarding informality.

This study uses the currency demand approach in a Vector Error Correction (VEC) framework to provide insights into the evolution of informality and its tax potential during the period 1973-2010. It was found that during the relevant sample period, informality averaged 47.7 percent of official GDP and grew at a rate of 2.7 percent per annum. Further, the maximum potential tax revenue forgone by not taxing informal economic activities was estimated to be about 7.7 percent of GDP per annum or equivalently 42 percent of the total tax revenues per annum. In practice however, only a fraction of this potential can be actually realised.

In the short run, the scope for further taxation of informality is non-existent because this tax potential is spread thinly across the 4 million-plus individuals who work in the informal economy. Thus, the long run approach should be to simplify the tax system and minimise the differential treatment between taxpayer types so as to encourage the ease of graduation of the micro and small and medium scale enterprises into the standard tax structure. This entails introducing both 'consumer taxes' and 'profit taxes' to the informal economy albeit to a segment only- The urban informal sector which is lucrative- to minimise distortions in the economy.

To Addy and Rosa- the best parents in the world!



Acknowledgments

Many thanks to my sponsors-The Bank of Zambia- who offered full financial support during my period of study.

My sincere gratitude to my supervisor, Dr Chrispin Mphuka, who helped impart in me, the skills of academic writing and research and made this work worth submitting for examination. Many thanks also to Dr Pamela Kabaso who acted as a co-supervisor (but preferred not to be termed as such) and under whose tutelage I learned to appreciate the skills and art of carrying out research for policy making purposes. I would also like to recognise the support of Professor Venkatesh Seshamani in spurring my interest in this topic and making my link with Dr Kabaso possible in the first place.

To wonderful Sanka, your support was invaluable! As for Twamana, I cannot forget your watchful eye over my typos in the earlier manuscripts.

To you all, I say may countenance of the Lord Jesus continue to shine upon you.

Table of Contents

List of Tables.....	viii
List of Figures	viii
List of Abbreviations.....	ix
1.0 Introduction.....	1
1.1 Problem Statement	3
1.2 Objectives of the Study	4
1.3 Research Questions and Hypotheses.....	4
1.4 Justification	4
2.0 Literature Review.....	5
2.1 Concept and Definition of Informal Economy.....	5
2.1.1 Defining the Informal Economy	5
2.2 Schools of Thought	6
2.3 Overview of the Methods for Measuring the Informality.....	7
2.4 Review of Empirical Findings.....	12
3.0 Methodology.....	20
3.1 The Currency Demand Model.....	20
3.1.1 Condition for Consistent Estimation of velocity when $\beta \neq 1$	22
3.2 Econometric Model	23
3.3 Data Description.....	23
4.0 Estimation	24
4.1 Unit root tests	24
4.1.1 Cointegration	27
4.2 Informality, Tax Evasion and Informal Economy Tax Potential	33
4.3 Insights for Tax Policy	34
4.3.1 Short run Implications	34
4.3.2 Implications for the Long run	35
4.3.3 Uncovering the Effective Tax Potential of Informality	36
5.0 Conclusion	37
5.1 Some Policy Recommendations.....	38
5.2 Limitations of study and Areas for Further Research	38
References.....	40
Appendix	43

List of Tables

Table 1: Trends in Informal Economy Tax collection since 2004 (Billions of Kwacha)	1
Table 2: Informality (% of GDP) for Selected African Economies	12
Table 3: Informality (% of GDP) in South Africa	14
Table 4: Informality (% of GDP) for Some Non- African Developing Economies	15
Table 5: Size of informal economy as percentage of GDP for Germany	16
Table 6: Size of informal Economy as percentage of GDP in 5 OECD Countries	18
Table 7: Unit Root Tests for ln(currency)	24
Table 8: Unit Root Tests for ln(GDP)	25
Table 9: Unit Root Tests for Tax/GDP Ratio	26
Table 10: Unit Root Tests for Interest Rate	26
Table 11: Unit Root Tests for Inflation	27
Table 12: Cointegration Tests	28
Table 13: Average Period Estimations of the informal Economy as % of Formal GDP	30
Table 14: Comparison of Schneider (2004) estimates with this study's estimates	32
Table 15: Average Growth Trends in the Formal and Informal Economy	32

List of Figures

Figure 1: Tax-GDP-Ratio	3
Figure 2: Time Plot of ln(currency)	24
Figure 3: Time plot of ln(GDP)	25
Figure 4: Time Plot of Tax/GDP Ratio	25
Figure 5: Time plot of Interest rate	26
Figure 6: Time plot of Inflation	27
Figure 7: Evolution of Informality	30
Figure 8: Trend of Informality	31
Figure 9: Formal and Informal GDP	31
Figure 10: Tax Evasion due to Informality	33

List of Abbreviations

CSO-Central Statistical Office

DYMIMIC- Dynamic Multiple Causes Multiple Indicators Model

JCTR- Jesuit Centre for Theological Reflections

CSPR-Civil Society for Poverty Reduction

MIMIC- Multiple Causes Multiple Indicators Model

NAPSA-National Pension Scheme Authority

PACRA- Patents and Companies Registration Agency

ZRA-Zambia Revenue Authority

1.0 Introduction

Since the advent of the fall in donor support to the Zambia's national budget in 2000, there have been continuous debates on how to best to raise/mobilise more domestic revenue for government programs. Various Civil Society Organisations (CSOs) have in this regard, continually cited the inadequate taxation of the mining sector and the informal economy as two major 'leakages' in Zambia's tax system (JCTR, CSPR, & CARITAS, 2009). In response to these concerns, government attempted to increase taxation to the mining sector by introducing a Windfall Tax on Mining, in 2008. However, this tax was scrapped off in the following year to mitigate the effects of the global recession. CSOs still urge government to reintroduce this Windfall Tax, but government is adamant to do so (GRZ, 2012). As an alternative, government, in 2012 increased the mineral royalty tax and so, an analysis of its productivity is left for another time.

In another attempt to raise revenue, a Presumptive Tax on taxis and minibuses and the Turnover Tax (TOT) on small scale enterprises, introduced in in the informal economy in 2004. Later, in 2005 and 2007, the Base Tax on marketeers and the Advance Income Tax (AIT) for cross border traders were introduced respectively. The TOT rate is 3 percent of the total sales of all firms that have gross turnover of at most K800 million; the base tax is charged at K500 per day for all marketeers and; the AIT rate is 6 percent of the value of imports exceeding US \$500 for all unregistered and partially compliant firms. However, revenues from these taxes as a proportion of total income taxes have generally been poor as can be seen in table 1 below.

Table 1: Trends in Informal Economy Tax collection since 2004 (Billions of Kwacha)

	2004	2005	2006	2007	2008	2009
Turn Over Tax	4.4	9.86	13.11	18.75	23.12	24.1
Base tax	-	0.07	0.09	0.04	0.03	0.03
Advance Income Tax	-	-	-	12.3	60.8	64.6
Presumptive Tax on Minibuses & Taxis	1	1.05	1.76	1.82	2.29	2.15
Total Informal Economy tax	5.4	10.98	14.96	32.9	86.2	90.88
Total Formal Income tax	2038	2462	2967	3841	4699	5072.9
Informal Economy tax (% of Income Tax)	0.27	0.45	0.50	0.86	1.84	1.79

Source: (Mwila, Manley, Chileshe, Phiri, & Mpembamoto, 2011)

The underperformance of these taxes motivates the question “is there enough scope for informal economy taxation in Zambia?” In part, this is a question about the nature of Zambia’s informal economy which is known to employ 89 percent of the working population (CSO, 2011). One view is that informality comprises marginal and subsistence economic activities that can be ignored for tax purposes altogether. This view regards informality as a “cost center” in terms of taxation and it is not surprising that in the 2013 budget, government has raised the tax threshold for Micro, Small and Medium Scale enterprises (MSME) from K200 million to K800 million to improve efficiency in tax administration (GRZ, 2012). In addition, a cross sectional study of Zambia’s informal MSMEs by (Shah, 2012) reveals that only about 3 percent of informal MSMEs have incomes that do overlap with those in the formal sector. Being urban based and visible, this lucrative informal sector usually forms the basis for proponents who believe that there is appreciable income in the informal economy that can be taxed (Shah, 2012).

Equally, the underperformance of these taxes could also be explained by the challenges in tax administration pointed out by (Mwila, Manley, Chileshe, Phiri, & Mpembamoto, 2011). Firstly, auditing informal transactions is difficult because informal transactions are usually cash-based and there is a general lack of resources or skills for proper record keeping by its participants. Secondly, relative to the formal sector, the administration of informal taxes is more labour intensive, inefficient and hence more costly. Thirdly, taxing informality is not politically correct, and so, administration of informal economy taxes is sometimes hampered by political interference.

Even though proponents of informal economy taxation may base their arguments on the small, but lucrative informal economy in urban areas as (Shah, 2012) suggests, their calls are not entirely misplaced because tax literature clearly points out that in addition to the revenue and equity reason, taxing informality increases general tax compliance in the formal economy (Terkper, 2003). Economies with high levels of informality are usually characterised by lower tax compliance rates in the formal economy (Alm, Vazquez, & Schneider, 2006) and this resonates well with (Mwila, Manley, Chileshe, Phiri, & Mpembamoto, 2011) who think that rising tax evasion is one of plausible reason for a low Tax-to-GDP threshold in Zambia. International best practise stipulates a Tax-to-GDP ratio of at least 20 percent for a tax system to

be deemed productive but for Zambia, this has not been the case since 1990 (see figure one below).

Figure 1: Tax-GDP-Ratio



Source: Own calculations from World Development Indicators

As it were, concluding this on-going debate on the scope for informal economy taxation requires an empirical investigation.

1.1 Problem Statement

Government's efforts at taxing informality, and the public debates on the informal economy's tax potential, have been poorly informed due to absence of data and evidence. With dearth of literature on the size, evolution, structure, causes and characteristics of the informal economy, there is generally lack of an informal economy data base to enable effective tax policy making. As it were, taxation in the informal economy was introduced without prior knowledge of the magnitude of informal economic output (informal GDP) and its tax potential. In addition, the basis for future tax policy on informality is non-existent because the evolution of informality and its tax potential over time is unknown. Indeed, an ever-growing proportion of the labour force is entering the informal economy but also, additional information on the growth of informal GDP over time would be insightful. Given the current paucity of literature Zambia's informal economy, any set of policies directed at it may not achieve the desired outcomes. This study is an attempt to fill in part of this knowledge gap in the literature.

1.2 Objectives of the Study

The main objective of this study was to find out whether the scope for informal economy taxation exists. Specific objectives of the study were;

- To provide insights into the evolution of the informal economy over time by estimating the size of the informal economy as a percentage of GDP.
- To establish the rate of growth of the informal economy in relation to the formal economy
- To provide estimates of the tax potential of the informal economy.

1.3 Research Questions and Hypotheses

The research questions and hypotheses below were answered by empirical techniques.

- How has the informal economy evolved over time in Zambia?
- What is the rate of growth of the informal economy in relation to the formal economy?
- Is there significant tax potential in the informal economy?
- Is it worthy to devote more resources to taxing the informal economy's potential?

The hypotheses tested are summarised into:

- The informal economy is growing faster than the formal economy
- There is significant taxable income in the informal economy

1.4 Justification

The attainment of long term human development in Zambia requires an increase in domestic resource mobilisation for the creation of fiscal space. Widening the tax base as opposed to further taxation of the highly burdened formal economy is more appropriate and hence, taxation of informality is a possible option. Having an idea of the size of the informal economy, its tax potential and how they have evolved, is an important factor to consider as taxation is extended to the informal economy. This knowledge provides a basis for future tax policy and also for performance assessment of taxes introduced in the informal economy. This study can be taken as a baseline study to inspire further research on a host of aspects on the informal economy including its causes and its characteristics. As the whole, conducting this study will enhance effective taxation of this pervasive economy.

2.0 Literature Review

2.1 Concept and Definition of Informal Economy

There are conceptual and practical challenges that come with estimating informality. The conceptual problem arises because of the absence of a single definition of informality. This challenge becomes intuitive if one regards the many terms used to describe it; shadow economy, black economy, hidden economy, underground economy, parallel economy, second economy and subterranean economy. The practical challenge arises because it is usually difficult to collect data from informal workers because some have an incentive not to disclose their true incomes and even if alternative methods of estimation are available their methodologies are often open to debate.

2.1.1 Defining the Informal Economy

A precise definition is almost impossible because the informal economy adjusts to changes in tax, sanctions from tax authorities and to general moral attitudes (Schneider, & Enste, 2000). Overall, the definition of the informal economy will vary depending on the focus of a study. However, (ILO, 1993) offered the first most comprehensive and widely used definition of the informal economy: “The informal economy is broadly characterized as consisting of units engaged in the production of goods and services with the primary objective of generating employment and income to the persons concerned.” The informal economy then is defined as comprising those households with market production that are:

- Informal own account enterprises comprising either own account enterprises or those which are not registered under specific forms with the national legislation,
- Enterprises of informal employers defined either as the size of the unit below a specified employment level or non-registration of the enterprise or its employees.

While this definition is helpful, (ILO, 2002) recognised that it does not capture all the dimensions of the informal economy. A more comprehensive definition at the 2002 International Labour conference was “all economic activities by workers and economic units that are in law or practice not covered or sufficiently covered by formal arrangements” (International Labour Conference, 2002).

Some common working definitions in the literature are given below;

Feige(1994) and Schneider (1994), define it as; “all economic activities that contribute to the officially calculated / observed GDP but are currently unregistered”. Smith (1994) defines it as “market based production of goods and services, legal and illegal that escapes detection in the official estimates of GDP.” Hartzenburg and Leimann (1992) prefer a broader definition; “all economic activities pursued without the sanction of the authorities; i.e. those not recorded in the national accounts.”

Of important note is that as the definitions broaden, they become somewhat vague and misleading, allowing for very little consensus. In the case of Zambia, and taking into account the above definitions to the definition would be; “the carrying out of economic activities outside the established control structures of the Government non-registration with Patents and Companies Registration Agency (PACRA), National Pension Scheme Authority (NAPSA), and Zambia Revenue Authority (ZRA)”, and this is the definition this study will use. This definition is chosen because it will make it easy to capture all legal informal economic activities which are amenable to taxation.

2.2 Schools of Thought

There are three competing schools of thought on the nature of the informal economy.

2.2.1 Dualists

Popular in the 1970’s, this school attributed the presence of informal activities to the lack of sufficient modern jobs to mop up surplus labour (due to low economic growth and/or higher population growth). They asserted that informal activities comprised marginal activities distinct from formal activities and mostly included the poor and unemployed (ILO 1972)

2.2.2 Structuralists

According to structuralists, the informal economy is a subordinated economic unit of firms (micro firms) and workers, serving to reduce the input and labour costs and thereby increase competition of large capitalists firms. The modes and forms of production in both the formal and informal economies are thought to co-exist and interdepend on each other. The nature of capitalist development, rather than a lack of growth, is what results in the growth of informal production relationships (Portes, Manuel, & Benton, 1989).

2.2.3 Legalists

Pioneered by Hernando de Soto in the late 1980's and early 90's, it is thought that micro enterprises rationally decide to participate informally in order to avoid the costs, time and effort of formal registration. The complex and usually time consuming procedure associated with registration usually favours large corporations rather than small and medium enterprises. As long as government procedures are cumbersome and costly, micro enterprises will continue to exist (deSoto, 1989).

2.3 Overview of the Methods for Measuring the Informality

Attempts to measure informality have been difficult due to the absence of a universal and precise definition. The methods of estimating informality are generally classified into two categories; direct estimation approaches and indirect estimation approaches.

2.3.1 Direct Estimation procedures: These are micro approaches that employ either surveys or samples based on voluntary replies, or tax auditing and other compliance methods.

i) Surveys

Sample surveys directly target potential informal workers in an attempt to quantify participation in the informal economy. They are widely used as a means of collecting data on all aspects of the informal economy from its size, determinants and characteristics.

Merits and Demerits

Surveys offer the advantage of providing detailed information about the structure of the informal economy. However, like all surveys, the precision and accuracy of results are heavily dependent on the design of the questionnaire and the willingness of respondents to cooperate. Another disadvantage is that surveys are costly, time consuming and difficult and since they only give a snapshot of informal activities, they are unable to provide estimates of the evolution, development and growth of the informal economy over time. Finally, from a direct questionnaire, it is often quite difficult to assess the amount of undeclared income as some interviewees are often hesitant to fully declare the amount of income they generate (Alderslade, Talmagem, & Freeman, 2006).

ii) Tax Audits

This approach is based on the discrepancies of income declared for tax purposes and that measured by institutional selective inspections by the relevant tax authorities. Since selection of tax payers for audit is not random but based on properties of submitted tax returns that indicate

the certain likelihood of tax fraud, the sample is not a random one of the whole population (Alderslade, Talmagem, & Freeman, 2006).

Demerits

Since the sample is not a random one of the whole population, estimates of the informal economy based on a compliance sample will not be consistent. Another problem is that estimates of the size of the informal economy based on tax audits will only be a part of total informal income because tax audits reflect only a portion of that income that authorities succeed in discovering.

Generally, direct estimation methods can only give you point estimates¹ and since they are unlikely to capture all informal activities, they can be viewed as providing lower bound estimates (Schneider & Enste, 2000). The major advantage they have over all other approaches is that they provide detailed information about the informal activities, the structure and composition of those working in the informal economy.

2.3.2 Indirect Methods: Researchers have developed indirect estimation methods involving macroeconomic relationships thought to contain information about the evolution of the informal economy. They are also called indicator approaches because they use any of the various indicators that contain information about the development of the informal economy over time. There are six indirect approaches are based on indicators that leave trace of the informal economy;

i) Discrepancy between National Expenditure and National Income Statistics

In this approach, an independent estimate of total expenditure on final goods in the economy is compared with another independent estimate of national income. These two are ideally supposed to be identical and so any gap between expenditure and income serves as an estimate of the size of informality.

Merits and Demerits

The major advantage of this method is that in as much as some individuals can hide their reported incomes, their expenditures will nonetheless be captured. This method is good only to the extent that all components of expenditure are measured without error. Otherwise, the

¹ Unless these surveys are carried systematically over time to form a pooled data set

discrepancy between income and expenditure may in part, be due to errors and omissions in the statistics (ibid).

ii) Discrepancy between the Official and Actual Labour Forces

This method estimates the size of the informal economy by getting the residual between the number of people working and the number of official jobs. In the presence of reliable and accurate data, this method can give indications of the number, size, decomposition and structure of the informal workforce (Alderslade, Talmagem, & Freeman, 2006).

Demerits

Not all differences in the rate of participation may be due to informality and so, the risk of double counting is high because some people in the formal economy have jobs in the informal economy. Estimates from this method can thus be viewed as weak indicators of the development and size of the informal economy and its reliance on reliable and accurate data makes it difficult to apply in developing economies (Alderslade, Talmagem, & Freeman, 2006).

iii) The Transactions Approach

Pioneered by (Feige, 1994) and refined (Feige, 2003) by this method uses Fisher's quantity equation $MV = PT$ as its conceptual framework (where $M = \text{money}$, $V = \text{velocity}$, $P = \text{Prices}$ and $T = \text{Total transactions}$). This equation states that in an economy, the volume of payments MV should be equal to the volume of transactions (PT). The difference between estimated payments (MV) and estimated transactions (PT) give an estimate of 'unrecorded transactions'. Given the estimates of the unrecorded transactions, it becomes possible to estimate the volume of unrecorded (informal) income by using the velocity from an independent investigation of the ratio of transactions to income (Feige, 1994).

Merits and Demerits

Estimates of total payments made by cheques are readily available from bank debit statistics and total currency payments can be estimated from data on the stock of currency. Total transactions can be decomposed into; i) final goods and services transactions (obtainable from standard GNP accounts; ii) intermediate transactions (obtainable from nation's input-output tables); iii) transactions in real and financial domestic assets (obtainable from flow of funds data); iv) transfer payments (from government transfer accounts); v) foreign goods and capital transactions (from balance of payments accounts) and vi) unrecorded transactions (which is the difference between estimated payments (MV) and estimated transactions (PT)). Given the

estimates of the unrecorded transactions, it becomes possible to estimate the volume of unrecorded (informal) income by using the velocity from an independent investigation of the ratio of transactions to income.

This method however, relies on the availability of precise figures of the total volume of transactions and these data might be especially difficult for cash transactions because they depend, among other factors, on the durability of bank notes in terms of the quality of the papers on which they are printed (Feige, 1994). According to (Schneider, 2004) , the upholding of the assumption that all variations in the ratio between total value of transaction and officially measured GDP are due to the shadow economy implies that considerable amounts of data are required in order to eliminate financial transactions from ‘pure’ cross payments which are legal and have nothing to do with the informal economy. Further, the assumption about a constant velocity is subject to a lot of criticism especially in the face of improving methods of payments such as the use of ATM’s, checks and electronic bank transfers which reduce the desire to hold cash and consequently velocity of money. In general, the empirical requirements necessary to obtain reliable estimates are difficult to fulfil and may lead to doubtful results especially in developing countries.

iv) The Currency Demand Approach

This method is based on the premise that transactions in the informal economy are usually conducted in cash in order to leave no traces for the authorities (Tanzi, 1980). As such, an increase in informal activities is associated with ‘excess’ demand for currency. Using econometrics, observed currency demand is bifurcated into currency demanded for formal transactions and currency demanded for informal transactions (excess demand). This excess currency can be turned into informal income using an appropriate velocity of income. The main flaw is that not all informal transactions are carried out in cash (some use barter) and tax burden is not the only factor influencing informality².

Merits and Demerits

The main merit of this method is that it is simple to apply and yields insightful results. However, not all transactions in the informal economy are carried out in cash and so, the size of the informal economy may be larger than estimated (Ahumada, Facundo, & Alfredo, 2006).

² See Breuch (2005) and Ahumada et al (2008) on the caveats of this approach

Secondly, it's not only the high tax burden that motivates people to participate in informal activities. Relevant factors such as impact of regulation, attitudes of tax payers towards the state and tax morality are usually left out, due to the absence of reliable data for most developing countries on these variables. In most developing countries, informality may be a coping strategy by individuals in environments where earning opportunities are scarce. Finally, the assumption of a base year in which there was no informal economy is open to criticism and relaxing this assumption would push estimates of the informal economy upward.

v) Physical Input/Electricity Consumption Method

The electricity method pioneered by Kaufmann and Kaliberda assumes that the best physical indicator of economic activity is electricity consumption and that the growth of total electricity consumption is an indicator for growth of formal and informal GDP (Kaufmann & Kaliberda, 1996) They empirically show that electricity consumption and GDP share the same elasticity and so, the difference in growth of GDP and electricity consumption can be attributed to informality.

Demerits

Schneider (2002) criticises this method on the grounds that not all informal activities require the use of electricity. In Zambia for example, wood fuel is responsible for over 75% of energy consumption. Secondly, the volatility of the elasticity of electricity consumption depends upon the respective market and on the efficiency of electricity distribution and consumption due to considerable technical progress. Finally, there may be considerable differences or changes in the elasticity of electricity/GDP across countries and over time

vi) The Dynamic Multiple Indicators-Multiple Causes Model (DYMIMIC) or Model Approach³

The dynamic multiple indicators multiple causes model (DYMIMIC) is based on the statistical theory of unobserved variables, where informality (the unobservable) is caused by multiple factors and manifests itself in multiple forms. The output obtained from a DYMIMIC is a time series index of the informal economy and so there is need to use another macro-model⁴ as a benchmark for the conversion of this index into a monetary value (Frey & Weck, 1984). It is more robust than the indirect methods especially when country specific indicators and causes of the informality are used.

³ If this modeling is not dynamic what we have is a Multiple indicators Multiple cause model (MIMIC)

⁴ Usually the currency demand or physical input method are used

Merits and Demerits

One of the many advantages of this method is its ability to utilise multiple data sources to capture as many components of informal economic activity as possible. Also, this method makes it possible to make use of country specific indicators and causes of the informal economy. The other advantage is its ability to determine both the size and evolution of the informal economy over time. However, the MIMIC or DYMIMIC is criticised on grounds that there is no theory that is used in order to determine which variables to include as indicators or as causes. In addition, the estimate of the informal economy from this model relies on physical input or monetary methods for the initial levels, thus making it vulnerable to the criticisms of these two methods (Arby, Malik, & Hanif, 2010).

2.4 Review of Empirical Findings

Estimates of informality from different estimation methods are unavailable for Zambia. The only available estimates available are due to (Schneider & Enste, 2000) and (Schneider, 2004) who use the DYMIMIC approach. Schneider (2004) is an update of findings in (Schneider & Enste, 2000) because the same methodology is used and only the time period under investigation is increased. In (Schneider, 2004), he applies the DYMIMIC method to 37 African economies including Zambia. His findings suggest that informality in Zambia, which was increasing during the period 1999-2002, was above the average levels of informality in the 37 countries (see table two below).

Table 2: Informality (% of GDP) for Selected African Economies

	Country	1999/2000	2001/2002	2002/2003
Top Three Largest Informal Economies	Zimbabwe	59.4%	61.0%	63.2 %
	Tanzania	58.3%	59.4%	60.2%
	Nigeria	57.9%	58.6%	59.4%
Fourth Ranked	Zambia	48.9%	49.7%	50.8%
Bottom Three Smallest Informal Economies	Namibia	31.4%	32.6%	33.4%
	Lesotho	31.3%	32.4%	33.3%
	South Africa	28.4%	29.1%	29.5%
Average for 37 African economies		41.3%	42.3%	43.2%

Source: Author's compilation from (Schneider, 2004)

Schneider (2004) ranks the three largest informal economies to be those of Zimbabwe, Tanzania and Nigeria in descending order and the smallest three being South Africa, Lesotho and Namibia in ascending order. Attributing informality to tax burden, intensity of regulation, and quality of public service provision for the 37 African economies over the period 1999-2003, he finds evidence that all countries in his sample experienced increasing informality.

Tanzania (with one of the largest informal economies) and South Africa (with one of the smallest informal economies) are the two notable exceptions that have estimates of informality other than those of Schneider (2004). The work by (Bagachwa & Maliyamkono, 1990) that used the currency demand deposit ratio suggested by (Guttman, 1977)⁵ was the first attempt into estimating informality in Tanzania. Later, (Bagachwa & Naho, 1995) used the currency demand approach and reported estimates consistently higher than those obtained in the previous study by (Bagachwa & Maliyamkono, 1990). Bagachwa and Naho (1995) found that the informal economy in Tanzania grew from an average of 20 percent of GDP in the late 1960's to over 40 percent of GDP in the 1980's and so, (Schneider, 2004) estimates are not off the mark.

While informality in most African economies has been on the rise since the 1960's, South Africa on the other hand has been experiencing declining levels of informality. In the 1960's average informality was around 12 percent and this dropped to 7.5 percent in the 1990's (Saunders, 2005). Saunders (2005) attributes the low levels of informality in South Africa to its rather unique political, economic and regulatory environment not present in most African countries. The table below shows the results of the various studies undertaken in South Africa for different time periods.

⁵ Guttman's method is an old variant of the currency demand method which is less preferred to Tanzi's approach

Table 3: Informality (% of GDP) in South Africa

Method	Informal Economy as % of GDP						S o u r c e
	1989	1993	1994	1999	2001	2002	
Survey	9 %	-	-	-	-	-	Van de Berg (1990)
	-	9.2%	6.7%	-	-	-	Martins & Ligthelm (1995)
Income –expenditure Discrepancy	-	-	-	7 %	-	-	Prinsloo (1999)
Actual –official Employment Discrepancy	12.6%	-	-	-	-	-	Loots (1991)
Currency Demand	9 %	-	-	-	-	-	Harztenburg & Leimann (1992)
	8.2 %	7.7%	8.4%	8.1%	7.2%		Saunders (2005)
DYMIMIC	-	-	-	28.4%	29.1%	29.5%	Schneider (2004)

Source: Author’s compilation from the various sources

As can be seen, most of the estimation approaches (except the DYMIMIC), suggest relatively low levels of informality not exceeding 13 percent during the 1990’s. The (Schneider, 2004) estimates are not only larger than from other studies, they also indicate growing informality unlike other methods, a discrepancy which is difficult to reconcile. It is not clear how the different methods (although considering one indicator of informality) give a totally different picture from the most robust method currently available. Notable in the table above is the closeness of results obtained by both the currency demand and the survey method, with the currency demand being the more conservative of the two.

In the other developing countries, studies by; (Ritchie, 2006)for Jamaica; (Arby, Malik, & Hanif, 2010) for Pakistan; (Perazzi, Giampaolo, & Castillo, 2010) for Venezuela and; (Macias & Cazzavillan, 2008) for Mexico; use more than one estimation method to estimate informality and hence it becomes possible to compare their results with those of (Schneider, 2004)

Table 4: Informality (% of GDP) for Some Non- African Developing Economies

Country	Source	Survey	Kaufman & Kaliberda	Currency Demand	DYMIMIC	Year
Jamaica	Richie (2006)		45.5%	28.1%	-	2000
	Schneider (2004)	-	-	-	36.64%	2000
Venezuela	Perrazzi et al (2010)	21.48%	21.93%	28.15%	-	2005
	Schneider (2004)	-	-	-	36.7%	2003
Pakistan	Arby et al (2010)	-	28.2%	29.0%	29.1%	2003
	Schneider (2004)	-	-	-	38.7%	2003
Mexico	(Macias & Cazzavillan, 2008)	-	-	29%	-	2006
	INEGI (2006)	27.2%	-	-	-	2006
	Schneider (2004)	-	-	-	33.2%	2003

Source: Author's compilation from the various sources

In the table above, comparing results of the three methods from the two studies done in Jamaica, it is seen that the electricity method gives comparable results to the DYMIMIC than the currency demand. For Venezuela, (Perazzi, Giampaolo, & Castillo, 2010) finds that the currency demand, electricity consumption and the survey method all give comparable estimates of informality (one of the few cases where the physical input method gives values close to the currency demand). However, estimates on Venezuela's level of informality in (Schneider, 2004) from the DYMIMIC are consistently higher than those reported by other methods in (Perazzi, Giampaolo, & Castillo, 2010). For Pakistan, (Arby, Malik, & Hanif, 2010) finds that the estimates from the currency demand, DYMIMIC and electricity consumption method are comparable, though the electricity method gave estimates closer to the DYMIMIC than the currency demand method. In Mexico, three separate studies using three different methods i.e. the currency demand, survey and DYMIMIC, produced comparable results among them, though like in the case of South Africa, the currency demand produced lesser estimates than those from the survey.

For the developing countries as a group, we see that the currency demand, survey and DYMIMIC give comparable results among them while the physical input method, on average,

gives larger estimates than the other three. As a rule of thumb, the (Schneider, 2004) estimates are expected to be larger on average because estimating informality is a ‘grope in the dark’ and so, the more one knows about this ‘unknown’ phenomenon, the higher estimates you obtain. Thus, by attributing informality to multiple causes and manifests in multiple indicators, the Schneider (2004) estimates using the DYMIMIC tend to be generally higher. However, country specific causes would be more insightful to use in a DYMIMIC framework and as such, it is advisable to use a DYMIMIC after such information has been garnered.

Findings for Some Developed Countries...

It would be imperative to also get insights into how the different methods of estimating informality contrast to each other in developed countries. Table five below shows some of the various studies that use different estimation methods for the German economy. The smallest values of informality are reported by the survey method while the largest are reported by the actual–official employment discrepancy method. The currency demand and DYMIMIC approaches give comparable results even though different sample sizes are used in different studies. Comparing between the two monetary methods-the transactions and currency demand approach-it becomes clear that the currency demand approach gives relatively conservative estimates than the transactions approach.

Table 5: Size of informal economy as percentage of GDP for Germany

Method	Informal Economy as % of GDP								Source
	1970	1975	1980	1985	1990	1995	2000	2005	
Survey	-	3.6	-	-	-	-	-	-	IFD Allensbach (1975)
	-	-	-	-	-	-	4.1	3.1	Feld and Larsen (2005)
Income -expenditure Discrepancy	11.0	10.2	13.4	-	-	-	-	-	Lipert and Walker (1997)
Actual –official Employment Discrepancy	23.0	38.5	34.0	-	-	-	-	-	Langstedt (1985)
Physical Input	-	-	-	14.5	14.6	-	-	-	Feld and Larsen (2005)
Transactions approach	17.2	22.3	29.3	31.4	-	-	-	-	Feld and Larsen (2005)
Currency Demand	3.1	6.0	10.3	-	-	-	-	-	Kirchgassner (1982)
DYMIMIC	-	-	9.4	10.1	11.4	15.1	16.3	-	Pickardt and Sarda (2006)
	4.2	5.8	10.8	11.2	12.2	13.9	16	15.4	Schneider (2004, 2007)

Source: (Buhn, Alexander, & Schneider, 2007)

For a cross country comparison of eight different methods for five OECD countries, table six below extracted from (Schneider & Enste, 2000) paints the picture that; the survey approach provides the lowest values of informality; the currency demand and DYMIMIC provide similar, intermediate range of informality estimates (are more conservative than electricity consumption methods) and; the actual/official labour force discrepancy provides the largest estimates. Closer inspection shows that the currency demand and transaction approach often given different estimates for most countries but on the other hand, the currency demand consistently gives estimates close to the Model approach. This similarity is not coincidental because the DYMIMIC approach usually uses the currency demand to convert the latent variable index into absolute figures.

Table 6: Size of informal Economy as percentage of GDP in 5 OECD Countries

Method	CANADA Average over				GERMANY Average over				GREAT BRITAIN Average over				ITALY Average over				UNITED STATES Average over			
	1970-75	1976-80	1970-75	1970-75	1976-80	1981-85	1986-90	1976-80	1980-85	1986-90	1980-85	1986-90	1970-75	1976-80	1981-85	1986-90	1970-75	1976-80	1981-85	1986-90
Survey	-	-	-	3.7	4.5	5.6	-	-	-	-	1.3	1.4	3.6	-	-	-	1.5	-	-	-
Tax Audit	-	-	3	4.9	6.3	8.2	10	3.9	-	10	2.9	-	-	-	-	-	-	-	-	-
Expenditure-income discrepancy	-	-	3.2	3.2	4.9	6.1	10.2	4.3	-	9.3	-	-	11	10.2	13.4	-	2.5	3.6	4.2	-
Official-Actual employment discrepancy	-	-	-	-	-	-	-	18.4	-	-	-	-	23	38.5	34	-	-	-	-	-
Physical input	-	-	-	-	-	7.8	9.9	-	-	19.3	-	11.2	-	-	-	14.5	-	-	-	13.2
Currency demand	5.1	6.3	11.3	3.5	4.6	5.3	6.2	13.2	17.5	21.3	8.8	12	4.5	7.8	9.2	11.3	4.3	7.9	8.5	9.7
Transactions Approach	-	26.5	19.5	17.3	24.9	21.2	19.4	26.4	34.3	-	15.4	21.21	17.2	22.3	29.3	31.4	17.2	12.6	15.9	-
MIMIC	-	8.7	-	-	8.2	-	-	10.5	-	-	-	-	5.8	6.1	8.2	-	-	8.0	-	-

Source: (Schneider & Enste, 2000)

Overall it has been observed that in economies with low informality (developed countries in general), though comparable, the survey method yields lesser estimates than the currency demand method. This observation is also seen for South Africa, an economy with low informality. The above observation changes when we focus on economies with relatively large levels of informality in Latin America. Studies by (Perazzi, Giampaolo, & Castillo, 2010) for Venezuela, and (Macias & Cazzavillan, 2008) for Mexico, indicate that the survey method seems to provide larger estimates of informality than the currency demand method. This observation is not surprising because informality in developing countries is caused by many factors other than a high tax burden and hence, the motive to hide income in say, a questionnaire, may be less avid than in developed economies (Gërkhani, 2005).

This study adopted the currency demand approach due to its comparable results with the more preferred estimation procedures such as the survey and the DYMIMIC approaches. Also, the need to observe how informality has evolved over time and the unavailability of information about the appropriate causes and indicators of Zambia's informal economy (as inputs in the DYMIMIC), makes the currency demand method preferable to use.

3.0 Methodology

Presented first is the theoretical framework of the currency demand model and later on the econometric model is presented.

3.1 The Currency Demand Model⁶

The currency demand function in Cagan's tradition is given by

$$C_o = A(1 + F)^\alpha Y_o^\beta e^{\gamma i} \quad A, \alpha, \beta, > 0 \text{ and } \gamma < 0 \quad (1)$$

C_o is the observed currency in real terms⁷, A is a multiplicative constant, F is the fiscal variable (e.g tax revenue to GDP or Government spending to GDP ratios) which is explicitly thought to influence informal activities, Y_o is the observed official real GDP and i is the opportunity cost of holding money (interest or inflation). Informality is assumed to be an increasing function of the fiscal variable and this increases the demand for currency; real GDP has a positive effect on the demand for currency as the total volume of transactions increase and; the opportunity cost of holding money takes the pressure off currency holdings. Taking logs gives the equation to estimate as;

$$\ln(C_o) = \ln A + \alpha \ln(1 + F) + \beta \ln(Y_o) + \gamma i \quad (2)$$

The observed currency C_o is equal to the total currency in circulation (C_t). The total currency in circulation is composed of currency used in the formal sector C_f and currency used in the informal sector C_{inf} . Therefore;

$$C_o = C_t = C_f + C_{inf} \quad (3)$$

It is assumed that observed GDP (Y_o) is composed only of formal income (Y_f) but total income in the economy, (Y_t), is composed of income from formal activities (Y_f) and informal activities (Y_{inf}). Therefore,

$$Y_t = Y_f + Y_{inf} \quad (4)$$

Estimating equation (2) would bring inconsistency in our estimates since observed currency C_o includes informal uses of currency C_{inf} , while observed GDP ($Y_o = Y_f$) does not include income from the informal economy. Equation (1) is a long run relationship, and by setting F

⁶ This section is based on (Ahumada, Facundo, & Alfredo, 2006) and (Hernandez, 2005)

⁷ Deflated by the GDP based deflator

to zero and assuming the demands for C_f and C_{inf} have the same functional form with equal parameters, it is possible to obtain an unbiased estimate of C_f since the incentives to engage in informal activities is eliminated⁸. As the fiscal variable F approaches Zero, Y_f approaches Y_t , in the limit.

$$C_f = AY_0^\beta e^{\gamma i} \quad (5)$$

Estimating equation (5) will give the estimated demand for currency for formal activities and using the fact that;

$$C_{inf} = C_t - C_f \quad (6)$$

We obtain the estimated excess demand for cash due to informal activities.

Having obtained demand for currency in the informal economy, the obvious way to obtain the velocity of cash in circulation in the formal economy is;

$$v_f = \frac{Y_f}{C_f} \quad (7),$$

Assuming equal velocity both in the formal and informal economy then;

$$v_f = \frac{Y_f}{C_f} = \frac{Y_{inf}}{C_{inf}} \quad (8)$$

We can use this velocity to convert informal cash demand into informal income as;

$$Y_{inf} = v_f C_{inf} \quad (9)$$

Where Y_{inf} is the estimated size of the informal economy and it is obtained using C_{inf} from equation (6) and v_f from equation (7).

Explicitly implied in equation (8) is that the income elasticity of currency demand is one i.e. $\beta = 1$. Recalling the fact that income velocity in equation (7) is

$$v_f = \frac{Y_f}{C_f} = \frac{Y_f}{AY_f^\beta e^{\gamma i}} = \frac{Y_f^{1-\beta}}{Ae^{\gamma i}} \quad (10)$$

The velocity for the informal economy is given by

⁸ This is only possible at zero taxation, state regulation is also zero-equivalent to assuming no government intervention

$$v_i = \frac{Y_{inf}}{C_{inf}} = \frac{Y_{inf}}{AY_{inf}^\beta e^{\gamma i}} = \frac{Y_{inf}^{1-\beta}}{Ae^{\gamma i}} \quad (11)$$

So velocity in both economies is equal if $\beta = 1$ or equivalently if Y_f and Y_{inf} are the same for any given β . Only under these conditions will estimates be consistent.

3.1.1 Condition for Consistent Estimation of velocity when $\beta \neq 1$

The above technique implicitly assumes that C_f and C_{inf} follow Cagan type forms with equal parameters. This allows us to write the aggregate demand equation (3) $C_t = C_f + C_{inf}$ as;

$$C_t = AY_f^\beta e^{\gamma i} + AY_{inf}^\beta e^{\gamma i} \quad (12)$$

The ratio of C_f to C_{inf} is given by;

$$\frac{C_f}{C_{inf}} = \frac{AY_f^\beta e^{\gamma i}}{AY_{inf}^\beta e^{\gamma i}} = \left(\frac{Y_f}{Y_{inf}}\right)^\beta \quad (13)$$

Equation (13) provides an expression of how to obtain Y_{inf} given Y_o , C_f , C_{inf} and β and there is no need/application of ad hoc assumptions of equal velocity. If the assumption of equal velocity in the formal and informal economy is accurate, then from equation (13)

$$\frac{Y_f}{C_f} = \frac{Y_{inf}}{C_{inf}} \left(\frac{Y_f}{Y_{inf}}\right)^{1-\beta} = v_f \quad (14.a)$$

or

$$v_f = v_i \left(\frac{Y_f}{Y_i}\right)^{1-\beta} \quad (14.b)$$

Equation (14.b) shows clearly that the assumption of equal velocity in the formal and informal economy is equal only if the hypothesis $\beta = 1$ is not rejected. To obtain an expression that gives 'correct' estimates when $\beta = 1$ is rejected, we can first let;

$$\frac{C_f}{C_{inf}} = \frac{\tilde{Y}_f}{\tilde{Y}_{inf}} \quad (15)$$

be the relationship derived assuming $\beta = 1$. Then from equation (13) and equation (15) we have;

$$\frac{Y_f}{Y_{inf}} = \left(\frac{C_f}{C_{inf}}\right)^{1/\beta} = \left(\frac{\tilde{Y}_f}{\tilde{Y}_{inf}}\right)^{1/\beta} \quad (16)$$

It is equation (16) above that is the correction formula to use when $\beta \neq 1$.

3.2 Econometric Model

One of the important caveats when using the currency demand is on how to deflate the currency series. The standard (Tanzi, 1983) approach uses M_2 to deflate the currency series but (Spiro, 1996) criticises this on grounds that currency is mainly used for transactions and so the use of M_2 becomes inadequate as it contains some amount corresponding to long term wealth accumulation. Thus, this study deflated the currency series with the GDP deflator following the approach by (Macias & Cazzavillan, 2008). Following the approach by (Hernandez, 2005) our modelling controls for both inflation and nominal interest rates to measure the (real) opportunity cost of holding money because during the 1990-2000 decade, Zambia was a high inflation country. To capture long and short run effects and to avoid the endogeneity and feedback effects among our variables, a restricted vector autoregressive model (VAR) was set up. By estimating long run relationships, we obviate the need to assume a time when informal activities were known for certain.⁹

The econometric model is given below after a logarithmic transformation of equation (1), the long run equation, from the chapter three.

$$\ln(C_0) = \ln A + \alpha \ln(1 + F) + \beta \ln(Y_0) + \gamma_1 i + \gamma_2 r + \varepsilon_i \quad (2)$$

Where C_0 = Nominal currency held by the public deflated by the GDP deflator

F = Is the fiscal variable which is tax revenue as a proportion of GDP

Y_0 = Real GDP

i = GDP deflator based inflation rate

r = interest rate as measured by the 91 day Treasury bill rate

ε_i = Error term

And $A, \alpha, \beta > 0$ and $\gamma_1, \gamma_2 < 0$ are all unknown parameters to be estimated.

3.3 Data Description

Data consisted of annual observations from 1973 to 2010 drawn from the Bank of Zambia and World Bank Statistics. Currency holdings by the public (C) was measured as nominal currency in circulation outside banks (in millions of kwacha) deflated by the GDP deflator. Real GDP (Y) (in millions) measured in 2005 prices, the average tax rate (T) approximated by the total revenues normalised by GDP, opportunity costs variables; interest (R) and inflation (π) were measured by the 91-day Treasury bill rate and the GDP based inflation rate. The GDP deflator and the GDP based inflation rate were all indexed to the year 2005.

⁹ See Ahumada et al (2008) for an in depth critique of estimating short run models in this approach

4.0 Estimation

Bearing in mind that the variables of interest are time series, unit root tests were carried out to avoid spurious results.

4.1 Unit root tests

When testing for unit roots in the variables, an inspection of each variable's time plot was used to give an indication of the assumptions to use when carrying out the unit root tests.

Variable 1: $\ln(\text{currency})$

Figure 2: Time Plot of $\ln(\text{currency})$

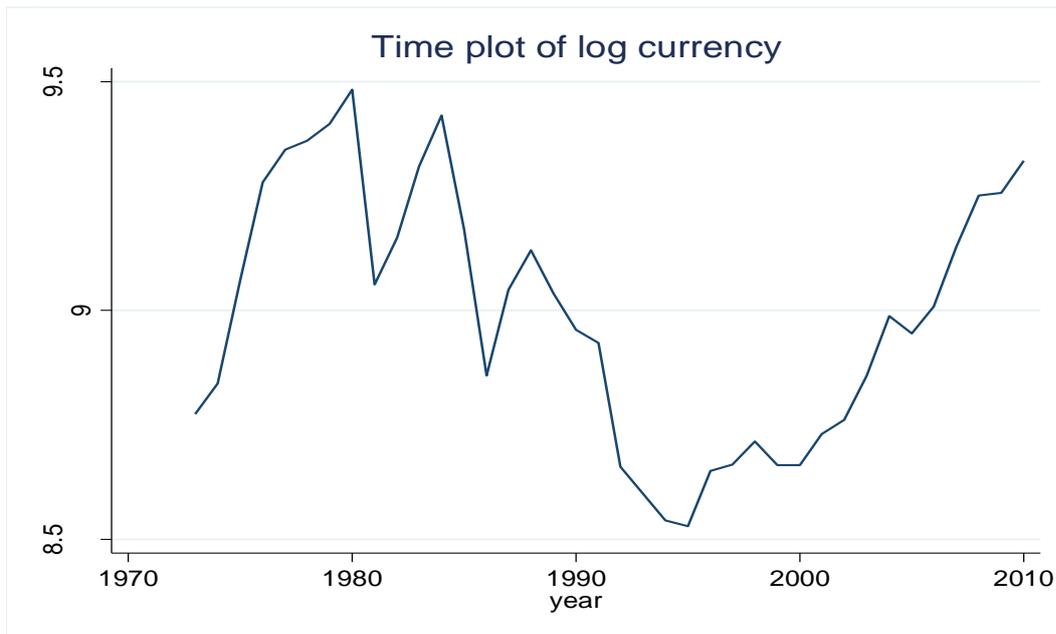


Table 7: Unit Root Tests for $\ln(\text{currency})$

Tests	$\ln(\text{currency})$	Statistic	Lag length
Augmented Dickey Fuller	Level	-1.171	2
	First difference	-3.780***	2
Phillips Perron	Level	-1.555	2
	First Difference	-4.994***	2

Given the time plot in the figure above, both tests were carried out assuming an intercept and no trend. The lag length was chosen using the Schwarz information Criterion. The null Hypothesis is: Variable has a unit root. Note: *** indicates significance at the one percent level

Conclusion

The series of log currency are stationary after first difference.

Variable 2: $\ln(GDP)$

Figure 3: Time plot of $\ln(GDP)$

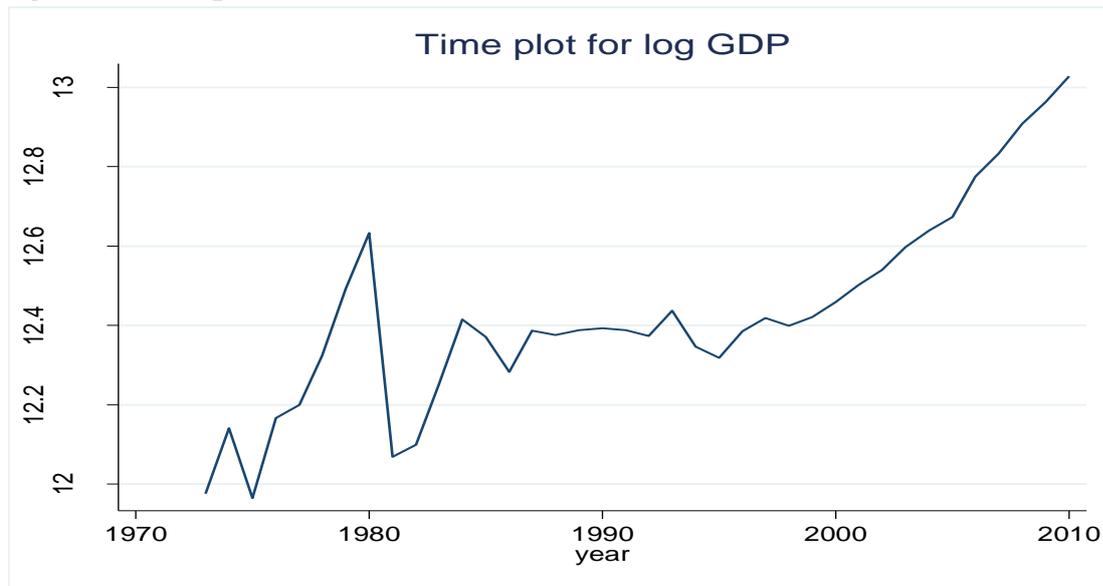


Table 8: Unit Root Tests for $\ln(GDP)$

Test	$\ln(GDP)$	Statistic	Lag length
Augmented Dickey Fuller	Level	-2.07	2
	First difference	-5.244 ***	2
Phillips Perron	Level	-15.078	2
	First Difference	-37.976 ***	2

Given the time plot in figure three, both tests were performed assuming a trend and an intercept term. The lag length was chosen using the Schwarz information Criterion. Null Hypothesis: Variable has a unit root.

Note: *** indicates significance at the one percent level

Conclusion

Series of Log of GDP is stationary in first differences.

Variable 3: Tax/GDP ratio

Figure 4: Time Plot of Tax/GDP Ratio



Table 9: Unit Root Tests for Tax/GDP Ratio

Test	Tax/GDP	Statistic	Lag length
Augmented Dickey Fuller	Level	-1.872	4
	First difference	-4.057***	4
Phillips Perron	Level	-15.635**	4
	First Difference	-46.148***	4

Given the time plot in figure four, both tests were carried out assuming an intercept but with no trend. The lag length was chosen using the Schwarz information Criterion. Null Hypothesis: Variable has a unit root.

Note: *** indicates significance at the one percent level and ** Indicates significance at the five percent level

Conclusion

Tax/GDP is stationary at first difference

Variable 4: Interest rate

Figure 5: Time plot of Interest rate

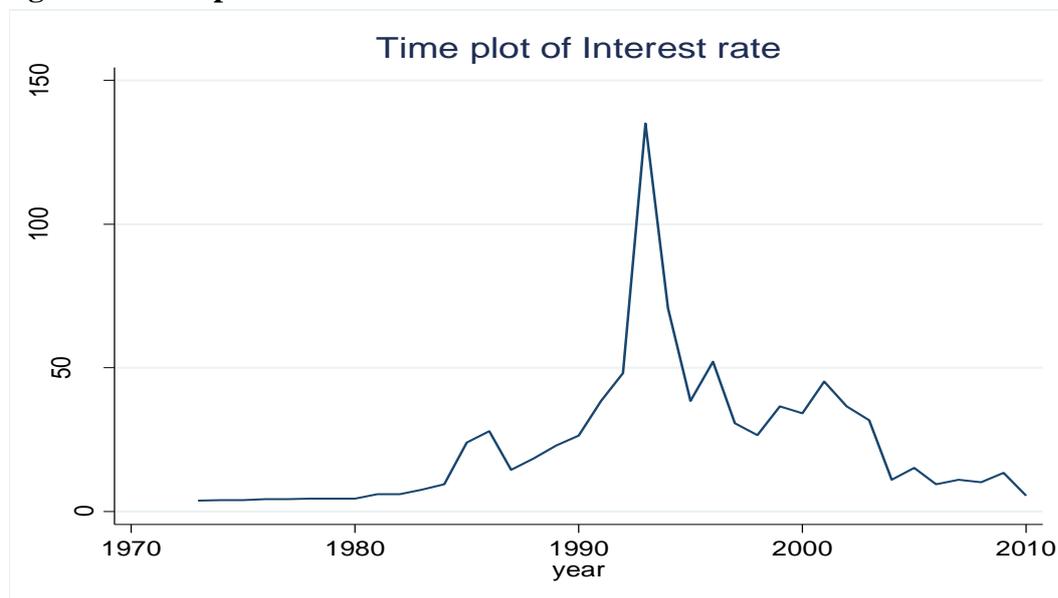


Table 10: Unit Root Tests for Interest Rate

Test	Interest rate	Statistic	Lag length
Augmented Dickey Fuller ^a	Level	-1.364	4
	First difference	-3.450**	4
Phillips Perron ^a	Level	-12.487	4
	First Difference	-37.486***	4
Augmented Dickey Fuller ^b	Level	-1.712	4
	First difference	-3.227**	4
Phillips Perron ^b	Level	-10.440*	4
	First Difference	-38.043***	4

The lag length was chosen using the Schwarz information Criterion. Null Hypothesis: Variable has a unit root.

Note:*** indicates significance at the one percent level, ** Indicates significance at the five percent level,

*indicates significance at the ten percent level. Given the time plot in figure five, two assumptions were upheld;

a-Test was conducted using intercept and trend ; b-Test was conducted with intercept only

Conclusion

Interest rate is stationary in first differences

Variable 6: Inflation

Figure 6: Time plot of Inflation

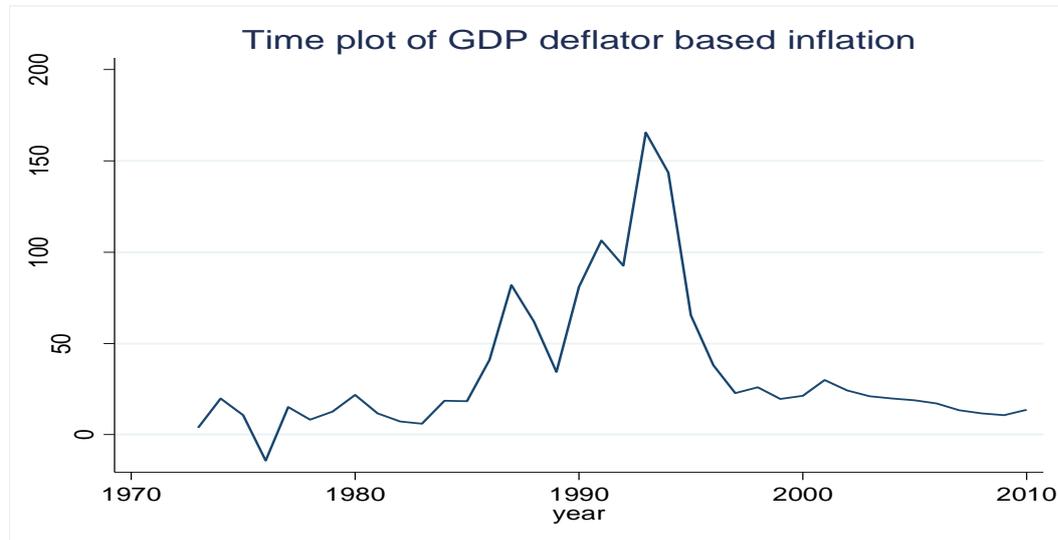


Table 11: Unit Root Tests for Inflation

Tests	<i>Inflation</i>	Statistic	Lag length
Augmented Dickey Fuller ^a	Level	-1.533	2
	First difference	-2.974	2
Phillips Perron ^a	Level	-7.467	2
	First Difference	-31.853***	2
Augmented Dickey Fuller ^b	Level	-1.645	2
	First difference	-2.881**	2
Phillips Perron ^b	Level	-7.754	2
	First Difference	-31.746***	2

The lag length was chosen using the Schwarz information Criterion

Null Hypothesis: Variable has a unit root.

Note:*** indicates significance at the one percent level; ** Indicates significance at the five percent level.

Given the time plot in figure six, two assumptions were upheld;

a-Test was conducted using intercept and trend

b-Test was conducted using intercept only

Conclusion

Inflation is stationary at first difference.

4.1.1 Cointegration

Having found evidence of the variables being integrated of the first order, the Johansens' cointegration test was employed to check if there exists a long run relationship among them.

Our tests as shown in the table 12 below indicate the existence of one long run relationship.

Table 12: Cointegration Tests

Null Hypothesis	Alternative Hypothesis		5% Critical Value	1% Critical Value	value
	λ_{trace} tests		λ_{trace} value		
None	$r = 0$	$r > 0$	97.0644	76.07	84.45
Utmost one	$r \leq 1$	$r > 1$	50.1604*	53.1	60.16
At most 2	$r \leq 2$	$r > 2$	23.4648	34.91	41.07
At most 3	$r \leq 3$	$r > 3$	9.3809	19.96	24.60
At most 4	$r \leq 4$	$r > 4$	3.4867	9.42	12.97
	λ_{max} tests		λ_{max} value		
One	$r = 0$	$r = 1$	46.9040	34.40	39.79
	$r = 1$	$r = 2$	26.6955	28.14	33.24
	$r = 2$	$r = 3$	14.0840	22.00	26.81
	$r = 3$	$r = 4$	5.8942	15.67	20.20
	$r = 4$	$r = 5$	3.4867	9.24	12.97

A maximum lag of two was used with no deterministic trend.

* Means that null hypothesis of the existence of one cointegrating equation is chosen at one percent.

With evidence suggesting the existence of a long run relationship among the variables, ordinary estimation methods are ruled out and a Vector Error Correction Model (VECM) was employed. The coefficients for the long-run relationship of the currency demand equation obtained from the VECM are reported below¹⁰;

$$\begin{aligned}
 \mathit{Incurrency} = & -8.643 + 17.764 \ln(1 + F) + 1.183 \ln GDP - 0.0156 \mathit{interest} + 0.008 \mathit{inflation} \\
 & (3.6320) \quad (2.77454) \quad (0.2583) \quad (0.0025) \quad (0.0016)
 \end{aligned}$$

Standard errors are in parenthesis and all the coefficients are significant at the five percent level.

Results show that all long run cointegrating parameters are statistically significant and have the expected signs, save inflation¹¹. The fiscal variable has an important and significant effect on currency and the income elasticity is slightly greater than one. In their application of the currency demand approach, (Gadea & Serrano-Sanz, 2002) state that inflation could also have a positive effect on currency by accelerating transactions particularly during periods of

¹⁰ A financial innovation variable (M2-GDP and Domestic credit to private sector as % of GDP) and also government consumption/GDP were used in alternative modeling's but gave estimates with wrong signs and were insignificant respectively

¹¹ The study by Hernandez (2005) also found a positive effect of inflation on currency demand for the Peruvian economy. It was also plagued with high inflation at some point

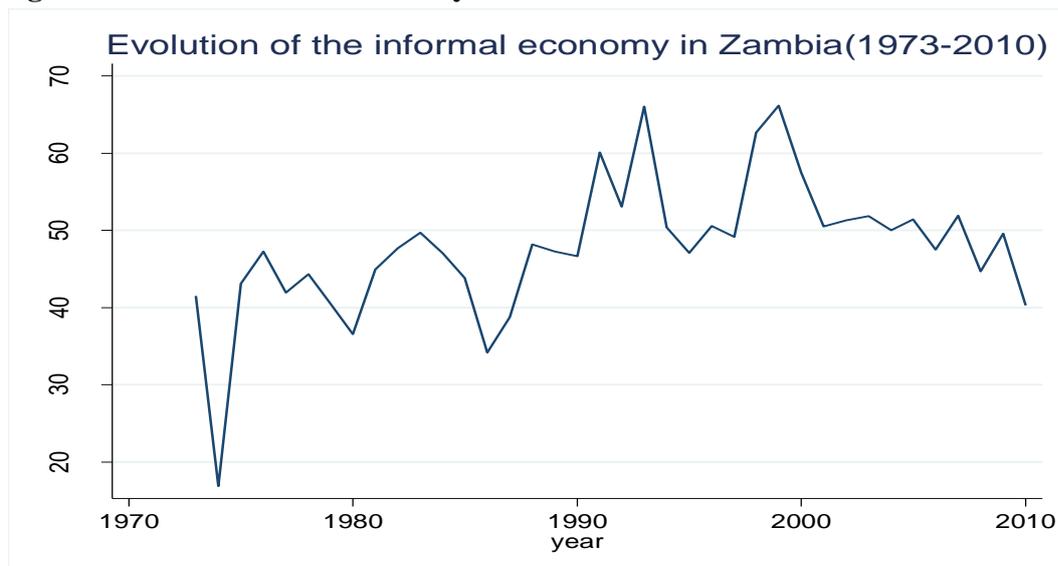
high inflation, and as such, the opportunity cost, measured through this variable, would only appear in broader monetary aggregates that include savings. (Crane & Nourzad, 1986) are also of the view that that inflation can have a positive effect on informal transactions by stirring the social climate and relaxing compliance to tax responsibilities.

By setting the tax/GDP ratio to zero and re-estimating the equation keeping all the other coefficients unchanged, currency demanded solely for formal transactions was predicted. Assuming an equal velocity of circulation between formal and informal transactions, and allowing for an income-elasticity different from one according to equation (16), the demand for currency for informal transactions, and, consequently, the size of the informal economy was estimated. In obtaining the velocity of circulation in the formal economy, (Gadea & Serrano-Sanz, 2002) recommend taking as reference a monetary aggregate M that is frequently used in the formal economy to carry out transactions which could reflect in other methods of payment M_1, M_2 or M_3 . Thus, excess currency, C_{inf} , is subtracted from M in order to arrive at a more realistic measure of formal currency. Following this approach the monetary aggregate used was M_1 and velocity was estimated using the equation below;

$$v = \frac{GDP}{M_1 - C_{informal}}$$

Figure seven below gives the estimates of Zambia's informality over time which, on average, has increased from 1973 to 2000. The highest levels of informality are coinciding with the era of liberalisation which was characterised by significant job cuts and redundancies due to structural adjustment. However, a conservative decline in informality as a proportion of GDP is seen after 2007.

Figure 7: Evolution of Informality



As a proportion of formal GDP, informality has averaged 47.7 percent per annum (or K 10,900 billion¹²), reaching its peak during the 1991-2000 decade where it averaged 56.3 percent. As of 2010, the informal economy was as large as 40 percent of GDP or equivalently K 15,512 billion.

Table 13: Average Period Estimations of the informal Economy as % of Formal GDP

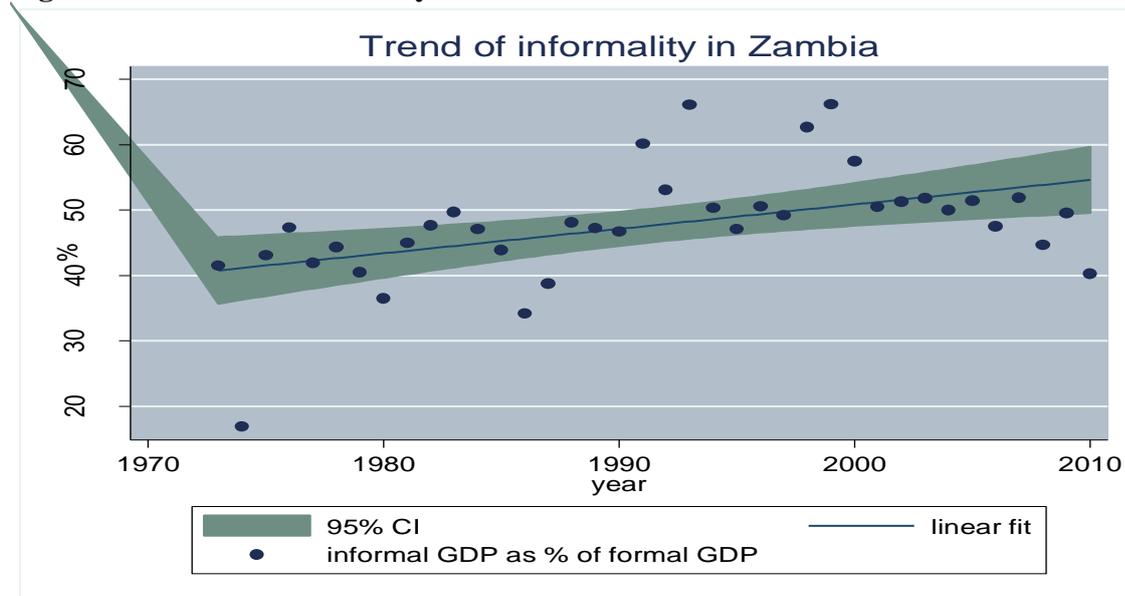
Period	1973-1980	1981-1990	1991-2000	2001-2010
Size of informality	39.01%	44.83%	56.27%	48.9%

Source: Author's own computation

From the table above, average informality as a percentage of GDP has increased during the period 1973-2000 and it is only during the decade 2001-2010 that it shows some reduction. Figure eight below shows that the trend of informality as depicted by a linear fit has generally been upward.

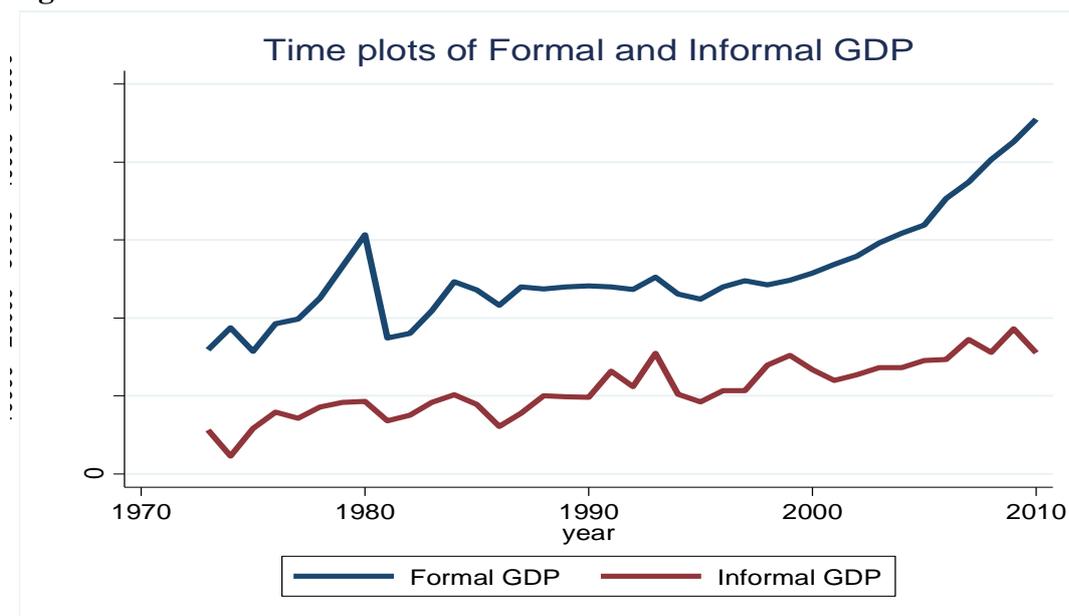
¹² All monetary figures estimated are in 2005 prices

Figure 8: Trend of Informality



Caution should be taken in interpreting a falling ratio of informal GDP to formal GDP as a general decline in the levels of informality. This is because the ratio of informal GDP to formal GDP, like any other ratio, may fall in one of three ways; a) an absolute rise in both the informal and formal GDP with formal GDP increasing more than informal GDP; b) a fall in informal GDP while formal GDP remains constant or increases; c) a fall in both informal and formal GDP with informal GDP falling more than formal GDP. Below is a time plot of formal and informal GDP since 1973 to make this caveat more intuitive.

Figure 9: Formal and Informal GDP



The evolution of both GDP series indicates that the fall in the ratio of informal to formal GDP during the decade 2001-2010 is due much to the fact that formal GDP rose sharper than informal GDP.

If the estimates from this study with those from (Schneider, 2004), a similarity is observed (see table 14 below). Bearing in mind that (Schneider, 2004) uses the DYMIMIC approach, the similarity in results obtained by the two studies reinforces the earlier observation that the Dynamic Multiple Indicators Multiple Causes model and the Currency demand method usually yield comparable results.

Table 14: Comparison of Schneider (2004) estimates with this study's estimates

Informality (% of GDP)	1999/2000	2001/2002	2002/2003
Schneider (2004)	48.9%	49.7%	50.8%
This study	61.8%	50.9%	51.5%

Source: Author's own computation

Table 15 below shows relative changes or growth rates in order to cast the evolution of informality in a different light.

Table 15: Average Growth Trends in the Formal and Informal Economy

Period	1974-1980	1981-1990	1991-2000	2001-2010	Total Average (1974-2010)
Informal GDP Growth	7.2%	0.5%	3.1%	1.5%	2.7%
Formal GDP Growth	9.4%	-2.3%	0.7%	5.7%	2.8%

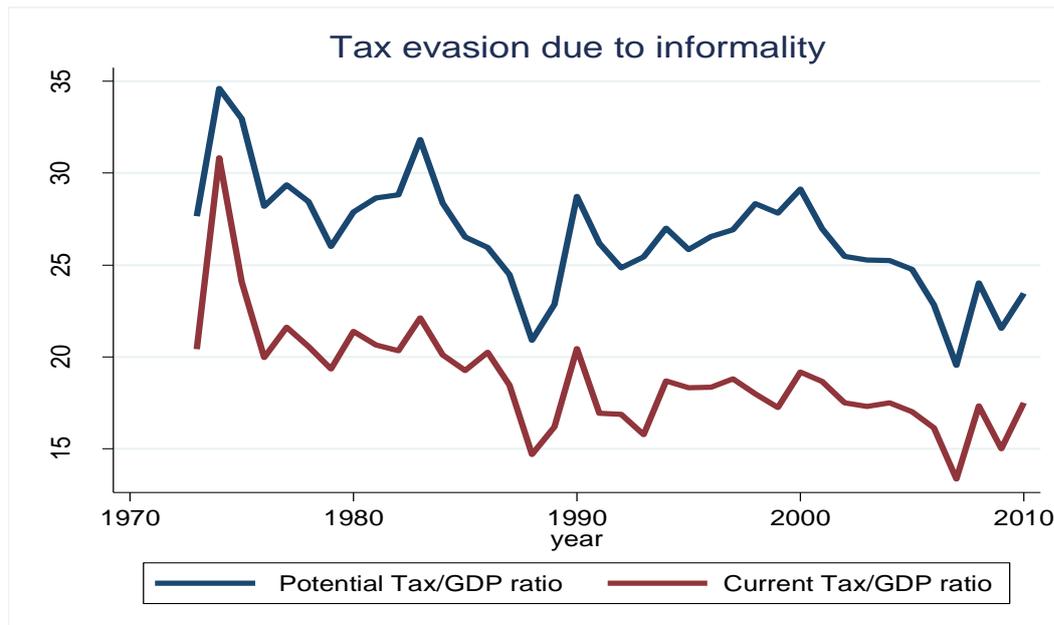
Source: Author's own computation

The average growth rate over the sample period shows that the formal and informal economy has grown at almost the same rate over the considered period. The growths of these economies are positively correlated with a correlation coefficient of 0.09 for the period 1974-2010. When the outlier observation for 1974 is omitted, the correlation coefficient for both economies during 1975-2010 rises to 0.232. That the growths of the two economies are positively correlated is no coincidence owing to the Structuralists' view that there exist linkages and synergies between the formal economy and the informal economy. It is not farfetched to think that some incomes earned in the formal economy get spent in the informal economy.

4.2 Informality, Tax Evasion and Informal Economy Tax Potential

We now consider this question; what has been the opportunity cost of having an informal economy in terms of tax revenues forgone? Or equivalently, the above question would be restated as “had the informal economy been fully incorporated in the formal economy what would Zambia’s tax revenues be?” Since this study is not using simulations, the above questions can be answered by a weak measure of the tax potential. This weak estimate is a question about the extent to which the observed tax rates and estimates of informality can provide insights into the level of tax revenue forgone. We begin by constructing a series of the upper-bound potential Tax-to-GDP ratio, by obtaining a product of the observed tax/GDP ratio (in the formal economy) and the augmented GDP (formal plus informal GDP) as depicted in figure ten.

Figure 10: Tax Evasion due to Informality



The gap between the potential Tax-to-GDP ratio series and the actual Tax-to-GDP ratio series is a reflection of the tax revenues forgone due to tax evasion by the informal economy. Therefore, assuming zero compliance costs, had the informal economy been incorporated in the formal economy, tax revenues would have been higher by an average maximum of 7.7 percent of GDP (K 1, 964.7 billion) per annum. As a proportion of total tax revenues, these forgone revenues from the informal economy are as large as 42 percent per annum. For the year 2010, total amount of tax evasion due to informality was 6 percent of GDP (K 2,715.1 billion) or 34 percent of the 2010 of total tax revenues. These incomes are enough to finance

total expenditure in the health sector.¹³ In practice however, only a fraction of this potential can be actually realised and so, we now ask whether it is worthwhile to tap into this potential or not.

4.3 Insights for Tax Policy

To find out whether it is worthwhile to devote more resources to tax this potential, there is need to gain insights into how this tax potential is distributed among the players in Zambia's informal economy. According to the 2008 labour force survey (CSO, 2011) out of the 4,6 million employed persons in Zambia, 89% (4.1 million) were employed in the informal sector while the remaining 11% (0.5 million) were employed in the formal sector. Of the 4.1 million informal sector employees, 3.4 million operated at household level. Furthermore, of the total informal sector employees, 3.2 million were employed in the Agricultural Sector while the second largest at 400,000 were working in Trade. This shows that Zambia's largest employer largely comprises the unregistered and hard-to-tax groups such as small scale traders, famers, small manufacturers, craftsmen, individual professionals and many small scale businesses.

4.3.1 Short run Implications

Notwithstanding its importance, the distribution of Zambia's informal economy's tax potential among over four million individuals is quite sparse to warrant taxation with minimal distortions in the economy. Since the informal sector produces about half of what the formal sector produces in monetary terms, it becomes intuitive that the incomes generated in the informal economy are largely for basic sustenance and as such, taxation would actually serve to increase the levels of poverty. This conclusion is corroborated by (Shah, 2012) who finds that of 75 percent of the MSMEs in the informal economy earn revenues of less than one million kwacha per month.

If income tax collections for each taxpayer type relative to their respective tax administration costs at the Zambia Revenue Authority are considered, it becomes apparent that the tax revenue collections from informal MSMEs may not be adequate to cover costs of tax administration. The bulk of income tax revenue contributions (about 75-80 percent) come from the large taxpayer's unit which has about 36 employees (or roughly 3.3 percent of staff). The Medium taxpayer office is allocated roughly 10 percent (113 in number) of the staff and

¹³ According to the WHO, this total health expenditure is the sum of public and private health expenditure. It covers the provision of health services (preventive and curative), family planning activities, nutrition activities, and emergency aid designated for health but does not include provision of water and sanitation.

they manage to rake in 18-23 percent of revenue contributions from income taxes. The small tax payer office is allocated about 14 percent (155 in number) of the staff but contributions to income taxes are only about two percent (ZRA, 2011). These figures show that it wouldn't be prudent to increase staffing to the small taxpayer office for purposes of taxing informality-at least not in the short run.

4.3.2 Implications for the Long run

In the long run however, the tax potential of the informal economy cannot be ignored and it would be prudent that informal MSMEs be placed within an appropriately designed framework that assigns comparable administrative resources to tax collection from this sector. When taxpayers are demarcated into small, medium and large, it is expected to observe a clustering of taxpayers just below the tax threshold as they try to minimise their tax burdens. In other words, a demarcation of this sort hinders growth of small businesses (and economic growth in the long run) because it does not encourage them to graduate into the standard tax regime to face higher compliance costs. This poses a constraint on the long term revenue potential and is therefore not in conformity with the objectives of a tax system.

Tax simplification and the minimisation of the differential tax treatment arising from differences in taxpayer size should be emphasised in order to encourage the ease of graduation into the standard tax regime. The main challenge is to come up with innovative incentives that encourage these small businesses to voluntarily opt into the standard tax system and begin to grow and enjoy the benefits of formalisation. The main target group for such strategies/interventions that encourage small business tax compliance should be those enterprises just below the tax threshold as they have the potential to grow into medium and even large taxpayers.

Alternatively, since the decision of participating in the informal economy also involves weighing the cost versus the benefits of being formal (or informal), formalisation could be coerced if measures that raise the costs of being informal relative to being in the formal are taken. As a benchmark, (Shah, 2012) considers the 'cost-benefit' situation at play in countries with low levels of informality elsewhere in Africa and notices a sharp delineation in the access to public infrastructure services such as; as telephone services, transport systems, electricity and water and sanitation, between formal and informal firms¹⁴. In Zambia however, (Shah, 2012) finds no significant difference in access to most public infrastructure

¹⁴For example, in South Africa 30 % informal firms have access to electricity while access rates for formal firms are 95%.

services between the formal and informal MSMEs in the urban areas,¹⁵ and in addition, these urban informal MSMEs are seldom recipients of tax inspection visits. She therefore advocates for policy makers to enforce stricter tax code on these urban informal operators so as to increase the costs of non-compliance which would in turn increase likelihoods of formalisation.

4.3.3 Uncovering the Effective Tax Potential of Informality

It should be borne that in uncovering the effective tax potential of the informal economy, aggregation should be avoided wherever necessary because aggregation tends to mask the presence of significant heterogeneities among its constituents that can be exploited for tax purposes. For instance, this study finds little tax potential for the informal economy as a whole, but at a disaggregate level, (Shah, 2012) finds significant tax potential only among the urban informal MSMEs along the line of rail.

Currently, the major difference between the standard tax structure and the small business tax regime relates to the absence of a tax on consumer purchases and a tax on firm profits in the informal economy. As it were, the Turnover Tax (TOT) on gross sales currently applicable in the informal economy can be viewed to capture both consumer tax and profit tax. To minimise this disparity with the standard tax system, there would be need for a specific tax on consumer purchases (a quasi-variant of the VAT)¹⁶ and, another tax specifically on profits, to replace the current TOT. All else being equal, and given the large volume of transactions that occur in the informal economy, if such a measure were introduced, it can be expected that revenues generated by the ‘consumer tax’ would generally be higher than those from the profit tax. Therefore, the key therefore lies in effectively coercing compliance to this ‘consumer tax’ because once that is achieved, enforcing compliance to the ‘profit tax’ becomes easier. This measure cannot be applied to the whole informal economy with success, and this is when partialling out the ‘lucrative’ informal firms becomes necessary. The urban informal MSMEs along the line of rail are this ‘lucrative’ informal economy.

In the spirit of (Shah, 2012), policy makers can then make such a measure incentive compatible by tying the provision of essential public infrastructure services (especially electricity) to compliance to this ‘consumer tax’. This conditional access to public infrastructure would be one way of raising the costs of being informal relative to being formal, and to minimise tax evasion, frequent tax inspection visits would need to accompany

¹⁵For example, 76% of urban informal MSMEs have access to electricity compared to 95 % for urban formal firms

¹⁶This tax on consumer purchases should be lower than the VAT rate currently applicable in the formal sector.

such measures. The success of implementing such a measure also rests on the ability of the MSMEs to practise rudimentary bookkeeping for purposes of remitting these taxes. Encouragingly, 85% of the urban informal MSMEs along the line of rail are run by individuals who have at least attended secondary school (Shah, 2012), and are thus literate enough to perform simple bookkeeping practices. Consequently, if some reasonable compliance to this ‘consumer tax’ based on kept records can be achieved, the administration of a tax on profits becomes less difficult. By partialling out the urban informal sector (especially those along the line of rail) for the purposes of stricter enforcement of the tax code, the development of a more invasive urban informal sector, as (Schneider & Enste, 2000) conjecture, is less likely.

5.0 Conclusion

The main objective of this study was to find out whether the scope for informal economy taxation exists and what it implies for tax policy in Zambia. The methodology involved the use of the currency demand approach to estimate the size of informality as a proportion of GDP for the period 1973-2010. It was found that informality has averaged 47.7 percent of official GDP per annum and grown at 2.7 percent per annum comparable to the formal economy’s growth at 2.8 percent per annum. Informality shows an increasing trend with time from the 1970’s where it averaged 39 percent till the 2000’s where it averaged 48.9 percent. The peak of informality occurred during the 1990’s at 56 percent of GDP.

Assuming zero tax compliance costs, the tax potential of the informal economy is estimated to be 7.7 percent of GDP or 42 percent of total tax revenues per annum. The distribution of this tax potential over the four million informal workers is quite thin to enable efficient taxation. This thin spread implies that most incomes generated in the informal economy are mainly for sustenance and hence, the tax collections thereof could be outweighed by the administration costs. Therefore, in the short run, devoting more resources to taxing informality is not economical. In the long run however, tax policy should be simplified and designed in such a way as to enable easy graduation of small and micro firms, who are taxed presumptively, into the standard tax regime. Thus it will be imperative for the policy makers to come up with incentives that encourage (coerce?) informal enterprises to formalise. It is through such incentives that the long term revenue potential of the informal economy can be effectively and efficiently tapped.

5.1 Some Policy Recommendations

Enhancing tax morale through improved public service provision: If Zambian citizens perceive taxes to be beneficial to them directly or indirectly through the public services they consume, voluntary tax compliance of some sort would eventually be encouraged. This can be done through increasing the delivery of public services.

Enforcement: The current low levels of enforcement by the tax authority tend to reduce tax morale because most informal businesses can afford to default on tax obligations with impunity.

Encouraging Bookkeeping through Sensitisation Campaigns: The Revenue Authority should conduct sensitisation campaigns that encourage the culture of record keeping. Just as ZRA has produced a simple one page document used to enforce the Turn over Tax, simple cash books can be designed and standardised for sale to Informal MSMEs for purposes of record keeping. By incentivising and encouraging small businesses to observe basic bookkeeping standards, transition from the presumptive to the standard tax regime by growing small and micro enterprises can be facilitated.

5.2 Limitations of study and Areas for Further Research

The limitations of this study points to a number of areas where there is need for further research;

- This study is a macro study and considers only one indicator of informality – excess demand for currency. This limits the generalisation of the results because in developing countries like Zambia, excess demand for currency is not the only indicator of informality.
- During the estimation of the demand for currency demand, data on an appropriate financial innovation variable stretching over the sample period was not available. Most robust financial innovation variables used in estimating currency demand functions begin in the mid-1990s and so, there would be need for a similar study with a study period begin in the mid-1990s.
- Due to the estimation procedure of the currency demand approach which gives point estimates of informality only, it was not possible to give an interval estimation of the upper and lower bounds of informality which would have been more insightful.
- The estimates of the tax potential of the informal sector are weak estimates. More robust estimates of this tax potential would be needed for comparisons sake.

- The multidimensional nature of informality necessitates for research into the evolution of informality using other estimation approaches. This will allow for comparison of results and better understanding of informality because different estimation methods focus on different aspects of informality.
- Future research should be undertaken to analyse the relationships and synergies that exist between the informal economy and formal economy. This would help policy makers understand the macroeconomic implications of policy made solely for the formal economy.
- To the effect that incomes in the informal economy are sometimes spent in the formal economy, there would be need to find out what proportion of these informal incomes find their way into the formal sector. This would give insights into the positive impacts that informality has.

References

- Ahumada, H., Facundo, A., & Alfredo, C. (2006). *The Demand for Currency Approach and the Size of the Shadow Economy. A Critical Assesment*. downloadable at <http://www.escholarship.org/uc/item/6zn9p98b>.
- Ahumada, H., Facundo, A., & Alfredo, C. (2008). The Monetary Method to Measure the Shadow Economy: The Forgotten Problem of the Initial Conditions. *Economics Letters* 101, 97-99.
- Alderslade, J., Talmagem, J., & Freeman, Y. (2006). *Measuring the Informal Economy-One Neighborhood at a Time*. Brookings: Brookings Metropolitan.
- Alm, J., Vazquez, J., & Schneider, F. (2006). Sizing the Problem of the Hard-To-Tax. *AYPSS Hard to Tax Conference*.
- Arby, M., Malik, M., & Hanif, N. (2010). *Size of The Informal Economy in Pakistan*. Bank of Pakistan .
- Bagachwa, M., & Maliyamkono, T. (1990). *The Second Economy in Tanzania*. Ohio: Ohio University Press.
- Bagachwa, M., & Naho, A. (1995). Estimating the Second Economy in Tanzania. *World Development Volume 23*.
- Breusch, T. (2005). *Fragility of Tanzi's Method of Estimating the Underground Economy*. Australian National University, Economics. Mimeo: Australian National University.
- Buhn, A., Alexander, K., & Schneider, F. (2007). Size and Development of the Shadow Economy and Do-it-Yourself Activities in Germany. *CESIFO Working Papers No. 202*, downloadable ad www.CEsifo-group.de.
- Cagan, P. (1958). The Demand for Currency Relative to Total Money Supply. *Journal of Political Economics Volume 66*, 302-328.
- Crane, S., & Nourzad, R. (1986). Inflation and Tax Evasion. *Review of Economics and Statistics Volume 68*, 217-223.
- CSO. (2011). *Zambia Labour force Survey 2008 Report*. Lusaka: Central Statistical Office.
- deSoto, H. (1989). *The Other Path: The Economic Answer to Terrorism*. New york: Harper Collins.
- Feige, L. (1994). The Underground Economy and the Currency Enigma. *Public Finances Publiques Volume 49*, 119-136.
- Feige, L. (2003). *Defining and Estimating Underground and Informal Economies: The New Institutional Economics Approach*. Wisconsin: University of Wisconsin.
- Frey, B., & Weck, H. (1984). The Hidden Economy as an Unobservable Variable. *European Economic Review(26)*, 33-53.
- Gadea, M., & Serrano-Sanz, J. (2002). The Hidden Economy in Spain-A Monetary Estimation. *Empirical Economics*, 499-527.

- Gërxxhani, K. (2005). *The Informal Sector in Less Developed Countries: A Literature Survey*. Amsterdam: Tinbergen Institute .
- Guttman, P. (1977). The Subterranean Economy. *Financial Analyst Journal*, 499-527.
- Hartzenberg, M., & Leimann, A. (1992). *The Informal Economy and its Growth Potential in South Africa*. Oxford: Oxford Press.
- Hernandez, M. (2005). *Estimating the Hidden economy in Peru: The Currency Demand approach*. International Food Policy Research Institute (IFPRI).
- ILO. (1972). *Employment, Incomes and Equality: A Strategy for Increasing Productive Employment in Kenya*. Geneva: International Labor Office.
- ILO. (2002). *Conclusions Concerning Decent Work and the Informal Economy*. Geneva: International Labour Office.
- INEGI. (2006). *Survey*. Mexican Statistics Institute.
- JCTR, CSPR, & CARITAS. (2009). Economic Growth and Equity. Investing in the Dignity of the People. *Pre-Budget 2010 Press Release*, 5th August.
- Kaufmann, D., & Kaliberda, A. (1996). Integrating the Unofficial Economy into the Dynamics of Post-Socialist Economies: A Framework of Analysis and Evidence. In B. Kaminski, *Economic Transition in Russia and the New States of Euroasia*. New York: M.E Sharpe I.c.
- Loots, A. (1991). *Die Belanrikheid van die Informele Sektor in die Suid-Afrikaanse Economie*. Johannesburg: Masters Dissertation, Department of Economics, Rand Afrikaans University.
- Macias, J., & Cazzavillan, G. (2008). The Dynamics of Parallel Economies. Measuring the Informal Sector in Mexico. *University of Venice, Department of Economics Working Paper Series # 42*.
- Martins, J. H., & Ligthelm, A. (1995). *The Informal Sector of the South African Economy*. Pretoria: Bureau of Research, Faculty of Economic and Management Studies, University of South Africa.
- Mwila, A., Manley, D., Chileshe, P., Phiri, E., & Mpembamoto, K. (2011). *The Taxation System in Zambia*. Lusaka: JCTR.
- Perazzi, J., Giampaolo, M., & Castillo, P. (2010). 2010. *Finnish Journal of Latin American Studies*.
- Portes, A., Manuel, C., & Benton, A. (1989). *The Informal Economy: Studies in Advanced and Less Developed Countries*. Johns Hopkins University Press.
- Prinsloo, J. (1999). South Africa's National Accounts: An Overview of Sources and Methods. *South African Reserve Bank Bulletin*, 1-60.
- Ritchie, A. (2006). The Informal Sector in Jamaica. *Economic and Sector Studies Inter-American Development Bank*.

- Saunders, G. (2005). Estimates of the Size of the Informal Economy in South Africa. Some Macroeconomic Implications. *PHD Thesies, University of Johannesburg*.
- Schneider, F. (1994). Can the Shadow Economy be Reduced Through Major Tax Reforms? An Empirical Investigation for Austria. *Public Finance Publiques Volume 49*, 137-152.
- Schneider, F. (2002). *Size and Measurement of the Informal Economy in 110 countries around the world*. World Bank.
- Schneider, F. (2004). *The Size of the Shadow Economies of 145 Countries All Over the World: First Results over the Period 1999 to 2003*. IZA.
- Schneider, F., & Enste, D. (2000). Shadow Economies: Size, Causes, and Consequences. *Journal of Economic Literature Volume XXXVIII*, 77-144.
- Shome, P. (2004). Tax Administration and the Small Taxpayer. *IMF Policy Discussion Paper 04/02*.
- Smith, P. (1994). *Assessing the Size of the Underground Economy: The Canadian Statistical Perspectives*. The Canadian Observer.
- Spiro, P. (1996). Monetary Estimates of the Underground Economy: A Critical Evaluation. *The Canadian Journal of Economics*, 171-175.
- Tanzi, V. (1980). The Underground Economy in the United States: Estimates and Implications. *IMF Staff Papers Volume 80*, 283-305.
- Tanzi, V. (1983). The Underground Economy in the United States: Annual Estimates (1930-1980). *Quarterly Review volume 35*, 283-305.
- Terkper, S. (2003). Managing Small and Medium-Size Taxpayers in Developing Countries. *Tax Notes International*, 211-234.
- Van de Berg, A. (1990). The Shadow Economy in South Africa: Some Results. *Unpublished Manuscripts, Department of Economics, University of South Africa*.
- ZRA. (2011). SME Taxation in Zambia. *International Growth Center(IGC) Workshop on Informal Sector Taxation in Zambia*.

Appendix

Table 15: Size of informality in Zambia 1973-2010

Year	Informal Economy as % of GDP	Year	Informal Economy as % of GDP
1973	41.50	1992	53.08
1974	16.88	1993	66.06
1975	43.08	1994	50.36
1976	47.27	1995	47.11
1977	41.95	1996	50.57
1978	44.32	1997	49.15
1979	40.54	1998	62.65
1980	36.55	1999	66.16
1981	44.93	2000	57.48
1982	47.70	2001	50.48
1983	49.74	2002	51.28
1984	47.05	2003	51.82
1985	43.87	2004	50.03
1986	34.21	2005	51.41
1987	38.76	2006	47.49
1988	48.16	2007	51.92
1989	47.24	2008	44.69
1990	46.68	2009	49.56
1991	60.09	2010	40.28
		Sample Average	47.7%