IMPACT OF VALUE ADDED TAX ON HOUSEHOLDS CONSUMPTION EXPENDITURE IN NIGERIA (1994 - 2016)

BY

MUAZU SULEIMAN SAYO
M.SC/SOC-SCI/3409/2011-2012

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FACULTY OF SOCIAL SCIENCES,
AHMADU BELLO UNIVERSITY,
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DECLARATION

I hereby declare that this research work entitled "Impact of Value Added Tax on Consumer Demand in Nigeria" has been carried out by me in the Department of Economics. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for award of any degree at this or any other institution.

Muazu Suleiman Sayo **Date**

CERTIFICATION

This dissertation entitled "Impact Value Added Tax on Consumer Demand in Nigeria" by MUAZU, Suleiman Sayo meets the regulations governing the award of the degree of Master of Science in Economics of the School of Postgraduate, Ahmadu Bello University, Zaria, and is this day approved for its contribution to knowledge and literary presentation.

Prof. M. C. Duru **Chairman, Supervisory Committee**	**Date**
Dr. MOHAMMED, Shaibu Jibril **Member, Supervisory Committee**	**Date**
Dr. Aliyu Rafindadi Sanusi **Head of Department**	**Date**
Prof. Sadiq Z. Abubakar **Dean, School of Postgraduate Studies**	**Date**

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TABLE OF CONTENTS

TITLE PAGE i
DECLARATION ii
CERTIFICATION iii
ACKNOWLEDGEMENTS iv
TABLE OF CONTENTS v
LIST OF TABLES viii
LIST OF FIGURES ix
ABSTRACT x
CHAPTER ONE: INTRODUCTION 1
1.1 Background to the Study 1
1.2 Statement of Research Problem 4
1.3 Research Questions 7
1.4 Research Hypotheses 8
1.5 Objectives of the Study 8
1.6 Justification for the Study 9
1.7 Scope of the Study 11
1.8 Limitations of Study 12
CHAPTER TWO: LITERATURE REVIEW 13
2.1 Conceptual Framework 13
2.2 Exempted Goods and Services in Nigeria 18
2.3 Overview of Nigeria Tax Laws, Administration and Reforms 1986-2012 19
2.3.1 Tax Administration in Nigeria 24
2.4 Theoretical Literature 27
2.4.1 The Absolute Income Hypothesis 27
2.4.2 The Drift Theory of Consumption 28
2.4.3 The Relative Income Hypothesis 30

2.4.4 The Permanent Income Hypothesis 32
2.4.5 The Life Cycle Hypothesis 34
2.4.6 Assumptions of the Theory 34
2.5 Empirical Literature 38
2.5.1 Other countries case studies 38
2.5.2 Cross country studies 45
2.5.3 Nigerian case study 48
CHAPTER THREE: RESEARCH METHODOLOGY 59
3.1 Introduction 59
3.2 Theoretical Framework 59
3.3 Model Building 59
3.4 Model Specification 63
3.4.1 Model 1: Impact of VAT on Household Consumption Expenditure 63
3.4.2 Impact of VAT on the Composition of Household Consumption 64
3.4.3 Model 3: Impact of VAT on Saving/Household Consumption Expenditure Ratio 66
3.5 Estimation Techniques 67
3.5.1 Unit root test 67
3.5.3 Sources of data 69
3.5.4 Post Diagnostic Test 70
CHAPTER FOUR:PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS 72
4.1 Introduction 72
4.2 Pre- Estimation Checks 72
4.2.1 Descriptive Statistic 72
4.2.2 Correlation Analysis 73
4.2.3 Trend Analysis 74
4.3.3.1 ARDL Result for Model 3 84

CHAPTER FIVE: SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATION 89

5.0 Introduction 89

5.1 Summary of Findings 89

5.2 Conclusion 89

5.3 Recommendations 90

5.4 Suggestion for Further Studies 91

References 93

APPENDICES 102

LIST OF TABLES

Table 2.1: Taxable Goods and Services in Nigeria 16

Table 2.2: Taxable Services in Nigeria 17

Table 2.3: Exempted Goods in Nigeria 18

Table 2.4: Exempted Services in Nigeria 19

Table 2.5: Zero Rated Items in Nigeria 19

Table 3.1: Data Source on Measurement 70

Table 4.1: Descriptive Statistic Result 73

Table 4.2: Correlation Analysis Result 74

Table 4.3: ADF and Phillip-Perron Unit Root Test Results 77

Table 4.4: Bounds Test Result for Model 1 78

Table 4.5: ARDL Result for impact of VAT on Per Capita Household Final Consumption (PCHFC) 80

Table 4.6: ARDL Bounds Test Result 82

Table 4.7: ARDL Result for Model 2 83

Table 4.8: ARDL Bounds Test Result for Model 3 84

Table 4.9: ARDL Result for Model 3: Impact of VAT on the Ratio of Household savings to Household consumption 86

Table 4.10: Error Correction Model Result for Model 3 87

LIST OF FIGURES

Figure 2.1: Consumption function 28

Figure 2.2: The Drift Consumption Function 30

Figure 4.1: VAT revenue, Household Final Consumption expenditure and Gross Domestic Product line plot 75

ABSTRACT

The main objective for the abolition of sales tax and subsequent introduction of Value Added Tax (VAT) is that the base of sales tax is too narrow. Also, the preference for VAT to income tax is essentially because income tax reduces incentive to work and reduces consumption. An attempt by the Federal Government of Nigeria to raise VAT rate from 5% to 10% in 2012 was counteracted by widespread condemnation and protest by both the members of the public and the Nigeria Labour Congress. These actions culminated into its subsequent reversal to 5%.This study used Autoregressive Distributed Lag method to evaluate the impact of VAT on households' consumption expenditure in Nigeria for the period 1994-2016.The long-run relationship between the variable was also investigated. The Autoregressive Distributed Lag results reveal that a 1% increase in effective VAT rate at period lagged by one, two and three significantly reduces per capital households' consumption expenditure by 0.49%, 0.59% and 0.26% respectively in the short run. Increasing effective VAT rate with no time lag or at period lagged by one, two and three, say by 1% reduces the households' savings-consumption ratio in the short run by 0.66%, 0.98%, 1.57% and 0.54% respectively. In the long-run the impact of effective VAT rate on household savings-consumption ratio is positive, but non significant. The study therefore concludes that VAT rate increase reduces per capita households' final consumption expenditure in the short run, increases the composition of household consumption non significantly in the short run, and reduces the household savings-consumption ratio in the short run. The study therefore recommends that VAT rate increment should not be implemented, but rather be cut. This will exact significant positive impact on per capita household consumption and welfare, household savings-consumption ratio and capital accumulation as well as economic growth.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In today's global market, all companies and individuals are required to pay taxes. The general idea behind the imposition of taxes by government is to balance the economy in terms of the redistribution of funds and income from the rich to the poor. There is a global shift in paradigm, because the focal point is moving from direct to indirect taxation policy. This action led to the implementation of Value Added Tax (VAT) in Nigeria on September 1st, 1993.The Value Added Tax (VAT) is undoubtedly the most fortuitous innovation of the last half-century with regards to taxation policy. No other taxes, not even income tax, have made an impact so quickly and rapidly to the extent that the Value Added Tax (VAT) now exist in over one hundred and Forty-five (145) countries around the world including Nigeria; and in these countries it typically accounts for one-quarter of all tax revenue (IBFD 2004). This is so because the Value Added Tax (VAT) is not only the least distorting tax, but can also be easily administered in most countries. Every country now makes use of the value added tax and each year sees a new continent adopting it.

By definition, the Value Added Tax (VAT), also known as goods and services tax, is a broad-base tax imposed on the various stages of production, starting from raw materials to the final product, with systematic offsetting of tax charged on inputs- except perhaps on capital goods- against that which is due on outputs (Bakare, 2013). Furthermore, value Added Tax (VAT) is basically a multiple stage tax, because economic agents have to pay tax at every stage of production and distribution. Hence, tax would be charged at every step of value addition. Since, tax is charged on commodities purchased for consumption, it is therefore a consumption tax. The rationale for replacing sales tax with a VAT was informed by a number

of factors and considerations, notable among these are that the base of the sales tax in Nigeria is narrow; it covers only nine categories of goods plus sales and services in registered hotels, motels and similar establishments. Secondly, the narrow base of the tax negates the principles of consumption tax which by its nature is expected to cut across all consumable goods and services. VAT base is broader and include most professional services and banking transactions that are of high profit -generating sectors. Only locally manufactured goods were targeted by the sales tax decree of 1986, although this might not have been the intention of the law. VAT is neutral in this regards. Under VAT, a considerable part of the tax to be realized is from imported goods. This means that under the new VAT, locally made or manufactured goods will not be placed at a disadvantage relative to imports.(Federal Inland Revenue Service(FIRS) Information Circular No. 9304).

Since VAT is based on the general consumption behaviour of the people, the expected high yield from it will boost the revenue collectible by government with the minimum resistance from tax payers.

The Nigeria VAT system, which is invoice based is a multiple stage tax imposed at every stage of production chain from the manufacturer to the consumer. In order to eliminate the cascading effect of taxation at every stage of production, a credit system has been put in place to allow VAT paid on import or purchase of raw materials (Input taxes) to be deducted from the VAT charged on sales (Output taxes) and therefore, the tax to be paid by a taxable firm is the difference between output tax and input tax (VAT Act, 1993).

The credit mechanism acts as a safeguard against the negative effect of the tax so that VAT is made neutral to price determination. The credit mechanism also helps VAT to promote export drive in view of its neutral characteristics to international trade. In export trade, the total input taxes incurred on production is refundable. A salient features of the VAT system is its ability

and promptness in making refunds as and when due. The Decree permits a taxable person to claim refund of the excess tax, in the event of input tax exceeding output tax. Refund is also available for VAT paid on zero-rated goods and services. The Federal Inland Revenue Service (FIRS) is empowered to set the guidelines and requirements for VAT refund from time to time. To apply for a refund, the VATable person must first fills the VAT return form 002, dully completed to the local VAT officer and the form must clearly and correctly indicate is excess of input tax over output tax to warrant refund. Refund can be claimed by credit method, by direct cash method, and or by both methods. The credit method is carried out with the use of VAT form 002 which contains the calculation of total output tax and input tax and deductions thereof. Where output tax equal input tax, no tax is payable or refundable and where output tax exceeds input tax, the difference is remittable to government. Where the output tax is less than the input tax, the excess input tax must be refunded. Here, the taxable person may decide to set off the balance resulting in his favour against the output tax in the subsequent month by making the outstanding input tax in the previous month as the first charge in the current month output tax. The direct cash method is applied to companies whose input taxes are perpetually in excess of output tax. Such companies cannot reasonably be persuaded to engage in future set-off by means of credit because the need for refund is repetitive and could be so for an extended period. It is to these categories of companies the regular cash refund may be necessary. The credit method is a popular VAT refund approach in many VAT systems and it is encouraged by the FIRS since it saves time and unnecessary paper work.

From the buyer's view point, it is a tax charged on purchase price while from a seller's perspective; it is levied on value addition made to any product, services or material at a particular stage in the supply chain. The difference between the two amounts is paid to the

government and the remainder is kept by the producer to mark up the costs they have incurred during production.

Consumer Demand in this context means household final consumption expenditure, which is the market value of all goods and services, including durable products (such as cars, washing machines and home computers) purchased by households. It excludes purchase of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to government to obtain permits and licenses (World Bank, 2013). Value Added Tax (VAT) and consumer demand have been joined together, in order that the links between the two concepts can be carefully understood and analyzed.

The introduction of VAT in Nigeria through decree 102 of 2012 (as amended) marks the phasing out of the Sales Tax Decree No. 7 of 1986. The decree took effect from 1st December, 1993, but it was actually effective on 1st January, 1994. Value Added Tax (VAT) is charged at 5% on all VATable goods and services. The revenue from VAT since then shows that VAT has been very effective from ₦20.8 billion received in 1994, revenue from VAT rose to ₦710.5 billion in 2012 (The Economist, 2013)

A simple relationship exists between consumer demand data and VAT data in Nigeria, based on observation. As VAT rises continuously, aggregate consumption expenditure equally continues to rise. Though not in accordance with apriori expectations, it suggests that the present VAT rate cannot influence the general consumption behaviour of households in Nigeria.

1.2 Statement of Research Problem

The magnitude of household consumption is a key factor in the process of income propagation in any developing or emerging economy. The multiplier according to Keynes

(1931)," establishes a precise relationship, given the propensity to consume, between aggregate employment, income and the rate of investment''. This theory states that when there is an increment of investment, income will increase by an amount which is K times the increment of investment". But then, the value of multiplier is determined by the marginal propensity to consume. The higher the marginal propensity to consume, the higher is the value of multiplier, and vice versa. Value Added Tax (VAT), which is a tax designed to penalize consumption has the tendency to reduce the aggregate consumption, thereby reducing the marginal propensity to consume and by implication necessitating the reverse operation of the multiplier in our domestic economy. In an attempt to harmonize the Africa VAT rate structure, there has been pressure from African Union on Nigeria to increase her VAT rate to 10%. An attempt to increase the rate from the current 5% to 10% in 2012 was accompanied by widespread condemnation on the parts of members of the public, which was championed by the Nigeria Labour Congress. It was this action that forced the government to revert the rate back to 10%. Fall in the price of crude oil per barrel in London commodity market and the dwindling of our revenue from oil, recent economic recession and slow growth of national income, and the unending quest for African VAT rates harmonization by the African Union are some of the reasons while the federal government will always perceive a policy of VAT rate increase as "a policy in the right direction". But then, we need a tax policy that will not be counter-productive to the private sector economy. We need a tax policy that will not significantly reduce the aggregate consumption function, consumer welfare, and their living standard. It is equally highly desirable for the current tax system in Nigeria to be able to generate adequate revenue to finance the ever increasing government expenditure. The relative effectiveness of VAT in revenue generation and the propensity to reject any further VAT increase has put the government in a state of dilemma as far as VAT rate increase is concerned.

It is theoretically believe that VAT increases savings, encourages capital accumulation and ultimately stimulates growth. The household saving consumption ratio is quite very important. Increased savings can lead to capital accumulation and ultimate growth of the economy which tend to boost consumption. The above scenario is not the case in Nigeria. Data on private sector savings show successive increment, but the sector is still faced with inability to mobilize savings and capital formation that will help Nigeria achieve her growth target. The issue we are pointing out here is that VAT in Nigeria encourage consumption and does not possess the capacity to bring about a significant increase in saving and capital accumulation which is still very desirable for a developing economy like Nigeria. Finally, VAT in Nigeria can neither be used to influence household consumption habits nor even influence 5% of the Gross Domestic Product (Musa, 2012).

The composition of consumption can be problematic to achieving the macroeconomic objective of maintaining both internal and external balance for the economy. Ajakaye (2000) believes that most VAT registered traders treat input VAT as cost component. This situation has cause consumers to switch their expenditure from locally made goods to imported goods. This cost cascading effects has reduce the competitiveness of locally made goods. When expenditure on imported goods outweighed that of the locally produced goods, it means more firms have to fold-up, more jobs have to be lost, domestic income output and employment must fall, as a result of the downward drift in the domestic consumption function. This means internal balance cannot be achieved in light of the scenario just described.

In the international arena balance of payment disequilibrium is certainly imminent on our current account balance. This is because of the relative attractiveness of foreign made goods imported into the country. This equally encourages capital flight because it is economically strategic for firms in Nigeria to shift their production base to foreign countries to produce goods and then import them into Nigeria. Again this remains the best strategy for them in

order to remain in business and compete favourably with their foreign counterparts who import goods into the Nigerian economy. This situation again shall definitely result in deficit in our capital account.

The impact of VAT on the ratio of household savings to household consumption expenditure is equally very critical to economic growth and development. By merely observing the data on household savings and household consumption expenditure, the ratio has been fallen continuously. The interpretation of this situation is that enough savings is not mobilized domestically, especially by the private sector for capital formation. This situation is quite detrimental or inimical to the growth and developmental process of our domestic economy. There are several theoretical evidences that VAT should reduced consumption, encourage savings and capital accumulation and finally boost the economic growth and development. It is very important to be cleared that this can only be achieved, if and only, if the implementation of VAT causes the ratio of household savings to consumption to increase progressively.

We therefore need to find a set of new knowledge which shall enable us to identify the nature of relations between Value Added Tax (VAT) and household consumption expenditure, VAT and the composition household consumption expenditure, and VAT and the ratio of household savings to consumption. This would enable us to make informed decisions about policies and economic prescriptions that will exact positive influences on private sector economy, as well as stimulating the growth process.

1.3 Research Questions

The research questions arising from the problem statement above are as follows:

- What is the impact of VAT on the magnitude of household consumption expenditure?

- What is the impact of VAT on the composition of Household consumption expenditure?
- What is the impact of VAT on the ratio of household Savings to household consumption?

1.4 Research Hypotheses

The research hypotheses for the study are as follows:

(i) H_0: Value Added Tax impacts negatively on of household consumption expenditure.

H_1: Value Added Tax does not impact negatively on household expenditure

(ii)H_0: Value Added Tax impacts negatively on the composition of household consumption expenditure

H_1: Value Added Tax does not impact negatively on the composition of household consumption expenditure.

(iii) H_0: Value Added Tax impacts negatively on the ratio of household savings to household consumption.

H_1: Value Added Tax does not impact negatively on the ratio of household savings to household consumption

1.5 Objectives of the Study

The objectives of this study are to:

- Evaluate the impact of Value Added Tax (VAT) on the magnitude of household consumption expenditure.
- Analyze the impact of VAT on the composition of household consumption expenditure.

- Examine the impact of VAT on the ratio of household savings to household consumption expenditure.

1.6 Justification for the Study

An examination of the relationship between Value Added Tax and consumer demand in Nigeria will help to contribute to policy debate about a VAT system that will ensure optimal revenue without inhibiting economic growth and private sector development. Also, the study outcome is expected to further strengthen policy decision on the Nigeria tax structure that will engender growth, income and wealth redistribution as well as employment creation.

An examination of the relationship between Value Added Tax (Effective VAT rate) and Households consumption in Nigeria is indispensable to determine if there is economic justification to increase the present VAT rate in Nigeria. The government has attempted to jack up the rate from 5% to 10%, while it received a widespread condemnation from members of the public. In this regard, an increase in VAT rate is the ideal, if a negative but non-significant relation exists between effective VAT rate and household consumption expenditure. The converse (reducing the VAT rate or holding it constant) remains the ideal, if a negative and significant relation exists between effective VAT rate and household consumption expenditure. This dissertation will not only investigate the relationship between effective VAT rate and households consumption expenditure, but also investigate the relationship between effective VAT rate and the magnitude of Households consumption expenditure in Nigeria.

The study outcome is expected to reveal how VAT affects changes in the composition of household consumption expenditure in Nigeria. If the introduction of VAT has shifted the household demand from local production to imported goods, there is imminent problem, because local consumption function would be adversely affected. This situation would affect

both internal and external balance for the economy. Internally, there would be folding up of some small scale industries, lost of jobs, reduction in aggregate investment, output and income. Externally, there would be unfavourable balance of payment in both our current and capital accounts. If the relationship between effective VAT rate and composition of household consumption do not follow or be in accord with economic theory, then there is imminent danger. This study would go a long way in establishing the aforementioned relationship, and recommends ways through which VAT can be made more productive.

The study is also insightful in determining whether the imposition of VAT in Nigeria has reduced or led to fall in the ratio of household savings to household consumption expenditure in Nigeria. We will begin to reap the full advantages of VAT implementation, if the aforementioned ratio is positive and increasing.

The most widespread and economic woe in Nigeria today seems to be slow growth process and economic recession. Consumption is one of the most important elements in the aggregate demand function. The growth in Gross Domestic Product is often triggered by the growth or {upward shift} in the consumption function. It is very important to know the relationship between our effective VAT rate and aggregate consumption expenditure. This will enable the policy makers to be able to stimulate growth or determining appropriate economic recovery strategy through the fiscal policy perspective. This study is therefore very central or germane to the recovery process of a depressed economy.

A study on how VAT affects consumer demand will put policy makers in the right frame of mind as to how we can stimulate the growth of our domestic economy. If VAT brings about a downward shift in the consumption function, then it means we can achieve economic growth by cutting such VAT rate. On the other hands, if the present VAT rate is incapable of shifting consumption function downward by a significant amount it means we can still pursue economic growth by raising the VAT rate. It is to be stressed that a decline in consumption

will cause aggregate demand to fall. The fall in aggregate demand means a fall in investment output, employment and income. Therefore, a study on VAT and households consumption expenditure can be a guide on how to prevent a developing economy from falling into recession.

The major gap that this study has identified in the literature is measuring the burden of VAT suffered by households by VAT revenue in the hand of the government. This is not only wrong, but also misleading and lacks theoretical justification. The burden of Value Added Tax (VAT) suffered by households is the proportion of their consumption expenditure that is taken away as tax (VAT). At the aggregate level the VAT burden of aggregate households is the aggregate of VAT revenue collected divided by aggregate consumption expenditure and then multiply by 100. This is what is known as the effective VAT rate (Bumpei, 2011) which is key at 5% in Nigeria. We bridge this gap by using effective VAT rate (EVR) as a measure of VAT burden suffered by household. We shall examine the impact of this effective VAT rate on the magnitude of household consumption, the composition of household consumption, and the household saving – consumption ratio.

Another contribution to knowledge is that this research can serve as a basis for further research. This is because of the systematic review of relevant and up to date literature on Value Added Tax and household consumption expenditure, which we have undertaken.

1.7 Scope of the Study

The research shall cover the period between 1994 and 2016. The period has been chosen because the decree which established VAT in Nigeria (Decree 102 of December, 1993) became effective in January, 1994, moreover 2016 is the latest year on which data is available. However, the result shall be applicable to the entire Nigerian economy.

1.8 Limitations of Study

The study is not without limitations. In the first place, financing the study was not easy a task. Time was not a problem at all, but locating or finding appropriate data for the study. Different organizations may collate different data for a particular economic variable. Again, obtaining data for the recent years like 2015 and 2016 required extra efforts. Our models were re-estimated severally, probably because of the nature of the data under consideration.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Framework

Value Added Tax

The Value Added Tax (VAT) is a tax that is applied to household consumption expenditure. It penalizes consumption and results in higher prices for consumers. VAT therefore has the tendency to reduce the purchasing power of household consumption expenditure through increase in prices. Since VAT increase the total tax burden of households, an inverse relation is expected between Value Added Taxation (effective VAT rate) and household consumption expenditure. The revenue generated in Nigeria through VAT is usually re-invested back into the economy through the federal, state and local government, in ratio 15: 50: 35 respectively. As a result, VAT revenue is expected to contribute positively to the growth of Gross Domestic Product.

The general idea behind the introduction of Value Added Tax in Nigeria in 1993 is to raise revenue with which to finance the ever increasing government expenditure. Ever since then, revenue realized from VAT has been on the increase on yearly basis. As a result, VAT is expected to be positively related to Total Tax Revenue. In addition to the objective of revenue generation of VAT, it should serve as fiscal tool in the hand of the authority with which to influence the general consumption behaviour of the people. In this regards, VAT policy should reduced consumption, mobilize adequate savings for capital formation and accumulation, and above all usher the economy into a new phase of growth and development.

Value Added Tax (VAT), also known as goods and services tax, is a broad – base tax imposed on the various stages of production, starting from raw materials to the final products.

Value Added Tax (VAT) is a tax on consumer spending. It is collected by VAT-registered traders on their supplies of goods and services effected within the state, for consideration, to their customers. Generally, each such trader in the chain of supply from manufacturer through to retailer charges VAT on his or her sales and is entitled to deduct from this amount the VAT paid on his or her purchases (Bakare, 2013).

The effect of offsetting VAT on purchases against VAT on sales is to impose the tax on the added value at each stage of production- hence Value Added Tax. For the final consumer, not being VAT-registered, VAT simply forms part of the purchase price.VAT is a form of consumption tax. VAT is a tax on the amount by which the value of an article has been increased at each stage of its production and distribution (Ojo, 2008).

Consumer Demand

Consumer demand or household final consumption expenditure (formally private consumption) is the market value of all goods and services including durable products (such as cars, washing machines and computers), purchased by households. It excludes purchases of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to government to obtain permits and licenses (World Bank, 2013).

Value

Smith (1776) maintained that value of a commodity, or the quantity of any other commodity for which it will exchange, depends on the relative quantity of labour which is necessary for its production, and not as the greater or lesser compensation which is paid for that labour.

VATable Agents (Registered Persons)

Sani (2012) defined registered person as manufacturers, wholesalers, importers and suppliers of VATable goods and services to be registered with Federal Inland Revenue Service (FIRS)

within six months of commencement of business. Such registered person is expected to charge and collect VAT on supplied goods and services. The amount so collected constitutes the VAT output. On the other hand, a purchaser of VATable goods and services is also expected to pay VAT on goods and services supplied to him; this constitutes VAT input (producer input purchases). The difference between the output and the input VAT represents the amount payable to the Federal Inland Revenue Service (FIRS). The amount is payable where the output tax exceeds the input tax. Where the input tax exceeds the output tax, this may be claimed from the Revenue.

Administration of Value Added Tax (VAT)

VAT is administered and managed by the Federal Inland Revenue Service (Mashi, 2012); a VAT Directorate which was established as one of the six directorate of Federal Board of Inland Revenue (FBIR). Local VAT offices were established in all the state capitals and some major towns in each States with the ultimate plan to have Local VAT Offices (LVO) in each of the 774 Local Government Councils. Each of the LVO was under the supervision and control of the zonal office in the area. The zonal coordinator reports regularly the activities and performances of the LVOs in his zone to the VAT Director in the head office. In terms of physical location, the local VAT offices are separated from Income Tax Area offices of the FIRS, but the same zonal co-coordinator was maintained for both income tax and VAT. Furthermore, a separate VAT Technical Committee was established by the Act and vested with powers to consider all matters that may require professional and technical expertise and make recommendation to the FIRS.

Five zonal tribunals are expected to be created by the Federal Ministry of Finance. Where a tax payer is aggrieved by an assessment, the law allows such a tax payer to object and subsequently file an appeal before the VAT tribunal. It is very important to state clearly that

technical services department in the Ministry of Finance handles all matters relating to tax or VAT issues.

Table 2.1: Taxable Goods and Services in Nigeria

S/N	Taxable Goods in Nigeria
i	All goods manufactured or assembled in Nigeria
ii	All goods imported into Nigeria
iii	All second hand goods
iv	Household furniture and equipment
v	Petrol and petroleum products (including engine oil, greases and gas).
vi	Jewels and jewelleries
vii	Textiles, clothing, carpets and rugs
viii	Bear, wine, liquor, spirit, soft drinks, and bottled water including mineral water.
ix	Cigarette and tobacco
x	All vehicles and their spare parts, excluding commercial vehicles and their spare parts.
xi	All aircraft, aircraft bodies and their spare parts.
xii	Perfumes and Cosmetics (including toiletries)
xiii	Soaps and detergents
xiv	Mining and mineral
xv	Office furniture and equipment.
xv	Electric materials of any description

Source: FIRS Information Circular NO. 9301,1993.

Table 2.2: Taxable Services in Nigeria

S/N	Taxable Services in Nigeria
i	All services rendered by financial institutions to their customers
ii	Accountancy services, auditing, book-keeping or related services
iii	The provision of report, advise, information or similar technical services in the following areas: management, financial, taxation and related consultancy services, recruitment, staffing and training, market research, public relation and advertising.
iv	Legal services, including services supplied in connection therewith.
v	Computer services, including the provision of bureau facilities, system analysis design, software, site development and training.
vi	Services supplied by architects (including landscape architects) and droughts men.
vii	Services supplied by land and building surveyors, quantity surveyors, insurance companies and assessors, fire and marine insures, and loss adjuster or similar services.
viii	Services supplied by consulting engineers.
ix	Services supplied by auctioneers, estate agents and valuers
x	Services supplied by agents including insurance agents and any person who acts for or represents someone else in arranging or conducting a transaction or other activities.
xi	Services supplied by brokers
xii	Services supplied by secretarial agencies, including the supply of typing photocopy, telex, facsimile and type-setting facilities and related services.
xiii	Services supplied by security companies and enterprises.
xiv	Courier services
xv	Repair, alteration, processing or any other services provided in connection with designated goods by designated dealers.
xvi	Services supplied in the course of altering, processing, assembling, packing, packaging, bottling, or manufacturing goods owned by any person.
xvii	Telecommunication services including rental of telecommunication equipment, and installation and maintenance services.
xviii	Letting of video tapes or any other audio visual records or hiring, coping and rewriting of video tapes and similar services.
xix	Restaurant services supplied by restaurant owner or operator.
xx	Air travels and company car hires.
xxi	Entertainment services including plays and performances, cinemas, shows and music concerts, excluding plays and performances conducted by educational institution as part of learning.
xxii	Accommodation and all other services provided by a hotel owner or operator including bars, beverages, telecommunications.
xxiii	Entertainment, laundry, dry cleaning, storage, safe deposits, conference and business services.

Source: FIRS Information Circular No. 9901: Value Added Tax, 1st January, 1999.

2.2 Exempted Goods and Services in Nigeria

Certain goods and services are exempted from tax (Vanguard, 2015). The implication is that VAT is not chargeable at all, but VAT input is not refundable. The goods exempted from VAT are listed in the table below.

Table 2.3: Exempted Goods in Nigeria

S/N	Exempted Goods in Nigeria
i	Medical and pharmaceutical products.
ii	Basic food items.
iii	Books and educational materials.
iv	Baby products.
v	Commercial vehicles and their spare parts.
vi	Agricultural equipment and products and veterinary medicine
vii	Fertilizers, farming machinery and farming transportation equipment.
viii	All exports
ix	Plant and machinery used in export processing zone.
x	Plant and machinery and equipment purchased for utilization for gas in down streams petroleum operations.
xi	Tractors, ploughs, agricultural equipment and implements purchased for agricultural purposes.

Source: FIRS Information Circular No. 9701: Detailed List of items Exempted from Value Added Tax, December 1st, 1997.

FIRS (2012) listed the exempted Services to include

Table 2.4: Exempted Services in Nigeria

S/N	Exempted Services in Nigeria
i	Services of Community Banks, Peoples Bank and Primary Mortgage Institutions.
ii	Play and Performance conducted by educational institutions as part of learning.
iii	Services related to education, medical services, and all exported services.

Source: FIRS Information Circular No. 9701: Detailed List of items Exempted from Value Added Tax, December 1st, 1997.

Zero Rated Items in Nigeria

Federal Inland Revenue Service (FIRS, 2012) explained that whereas the zero – rated goods are VATable, the applicable rate is zero percent. It explained further that the implication of zero-rated item is that a refund of VAT input is due, whereas for an exempted item, the VAT input is not refundable. The zero-rated goods and services are summarized in the table below

Table 2.5: Zero Rated Items in Nigeria

S/N	Zero Rated Items in Nigeria
i	Non – oil export.
ii	Goods and services purchased by diplomat.
iii	Goods and services purchased by humanitarian donor-funded project.

Source: Value Added Tax Act 1993 NO. 102, 1993

2.3 Overview of Nigeria Tax Laws, Administration and Reforms 1986-2012

The federal government had taken far-reaching steps aimed at reforming the nation's tax system before 2002 reform efforts. Among these are;

The 1978 Task Force on Tax Administration was headed by Alhaji Shehu Musa. The major thrusts of the report of the task force are;

- Introduction of the Withholding Tax (WHT) regime

- Imposition of 10 per cent special levy on Bank's excess profits
- Imposition of 21/22 per cent turnover tax on building and construction companies.

The 1992 Study Group on Nigerian Tax System and Administration headed by Professor Emmanuel Edozien, recommended;

- The establishment of Federal Inland Revenue Service as the operational arm of Federal Board of Inland Revenue and
- Setting up of Revenue Services at the other tiers of government (State and Local Government)

The 1992 Study Group on Indirect Taxation headed by Dr. Sylvester Ugoh recommended a policy shift from direct taxation to indirect / consumption (VAT evolved)

Overview of the Report of the Study Group (2003) and Working Group (2004) on the Nigerian Tax System

The current reform processes commenced on August 6, 2002, after series of proposal forwarded by the Nigerian Institute of Taxation to the Federal Ministry of Finance. A Study Group was eventually inaugurated to examine the tax system and make appropriate recommendations to the government, on ways to entrench a better Tax Policy and improve tax administration in the country.

It is instructive to note that the Study Group on the review of the Nigerian Tax System was inaugurated on August 6, 2002 with the 11- Points Terms of Reference. In all intents and purposes, the Study Group which has three members of Chartered Institute of Taxation of Nigeria, was set up to take a critical look at the existing tax laws, the inherent lapses and proffer ways and means of enhancing tax system through feasible recommendations.

A comparative analysis showed that Terms of Reference of 2002 Study Group was broader in scope than the 1991 Study Groups in that while the latter's exercise covered the review of direct taxes under the jurisdiction of the Federal and State Revenue Services, the 2002 exercise was more comprehensive as it covered the entire gamut of taxes under the jurisdiction of the Federal, State and Local Government Levels. The Study Group had its main Report in 20 Chapters of 17 Volumes. In all, about 39 taxes, levies and fees, including 8 Federal, 11 State and 20 Local Government taxes and levies captured in the taxes and levies (Approved list of collection) Decree No. 21 of 1998 were thoroughly appraised by the Group consequent upon which the study recommendations were made to the federal government. Some of its recommendations include;

- Nigeria to have a 24 clause national tax policy;
- Compilation of registers of individuals and corporate tax payers and also issuance of smart tax identity cards for all tax payers;
- Raising of the threshold of personal income tax up to #200, 000, consolidation of personal income tax free allowances to a single bulk of 40% of assessable income and the highest income rate should be 20%;
- Limitation of special tax incentives such as tax holidays and import duty reliefs to only industries located in rural areas, fully export oriented industries, solid minerals production companies and oil and gas operations;
- A company to make profit before being exposed to companies' income tax in any assessment year;
- Reduction of companies' income tax rate to 20% from the current 30% rate;
- Companies with less than #50, 000, 000 capital base to henceforth pay its companies income tax to state where it operates;

- Speedy constitutional amendments to confirm the legality of Value Added Tax (VAT) which should be shared among the states after 3% had been deducted as part of its administration cost nationwide; and
- Local government to charge tenement rate and capitation rates and other clear-cut user charges for services directly beneficial to the citizens only.

After a thorough appraisal of the technical issues involved in the implementation of its far-reaching recommendations, the Group also suggested a tax environment where taxpayer is registered as the "King" and tax system with a "human face" as a strategic option of achieving the broad policy of its sundry recommendations. The Study Group submitted its report in July 2003.

A private sector driven-group was constituted on 12 January 2004 and was fundamentally based on issues covered by the Study Group's report of 2003. The Working Group was mandated in its Terms of Reference to "critically evaluate the recommendations of the Study Group and propose prioritized set of strategies whose implementation would give effects to the reform of the Nigerian tax system, which were grouped into;

- Short Term : Within 6 month of submission of the Working Group's Report
- Medium Term: Within 2 years of submission of the Working Group's Report
- Long Term: Within 5 years of submission of the Working Group's Report

Both groups addressed macro and micro issues in tax policy and administration. Among the macro issues discussed were the drafting of National Tax Policy, Taxation and Federalism, Tax Incentives and Tax Administration generally.

The Study Group and the Working Group recommendations saw the need for more inputs from stakeholders in the nation's tax system, hence the convening of the 1st National Tax Retreat, tagged "Tax Reform and Democracy" held in Lagos from 22-24 August, 2005.

Stakeholders agreed at the end of the Retreat that the following reasons were not only expedient but necessary for the Nigerian tax system;

- Efficient and effective tax administration
- Stimulate the non-oil sector of the economy
- To solve contentious issues in tax administration
- Redistribute wealth and entrench a more equitable tax system
- Capacity building for administrators and tax payers
- Centralization of revenue agency and computerization
- Reduce effective tax rates and simplify tax regime
- Develop a tax policy for Nigeria, etc.

Summary of recommendations on the position Paper on the Value Added Tax (VAT) presented by the Chartered Institute of Taxation of Nigeria (CITA) to the National Assembly Public Hearing on Tax Bills, December,2005 are as follows.

Value Added Tax (VAT) Amendment Bill 2005

- Companies operating in the oil and gas sector should not be treated like government agencies and parastatals;
- Vat rate should remain 5%;
- VAT base and administration should be extended to untapped areas;
- Exemption granted to goods and services should be limited to imports;
- Goods and services purchased for use in donor funded agency should be zero rated;
- Zero rates should be limited to those producing for export;
- There should be consistency in the use of either “taxable person” or” taxpayer” to preclude any confusion.

Sani (2012) maintained that there are almost 14 different tax laws in Nigeria. The tax laws are necessary to give legal backing to the collection, as well as how the tax is to be administered. The administrative machinery currently in existence in Nigeria include the Joint Tax Board (JTB), the Federal Board of Inland Revenue (FBIR), the State Board of Internal Revenue (SBIR), Local Government Revenue Committee and Joint State Revenue Committee. Nigeria has embarked on different tax reforms since the colonial era. The objective of tax reform is to strengthened the tax laws and reposition such tax system to enhance greater revenue generation and minimize its distortions effects on the working of the economy. It is to be emphasized that 2012 tax reform has granted autonomy to the Federal Inland Revenue Service, which enables the organization to handle legal, administrative, recruitment matters without recourse to the ministry of finance.

2.3.1 Tax Administration in Nigeria

Ojo (2008) stated that there are currently five administrative set up in Nigeria. We shall briefly discuss the composition and the major function of each administrative set up.

Since 1992, Technical Committees were also set up at the Federal and State levels of administration. The Federal Inland Revenue Service (Enactment) of 2007 had far reaching impact on tax administration in Nigeria (FIRS, 2012). The administrative machinery currently in existence in Nigeria include the Joint Tax Board(JTB), the Federal Board of Inland Revenue(FBIR), the State Board of Internal Revenue(SBIR), Local Government Revenue Committee and Joint State Revenue Committee(FIRS, 2012).

The Joint Tax Board is made up of The Executive Chairman of FIRS as Chairman and a representative from each state of the federation. The major function of this board is to advise the federal government in respect of double taxation arrangements, rates of capital

allowances and other tax matters including proposed amendments to Personal Income Tax Decree (Ojo, 2008).

The Federal Board of Inland Revenue has an executive arm called the Federal Inland Revenue Service and it composed of Executive Chairman being person experienced in taxation to be appointed by the president and subject to confirmation of the senate; six members with relevant qualification and expertise who shall be appointed by the president to represent each of the six geo-political zones; a representative of Attorney General of the Federation; the Governor of the CBN; a representative of Minister of Finance; Chairman of the Revenue Mobilization, and Fiscal Commission; the Group Managing Director of NNPC; the Comptroller – General of Nigeria Custom Service; the Registrar General of the Corporate Affairs Commission and the Chief Executive Officer of the National Planning Commission. Their major responsibility has to do with assessing persons including companies, enterprises chargeable with tax, in collaboration with relevant ministries and agencies, review the tax regimes and promote the application of tax revenues to stimulate economic activities and development among others (Ojo, 2008).

The Technical Committee composed of the Executive Chairman as Chairman, all Directors and Heads of Department of the FIRS, the Legal Adviser to the Board and the Board Secretary. Their major responsibility has to do with consideration of all tax matters that require professional and technical expertise and make recommendation to the Board (Ojo, 2008).

State Board of Internal Revenue composed of the Executive Chairman of the State Service who shall be a person experience in taxation appointed by the State Governor from within the State Service, the Director and Heads of Department within the State Service, a Director from the Ministry of Finance, three persons nominated by the Commissioner of Finance in the

State on their personal merit, a Legal Adviser to the State Service and the Secretary to the State Service. The Board is responsible for the assessment and collection of Pay-as You Earn and other Personal Income Tax, Appointing, promoting, transferring and imposing discipline on the employees of the State Service among others (Sani, 2012).

Technical Committee of State Board of Internal Revenue (SBIR) comprises the Executive Chairman as Chairman, all Directors and Heads of Department of the State Internal Revenue Service, the Legal Adviser to the Board and the Board Secretary. Their major responsibility is to consider all tax matters that require professional and Technical expertise and make recommendation to the Board among others (Ojo, 2008).

Local Government Revenue Committee is to be established for each Local Government Area of each State and it is composed of the Supervisor for Finance as Chairman, three Local Government Councillors as members and two other persons experienced in tax matters to be nominated by the Chairman of the Local Government Area on their personal merit. This Committee shall be responsible for assessment and collection of all taxes, fines and rates under its jurisdiction; and responsible for day to day running of the Treasury (FIRS, 2012).

Joint State Revenue Committee, which was established for each state of the Federation by Decree 19 of 1998 composed of the Chairman of the State Internal Revenues Service as Chairman, the Chairman of the Local Government Revenue Committee, a Representative of the Bureau on Local Government Affairs, a Representative of the National Revenue Mobilization, Allocation and Fiscal Commission as an observer, the State Sector Commander of the Federal Road Safety Commission, the Legal Adviser to the State Board of Internal Revenue, and the Secretary of the Committee. Their major functions include implementing the decision of the Joint Tax Board, advice the Joint Tax Board (JTB) and the State and Local

Government on Revenue matters; carry out such other functions as may from time to time be assign to it by the Joint Tax Board (JTB) among others (FIRS, 2012).

2.4 Theoretical Literature

2.4.1 The Absolute Income Hypothesis

Keynes (1936) postulated that aggregate current disposable income is based on his fundamental psychological law of consumption which states that when income increases consumption expenditure also increases but by a smaller amount.

The Keynesian consumption function is written as

$C = a + cY$…… (2.1) $a > 0, 0< c < 1$

Where C is consumption, a is the intercept, a constant which measures consumption at a zero level of income (disposable), c is the marginal propensity to consume (MPC), and Y is the disposable income. The above relation that consumption is a function of disposable income whether linear or non-linear is called the absolute income hypothesis. Keynes (1936) stated that consumption function has the following properties.

As income increase, average propensity to consume (APC = c/y) falls, the marginal propensity to consume (MPC) is positive but less than unity ($o < c < 1$) so that higher income leads to higher consumption, the consumption expenditure increase (or decreases) with increase (or decrease) in income but non-proportionally. This non-proportional consumption function implies that in the short run average and marginal propensities do not coincide (APC > MPC), this consumption function is stable both in the short- run and the long-run.

This consumption function is explained in Fig. 2.1 below

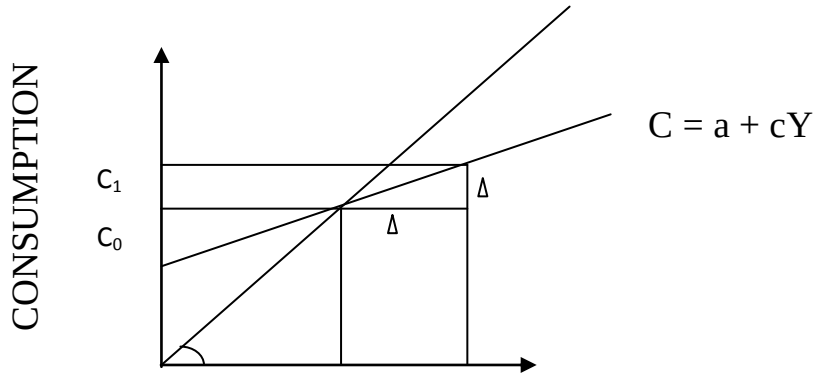


Figure 2.1: Consumption function

Where c = a + cy is the consumption function at point E on the C curve the income level is 0Y. At this point APC > MPC where APC = 0C/0Y, and MPC= ΔC/ΔY = ER/RE. This shows disproportional consumption function. This corresponds to zero level of income. At income level 0y where the curve C intersect the 45^0 line, point E_0 represent APC ($=0C_0/ 0Y_0$) below the income level $0Y_0$, consumption increases less than proportionately with income so that APC declines and it is less than one.

2.4.2 The Drift Theory of Consumption

One of the first attempts to reconcile the short-run and long-run consumption function was by Arthur Smithies and James Tobins (1945). They tested Keynes's studies and came to the conclusion that the short-run relationship between consumption and income is non-proportional but the time series data show the long-run relationship to be proportional. The latter consumption –income behaviour results through an upwards shift or "drift" in the short-run non-proportional consumption function due to factors other than income. Smithies and Tobins (1945) stated that the drift in consumption involves the following factors:

- Asset holdings: Tobin introduced asset holdings in the budget studies of Negroes and white families to test the hypothesis. He came to the conclusion that the increase in

asset holdings of families tends to increase their propensity to consume thereby leading to an upward shift in their consumption functions.

- New products: Since the end of the Second World War, a variety of new household consumer goods have come into existence at a rapid rate. The introduction of new products tends to shift the consumption functions upward.
- Urbanization: Since the post-World War period, there has been an increase tendency toward urbanization. This movement of population from rural to urban areas has tended to shift the consumption function upward because the propensity to consume of urban wage earner is higher than that of the farm workers.
- Age distribution: There has been a continuous increase in the percentage of old people in the population over long-run. Through the old people do not earn but they do consume commodities. Consequently, the increase in their numbers has tended to shift the consumption function upward.
- Decline in saving motive: The growth of social security system, which makes automatic saving necessary and guarantee income during illness, unemployment disability and old age, has increased the propensity to consume.
- Consumer credit: The increasing availability and convenience of short term consumer credit shifts the consumption function upward. The greater the ease of buying consumer goods with credit card, debit card, use of ATM's and cheque, and availability of instalment buying, the more upward consumption function drifts. Expectation of income increasing: The average real wages of workers have increased and this causes upward shift in their future consumption. These cause an upward shift in the consumption function of those who expect higher future earnings and tend to reduce their savings.

The Consumption Drift Theory is explained in fig. 2.2 below

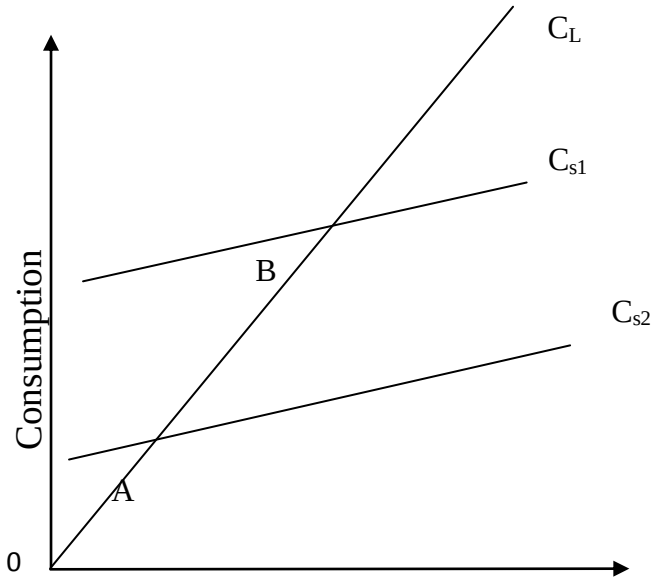


Figure 2.2: The Drift Consumption Function

Smithies and Tobins (1945) stated that C_L is the long-run consumption function, which shows the proportional relationship between consumption and income, as we move along it. C_{s1} and C_{s2} are the short-run consumption functions which cut the long-run consumption function C_L at points A and B. But due to the factors mentioned above, they tend to "drift" upward from points A to B along the C_L curve. Each points such as A and B on the curve represents an average of all values of factors included in the corresponding short –run functions, C_{S1} and C_{s2} respectively and the long-run functions, C_L connecting all the average values. But the movement along the dotted portion of the short-run consumption function, C_{s1} C_{s2} would cause consumption to increase in proportion to the increase in income.

2.4.3 The Relative Income Hypothesis

The relative income hypothesis as explained by James Duesenberry (1949) is based on the rejection of the two fundamental assumptions of the consumption theory of Keynes. Duesenberry (1949) states that:

- Every individual's consumption behaviour is not independent but interdependent of the behaviour of every other individuals and

- That consumption relation is irreversible and not reversible in time.

In formulating his theory of the consumption function Duesenberry (1949) writes; "A real understanding of the problem of consumer behaviour must begin with a full recognition of the social character of consumption pattern". By the "Social character of consumption patterns", he means the tendency in human beings not only "to keep up with the "Joneses" but also surpass the Joneses. Joneses refers to rich neighbours. In other words, the tendency is to strive constantly toward a higher consumption level and to emulate the consumption pattern of one's rich neighbours and associates. Thus consumers' preferences are interdependent. It is, however, differences in relative incomes that determine the consumption expenditures in a community. A rich person will have a lower APC because he will need smaller proportion of his income to maintain his consumption pattern. On the other hand, a relatively poor man will have a higher APC because he tries to keep up with the consumptions standard of his neighbours and associates. This provides the explanation of the constancy of the long – run APC because lower and higher APC's would balance out in the aggregate. Thus even if the absolute size of income in a country increases, the APC for the economy as a whole at the higher absolute level of income would be constant. But when income decreases, consumption does not fall in the same proportion because of the ratchet effect.

The Ratchet Effect

The second part of the Duesenberry (1949) is that the "past peak of income" hypothesis, which explains the short – run fluctuations in the consumption function and refute the Keynesians assumption that consumption relations are reversible. The hypothesis states that

during a period of prosperity, consumption will increase and gradually adjust itself to a higher level. Once people reach a particular peak income level and become accustomed to this standard of living, they are not prepared to reduce their consumption pattern during a recession. As income falls, consumption decline but proportionally less than the decreases in income because the consumer disserves to sustain consumption. On the other hand, when income increases during the recovery period, consumption raises gradually with rapid increase in savings. Economists call this the ratchet effect.

Dussenbery (1949) combined his two related hypothesis in the following form:

$C_t = a - cY_t$ ……(2.2)

Y_t/Y_0

Where C_t and Y_t are consumption and income respectively, t refers to the current period, subscript 0 refers to previous period, a refers to the positive autonomous consumption and c is the marginal propensity to consume. In this equation, the consumption income ratio in the current period (C_t/Y_t) is regarded as a function of Y_t/Y_o, that is, the ratio of current income to the previous peak income. If the ratio is constant, current consumption income ratio is constant. During recession when current income (Y_t) falls below the previous peak income (Y_o), the current consumption income ratio (C_t/Y_t) will increase.

2.4.4 The Permanent Income Hypothesis

Another solution to the present contradiction between the proportional long – run and non – proportional short – run consumption function is Friedman (1957) Permanent Income Hypothesis. Freedman (1957) rejected the use of "current income" as the determinant of consumption expenditure and instead divides both consumption and income into "permanent" and transitory" component, so that

Y_m or $Y = Y_p + Y_t$ …….. …… (2.3)

$C = C_p + C_t$ …… …… (2.4)

Friedman (1957) stated that Y_p refers to permanent income; Y_t refers to transitory income, Y refers to income and C_p and C_t refers to permanent and transitory consumption respectively.

Permanent income is defined as "the amount a consumer unit could consume (or believes that it could) while maintaining its wealth intact". It is the main income of family unit which in turn depends on its time – horizon and foresightedness. It includes non – human wealth that it owns, the personal attributes of earners in the unit; that is the attributes of the economic activity of the earners such as occupation followed, the location of economic activity and so on. Y_m been the consumers measured income or current income, it can be larger or smaller than his permanent income in any period and permanent income are due to the transitory component of income (Y_t). Transitory income may rise or fall with windfall gains or losses and cyclical variations. If the transitory income is positive due to windfall gain, the measured income will rise above the permanent income. If the transitory income is negative due to theft, the measured income falls below the permanent income. The transitory income can also be zero in which case measure income equals permanent income, permanent consumption is defined as "the value of the services that it is planned to consumed during the period in question". Measured consumption are also divided into permanent consumption (Cp) and transitory consumption (C_t). Measured consumption (or current consumption) may deviate from or equal permanent consumption depending on whether the transitory consumption is positive or zero, permanent consumption is a multiple (k) of permanent income, Yp.

$C_p = kY_p$ …….. ……(2.5)

And $k = f(r,w,u)$

Therefore $C_p = k (r,w,u) Y_p$

Where k is a function of the rate of interest (r), the ratio of property and non-property income to total wealth or national wealth (w), and the consumer's propensity to consume (u) . This equation tells that over the long run period consumption increases in proportion to the change in Y_p. This is attributable to a constant k (= C_p/Y_p) which is independent of the size of income. Thus k is the permanent and average propensity to consume and APC = MPC.

2.4.5 The Life Cycle Hypothesis

Ando and Modigliani (1963) formulated a consumption function which is known as the life cycle hypothesis. According to this hypothesis, consumption is a function of lifetime expected income of the consumer. The consumption of the individual consumer depends on the resources available to him, the rate of return on capital, the spending plan and the age at which the plan is made. The present value of his resources includes income from assets or wealth or property and from current and expected labour income. Thus his total resources consist of his income and wealth.

2.4.6 Assumptions of the Theory

Ando and Modigliani (1963) gave the following assumptions of Life Cycle Hypothesis: The lifecycle hypothesis is based on the following assumptions, there is no change in the price level during the life of the consumer, the rate of interest paid on assets is zero, the consumer does not inherit any assets and his net assets are the result of his own savings, his current saving result in future consumption, he intends to consume his total lifetime earnings plus current assets, he does not plan any bequest, there is certainty about his presents and future flow of income, the consumer has a definite conscious vision of life expectancy, the

consumer is aware of the future emergencies, opportunities and social pressures that will impinge upon his spending, the consumer is rational.

Given these assumptions, the aim of the consumer is to maximize his utility in his lifetime, which will in turn depend on the total resources available to him during his lifetime. Given that his consumption is proportional to these resources, the proportion of resources that the consumer plans to spend will depend on whether the spending plan is formulated during the early or later year of his life. As a rule individual's income is relatively low at the beginning of his life and also at the end of his life. This is because in the early years of his life, he has little assets (wealth) and during the later years, his labour income is low. It is, however in the middle of his life that his income, both from assets and from labour, is high. As a result, the consumption level of the individual throughout his life is somewhat constant or slightly increasing.

Other Theoretical Studies

Few studies have examined the theoretical nexus between the Value Added Tax (VAT) and consumption behaviour focusing primarily on the result of a tax reform that aims to replace income tax with a VAT. For instance, Batina (1999) studied the effects of conversion of income tax in the presence of a bequest, by using an overlapping generation model, the author found that the taxation of bequests at the rate of consumption tax pushes the benefits of tax reform as saving and capital accumulation does no increase. Consequently, the bequest decision will be distorted, as bequests will then be affected since they will be taxed twice and this can lead to a reduction in capital accumulation when the reform take place; as there is less incentive saving for bequest.

Matsuzaki (2003) studied the effect of consumption tax on effective demand under stagnation. Using a two class model with unequal distribution of wealth, the author noticed that under stagnation, a rise in consumption tax rate decreases (increases) effective demand

with respect to heterogeneous households when the proportion of poorer household is large (small) in relation to the whole population. The author explained his findings in this way; increasing the rate of consumption tax on richer households does not alter their consumption, because in this case the marginal utility of money reaches its lowest edge. However, when the rate of consumption tax is raised on poorer households, it initiates two effects (i) the effect of pure consumption tax that increases the marginal utility of households' money and therefore this always reduce consumption, and (ii) the redistribution effect (the government in a way gives back the consumption tax revenues in the form of lump-sums to all households) which increase the consumption of the poor households. In addition the effect of redistribution is less effective as proportion ratio of poorer households is larger compare to the total population. Therefore, the net effect of the consumption tax on the poorer households depends on which of these two effects assumes more dominance.

Moreover, Prieto, Romero and Sanzsanz (2005) used Almost Ideal Demand System (AIDS) model to determine the benefits of VAT cut while considering cultural commodities and found gain to be regressive.

Other studies made use of models such as computable general equilibrium (CGE) to determine the effect of their implementing the VAT in the economy or increasing its rate, on determinants such as consumer prices, consumption, investment and welfare. Most of these studies were carried out on developing countries. For example, Rage (2002) identified that the immediate administration of VAT in India, in place of other indirect taxes, decreases welfare more than if its implementation has been progressive because it leads to a raise in the price of basic necessities. Consequently, he observed that when the essentials such as food, agriculture and textile are tax free, welfare loss is half.

Petrucci (2002) investigated the effects of a consumption tax on capital formation and economic development using a simple model of endogenous growth sector with finite

horizons. To be able to concentrate solely or fully on the effect of the consumption tax on relative price of consumption today and tomorrow, the author took the inelastic supply of labour to remove the distortion in the inter-temporal consumption leisure brought about by the consumption tax. He noted that in the endogenous growth model with new generations constantly coming into the economy, the consumption tax decreases aggregate consumption and raises saving, stimulating capital accumulation and economy growth in two ways first, when currently living consumer receive lump-sum for the consumption tax, and second when the increase in consumption tax is supplemented by fall in public debt. The author contends that under the first scenario, consumption taxes influences aggregate savings by the generational redistribution of income, since the younger consumers save relatively more than the older ones, which is performed by the distribution of tax revenue. Consequently, there is a positive impact of consumption tax on saving and economic growth as a result of the demographic heterogeneity of households. On the hand, the second scenario; the reduction of public debt that occurs simultaneously with the increase in the consumption tax reduces share of consumption in national income, promotes capital accumulation and long-term economic growth as the change in public debt redistributes wealth between the age group, while consumption tax, by itself, is neutral. However, if the income is not redistributed inter generationally between the actual generations and generations that are yet to be born, because the resources of taxation have been used to finance unproductive government expenditure, the net outcome of the consumption tax on the rate of growth would disappear. The result creates a transitional adjustment of the economy, in which short-term effects of the consumption tax on real growth and the proportion of private consumption to national income are smaller than long-run results. In conclusion, the author recommended a policy that encourages the tax proposal seeking to reduce output tax in place of expenditure tax, since it creates less distortion and it will therefore stimulate capital accumulation and growth.

Delfin, Kearney, Sherman and Thierfelder (2005) reported that South Africa's value added tax is mildly regressive, and it is an effective source of government revenue, compared with other tax instruments in South Africa. They evaluated the VAT in the context of other distortions in the economy by computing the marginal cost of fund - the effect of raising government revenue by increasing the VAT rate on household welfare. Then they evaluated the alternative, revenue neutral tax systems in which they reduce the VAT and raise income taxes. They demonstrated that alternative tax structures can benefit low-income households without placing excess burdens on high-income households.

2.5 Empirical Literature

2.5.1 Other countries case studies

Some studies have investigated the empirical relationship between Value Added Tax (VAT) and consumption, for instance Andrikopoulos (1993) examined the short run effects of the VAT on consumption pattern in Greece. The aim of the study was to evaluate the influence of the VAT on individual commodity price index, shares and the allocation pattern of total consumption expenditures, among groups of commodities by making use of a time series data involving thirteen commodity groups in Greece for the period 1958 – 1986 and by employing the Full Information Maximum Likelihood (FIML) approach to assess and test static Almost Ideal Demand System (AIDS) model, some major empirical conclusions were recorded. Firstly, the VAT has altered the composition of commodity prices, both positively and negatively. In fact VAT has raised the consumer price index by 4.7 percent above the rate supposed to occur without the presence of VAT. Secondly, the VAT has changed consumption pattern or the distribution of total consumption expenditure between groups of goods and services under study. This is the result of significant difference between the prevailing and anticipated budget shares and the considerable change in demand both

compensated and uncompensated. Andrikopulos (1993) examined the short run effect of VAT on consumption pattern in Greece by adopting Full Information Maximum Likelihood approach to assess and test static AIDS model, Stainlave, et.al (2007) on the other hand conducted a household survey on consumption expenditure and various household attributes. Their conclusions are not similar in that the former observed that VAT has raise the consumer price index and change consumption pattern while the later found VAT to be progressive.

Stainslav, Slintakova, Slovamira andZeleny (2007) used 2004 household budget survey data on consumption expenditures and various households attributes. They estimated the VAT burden of Czech household before and after the entry into the EU. The authors found that the Czech VAT is progressive. The progressiveness of the VAT is probably caused by a design of the tax when different items of household consumption are taxed at different rates including exemptions. Stanilav, et.al (2007) study and Newhouse, et al.(2007) are both survey study, but their conclusion differs. The former found VAT to be progressive while the later observed an inverse relationship between VAT and household consumption.

More recently, Newhouse, Zakharova (2007) studied the impact of VAT modification in Philippines and evaluated the various methods that were adopted to mitigated the expected consequences faced by poor households. Their survey revealed that as VAT was reformed, real household consumption experienced reduction in both poor and high income households. Further, they revealed that poor relied more upon unrefined agricultural products for consumption as they were exempted from VAT. They also found that by lessening measures aimed at social protection, hostile effect of VAT reform could be reduced. Newhouse and Zakarova(2007) and Eimear, et. Al(2010) adopted different methodology, and arrived at almost similar conclusions.

Eimear, Seen and Richard (2010) examined the distributional effect of Value Added Tax (VAT) in Ireland. Using 2004 /2005 household budget survey, the authors assess the amount of VAT that household pay as a proportion of weekly disposable income. They measured VAT payments by equalizing income docile, households of different composition and different household sizes. The current system is highly regressive. With the use of a micro-simulation model changing the VAT rate on certain groups of items and the associated change in revenue. The author considered how the imposition of flat rate across all goods and services would affect households in different categories. Eimear et. al(2010) and Satti et. al(2010) use simulation analysis to study the effect of VAT in Ireland and Lebanon respectively. The former found VAT to be highly regressive while the later observed that VAT has negative impact on consumption.

Satti and Chabaan (2010) studied the effect of increasing rate of VAT by targeting poverty and inequality in Lebanon. An empirical model Almost Ideal Demand System, based on consumer theory of demand was established to study the impact. Simulation result shows that increased rate of VAT would have significant impact on poverty. Although the increased rate would have a negative impact on overall consumption, yet its effect on poor is greater compared to rich populace. Unlike Satti and Chaban(2010) study, Ernest and Young and Tax Policy Advisor(2010) used simulation to analyse macroeconomic impact of VAT. Similar conclusions were reached by both the former and the latter that VAT reduces consumption.

Ernst & Young and Tax Policy Advisers (2010) analysed the macroeconomic effects of implementing a VAT to reduce projected federal deficit in the United States. The study made use of the Tax Policy Advisers' model of the United States to simulate the effects of VAT on some key macroeconomic variables under three different scenarios, where each raises revenue equal to two per cent of Gross Domestic Product. These scenarios are:

- A narrow – based VAT covering 41 per cent of total consumption, which exclude a wide variety of items due to administrative concern or they account for a larger share of low-income families' budget. This would require a VAT rate of 10.3 per cent.
- A broader-based VAT covering 67 per cent of total consumption that replaces some of the exemptions under narrow – based VAT with a cash grant to low – income families to fully offset VAT on families below the federal poverty level. This would require a VAT rate of 8.0 per cent.
- A narrow-based VAT that also includes cash grant to low income families. This would require a VAT rate of 12.4 per cent.

The three principal findings of the study are:

- An add-on VAT would reduce retail spending by $2.5 trillion over the next decade. Retail spending would decline by almost $260 billion or 5.0 per cent in the first year after the enactment of VAT.
- An add-on VAT would cause GDP to fall for several years. The economy would lose 850,000 jobs in the first year, and there would be 700,000 fewer jobs ten years later. By comparison, a comparative reduction in the deficit through reduced government spending would have less adverse effect on the economy, and could have positive effects for economic growth.
- Although lower deficits and debt would have positive long-run effects for the economy, most American over 21 years of age would be worse-off, when the VAT is enacted. A VAT would have significant re-distributional effects across generations, reducing real income and employment for current workers.

They concluded that as a consumption-based tax, an add-on VAT would be shifted forward to consumers through higher consumer prices. As a result, private consumption would fall by

increasing consumer prices, the VAT also reduces real or inflation adjusted wages, which would cause labour supply to fall as well. David and Takashi (2011) did not employ simulation analysis like Ernest and Young and Tax Policy Advisor (2010), but panel regression analysis to study the impact of VAT increase. They observed an inverse but non-significant relationship between VAT and consumption. This conclusion differs from the position of Ernest and Young and Tax Policy Advisor (2010), because they observed negative and significant relationship between VAT and consumption.

David and Takashi (2011) evaluated the impact of Japan's April 1997 VAT rate increase from 3 to 5 % on household expenditure. Data from Japanese family income and expenditure survey (JFIES) for the period 1992-2010 (a panel) was used. The regression result showed that VAT increase did not have a significant impact on real household expenditure, though a negative relationship was observed.

David and Takashi (2011) evaluated the impact of VAT on household expenditure, in Japan's. It could be observed that a rate increase induces price hikes, and provided the increase in price levels in anticipated, households should engage in inter-temporal substitution of purchases. In addition if household are not compensated for the rate increase, it has the potential to induce income effect on household consumption. Based on monthly household expenditure data, the authors found out that household spent 30,231 yen more in a quarter prior to the rate increase than they would have in its absence, while the income effect was negligible. Wein (2011) also conducted household expenditure survey like David and Takashi (2011). The two works are not free from methodological issues. The number of respondents used in the studies and the procedures with which their sample sizes were determined were not expressly stated in their studies.

Wein (2011) reported that VAT - exemption leads to two problems at least: (i) the expectable financial gain, which can be achieve by the exempted firm, is unpredictable and (ii) the

welfare consequences depend on the prevailing type of market structure. The VAT-exemption for German postal services can be seen as an outstanding case study to show the typical consequences. Unlike Wein (2011) and David and Takashi (2011), Fabian, et. al (2011) is cleared about the numbers of respondents used in their survey. The method used in selecting their sample size was not expressly stated, though it represents an improvement over the two studies mentioned earlier.

Fabian, Detlef, Fetchenhauer and Hoelzl (2011) conducted a study 2 month before and after a raise in value added tax (VAT), 303 participants had to estimate the current prices for four products affected and four products not affected by this raise in VAT and the anticipated or recalled prices of these products. Before the VAT increase, an undifferentiated belief in strong future price increases was prevalent. After the VAT increase a confirmation bias was found in respect, participants reported price increases that were significantly higher than the official price development and in line with an undifferentiated belief in market price increase. Qamruz et al (2011) and Fabian et al(2011) reach the same conclusions. Both are survey study, though Fabian is more precise in terms of method and sample size used.

Qamruz, Muhammad (2011) analyzed the impact of VAT when enforced in an underdeveloped country such as Pakistan. Using household survey data, the paper tries to grasp the effect this tax would have on social and economic life of the populace. Result showed that VAT would disturb economic order of the society and hence the concept was inappropriate in the current state of affairs. The study of Siroky and Striltakva (2012) and Qamruz and Muhammad (2012) do not differ significantly. The former used Analytic Synthetic method while the latter was not cleared about the methodology used, though their conclusions are similar.

Siroky and Strilkova (2012) investigated how changes in VAT burden on expenses of selected households in the Czech Republic between 2007 and 2012. The study made use of

the analytic synthetic method to determine how these changes manifested themselves in reference to the share of community consumption included in the standard VAT rates and to the exempt transactions and in particular to determine how they affected the VAT burden of hypothetical household in monetary term. Results showed that continuous increase in the proportion of exempt items in the consumer basket and the expected increase in taxes paid in household expenses both in absolute and with the inclusion increases the price level when the increase was 2.65%. Paolo (2013) unlike Siroky and Striltakova (2012) used the theory of marginal tax reform, still arrived at almost similar conclusions.

Paolo (2012) assessed the effects of the changes of the Value Added Tax (VAT) rates in Italy for the period 1988 – 1997. By using the theory of marginal tax reforms the author has shown that most real relative price changes due to selected use of VAT rates have cause a welfare loss which is increasingly negative in the degree of inequality aversion. This means that many VAT changes implemented during the last decade have been welfare inferior to a distributionally neutral proportional change of all VAT rates providing the same revenue.

Cashin (2013) adopted the Standard Life Cycle Permanent Income Hypothesis with test shifter unlike Paolo (2012). The latter showed that implementation of VAT has cause welfare loss while the former showed that VAT rate increase increases retail sales in proportion to price increase.

Cashin (2013) investigated the household response to pre-announced consumption tax changes. He employed the standard Life Cycle Permanent Income Hypothesis (LCPIH) with a test shifter as method of data analysis. The method uses durable and non-durable retail sales data to estimate the inter-temporal substitution and income effects of the increase in New Zealand's Good and Service Tax (GST) rate. The inter-temporary substitution estimates are consistent with the results from Japan. It was also found that uncompensated tax rate increase increases retail sales in proportion to the price increase. The result suggests that policies that

alter inter-temporal prices will have a large, but short-lived impact on household expenditure. Ahmed, et. al (2013) used correlation analysis and t-test statistic which was different from the method used by Cashin (2013); LCPIH with test shifter, however both studies concluded that VAT increase has significant impact on consumption.

Ahmed, Zaman and Samaduzzaman (2015) conducted a survey to find out how increased standard VAT influence consumer's satisfaction and consumption habit in North Wales area of United Kingdom. 80 respondents participated in the survey. Reliability test analysis was used to analyze the reliability of each question in the questionnaire. Data collected were analyzed by using correlation analysis and t-test to determine the relationship between the variables and test the hypothesis. Their findings revealed that VAT increased has significant impact on consumers' consumption habit.

The gaps identified in above literature are that all the studies neglect the impact of VAT on the composition of household consumption expenditure and the impact of VAT on the ratio of household savings to household consumption. If the implementation of VAT shifted household consumer demand to foreign made goods, the local productive sector will operate below capacity due to low patronage. Secondly if VAT could not increase the ratio of savings to household consumption, then capital accumulation and economic growth process will be impaired. This study shall bridge these gaps by estimating the impact of VAT on the composition of household consumption and on household savings consumption ratio respectively.

2.5.2 Cross country studies

Few cross country studies have examined the linkage between Value Added Tax (VAT) and aggregate consumption. Notable among them is Keen and Lockwood (2010) who investigated the causes and consequences of the remarkable rise of the Value Added Tax

(VAT). It is observed that the introduction of a VAT, reduces the funds and it leads an optimizing government to increase the ratio of tax. These lead to the estimation, on a panel of 143 countries for twenty-five years, of a system describing both the probability of VAT adoption and the revenue impact of the VAT. The results pointed to a rich set of determinants of VAT adoption, and a significant but complex impact on the revenue ratio. The estimate suggests, very tentatively, that most countries which have adopted VAT have thereby gain a more effective tax instrument, though this is less apparent in sub-saharan Africa. Both Keen and Lockwood(2010) study and Erhart and Ebeke (2011) used panel regression as method of data analysis, but arrived at different conclusion.

Ehrhart and Ebeke (2011) used a large panel of 103 developing countries data over 1980 – 2008 over the period with respect to the issue of VAT adoption, the authors found out robust evidence that the presence of VAT leads to significantly lower tax revenue instability. The authors found out that average country with value added tax experience tax revenue instability forty to fifty percent lower than countries which do not have a VAT system. Those effects decrease with the levels of economic development and trade openness. It is observed that Erhart and Ebeke (2011) study and Bumpei (2011) study are similar in terms of methodological approach---Panel regression Analysis, the theme of their studies differs.

Bumpei (2011) investigated the effect of a change in a country's Value Added Tax on its aggregate consumption and its economic growth. As for the effect on aggregate consumption, he removed the income effect and discussed only the substitution effect. Using panel data models on a sample covering up to 14 developed countries, including Japan, and quarter periods from the second quarter in 1980 (1980 Q2) to the third quarter in 2010 (2010 Q3) and picking up 53 cases of the change of the VAT rate, this paper showed empirically that aggregate consumption and economic growth display three kinds of trends when the VAT rate was changed. The first trend was that aggregate consumption and economic growth

increases [or decreases] just before the rise [or reduction] of the VAT rate. The second trend was that they decrease [or increase] relatively dramatically as soon as the rise [or reduction] is implemented. The third trend was that after the dramatic decrease [or increase] they increase [or decrease] gradually. Unlike Bumpei (2011) study, Alms and Eiganainy (2012) used dynamic panel Generalised Method of Moment system estimator, though their conclusions are similar in all respects.

Alm, and El-Ganainy (2012) estimated the impact of a broad-base consumption tax, the Value Added Tax on the aggregate consumption of fifteen European countries over the period 1961-2005. By adopting the recently developed dynamic panel Generalized Method of Moments (GMM) system estimator, came to the conclusion that a one percentage point increase in the VAT rate lead to roughly a one percentage reduction in the level of aggregate consumption in the short-run and to a somewhat larger reduction in the long-run. Alms and EL-Ganainy (2012) study differs significantly from Alexander (2013) study in terms of methodological approach. The latter adopted a graphical analysis and could not observe a negative relation between VAT and household consumption.

Alexander (2013) described and analyzed whether consumers in the U.K and Canada alter their behaviour when those countries introduced their Value Added Tax. Both retail volume and percentage change from the prior year (on a monthly basis) were used in the graphical description. By employing graphs as tools of analysis, it was found that there was no or little major behavioural change when the new taxes were introduced. However, when the tax rates were changed substantially, consumers did adapt their behaviour to take advantage of the changes by engaging in arbitrage behaviour. He concluded that US consumers are likely to act in similar manner as U.K and Canadian consumers. This work differs significantly from Sayed*et al.*,(2016) in terms of both methodological approach used and conclusions reached.

Sayed, Ghafarian, Mohd Noor and Kashmar (2016) investigated the effect of Value Added Tax (VAT) on the consumption of 19 developing countries for the duration of 1995 – 2010. By applying Generalized Method of Moment Panel to analyze the data observed that VAT with a lag influences the consumption negatively.

The major gap identified in the cross country studies is fallacy of composition. The countries grouped together under the same study differ significantly in terms of political and economic policies that are used to drive the functioning of their respective economy. What is true of a grouped of countries may not be true of an individual country within the same study. This study bridges this gap by focusing on Nigeria economy alone while estimating the impact of VAT on household consumption expenditure, among others.

2.5.3 Nigerian case study

Few studies have examined the relationship between VAT and consumption in Nigeria. For example, Ajakaiye (2000) worked on the impact of VAT on key sectors and macroeconomic aggregates, using a computable general equilibrium (CGE) model considered suitable for Nigeria. The study developed three scenarios. In order to approximate the presumed Nigerian situation, the study assume that government pursue an active fiscal policy involving the re-injection of VAT via increases in government final consumption expenditure in combination with a presumed non-cascading treatment of VAT and a positive fiscal policy combined with a non-cascading treatment. As it turns out, the scenario of a cascading treatment of VAT with an active fiscal policy not only had the most deleterious effects on the economy, it was also the one that most closely approximated the situation in Nigeria. VAT revenue under this scenario are more than 3% lower than the first scenario, the general price index increased by 12%, and wage and profit incomes fall by 8.54% and 12.27% respectively. Overall Gross Domestic Product (GDP) declines by11.34%. Such a situation, as observed by the researcher,

poses a great threat to the sustainability of VAT. This study differs significantly from Owolabi*et al.*(2011) study both in terms of methodological approach and conclusion reached.

Owolabi, *et al.*(2011) empirically evaluated the contribution of VAT to the development of Lagos state economy. Development aspects considered included infrastructural development, environmental management, education sector development and agricultural sector. Result showed that VAT revenue contributed positively to the development of the respective sectors. However, the positive contribution was statistically significant only in agricultural sector development. Both Owolabi*et al.*,(2011) study and Aderet*iet al.*,(2011) study adopted the same methodological approach and arrived at similar conclusions.

Adereti, *et al.*,(2011) investigated the relationship between Value Added Tax (VAT) and economic growth in Nigeria. The time series data on GDP, VAT revenue from 1994 to 2008 was used. He used both simple regression technique and descriptive statistic for his analysis. Findings showed that a positive and significant correlation exist between VAT revenue and GDP. Both economic variables fluctuated greatly over the period though VAT revenue was more stable. No causality exists, but a lag period of two years exists. Adereti, *et al.*,(2011) and Unegbu (2000) used the same methodology in their respective studies and arrived at similar conclusion that VAT impact positively on economic development.

Unegbu and Irefin (2011) investigated the impact of Value Added Tax (VAT) on human development of emerging nation, using Adamawa State as a case study. Both primary and secondary data for a period between 2001 and 2009 were analysed through Ordinary Least Squares technique, discriminant analysis and ANOVA. They observed that VAT allocation alone accounted for 91.2% of the variation in expenditure pattern of Adamawa state and that VAT impact on economic and human development of the state during the study period, but data obtained from primary sources suggest minimum VAT impacts. The study concluded that VAT allocations to the state within the period under study were very significant when

compared with the total revenue of Adamawa state within the same period. The perceptions of VAT impact on economic and human development across the administrative areas of Adamawa state are not different significantly. Unegbu and Irefin (2000) study differs from that of Anichebe, et. al (2012) in that the latter assessed the impact of VAT on inflation . Both studies are similar in terms of methodological approach, because they used Ordinary Least Squares regression analysis.

Anichebe, Alphonsus, Sunday (2012) examined the effect of tax policy on inflation in Nigeria using aggregate time series data from 1981 to 2012. Some of the estimation techniques adopted in the study include Johansen Co-integration Test technique, Ordinary Least Square technique and Granger Causality/Block Erogeneity Wald Test. The results of the estimates showed that Tax policy has long-run relationship with inflation in Nigeria; personal income tax rate has negative impact on inflation in the long-run, while company income tax rate and consumption and property tax have significant positive relationship with inflation in the long-run. They concluded that government should factor in tax policy when formulating policies that are meant to control inflation. Anichebe, *et al.*,(2012) and Bakari (2012) studies are similar in terms of their conclusions about VAT and inflation, but methodologically differs. The latter used simulation analysis while the former used regression analysis.

Bakari (2012) evaluated the macroeconomic effects of tax reform in Nigeria, and accessed the implications of the proposed change in VAT through simulation experiment. By beginning from a baseline scenario of 5% VAT rate and stimulating the economy through a trajectory of a proposed 10% VAT rate, he documented the following conclusions:

- The effect of 100% VAT increase will have the most negative impact on sectoral output of manufacturing sector (38.58%), export (23.29%), agricultural sector output

(17.87%), building and construction sectoral output (16.39%), finance and insurance sectoral output (8.68%), and private consumption (5.99%).

- Demand for money shall rise by 141.79%, wholesale and retail trade sectoral output will increase by 45.52%, consumer price index will rise by 35.41, inflation will rise by 22.95%, non-oil revenue shall rise by7%, and sectoral output of mining and quarrying will rise by 4.43%. Methodologically, Bakari (2012) and Musa (2012) studies differ. Musa (2012) study adopted effectiveness and efficiency parameter of judging the performance of any tax system. However, both their conclusions are eye opener.

Musa (2012) appraised the usefulness of the tax system in Nigeria, using Value Added Tax as reference point. Using data on VAT, total consumption expenditure and Gross Domestic Product of Nigeria from 1994 to 2004 and by adopting the Efficiency and Effectiveness Parameter of judging any tax system arrived at the following conclusions; (a) that the Value Added Tax system was neither effective in generating revenue for the public sector activities, nor was it efficient in directing the consumption pattern of the economy when appraised with the gross value, (b) these assertions are based on the fact that the VATGDP standard VAT rate was just about 33 percent, (c) similarly the VAT- Total consumption Expenditure standard was also very low, just about 39 percent, (d) this means that the system could not generate 5% of both the national income (GDP) or influence up to 5 percent of the total consumption. Musa(2012) study differs significantly from Worlu and Emeka(2012) study both in terms of methodological approach used and conclusion drawn from their respective study.

Worlu and Emeka (2012) investigated the impact of tax revenue on economic growth in Nigeria. Using time series data for the period between 1980 and 2007, and by adopting Ordinary Least Squares technique as a method of data analysis, concluded that tax revenue

has direct and indirect relationship with the infrastructural development and the Gross Domestic Product (GDP). The authors argued that the channels through which tax affect economic growth in Nigeria are infrastructural development, Foreign Direct Investment (FDI), and Gross Domestic Product (GDP). Worlu and Emeka (2012) study and Okafor and Regina (2012) study are the same in all respects; the theme, methodology adopted and conclusions reached.

Okafor and Regina (2012) examined the impact of tax revenue on Nigerian economic development. He expressed GDP as a function of petroleum profit tax, company income tax, custom and excise duty and value added tax. By making used of data on the above variables over a period covering 1981 to 2007 and by adopting Ordinary Least Squares regression technique as method of analysis, he concluded that a positive and significant relationship exist between tax revenues and economic development. Okafor and Regina (2012) study differs from Olatunji (2013) study in that the latter adopted descriptive analysis, with different theme of study entirely.

Olatunji (2013) examined the determinants of VAT, interest rate, inflation and influence on revenue generation in Nigeria. Secondary data from CBN statistical bulletin from 1990 to 2012 was used and the data were analyzed with descriptive analysis and Johansen Co-integration test. The result reveals that there is a positive and significant relationship between VAT and inflation both in the short and long-run, while interest rate exert negative influence on inflation both in the short and long run.

Olatunji (2013) studied the impact of VAT on revenue generation in Nigeria and the perception of citizens on VAT and inflation. Accordingly data gathered were, primary data from oral interviews and structural questionnaire while secondary data were obtained from Federal Office of Statistic, annual abstract of statistics, Federal Ministry of Finance, Abuja on VAT and inflation, by adopting descriptive research approach as a method of analysis the

researcher concluded that VAT has affected the increases or decreases in inflation rates. Olatunji (2013) study differs from Ikpe and Nteegah (2013) study in terms of methodological approach. They both study the same theme and arrived at similar conclusions. It is to be noted that the latter used multiple regression analysis in static form as oppose to the former descriptive analysis.

Ikpe and Nteegah (2013) empirically examine the influence of VAT on price stability in Nigeria using partial equilibrium analysis. The analysis was conducted by applying multiple regression analysis in static form to time series data for the period between 1994 and 2010. The results revealed that VAT exerts a strong upward pressure on price levels, most likely due to the burden of VAT on intermediate outputs. The study recommends a detailed post-VAT cost-benefit analysis to assess the social desirability of VAT policy in Nigeria. Nteegah (2013) study and Emmanuel (2013) differs in terms of theme of study, methodological approach to study and conclusion drawn from their respective study.

Emmanuel (2013) adopted simple linear regression analysis, while the former used multiple regression analysis in static form. Emmanuel (2013) investigated the effects of Value Added Tax on economic growth (GDP) and total tax revenue in Nigeria. Simple linear regression method was used to analyse time series data relating to Value Added Tax (VAT), Gross Domestic Product (GDP), and Total Tax Revenue (TTR) for a period from 1994 to 2010. The results of the regression analysis show that Value Added Tax (VAT) has positive and significant effect on Gross Domestic Product (GDP), and also on Total Tax Revenue (TTR). Emmanuel (2013) study only differ from Onaolapo (2013) study in terms of methodological approach adopted. The former used simple linear regression analysis while the latter used panel regression with random effect estimator. The theme and conclusion of their studies are similar. They found a positive and significant relation between VAT and economic growth.

Onaolapo (2013) investigated the effect of VAT on the revenue profile of South - Western Nigeria. Secondary Panel data from the approved budgets of five out of the six states that make up the south -western Nigeria were used. The study was for the period between 2002 and 2011. By employing Panel regression as a method of data analysis, with random effect estimator, they concluded that VAT is positively and significantly related to revenue profile of the states. Onaolapo (2013) and Madugba, et. al (2013) studies differ in terms of methodological approach. The latter adopted Ordinary Least Squares regression analysis, as opposed to panel regression with random effect estimator of the former. The theme and conclusions of the two studies remain the same.

Madugba, Ugochukwu and Azubuike (2013) examined the relationship between Value Added Tax and economic development in Nigeria. By making used of data that cover a period between 1994 and 2012 and by adopting Ordinary Least Squares regression technique as a method of data analysis, they concluded that there is a negative and significant relationship between VAT and Gross Domestic Product (GDP), and that a positive and significant relationship exist between total consolidated revenue and Gross Domestic Product (GDP). Madugbaet. al (2013) study and Ofishe (2013) studies are similar in all respects. The theme of study, the methodological approach used; Ordinary Least Squares regression analysis, and the conclusion reached; positive and significant relation between VAT and economic growth.

Ofishe (2013) investigated the impact of value added tax on economic growth in Nigeria among others. Using data on Value Added Tax (VAT) and Gross Domestic Product (GDP) covering a period of 1994 to 2012 and by applying Ordinary Least Squares technique as a method of analysis, recorded a positive and significant relationship between VAT and GDP in Nigeria. It was recommended among others that government should put in place measures to effectively utilize the generated VAT revenue for infrastructural and economic

development. Ofishe (2013) and Bukie and Adejumu (2013) are similar in all respects. They are similar in terms of theme of study, the methodological approach; Ordinary Least Squares technique of analysis, and conclusion reached; a positive and significant relation between VAT and economic growth.

Bukie and Adejumu (2013) examined the impact of tax revenue on economic growth in Nigeria for the period between 1970 and 2011. By adopting Ordinary Least Squares technique and regressing the indicators of economic growth such as domestic investment, labour force and foreign direct investment on tax revenue, they concluded that all the indicators have a positive and statistical significant relationship with economic growth in Nigeria. Bukie and Adejumu (2013) study and Umeora (2013) study are all similar in terms of theme of study, methodological approach and conclusion reached; Positive and significant relation between VAT and economic growth.

Umeora (2013) investigated the effects of Value Added Tax (VAT) on economic growth and total revenue in Nigeria. Time series data on VAT, Gross Domestic Product (GDP) and total revenue covering the period between 1994 and 2010 were used. Ordinary Least Squares technique was used to access the link. They concluded that VAT has significant effect on GDP, and also on Total Tax Revenue. Umeora (2013) study differs from Okoli and Afolayan (2013) study in terms of methodological approach. The latter adopted Error Correction Mechanism while the former adopted Ordinary Least Squares technique. They both reported a positive and significant relation between VAT and total federally collected revenue in Nigeria.

Okoli and Afolayan (2013) examined the correlation between Value Added Tax (VAT) and National Revenue in Nigeria. Data spanning from 1994 to 2012 were used and error correction model was adopted as technique of data analysis. They concluded that VAT is the second largest sources of total federally collected revenue. Okoli and Afolayan (2013) study

differs from Chigbu and Ali (2014) study in terms of theme and even methodological approach. They concluded that VAT has positive effect on growth and total federally collected revenue respectively.

Chigbu and Ali (2014) empirically analyzed the relationship between Value Added Tax and economic growth in Nigeria. Using Engel and Granger co integration technique on annual data sample covering a period between 1994 and 2012, they concluded that Value Added Tax has positive effect on economic growth proxy by real Gross Domestic Product. The result also showed the absence of both long-run and short-run relationship between Value Added Tax and Gross Domestic Product. Chigbu and Ali(2014) study and Onwuchekwa and Aruwa (2014) study are similar in terms of theme of study, and conclusion reached respectively. They differ significantly in terms of the methodological approach used. The former adopted Engel and Granger Co integration Technique while the latter Ordinary Least Squares technique of analysis.

Onwucheckwa and Aruwa (2014) investigated the impact of Value Added Tax on economic growth in Nigeria. Time series data for the period between 1994 and 2011 was used. By applying Ordinary Least Squares technique of analysis, they concluded that VAT contributes significantly to the total tax revenue of government and by extension the economic growth of Nigeria. Their recommendation involves sensitization of VATable persons on the need to remit VAT and proper training of VAT officials in charge with the responsibilities of assessing and collection of VAT. This study and Ajibola and Olowolaju (2017) study differs in terms of theme of study, they adopted the same methodological approach—Ordinary Least Squares technique. Their findings differ significantly, as the former found a positive and significant relation between VAT and economic growth while the latter established a positive but non - significant relation between VAT and consumption expenditure among others.

Gatawa, Allero, and Abdullai (2016) empirically investigated the impact of VAT on the level of economic activities in Nigeria from 1994Q4 to 2014Q4. Quarterly secondary data were analysed using Johansen (1968) Co-integration test. They found a positive and significant relation between VAT and economic growth. The study recommends that VAT should be sustained hence; all identified administrative loopholes should be covered for VAT revenue to continue to contribute significantly to economic growth of the country.

Ajibola and Olowolaju (2017) investigated taxation and its influence on household consumption in Nigeria. Time series secondary data between 1994 and 2014 was used by applying ordinary least squares technique as method of data analysis observed that:

- There is a negative but non-significant relationship between inflation and private consumption expenditure, there is a positive but non-significant relationship by company income tax and private consumption expenditure.
- There is a positive but non-significant relationship between VAT and consumption expenditure. They therefore recommended that the government should ensure that inflation in managed and kept at its minimum so as to increase household consumption. Furthermore, they also recommended that the government should implement and maintain an effective and efficient taxation system to increase revenue so that government can provide the essential infrastructure that will boost the economy's productive capacity.

A number of gaps have been identified in the literature. Firstly, the study on VAT and consumption in Nigeria is quite limited and grossly inadequate. Except Musa (2012), Bakari (2012), Ajakaiye (2000) and Ajibola and Olowolaju (2017), all literature in Nigeria about VAT seems to have focused exclusively on economic growth. This study bridges this gap by being not only an addition to the few literature on VAT and consumption, but also one of the most recent study that dwell exclusively on VAT and household consumption expenditure.

Even those studies that seem to link VAT with consumption could not measure VAT burden correctly. The implicit assumption in their studies is that VAT revenue is coming back to consumers directly in Nigeria. This is not so. This study bridges this gap by examines how effective VAT rate, which is key at 5% in Nigeria affects household consumption expenditure. This is a more accurate measure of VAT burden, because it is the change in VAT rate that has direct impact on consumption expenditure of households, and not change in VAT revenue in the hand of government.

Another contribution to knowledge is that this study has succeeded in building some solid foundations for further studies on VAT and household consumption expenditure anywhere in the world. The literature on VAT and household consumption expenditure has been technically and systematically reviewed in an attempt to identify similarities and divergence in methodology adopted, and conclusions reached. The study therefore reviewed other countries studies, cross countries studies and studies in Nigeria that are relevant to the research theme of study.

The study has also identified gap to be filled in Ajibola and Olowolaju (2017) study. This gap lies in the discovery of positive but non - significant relation between VAT and consumption. This relation has no theoretical underpinning. It is not empirically possible for VAT burden to impact positively on consumption expenditure. Based on their conclusion, we say the measure of their VAT burden is not acceptable. This study bridges this gap by examined the nexus between effective VAT rate and household consumption expenditure in Nigeria. VAT burden is the ratio of total VAT revenue and total household consumption expenditure multiplied by 100 (Bumpei, 2011). This is equal to 5%, using Nigeria data, which is the applicable VAT rate in Nigeria.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

Autoregressive Distributed Lag (ARDL) is adopted as the method of analyzing the three models under consideration. This method is considered most appropriate because it can efficiently estimate the co-efficient of stochastic regressors included in the model without bias. Also it doesn't require the stationarity of the time series data. Above all, it is the most appropriate method for analyzing the co-efficient of a dynamic regression model like the adaptive expectation models relied upon in the study. We have estimated the impact of Value Added Tax (VAT) on the magnitude and composition of household consumption as well as on the ratio of household savings to consumption.

3.2 Theoretical Framework

3.3 Model Building

Given the Keynes consumption function,

$C = f(Y_d)$ which means that consumption is a function of aggregate disposable income. But

$Y_d = Y - T$ ……(3.1.5)

Y_d is disposable income, Y is income, T is taxation

Given that T, which is a tax function is defined as $\alpha + \beta y$, we can rewrite equation (3.1.6) as

$C = Y - (\alpha + \beta y)$…….(3.1.7.)

Where α is the autonomous component of taxation that does not relate to the level of one's income and β is the proportion of income tax that vary with the level of income. It is to be emphasized that α, which is the autonomous component of tax has provided an entry point for VAT into the Keynes absolute income hypothesis. The other part of the tax function β, which

is the proportional income tax is not relevant to our study. If we drop this component and rewrite equation (3.6), we have

$C = f(Y - \alpha)$…… (3.1.8)

Since VAT is not deductible from income, we put the equation as

C = f (Y, – effective VAT rate) …… (3.1.9)

Effective VAT rate (EVR) is not applicable to income but household final consumption expenditure. We justify the inclusion of EVR in the model, because it is a tax on consumer spending.

But Friedman did not only reject the use of current income "as the determinant of consumption expenditure, but also establish a proportional relation between short run consumption and income through the permanent and average propensity to consume (K).

Therefore $C_p = kY_p$…… (3.2.0)

Where C_p is permanent consumption and Y_p is the permanent income. Friedman believes that permanent income depends partly on current income and partly on previous period income. This can be measured as

$Y_{pt} = aY_t + (1 - a)\ Y_{t-1}$……(3.2.1)

Where Y_{pt} is permanent income in the current period, Y_{t-1} is previous periods income, a is the ratio of change in income between current period (t) and the previous period (t-1)

By integrating equations (3.2.0) and (3.2.1), the short run and long run consumption function can be explained as

$C_t = kY_{pt} = k_9Y_t + k\ (1\text{-}a)Y_{t-1}$……(3.2.2)

Where C_t is current period consumption, k_9 is the short run MPC, k is the long run MPC ad k(1-a) Y_{t-1} is the intercept of short run consumption function. According to Friedman, k and ka are different from one another and k>ka. Further, k=1 and ka = 0.

Equations 3.2.2 justify the inclusion of current and previous income in the consumption Function. Previous income is important for consumption because it helps in forecasting the future income of people.

Hence equation 3.1.9 can be re-written as

$C_t = f(Y_t, Y_{t-1}, -$ effective VAT Rate$)$…….....(3.2.3)

Assuming $C_p = C_t$

To be able to build the lagged value of consumption into equation 3.2.3, we proceed from Friedman hypothesis that permanent consumption is a function of permanent income.

$C^*_{pt} = \beta_0 + \beta_1 Y_{pt}^* + u_t$……(3.2.4)

Were $C^*_p$is the permanent income Y_p^* is equilibrium, expected or permanent income, and u_t is the error term.

Equation (3.2.4) postulated that permanent consumption is a function of permanent income.

Since the permanent consumption and permanent income are not directly observable, we could use the partial adjustment mechanism for C^*_p and the adaptive expectation model for Y_p to arrive at the following estimating equation.

$C_t = \beta_0 \delta\gamma + \beta_1 \delta\gamma Y_t + [(1-\gamma) + (1-\delta)]C_{t-1}$

$-(1-\delta)(1-\gamma)C_{t-2} + [\delta u_t - \delta(1-\gamma)u_{t-1}]$

$= \alpha_0 + \alpha_1 Y_t + \alpha_2 C_{t-1} + \alpha_3 C_{t-2} + v_t$ ……(3.2.5)

Equation (3.2.5) justifies the inclusion of lagged values of consumption and current income as part of the explanatory variables.

The researcher has applied the combination of Adaptive Expectations and Partial Adjustment Model to Friedman's long run consumption function. This model is used in order to build in the role of behaviour and expectations into the consumption function proposed by Friedman. In economics the dependence of a dependent variable on an explanatory variable is rarely instantaneous. Very often, dependent variable (y) responds to explanatory (x) with a lapse of time (Gujarati, 2009).

The function of (3.2.3) can be re–written as

$C_t=f\ (Y_t,\ Y_{t-1,}EVR_{t,}\ C_{t-1})$ …….....(3.2.6)

The general price level is also one the determinants of consumer demand. The fluctuation in the general price level affect the purchasing power of money and hence the volume of consumption. We include inflation in equation 3.2.7 because it is a measure of fluctuation in the general price level. Therefore we re-write equation 3.4.3 as

$C_t=f\ (Y_t,\ Y_{t-1,}EVR_{t,}\ C_{t-1},\ INF_{t,})$ …….....(3.2.7)

Again the first factor affecting demand in line with theory is price. The amount collected as VAT revenue is usually shared in Nigeria between the Federal, State and local governments. This is further reinvested back into the economy, which increases income and raises the consumption. Thus we include VAT revenue in equation 3.2.7. We can now write equation 3.2.7 as

$C_t=f\ \ (Y_t,\ Y_{t-1,}EVR_{t,}\ C_{t-1},\ INF_{t,}\ VATR_t)$ …….....(3.2.8)

One of the factors responsible for drifting of the short-run consumption toward the long-run by Arthur and James (1945) is availability of credit. But availability of credit is a function of the rate of interest. If the rate of interest is low, people will apply for more credit in the financial institutions which will promote economic activities. This in turn will boost aggregate demand, income and employment and increase the propensity to consume. We therefore include real interest rate as one of the determinants of household consumption. We rewrite equation (3.2.8) as follows:

$C_t=f\ (Y_t,\ Y_{t-1,}EVR_{t,}\ C_{t-1},\ INF_{t,}\ VATR_t\ ,RIR_t)$ …….....(3.2.9)

This function forms the basis for analysing the impact of Value Added Tax on consumer demand.

3.4 Model Specification

Based on the foregoing, the empirical models to be estimated are highlighted in the following subsections.

3.4.1 Model 1: Impact of VAT on Household Consumption Expenditure

This specification draws inspiration from Alm and El-Ganainy (2012), but it is modified to reflect the impact of effective Value Added Tax (VAT) rate on household consumption and is specified as follows

$PCHC_t= f(EVR_t\ ,DR_{t,}\ )$

$$\Delta \log PCHC = \propto_0 + \beta_1 \log PCHC_{t-1} + \beta_2 \log EVR_{t-1} + \beta_3 \log DR_{t-1}$$
$$+ \sum_{i=1}^{k} \delta_{1i}\, \Delta \log PCHC_{t-i} + \sum_{i=1}^{k} \delta_{2i}\, \Delta \log EVR_{t-i}$$
$$+ \sum_{i=1}^{k} \delta_{3i}\, \Delta \log DR_{t-i} + \epsilon_t \quad \text{.....(3.3.0)}$$

Where

PCHC = Per capita household consumption

EVR = Effective VAT rate measure by dividing VAT Revenue by consumption and Multiplied by 100

DR = The ratio of old dependants to young dependants

K = The lag length

β's = The parameter of long run relationship

δ's = The parameters of short run dynamics

ε_t = The stochastic error term

Appriori Expectations

EVR < 0, DR < 0

Theoretically effective VAT rate is expected to reduce the volume of consumption, and empirically Alm and El-Ganainy (2012) in their study of impact of a broad base consumption tax, Value Added Tax on aggregate consumption of fifteen European countries concluded that a one percentage point increase in VAT rate lead to approximately a one percentage reduction in the level of aggregate consumption in the short run and to a somewhat larger reduction in the long run.

The dependants have no income, but have to consume goods and services. Their presence in the population over the long run has tended to shift consumption function upward (Tobin, 1945). Their influence on per capital household consumption is expected to be negative

3.4.2 Impact of VAT on the Composition of Household Consumption

This model draws inspiration from Sadiq et.al (2014). They analysed the impact of sales taxes on household consumption. We modified their model to suite the impact of VAT on the composition of household consumption.

$$\Delta \log CHFC = \propto_0 + \beta_1 \log CHFC_{t-1} + \beta_2 \log VATR_{t-1} + \beta_3 \log EVR_{t-1}$$
$$+ \sum_{i=1}^{k} \delta_{1i} \Delta \log CHFC_{t-i} + \sum_{i=1}^{k} \delta_{2i} \log VATR_{t-i}$$
$$+ \sum_{i=1}^{k} \delta_{3i} \Delta \log EVR_{t-i} + \epsilon_t \quad \text{.....(3.3.1)}$$

Where CHFC = Composition of household final consumption

VATR = VAT revenue

EVR = Effective VAT rate

β's = Parameters of the long run relationship

δ's = Parameters of the short run dynamics

ε_t = The stochastic error term

Appriori Expectations

VATR > 0, EVR <0

Emmanuel (2013) has shown empirically that a positive and significant relationship exists between VAT revenue and economic growth proxy by gross domestic product. But Keynes (1936) maintained that the increase in income is shared between consumption and savings. Therefore as Value Added Tax revenue increases both income and saving increases.

Theoretically effective VAT rate is expected to decrease the volume of consumption, and empirically Alm and El-Ganainy (2012) in their study of impact of a broad base consumption tax, Value Added Tax on aggregate consumption of fifteen European countries concluded that a one percentage point increase in VAT rate lead to approximately a one percentage reduction in the level of aggregate consumption in the short run and to a somewhat larger reduction in the long run

3.4.3 Model 3: Impact of VAT on Saving/Household Consumption Expenditure Ratio

This model is built on the inspiration of Emmanuel (2013) who studied the effect of Value Added Tax on economic growth in Nigeria. We modified his model to suite our objective.

$$\Delta \log SHFC = \propto_0 + \beta_1 \log SHFC_{t-1} + \beta_2 \log VATR_{t-1} + \beta_3 \log EVR_{t-1}$$
$$+ \sum_{i=1}^{k} \delta_{1i} \Delta \log SHFC_{t-i} + \sum_{i=1}^{k} \delta_{2i} \Delta \log VATR_{t-i}$$
$$+ \sum_{i=1}^{k} \delta_{3i} \Delta \log EVR_{t-i} + \epsilon_t \quad \text{.....(3.3.2)}$$

Where

SHFC = The ratio of household saving to consumption

VATR = VAT revenue

EVR = Effective VAT rate

β's = Parameters of the long run relationship

δ's = Parameters of the short run dynamics

ε_t = The stochastic error term

Appriori Expectations

VATR > 0, EVR <0

Emmanuel (2013) has shown empirically that a positive and significant relationship exists between VAT revenue and economic growth proxy by gross domestic product. But Keynes (1936) maintained that the increase in income is shared between consumption and savings. Therefore as Value Added Tax revenue increases both income and saving increases.

Theoretically effective VAT rate is expected to decrease the volume of consumption, and empirically Alm and El-Ganainy (2012) in their study of impact of a broad base consumption tax, Value Added Tax on aggregate consumption of fifteen European countries concluded that a one percentage point increase in VAT rate lead to approximately a one percentage

reduction in the level of aggregate consumption in the short run and to a somewhat larger reduction in the long run.

3.5 Estimation Techniques

3.5.1 Unit root test

The Augmented Dickey-Fuller (ADF) Test and Phillips-Perron Test

The ADF test consist of estimating the following regression

$$\Delta Y_t = \beta_1 + \beta_{2t} + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots(3.4.0)$$

Where ε_t is a pure white noise error term and where $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$, etc. The number of lagged difference terms to include is often determined empirically, the idea being to include enough terms so that the error term in equation (3.4.0) is serially uncorrelated, so tha we can obtain an unbiased estimate of δ, the coefficient of lagged Y_{t-1} .In ADF we test whether $\delta = 0$ and the ADF follows the same asymptotic distribution as the DF statistic, the same critical value can be used.

The ADF test adjusts the DF test to take care of the possible serial correlation in the error terms by adding the lagged difference terms of the regressand. Phillips and Peron use non-parametric statistical method to take care of the serial correlation in the error terms without adding lagged difference terms.

H_0 = There is unit root

H_1= There is no unit root

The decision rule is that if the computed ADF test statistic or Phillips-Perron test statistic is greater than the critical value at 5% , and with a probability value of less than 0.05 we reject the null hypothesis otherwise we cannot reject it.

3.5.2 Autoregressive Distributed Lag Model (ARDL) Approach

When one co integrating vector exists, Johansen and Juselius (1990) co integration procedure becomes inapplicable. Hence, it become imperative to explore Pesaran and Shin and smyth (2001) proposed Autoregressive Distributed Lag (ARDL) Approach to co integration or Bounds procedure for a long run relationship, irrespective of whether the underlying variables are I(0), I(1) or a combination of both. In such a situation, the application of ARDL approach to co integration will give realistic and efficient estimates. Unlike the Johansen and Juselius (1990) co integration procedure, Autoregressive Distributed Lag (ARDL) approach to co integration helps in identifying the co integrating vector(s).that is, each of the underlying variables is standing as a single long run equation. If one co integrating vector (i.e the underlying equation) is established, the ARDL of co integrating vector is reparameterized into ECM. The reparameterized result gives short-run dynamics (i.e traditional ARDL) and long run relationship of a single model. The re-parameterization is possible because the ARDL is a dynamic single model equation and of the same form with ECM. Distributed Lag model simply means the inclusion of the unrestricted lag of the regressors in the regression function.

ARDL approach has some advantages. In the first place, endogeneity is less a problem in ARDL technique because it is free of residual correlation. Secondly when there is a single long run relationship, the ARDL procedure can distinguish between dependent and explanatory variables. The major advantage of this approach lies in its identification of the cointegrating vectors where there are multiple cointegrating vectors. Furthermore, the Error Correction Model (ECM) can be derived from ARDL model through a simple linear transformation, which integrates short run adjustments with long run equilibrium without losing long run information. The associated ECM model takes a sufficient number of lags to capture the data generating process in general to specific modeling frameworks.

The co integration testing procedure specifically helps us to know whether the underlying variables in the model are co integrated or not, given the endogenous variable. However, when there are multiple co integrating vectors ARDL Approach to co integration cannot be adopted. Hence, Johansen and Juselius (1990) approach becomes the alternative.

3.5.3 Sources of data

Annual time series data were sourced from World Bank World Development Indicators and Federal Inland Revenue Services respectively. All the data were sourced from World Bank World Development Indicators except the VAT revenue which was obtained from the Federal Inland Revenue Service. The breakdown of the sources is given in the table below:

Table 3.1: Data Source on Measurement

S/N	Variable	Source	Measurement/Unit, Description
I	Per Capita Household Final Consumption (PCHC)	World Bank World Development Indicators	(Consumption/Population)*100
	Real Interest Rate (RIR)	World Bank World Development Indicators	Percent (%)
Ii	Value Added Tax Rev.	Federal Inland Revenue Services (FIRS)	In billion ₦
Iii	Gross Domestic Product (GDP)	World Bank World Development Indicators	At current market prices in millions
Iv	Inflation (INF)	World Bank World Development Indicators	Percent (%)
V	Effective VAT Rate (EVR)	World Bank World Development Indicators	(Consumption/VAT Rev.)*100
Vi	Composition of Household Final Consumption (CHFC)	World Bank World Development Indicators	(HFC/IMPORT)
Vii	IMPORT	World Bank Development Index	In million $
Viii	SAVINGS	World Bank Development Index	In million $
Ix	Saving Ratio Household Final Consumption (SHFC)	Author's calculation	(SAVINGS/HFC)

3.5.4 Post Diagnostic Test

Breusch-Godfrey Serial Correlation LM Test shall be conducted to ensure that the error terms in the model have no autocorrelation with each other, the variance inflation factor test is also necessary to know if there is the presence of multicollinearity among some or all the explanatory variables included in the model. We shall conduct Heteroskedasticity Test (Breusch-Pagan-Godfrey) to confirm the constancy of variance and mean of the data in the model. Ramsey RESET Test shall be conducted to ensure that the models are correctly specified. Histogram and Normality Test shall be conducted to ensure that the data used

follow a normal distribution and CUSUM and CUSUM SQ. Test will be conducted to determine if the models are stable through the periods of analysis.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Introduction

This chapter discusses the research findings. We begin by presenting the pre-estimation diagnostic test, plotting some graphs and bar charts involving some important variables and end it with post diagnostic test. The pre-diagnostic test includes descriptive statistics of the variables, line plots, multiple bar chart, and correlation matrix and unit root test. The post diagnostic test on the other hand include Breusch-Godfrey Serial Correlation LM Test, heteroskedasticity test, histogram and normal distribution test, Ramsey RESET Test and stability test. The findings of our analysis which we obtained through the Auto Regressive Distributed Lag models were presented before the post diagnostic test.

4.2 Pre- Estimation Checks

4.2.1 Descriptive Statistic

Looking at the mean and median of the observations, we conclude that the distribution is not skewed and therefore there are no outliers. The data set is symmetrical and follows that of a normal distribution. The kurtosis of the distribution also point towards a normal distribution observations.

The mean and median of per capita household consumption and effective VAT Rate have no wide deviation. The mean and median of per capita household consumption is 1349.67 and 1383.84 respectively, while that of effective VAT rate is 221.18 and 121.82. This means that the distribution is not skewed and contained no outlier. Also the mean and median of the composition of household consumption (CHFC) are 0.10 and 0.07 respectively. The distribution can be said to be normal.

Table 4.1: Descriptive Statistic Result

	PCHC	CHFC	SHFC	EVR	log(GDP)	log(DR)	log(VATR)
Mean	1349.67	0.10	12.27	221.18	25.40	-2.76	25.76
Median	1383.84	0.07	4.85	121.82	25.32	-2.76	25.90
Maximum	1736.01	0.58	34.08	1199.66	27.07	-2.73	28.02
Minimum	933.71	0.02	0.77	19.88	23.62	-2.78SS	22.03
Std.Dev.	272.53	0.12	12.56	291.22	1.11	0.02	1.46
Skewness	-0.22	3.00	0.68	2.22	0.15	0.16	-0.36
Kurtosis	1.69	12.49	1.82	7.39	1.63	1.35	2.07
Jarque-Bera	1.75	115.68	2.98	35.78	1.80	2.58	1.26
Probability	0.42	0.00	0.23	0.00	0.41	0.27	0.53
Sum	29692.60	2.21	269.89	4865.99	558.85	-60.63	566.69
Sum Sq Dev.	155973	0.30	3313.99	1780962	26.03	0.00	44.85
Observation	22	22	22	22	22	22	22

Source: Author's Computation from E-Views 9.0

4.2.2 Correlation Analysis

A very high negative correlation is observed between per capita household consumption (PCHC), household savings-consumption ratio, log of VAT revenue (VATR) and effective VAT rate (EVR). A high positive correlation is observed between the composition of household final consumption (CHFC), log of gross domestic product (GDP), log of dependency ratio and effective VAT rate (EVR).

A high negative correlation of 68% is observed between effective VAT rate and per capita household consumption expenditure. The correlation between effective VAT rate and the composition of

household final consumption is positive and amounted to 89%. The correlation between effective VAT rate and the ratio of household savings to household consumption is negative and stood at 56%.

Table 4.2: Correlation Analysis Result

	PCHC	CHFC	SHFC	EVR	Log(GDP)	Log(DR)	Log(VATR)
PCHC	1.00	-0.64	0.66	-0.68	0.80	-0.86	0.85
CHFC	-0.65	1.00	-0.53	0.89	-0.70	0.62	-0.77
SHFC	0.66	-0.53	1.00	-0.56	0.94	-0.86	0.87
EVR	-0.68	0.89	-0.56	1.00	0.72	0.70	-0.85
Log(GDP)	0.80	0.70	0.94	-0.72	1.00	-0.95	0.96
Log(DR)	0.86	0.62	-0.86	0.70	-0.95	1.00	-0.95
Log(VATR)	0.85	-0.77	0.87	-0.85	0.96	-0.95	1.00

Source: Author's Computation from E-Views 9.0

4.2.3 Trend Analysis

As can be seen from the Figure 4.1 as gross domestic product increases, household final consumption and VAT revenue increases. Though, the VAT revenue compared with gross domestic product is very low; as it cannot even account for 5% of the country's gross domestic product.

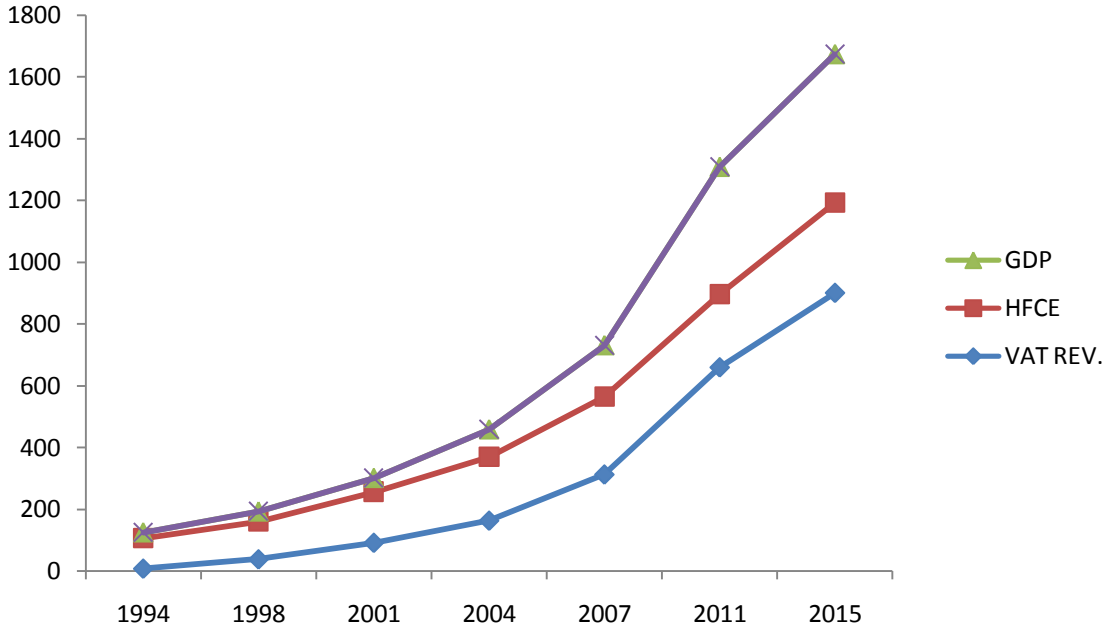


Figure 4.1: VAT revenue, Household Final Consumption expenditure and Gross Domestic Product line plot

From the Fig. 4.2, Value Added Tax revenue (VAT) as a percentage of Gross Domestic Product (GDP) stood at 0.9% in 1994, 1.2% in 1998, 1.9% in 2001, 1.4% in 2004, 1.5% in 2007, 1.7% in 2011, and 0.03% in 2015 respectively.

VAT as a percentage of Households Final Consumption Expenditure (HFC) is less than 5% though out the periods of analysis, except for the year 2015. This could be as a result of the disbursement and spending of the balance in excess crude account by the federal and state governments, and the excessive spending that characterized the 2015 general election in Nigeria

VAT as a percentage of aggregate national savings stood at 7.3% in 1994, 19.1% in 1998, 18.8% in 2001, 20.5% in 2004, 11.6% in 2007, 10.1% in 2011, and 15.4% in 2015 respectively. This observation is in line with the theoretical studies concerning VAT and savings, though the Federal Government has taken some steps to increase the national savings. Among these include the implementation of National Health Insurance Scheme

(NHIS), Pension Fund Contribution Scheme. The economic implications of all these findings are that VAT in Nigeria is neither effective in generating even 5% of the country's Gross Domestic Product (GDP), nor is it effective in influencing up to 5% of the Household Final Consumption Expenditure. However, it could be very effective in influencing the level of savings for capital formation and economic development.

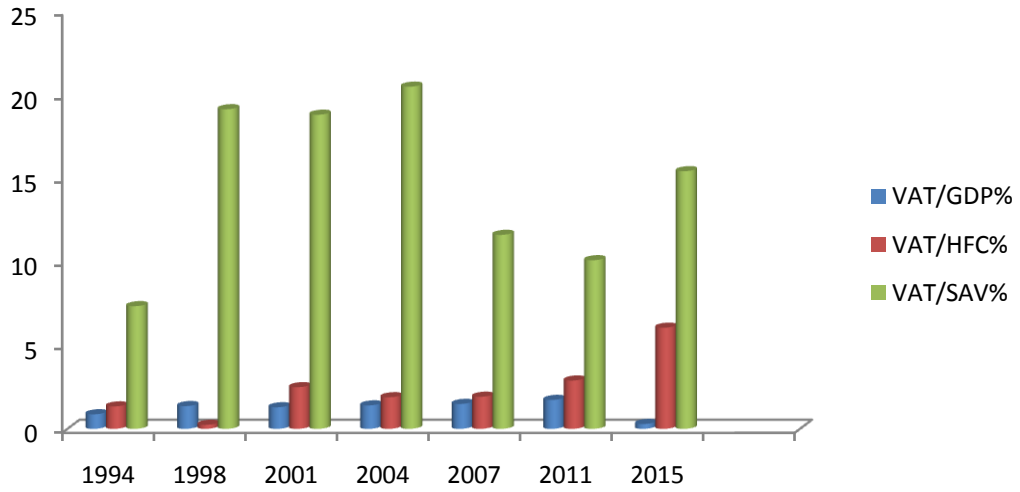


Figure 4.2: Multiple Bar Chart showing VAT revenue as a percentage of Gross Domestic Product (GDP), Households Final Consumption Expenditure and Savings

4.2.4 Unit Root Test Result

Most empirical work on time series data required that the underlie time series is stationary (Gujarat, 2009). The time series data employed in this research has been made to be stationary through appropriate transformation. Per capita household consumption(PCHC), composition of household final consumption (CHFC),saving-households final consumption ratio (SHFC), households final consumption(HFC), gross domestic product (GDP), import (IMP), effective VAT rate (EVR), inflation (INF), VAT revenue (VATR) and the ratio of old dependants to young dependants (DR) are stationary at first difference, using both Augmented Dickey-Fuller and Phillips-Perron Test. Only real interest rate is stationary at level, while household savings (SAV) is second difference stationary. Savings is therefore

dropped from our models, since it is a violation of assumptions guiding the use ARDL model estimation.

Table 4.3: ADF and Phillip-Perron Unit Root Test Results

VARIABLES	ADF TEST STAT.	CRITICAL VALUES @ (5%)	LEVEL OF STATI.	PHILLIP – PERRON TEST STATISTICS	CRITICAL VALUES @ (5%)	LEVEL OF STATION ARITY
PCHC	-7.26	-3.01	First Diff.	-7.23	-3.01	First Diff.
CHFC	-5.17	-3.02	First Diff.	-7.23	-3.02	First Diff.
SHFC	-4.62	-3.02	First Diff.	-4.62	-3.02	First Diff.
HFC	-8.15	-3.02	First Diff.	-8.36	-3.02	First Diff.
GDP	-5.05	-3.01	First Diff.	-5.05	-3.01	First Diff.
IMP	-4.90	-3.01	First Diff.	-5.34	-3.01	First Diff.
EVR.	-6.82	-3.02	First Diff.	-15.50	-3.02	First Diff.
RIR	-4.66	-3.00	Level	-4.88	-3.00	Level
INF	-4.27	-3.01	First Diff.	-4.19	-3.00	First Diff.
VATR	-7.37	-3.01	First Diff.	-11.34	-3.01	First Diff.
DR	-261	-1.96	First Diff.	-2.64	-1.96	First Diff.
SAV	-6.81	-3.02	Second Diff.	-9.00	-3.02	Sec. Diff

Source: Author's Computation from E-Views 9.0

4.3 Long and Short Run Estimation of Output

4.3.1 Model 1: Impact of VAT on Households Consumption

The length of lag was automatically selected by E-View 9.0. An optimal initial lag of 4 was selected for the variable. However, the selection criteria are based on all the selection criteria

The analysis of the impact of Value Added Tax on household consumption in Nigeria in the contexts of this thesis is a short-run phenomenon. This is because the value of F-statistic is less than the critical value Bounds (integrated of order zero) at 5% level of significance. On the other hand the hypothesis of no long-run relationship cannot be rejected.

Table 4.4: Bounds Test Result for Model 1

Test Statistic	Value	K
F-statist	1.48	2
Critical Value Bounds		
Significance	I0 Bounds	I1 Bounds
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	1.13	5

Source: Author's Computation from E-Views 9.0
Note: Null hypothesis: No long-run relationships exist

The Table 4.5 shows the Autoregressive Distributed Lag (ARDL) results for the impact of Value Added Tax on per capita household consumption. There is a negative and significant relationship between effective VAT rate lagged by three periods and per capita household consumption. The economic implication of this is that if the government gives a three years notice of VAT rate increase to members of the public before its implementation, it will reduce per capital household consumption spending significantly when implemented. For instance, increasing VAT rate by say 1% would reduce per capita household spending by 0.21%.

Furthermore, a negative but non-significant relationship is observed between effective VAT rate lagged by one and two periods respectively and per capital household consumption. However, a positive but non-significant relationship is observed between effective VAT rate at current period and per capita household consumption. The economic implication of this finding is that implementing a VAT rate increase without a notice time lag will impact positively, but non-significantly on per capita household consumption.

This findings conform with the works of Alms and El-Ganainy (2012), Ahmad and Samaduzzaman (2015), David and Takashi (2011), Matsuzaki (2003), Petrucci (2002), Salti and Chaban (2010), Ernst & Young and Tax Policy Advisers (2010), Paolo (2012) , Sayed,

Ghafarian, Moh'd Noor and Kashmar (2016), Bakari (2012), Petrucci (2002), Bumpei (2011), Cashin (2013). All the aforementioned studies established a negative and significant relationship between values added tax and household consumption spending.

From the post diagnostic test of our model no evidence of autocorrelation in the error term. . The variance of the error term is homoskedastic. The RESET test indicates that the model is correctly specified. The model passes the Jaque-Bera normality tests suggesting that the error terms are normally distributed. The model also passes cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests of structural stability. This indicates that the parameters are stable during the sample period. The variance inflation factor test reveals that there is no multicollinearity among the regressors included in the dynamic regression model.

Table 4.5: ARDL Result for impact of VAT on Per Capita Household Final Consumption (PCHFC)

Dependent Variable: LOG (PCHFC)

Method: ADRL

Variable	Coefficient	Standard Error	T-Ratio[Prob.]
LOG(PCHFC(-1))	-0.03	0.32	-0.08[0.94]
LOG(PCHFC(-2))	0.31	0.25	1.22[0.28]
LOG(EVR)	0.16	0.13	1.26[0.26]
LOG(EVR(-1))	-0.17	0.12	-1.35[0.24]
LOG(EVR(-2))	-0.12	0.08	-1.64[0.16]
LOG(EVR(-3))	-0.21	0.08	-2.68[0.04]
LOG(EVR(-4))	0.22	0.09	2.38[0.06]
LOG(DR)	-25.61	8.26	-3.10[0.03]
LOG(DR(-1))	28.62	10.32	2.77[0.04]
LOG(DR(-2))	-13.02	9.30	-1.44[0.22]
LOG(DR(-3))	2.08	8.94	0.23[0.83]
LOG(DR(-4))	6.95	5.88	1.11[0.29]
C	2.93	22.04	0.13[0.90]
R-Square	0.96		
Adjusted R-Square	0.88		
S.E of Regression	0.20		
DW-Statistic	1.74		
F-Statistic	11.05		
Post Diagnostic Test			
χ^2 Auto.	0.04		
χ^2 B-P-G Heter.	0.33		
Jarq.-Bera[Prob.]	2.00[0.37]		
RESET.(t & F-stat.)	0.95&0.90 [0.04]		

Source: Author's computation from E-views 9.0

4.3.1.1 Vector Autoregressive Estimates of Model 1

Vector Autoregressive estimates of the impact of value added tax on consumer demand has become very expedient, because of the observed short run relationship between the two variables, and the need to account for fluctuation that may be inherent in the short run dynamic. It is to be emphasised that a lag length of three was selected for our VAR model, and that was based on all lag selection criteria.

In the short run effective VAT rate (EVR) lagged by period one, two and three are negatively and significantly related to per capital household final consumption. The economic implication of these findings is that increasing effective VAT rate will exact negative influences on per capita household consumption spending. This finding is in line with the conclusion of Sayeed, Ghafarian, Noor and Kashmar (2016) for Pakistan, which states that VAT with lag influences consumption negatively.

$$PCHC = -7433.21 + 0.11PCHC(-1) + 0.52PCHC(-2) - 0.09PCHC(-3) - 0.49EVR(-1) - 0.59EVR(-2) - 0.26EVR(-3) + 311552.62DR(-1) - 127490.23DR(-2) - 51853.20DR(-3) + \mu$$

4.3.2 Model 2: Impact of VAT on the Composition of Consumption

An optima initial lag of 4 was automatically selected for the variables based on all the selection criteria.

The analysis of the impact of Value Added Tax on the composition of household consumption in Nigeria is confined to the short-run. This is because the value of F-Statistic is less than the critical value Bounds integrated of order zero at 5% level of significance.

Table 4.6: ARDL Bounds Test Result

Test Statistic	Value		K
F-statist	2.98		2
Critical Value Bounds			
Significance	I0 Bounds		I1 Bounds
10%	2.63		3.35
5%	3.1		3.87
2.5%	3.55	4.38	
1%	1.13		5

Source: Author's Computation from E-Views 9.0
Note: Null hypothesis: No long-run relationships exist

The Table 4.7 shows the Autoregressive Distributed Lag results for the impact of VAT on the composition of household consumption. The results reveal a positive and significant relationship between effective VAT rate (EVR) and the composition of household consumption expenditure. The economic implication of this result is that increasing effective VAT Rate (EVR) by say 1% will make household demand for locally made goods to grow faster than their demand for imported goods by almost 2%.This finding is in line with the finding of Musa (2012), Alexander (2013). All these studies reported that VAT has not altered the composition of household consumption expenditure.

The post diagnostic test of our model shows no evidence of autocorrelation in the error term. The variance of the error term is constant. The RESET test indicates that the model is correctly specified. The model passes the Jaque-Bera normality tests suggesting that the error terms are normally distributed. The model also passes cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests of structural stability. This indicates that the parameters are stable during the sample period. The Variance Inflation Factor test reveals no evidence of multicollinearity among the regressors.

Table 4.7: ARDL Result for Model 2
Dependent Variable: LOG (CHFC)

Method: ARDL

Variable	Coefficient	Standard Error	T-Ratio[Prob]
LOG(CHFC(-1))	0.09	0.32	0.29[0.78]
LOG(CHFC(-2))	-0.07	0.26	-0.28[0.79]
LOG(CHFC(-3))	-0.34	0.31	-1.09[0.32]
LOG(VATR)	2.08	0.89	2.33[0.06]
LOG(VATR(-1))	-0.81	0.64	-1.27[0.25]
LOG(VATR(-2))	-1.38	0.54	-2.53[0.04]
LOG(EVR)	1.76	0.72	2.45[0.04]
LOG(EVR(-1))	0.07	0.60	0.11[0.92]
LOG(EVR(-2))	-0.62	0.46	-1.34[0.22]
LOG(EVR(-3))	0.29	0.34	0.84[0.43]
LOG(EVR(-4))	-0.63	0.27	-2.37[0.06]
C	-5.18	32.48	0.16[0.88]
R-Squared	097		
R-Squared Adjusted	091		
S.E of the Regression	0.20		
DW Statistic	2.19		
F-Statistic[Prob.]	17.54[0.00]		
Post Diagnostic Test			
χ^2 Auto.	0.01		
χ^2 B-P-G Heter.	0.59		
Jarq.-Bera[Prob.]	0.46[0.79]		
RESET.(t & F-stat.)	0.03 &0.00[0.98]		

Source: Author's Computation from E-views 9.0

4.3.2.1 Vector Autoregressive of Model 2

Effective VAT rate with lags are positively, but not significantly related to the composition of household final consumption expenditure in the short run. The economic implication of these findings is that increasing effective VAT rate increases the composition of household consumption, but non significantly. This findings is in line with the study of Andrikopoulos(1993), which concluded that VAT has altered the composition of commodity prices, both positively and negatively.

CHFC = 0.72 + 0.16CHFC (-1) – 0.19CHFC (-2) – 0.07CHFC (-3) – 2.10e-13 VATR (-1)

- 1.47e-13VATR (-2) + 3.14e-13VATR (-3) + 2.59e-05 EVR (-1)

+ 9.39e-05EVR (-2) + 4.33e-05EVR (-3) + μ

4.3.3 Model 3: Impact of VAT on Households Saving-Consumption Ratio

The length of lag was automatically selected by E-View 9.0. An optima initial lag of 4 was selected for the variable. However, the selection criteria are based on all the selection criteria.

The F-Statistic , as can be seen in the table below is greater than the critical value bounds integrated of order 0, even at all levels of significance. Therefore, the hypothesis of no long-run relationship between Value Added Tax and household saving-consumption ratio is rejected.

Table 4.8: ARDL Bounds Test Result for Model 3

Test Statistic	Value	K
F-statist	50.35	2
Critical Value Bounds		
Significance	I0 Bounds	I1 Bounds
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	1.13	5

Source: Author's Computation from E-Views 9.0
Note: Null hypothesis: No long-run relationships exist

4.3.3.1 ARDL Result for Model 3

From the table 4.9, a negative and significant relationship is observed between effective VAT rate and the ratio of household saving to household consumption in the short run. However, in the long run a positive relationship is observed but non-significant. The speed of adjustment to the long run is estimated to be 72%.

This finding is in agreement with the findings of Petrucci (2002), Emmanuel (2013), Ofishe (2013), Bukie and Adejumu (2013), Chigbu and Ali (2011). All the above studies except Petrucci, reported a positive and significant relation between VAT and economic growth. If VAT lead to increase in income, then such increase is shared between savings and consumption because not all earnings is spent on consumption. On the other hand, when income increases, savings also increases.

The post diagnostic test of our model shows no evidence of autocorrelation in the error term. The variance of the error term is constant. The RESET test indicates that the model is correctly specified. The model passes the Jaque-Bera normality tests suggesting that the error terms are normally distributed. The model also passes cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests of structural stability. This indicates that the parameters are stable during the sample period. The variance inflation factor test reveals no evidence of multicollinearity among the regressors included in the model.

Table 4.9: ARDL Result for Model 3: Impact of VAT on the Ratio of Household savings to Household consumption

Dependent Variable: LOG (SHFC) (Saving: Household final consumption)

Method: ARDL

Variable	Coefficient	Standar Error	T-Ratio[Prob.]
LOG(SHFC(-1))	0.76	0.09	8.13[0.00]
LOG(SHFC(-2))	-0.71	0.12	-5.78[0.01]
LOG(SHFC(-3))	0.87	0.14	5.97[0.01]
LOG(SHFC(-4))	-0.65	0.11	-5.74[0.01]
LOG(VATR)	-0.68	0.17	-3.80[0.03]
LOG(VATR (-1))	0.46	0.25	1.84[0.16]
LOG(VATR (-2))	-0.65	0.19	-3.44[0.04]
LOG(VATR(-3))	1.38	0.19	7.34[0.01]
LOG(VATR(-4))	0.53	0.11	4.74[0.02]
LOG(EVR)	-0.66	0.18	-3.70[0.03]
LOG(EVR(-1)	0.21	0.22	0.96[0.41]
LOG(EVR(-2))	-0.59	0.17	-3.48[0.04]
LOG(EVR(-3))	-1.03	0.18	5.82[0.01]
LOG(EVR(-4))	0.54	0.15	3.67[0.03]
C	-27.67	10.62	-2.61[0.08]
R-Squared	0.99		
R-Squared Adjusted	0.99		
S.E of the Regression	0.191		
DW Statistic	2.24		
F-Statistic[Prob.]	1150.0[0.00]		
Post Diagnostic Test			
χ^2 Auto.	0.00		
χ^2 B-P-G Heter.	0.28		
Jarq.-Bera[Prob.]	0.24[0.89]		
RESET.(t & F-stat.)	3.69 &13.65[0.07]		

Source: Author's computation from E-Views 9.0

4.3.3.2 Error Correction Model

Table 4.0 shows that effective VAT rate (EVR) both at current period and at periods lagged by one, two and three exhibit negative and significant relationship with household savings – consumption ratio in the short run. The speed of adjustment from the short run to long run is 72%. Similarly VAT revenue both at current period and at periods lagged by one, two and three exhibit negative, but significant relation with household savings-consumption ratio in the short run.

However, in the long run both effective VAT rate and VAT revenue are positively, but non significantly related to household saving-consumption ratio.

Table 4.10: Error Correction Model Result for Model 3

Dependent Variable: LOG (SHFC) (Saving: Household final consumption)

Method: ARDL

Variable	Coefficient	t-statistics	T-Ratio [Prob.]
LOG(SHFC(-1))	0.49	8.91	8.91 [0.00]
LOG(SHFC(-2))	-0.22	-4.16	-4.16[0.00]
LOG(SHFC(-3))	0.65	10.58	10.58[0.00]
LOG(VATR)	-0.68	-7.55	-7.55[0.00]
LOG(VATR (-1))	-1.25	-10.86	-10.86[0.00]
LOG(VATR (-2))	-1.90	-14.62	-14.62[0.00]
LOG(VATR(-3))	-0.53	-7.73	-7.73[0.00]
LOG(EVR)	-0.66	-8.64	-8.64[0.00]
LOG(EVR(-1)	-0.98	-9.64	-9.64[0.00]
LOG(EVR(-2))	-1.57	-14.55	-14.55[0.00]
LOG(EVR(-3))	-0.54	-7.68	-7.68 [0.00]
Coin. Eq (-1)	-0.72	-20.07	-20.07[0.00]

Source: Author's computation from E-Views 9.0

Long Run Coefficients

Variables	Coefficient	t-Statistic	Prob.
LOG(VATR)	1.43	2.20	0.11
LOG(EVR)	0.74	0.83	0.47
C	-38.23	-1.83	0.17

Source: Author's Computation from E-Views 9.0

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSION AND RECOMMENDATION

5.0 Introduction

This chapter consists of the findings of the study, conclusion as well as recommendations.

5.1 Summary of Findings

A negative and significant relationship is observed between effective VAT rate lagged by periods one, two and three and per capita households' final consumption in the short run.

There is a positive, but non significant relationship between the lags effective VAT rate and the composition of households' final consumption expenditure in the short run.

A negative and significant relationship is also observed between effective VAT rate at current period and at periods lagged by one, two and three and the household savings- consumption ratio in the short run. In the long run, effective VAT rate is positively, but not significantly related to household savings-consumption ratio.

5.2 Conclusion

Implementing effective VAT rate increase with time lag(s) between the period of its announcement and its implementation will reduce per capita household consumption spending significantly, increases the composition of household consumption non significantly.

Such policy will also reduce the household savings-consumption ratio significantly in the short run and increases it non significantly in the long run. This implies that increasing VAT rate in Nigeria now will not lead to increase in savings and capital accumulation.

We therefore advocate VAT reduction to ensure improved standard of living for households, mobilisation of household savings for capital accumulation to strengthen the growth and development of Nigerian economy.

5.3 Recommendations

The following recommendations have been proposed based on the findings of the studies. It is to be emphasized that effective VAT rate exacts significant negative influence on per capita household consumption in the short-run, positive non significant influence on the composition of household consumption in the short-run, and positive, but non significant influence on the household saving-consumption ratio over the long-run

Effective VAT rate cut should be implemented so as to drive home the following objectives

(i) Improvement in the welfare of consumers through increase in aggregate household consumption;

(ii) Increase in household savings-consumption ratio and capital accumulation; and

(iii) Stimulation of private sector development and economic growth.

Given the significant negative relation between effective VAT rate and per capita household consumption and the positive but non significant relation between household savings-consumption ratio in the long run, increasing effective VAT rate will not only reduce household consumption and welfare, but also will impinge on the ability of the consumers or household to save. Their inability save will retard capital accumulation, negatively affect private sector development and by implication economic growth.

The impact of effective VAT rate on household saving-consumption ratio in the short run is negative and significant. It therefore followed that increasing effective VAT rate will reduce

household savings-consumption ratio significantly. This will affect capital accumulation and economic growth in the short run.

Therefore, VAT rate increment in Nigeria is untimely and inappropriate, based on the current economic situation. VAT rate increment should not be implemented, but rather be cut to enhance household welfare and consumption, increase the ratio of household savings-household consumption, capital accumulation and economic development.

5.4 Suggestion for Further Studies

The following suggestions for further studies have been arrived at based on the existing literature gap in Nigeria, as far as Value Added Tax is concern. More research or studies in the following areas of VAT can help a lot in the implementation of Value Added Tax in Nigeria.

i. Impact of Value Added Tax on Poverty and Income redistribution in Nigeria
ii. Impact of the proposed VAT rate increase on Household welfare in Nigeria
iii. Impact of VAT Exceptions on low income group in Nigeria
iv. Impact of Value Added Tax on Aggregate Consumption in Africa (A case study of Nigeria and some African Union member countries)
v. Impact of VAT revenue on Household Consumption and Private Sector Development in Nigeria
vi. Impact of Value Added Tax Revenue on Infrastructural Development in Nigeria.
vii. Perception of Household on the effects of the proposed VAT rate increase on inflation and standard of living in Nigeria
viii. Macroeconomic Effects of the proposed VAT rate increase in Nigeria
ix. Intertemporal Substitution and Income Effects of the Propose VAT rate increase in Nigeria

x. The Effectiveness of Value Added Tax in influencing household consumption spending, savings and Gross Domestic Product in Nigeria.

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APPENDICES

Appendix 1: Summary of Empirical Study

S/N	Study	Country	Methodology	Measure of Value Added Tax	Measure of Households Consumption	Impact
1	Andrikopulous(1993). Short-Run Effects of VAT on Consumption Pattern Greece. (1958-1986)	Greece	Full Information Maximum Likelihood Approach	Value Added Tax	Consumption Expenditure	Negative
2	Stainlav et.al(2007).Incidence of the VAT rate Harmonization in the Czech Republic Act on Economic Pragnesia	Czech Republic	Survey	Value Added Tax Rates, exemption	Households Consumption spending	Progressive
3	Newhouse, et.al(2007)Distribution Implication of the VAT Reform in Philippines	Philippines	Survey	Value Added Tax Revenue	Households Consumption	Negative
4	Eimear et.al(2010).The Distributional Effect of Value Added Tax in Ireland	Ireland	2 04/2005 Household Budget Survey and micro simulation model	Value Added Tax as a proportion of disposable income	Real Household Consumption	Regressive
5	Satti and Chaban(2010)The Poverty and Equity Implication of rise in Value Added Tax: A Microsimulation for Lebanon	Lebanon	Ordinary Least Squares	Value Added Tax rate	Aggregate Household Consumption	Negative
6	Ernest and Young et.al(2010)The Macroeconomic Effects of an Add-on Value Added Tax.	USA	Ordinary Least Square	VAT rates	Some key macroeconomic variables like GDP, Household Consumption, Retail Spending, Deficit and Debt	Negative
7	David and Takashi(2011)Inter-temporal Substitution and Income Effect of VAT Rate Increase	Japan	Ordinary Least Squares	VAT Rates	Household Expenditure	Negative
8	Wein, T.(2011)Microeconomic Consequence of Exemptions from Value Added Taxation	Luxemburg	Survey	VAT Rates, Exemptions	Households Consumption spending	Negative
9	Fabian et. Al(2011)Price Perception and Consumption bias in the	Germany	Survey	VAT Rate	Household Consumption expenditure	Negative

	context of VAT Increase					
10	Qamruz et.al(2011)Value Added Tax-Theoretical Aspect and Empirical Evidence for Pakistan	Pakistan	Survey	Vat rate	Social and economic life of the populace	Negative
11	Siroky et.al(2012)Change in the VAT Burden on Expenses of Selected Household in Czeck Republic	Czeck Republic	Analytic Synthetic Method	VAT Rates	Consumption Expenditure	Negative
12	Paolo, L.(2012)Effect of Change in the Value Added Tax rate in Italy(1988-1997)	Italy	OLS	VAT Rate	Consumption	Negative
13	Cashin, D.(2013)The Household Expenditure Response to Pre-Announced Consumption Tax changes	New Zealand	StandardLife CyclePermanent Income Hypothesis with a test shifter	VAT rates	Household Consumption spending	Negative
14	Ahmed et.al(2015)VAT increase and Impact on Consumer's Consumption Habit	North Wales	Reliability analysis, correlation analysis	VAT rates	Consumption	Negative
15	Keen et.al(2010)The Value Added Tax; It causes and consequence	143 European countries	Panel Regression	VAT Rate and revenue	A system describing the probability of VAT adoption	Positive
16	Ehrhart et.al(2011)Is VAT stabilizing?	103 developing countries	Panel regression	VAT revenue ratio instability, Dummy of presence of VAT	GDP per capita,trade openness and level of natural resources rent	Positive
17	Bumpei, M.(2011).The Effect of VAT Rate change on Aggregate Consumption and Economic Growth	Japan	Panel regression	VAT rate	Aggregate consumption and Economic Growth	Negative
18	Alm et.al(2012)Value Added Tax and Consumption	15 European Countries	Dynamic Panel Generalised Method of Moment system estimator	VAT Rate	Aggregate Consumption	Negative
19	Alexander M.G.(2013)Value Added Tax and Inflation: Agraphical and Statistical Analysis	U.K and Canada	Graph	Value Added Tax Rates	Retail volume and percentage change from the prior year	Positive
20	Sayeed et.al(2016)Effect of Value Added Tax on Consumption in Developing Countries	Developing countries	Generalize Method of Moment Panel	Value Added Tax rate	Consumption	Negative
21	Ajakaiye(2000)Macroeconomic Effects of VAT in Nigeria: A computable General Equilibrium	Nigeria	Simulation with regression model	VAT revenue, VAT rate	Consumption expenditure, Gross Domestic Product, wage	Negative

	Analysis				and profit income	
22	Owolabi et.al(2011)Contribution of VAT to the development of Lagos economy, Nigeria	Nigeria	Simple Regression Analysis	VAT revenue	Gross Domestic Product	Positive
23	Adereti et.al(2011)Value Added Tax and Economic Growth in Nigeria	Nigeria	Ordinary Least Squares regression Analysis and descriptive statistic	VAT Revenue	Gross Domestic Product	Positive
24	Unegbu et.al(2000)Impact of VAT on Economic Development of emerging Nations	Nigeria	Ordinary Least Squares technique	VAT revenue	Gross Domestic Product	Positive
25	Anichebe et.al(2012)Implication of Tax Policy on Inflation in Nigeria(1981-2012).	Nigeria	Ordinary Least Squares technique	Tax policy, personal income tax rate, company income tax rate	Consumption, inflation	Negative
26	Bakari W.(2012)An Evaluation of Macroeconomic Effects of Tax Reform in Nigeria(1993-2007)	Nigeria	Ordinary Least Squares technique model for simulation experiment	5% and 10% VAT rate increase	Output of manufacturing sector, export, agricultural, building and construction, private consumption, demand for money , wholesale and retail, consumer price index, inflation	Negative
27	Musa A. et.al(2012)Appraiser of Tax System in Nigeria(Acase study of Value Added Tax)1994-2004	Nigeria	Efficiency and Effectiveness parameter of judging a tax system	VAT Revenue	Gross Domestic Product	Negative (not efficient)
28	Emeka et.al(2012)Tax Revenue and Economic Development in Nigeria:An Econometric Approach	Nigeria	Ordinary Least Squares technique	Value Added Tax Revenue	Infrastructural development and Gross Domestic Product	Positive and negative respectively
29	Okafor, G. and Regina(2012)Tax Revenue Generation and Nigeria Economic Development	Nigeria	Ordinary Least Squares regression technique	Petroleum Profit Tax, Company Income Tax, Customs and Excise duty, and Value Added Tax	Gross Domestic Product	Positive
30	Olatunji(2013)Value	Nigeria	Descriptive	Value	Inflation rates	Positive

	Added Tax and Inflation in Nigeria(1990-2013)		research approach	Added Tax rates		and negative
31	Ikpe, M. and Nteegah(2013)Determinant of Inflation in Nigeria	Nigeria	Multiple Regression Analysis	Value Added Tax rate	Price level	Negative
32	Emmanuel(2013)The Effect of Value Added Tax on Economic Growth in Nigeria	Nigeria	Simple Linear Regression Analysis	Value Added Tax	Gross Domestic Product and Total Tax Revenue	Positive
33	Onaolapo,A.A & Fasina, A.H.(2013)An Investigation of the Effect of VAT on Revenue Profiles of South-Western Nigeria	Nigeria	Panel Regression	Value Added Tax Revenue	Source of revenue data for the respective state obtained from budget	Positive
34	Madugba et.al(2016)Value Added Tax and Economic Development in Nigeria	Nigeria	Ordinary Least Squares regression technique	Value Added Tax Revenue	Gross Domestic Product	Positive
35	Ofishe, O.W(2013)The Impact of Value Added Tax on Economic Growth in Nigeria	Nigeria	Ordinary Least Squares technique	Value Added Tax Revenue	Gross Domestic Product	Positive
36	Bukie, H.O & Adejumu,T.(2013)The Effecs of VAT Revenue on Economic Growth in Nigeria	Nigeria	Ordinary Least Squares technique	Tax revenue	Domestic investment,labour force, and foreign direct investment	Positive
37	Umeora, C.E. (2013)The Effect of Value Added Tax on Economic Growth and Total Revenue of Nigeria	Nigeria	Ordinary Least Squares technique	Value Added Tax Revenue	Gross Domestic Product and Total Tax Revenue	Positive
38	Okoli,M.N.& Afolayan, S.M.(2013)Correlation between VAT and National Revenue in Nigeria:An ECM M.	Nigeria	Error Correction Mechanism	Value Added Tax Revenue	National Revenue	Positive
39	Owuchekwa,J.C& Aruwa,A.S.(2014)Value Added Tax and Economic Growth in Nigeria	Nigeria	Ordinary Least Squares	Value Added Tax Revenue	Total Revenue, Gross Domestic Product	Positive
40	Chigbu, E.E. & Ali, I.P.(2014)Econometric Analysis of the Impact of Value Added Tax on Economic Growth in Nigeria; European Journal of Business and Management	Nigeria	Engel and Granger Cointegration Test	Value Added Tax revenue	Total tax revenue and Gross Domestic Product	Positive (long-run or short-run relations does not exist)
41	Gatawa et.al(2016)Evaluating the Impact of Value Added Tax on Economic Growth in Nigeria; Journal of Accounting and Taxation	Nigeria	Cointegration Test	Value Added Tax revenue	Gross Domestic Product	Positive
42	Ajibola, J.S & Olowolaju, P.S(2017)Taxation and its Influence on Household	Nigeria	Ordinary Least Squares regression	Value Added Tax revenue,	Private consumption expenditure	

	Consumption; The Nigeria Experience, HARD. International Journal of Economics and Business Management ISBN 2489-0065		technique	and inflation		

Source: Various sources as indicated above

APPENDIX 2: LIST OF ABBREVIATIONS

(i) VAT: Value Added Tax
(ii) VATR: Value Added Tax Revenue
(iii) EVR: Effective Value Added Tax Rate
(iv) PCHC: Per Capita Household Consumption
(v) CHFC: Composition of Household Final Consumption
(vi) SHFC: Household Saving-Consumption Ratio
(vii) INF: Inflation
(viii) RIR: Real Interest Rate
(ix) DR: Ratio of old dependants to young dependants
(x) GDP: Gross Domestic Product
(xi) SAV: Household Savings
(xii) FIRS: Federal Inland Revenue Service
(xiii) LVO: Local VAT Office
(xiv) HFC: Household Final Consumption

APPENDIX 3: Correlation Matrix

4.2.2 Correlation Analysis

	PCHC	CHFC	SHFC	EVR	Log(GDP)	Log(DR)	Log(VATR)
PCHC	1.00	-0.64	0.66	-0.68	0.80	-0.86	0.85
CHFC	-0.65	1.00	-0.53	0.89	-0.70	0.62	-0.77
SHFC	0.66	-0.53	1.00	-0.56	0.94	-0.86	0.87
EVR	-0.68	0.89	-0.56	1.00	0.72	0.70	-0.85
Log(GDP)	0.80	0.70	0.94	-0.72	1.00	-0.95	0.96
Log(DR)	0.86	0.62	-0.86	0.70	-0.95	1.00	-0.95
Log(VATR)	0.85	-0.77	0.87	-0.85	0.96	-0.95	1.00

APPENDIX 4: DESCRIPTIVE STATISTICS

	PCHC	CHFC	SHFC	EVR	log(GDP)	log(DR)	log(VATR)
Mean	1349.67	0.10	12.27	221.18	25.40	-2.76	25.76
Median	1383.84	0.07	4.85	121.82	25.32	-2.76	25.90
Maximum	1736.01	0.58	34.08	1199.66	27.07	-2.73	28.02
Minimum	933.71	0.02	0.77	19.88	23.62	-2.78	22.03
Std.Dev.	272.53	0.12	12.56	291.22	1.11	0.02	1.46
Skewness	-0.22	3.00	0.68	2.22	0.15	0.16	-0.36
Kurtosis	1.69	12.49	1.82	7.39	1.63	1.35	2.07
Jarque-Bera	1.75	115.68	2.98	35.78	1.80	2.58	1.26
Probability	0.42	0.00	0.23	0.00	0.41	0.27	0.53
Sum	29692.60	2.21	269.89	4865.99	558.85	-60.63	566.69
Sum Sq Dev.	155973	0.30	3313.99	1780962	26.03	0.00	44.85
Observation	22	22	22	22	22	22	22

APPENDIX 5: ADF UNIT ROOT TEST

ADF UNIT ROOT TEST

(i)PCHC :FIRST DIFF. STATIONARY

Null Hypothesis: LOG(PCHC) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.859049	0.3437
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(PCHC))
Method: Least Squares
Date: 04/19/18 Time: 06:31
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PCHC(-1))	-0.292145	0.157148	-1.859049	0.0794
D(LOG(PCHC(-1)))	-0.428947	0.210514	-2.037617	0.0566
C	2.127870	1.130738	1.881842	0.0761

R-squared	0.377356	Mean dependent var	0.012260
Adjusted R-squared	0.308173	S.D. dependent var	0.162637
S.E. of regression	0.135275	Akaike info criterion	-1.031445
Sum squared resid	0.329390	Schwarz criterion	-0.882228
Log likelihood	13.83018	Hannan-Quinn criter.	-0.999061
F-statistic	5.454491	Durbin-Watson stat	1.723317
Prob(F-statistic)	0.014066		

Null Hypothesis: D(LOG(PCHC)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.260083	0.0000
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(PCHC),2)
Method: Least Squares
Date: 04/19/18 Time: 06:33
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(PCHC(-1)))	-1.547637	0.213171	-7.260083	0.0000
C	0.026512	0.031856	0.832241	0.4156

R-squared	0.735040	Mean dependent var	-0.013765
Adjusted R-squared	0.721094	S.D. dependent var	0.272200
S.E. of regression	0.143753	Akaike info criterion	-0.951048
Sum squared resid	0.392633	Schwarz criterion	-0.851570
Log likelihood	11.98600	Hannan-Quinn criter.	-0.929459
F-statistic	52.70881	Durbin-Watson stat	1.694302
Prob(F-statistic)	0.000001		

(ii)CHFC : FIRST DIFF. STATIONARY

Null Hypothesis: LOG(CHFC) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.866524	0.0663
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(CHFC))
Method: Least Squares
Date: 04/19/18 Time: 06:25
Sample (adjusted): 1995 2015
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CHFC(-1))	-0.197891	0.069035	-2.866524	0.0099
C	-0.672613	0.194629	-3.455870	0.0026

R-squared	0.301906	Mean dependent var	-0.142067
Adjusted R-squared	0.265164	S.D. dependent var	0.321845
S.E. of regression	0.275894	Akaike info criterion	0.352789
Sum squared resid	1.446228	Schwarz criterion	0.452268
Log likelihood	-1.704288	Hannan-Quinn criter.	0.374379
F-statistic	8.216958	Durbin-Watson stat	1.809962
Prob(F-statistic)	0.009878		

Null Hypothesis: D(LOG(CHFC)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.174889	0.0005
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(CHFC),2)
Method: Least Squares
Date: 04/19/18 Time: 06:28
Sample (adjusted): 1996 2015
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(CHFC(-1)))	-0.997035	0.192668	-5.174889	0.0001
C	-0.099643	0.067825	-1.469129	0.1591

R-squared	0.598030	Mean dependent var	0.055591
Adjusted R-squared	0.575698	S.D. dependent var	0.417636
S.E. of regression	0.272042	Akaike info criterion	0.328916
Sum squared resid	1.332120	Schwarz criterion	0.428490
Log likelihood	-1.289164	Hannan-Quinn criter.	0.348354
F-statistic	26.77947	Durbin-Watson stat	2.089193
Prob(F-statistic)	0.000064		

(iii)FIRST DIFF. STATIONARY

Null Hypothesis: LOG(SHFC) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.883174	0.7731
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(SHFC))
Method: Least Squares
Date: 04/19/18 Time: 06:17
Sample (adjusted): 1995 2015
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(SHFC(-1))	-0.030803	0.034877	-0.883174	0.3882
C	0.231853	0.074710	3.103379	0.0059

R-squared	0.039434	Mean dependent var	0.179183
Adjusted R-squared	-0.011123	S.D. dependent var	0.205077
S.E. of regression	0.206214	Akaike info criterion	-0.229412
Sum squared resid	0.807960	Schwarz criterion	-0.129934
Log likelihood	4.408826	Hannan-Quinn criter.	-0.207823
F-statistic	0.779996	Durbin-Watson stat	2.179653
Prob(F-statistic)	0.388181		

Null Hypothesis: D(LOG(SHFC)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.616045	0.0018
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(SHFC),2)
Method: Least Squares
Date: 04/19/18 Time: 06:21
Sample (adjusted): 1996 2015
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(SHFC(-1)))	-1.102826	0.238911	-4.616045	0.0002
C	0.200286	0.065762	3.045599	0.0070

R-squared	0.542076	Mean dependent var	-0.006958
Adjusted R-squared	0.516636	S.D. dependent var	0.309094
S.E. of regression	0.214896	Akaike info criterion	-0.142688
Sum squared resid	0.831244	Schwarz criterion	-0.043114
Log likelihood	3.426877	Hannan-Quinn criter.	-0.123250
F-statistic	21.30787	Durbin-Watson stat	1.954448
Prob(F-statistic)	0.000215		

(iv)FIRST DIFF. STATIONARY

Null Hypothesis: LOG(HFC) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.104408	0.6929
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(HFC))
Method: Least Squares
Date: 04/19/18 Time: 07:03
Sample (adjusted): 1996 2015
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HFC(-1))	-0.098206	0.088921	-1.104408	0.2848
D(LOG(HFC(-1)))	-0.539158	0.194853	-2.766993	0.0132
C	2.627243	2.304535	1.140031	0.2701

R-squared	0.374309	Mean dependent var	0.051428
Adjusted R-squared	0.300698	S.D. dependent var	0.154613
S.E. of regression	0.129294	Akaike info criterion	-1.115969
Sum squared resid	0.284190	Schwarz criterion	-0.966609
Log likelihood	14.15969	Hannan-Quinn criter.	-1.086813
F-statistic	5.084981	Durbin-Watson stat	1.946920
Prob(F-statistic)	0.018581		

Null Hypothesis: D(LOG(HFC)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.146323	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(HFC),2)
Method: Least Squares
Date: 04/19/18 Time: 07:06
Sample (adjusted): 1996 2015
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(HFC(-1)))	-1.574862	0.193322	-8.146323	0.0000
C	0.082322	0.030887	2.665278	0.0158

R-squared	0.786635	Mean dependent var	-0.002313
Adjusted R-squared	0.774782	S.D. dependent var	0.274102
S.E. of regression	0.130081	Akaike info criterion	-1.146678
Sum squared resid	0.304580	Schwarz criterion	-1.047105
Log likelihood	13.46678	Hannan-Quinn criter.	-1.127240
F-statistic	66.36257	Durbin-Watson stat	1.941999
Prob(F-statistic)	0.000000		

GDP: FIRST DIFF. STATIONARY
Null Hypothesis: LOG(GDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.303968	0.6088
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GDP))
Method: Least Squares
Date: 04/19/18 Time: 15:08
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP(-1))	-0.055536	0.042590	-1.303968	0.2071
C	1.552008	1.082875	1.433230	0.1672

R-squared	0.078355	Mean dependent var	0.141267
Adjusted R-squared	0.032273	S.D. dependent var	0.220898
S.E. of regression	0.217304	Akaike info criterion	-0.128531
Sum squared resid	0.944420	Schwarz criterion	-0.029346
Log likelihood	3.413846	Hannan-Quinn criter.	-0.105166
F-statistic	1.700333	Durbin-Watson stat	2.124797
Prob(F-statistic)	0.207054		

Null Hypothesis: D(LOG(GDP)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.052978	0.0006
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(GDP),2)
Method: Least Squares
Date: 04/19/18 Time: 15:13
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(GDP(-1)))	-1.146377	0.226872	-5.052978	0.0001
C	0.149129	0.059281	2.515616	0.0210

R-squared	0.573346	Mean dependent var	-0.029970
Adjusted R-squared	0.550891	S.D. dependent var	0.324934
S.E. of regression	0.217757	Akaike info criterion	-0.120485
Sum squared resid	0.900941	Schwarz criterion	-0.021006
Log likelihood	3.265090	Hannan-Quinn criter.	-0.098895
F-statistic	25.53259	Durbin-Watson stat	1.928568
Prob(F-statistic)	0.000071		

(iv)IMP: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(IMP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.919535	0.0591
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(IMP))
Method: Least Squares
Date: 04/19/18 Time: 15:18
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(IMP(-1))	-0.152352	0.052184	-2.919535	0.0085
C	4.542263	1.496183	3.035902	0.0065

R-squared	0.298828	Mean dependent var	0.177930
Adjusted R-squared	0.263770	S.D. dependent var	0.342177
S.E. of regression	0.293601	Akaike info criterion	0.473317
Sum squared resid	1.724029	Schwarz criterion	0.572502
Log likelihood	-3.206483	Hannan-Quinn criter.	0.496682
F-statistic	8.523687	Durbin-Watson stat	1.847338
Prob(F-statistic)	0.008476		

Null Hypothesis: D(LOG(IMP)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.909422	0.0009
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(IMP),2)
Method: Least Squares
Date: 04/19/18 Time: 15:21
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(IMP(-1)))	-0.951963	0.193905	-4.909422	0.0001
C	0.127496	0.074866	1.703001	0.1049

R-squared	0.559190	Mean dependent var	-0.057098
Adjusted R-squared	0.535989	S.D. dependent var	0.435522
S.E. of regression	0.296670	Akaike info criterion	0.498001
Sum squared resid	1.672250	Schwarz criterion	0.597479
Log likelihood	-3.229009	Hannan-Quinn criter.	0.519590
F-statistic	24.10243	Durbin-Watson stat	2.156708
Prob(F-statistic)	0.000097		

(vi)EVR: FIRST DIFF. STATIONAR

Null Hypothesis: LOG(EVR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.448289	0.5392
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(EVR))
Method: Least Squares
Date: 04/19/18 Time: 15:24
Sample (adjusted): 1995 2015
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EVR(-1))	-0.103766	0.071647	-1.448289	0.1638
C	0.308893	0.356094	0.867447	0.3965

R-squared	0.099421	Mean dependent var	-0.195248
Adjusted R-squared	0.052022	S.D. dependent var	0.353269
S.E. of regression	0.343957	Akaike info criterion	0.793792
Sum squared resid	2.247822	Schwarz criterion	0.893271
Log likelihood	-6.334821	Hannan-Quinn criter.	0.815382
F-statistic	2.097541	Durbin-Watson stat	2.449927
Prob(F-statistic)	0.163838		

Null Hypothesis: D(LOG(EVR)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.822921	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(EVR),2)
Method: Least Squares
Date: 04/19/18 Time: 15:27
Sample (adjusted): 1996 2015

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(EVR(-1)))	-1.379028	0.202117	-6.822921	0.0000
C	-0.229149	0.077590	-2.953323	0.0085

R-squared	0.721156	Mean dependent var	0.012824
Adjusted R-squared	0.705665	S.D. dependent var	0.568868
S.E. of regression	0.308626	Akaike info criterion	0.581268
Sum squared resid	1.714503	Schwarz criterion	0.680841
Log likelihood	-3.812678	Hannan-Quinn criter.	0.600706
F-statistic	46.55225	Durbin-Watson stat	2.512080
Prob(F-statistic)	0.000002		

(vii)RIR: LEVEL STATIONAR

Null Hypothesis: RIR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.657134	0.0014
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RIR)
Method: Least Squares
Date: 04/19/18 Time: 15:32
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RIR(-1)	-1.033132	0.221838	-4.657134	0.0002
C	3.277504	4.023984	0.814492	0.4250

R-squared	0.520256	Mean dependent var	0.669079
Adjusted R-squared	0.496269	S.D. dependent var	26.33419
S.E. of regression	18.69044	Akaike info criterion	8.780409
Sum squared resid	6986.647	Schwarz criterion	8.879595
Log likelihood	-94.58450	Hannan-Quinn criter.	8.803774
F-statistic	21.68890	Durbin-Watson stat	1.840756
Prob(F-statistic)	0.000152		

(viii)INF: LEVEL STATIONARY

Null Hypothesis: LOG(INF) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.023708	0.0482
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(INF))
Method: Least Squares
Date: 04/19/18 Time: 15:35
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(INF(-1))	-0.449289	0.148589	-3.023708	0.0067
C	1.091542	0.391796	2.785999	0.0114

R-squared	0.313724	Mean dependent var	-0.058643
Adjusted R-squared	0.279411	S.D. dependent var	0.518566
S.E. of regression	0.440198	Akaike info criterion	1.283325
Sum squared resid	3.875489	Schwarz criterion	1.382510
Log likelihood	-12.11657	Hannan-Quinn criter.	1.306690
F-statistic	9.142807	Durbin-Watson stat	1.857646
Prob(F-statistic)	0.006708		

Null Hypothesis: D(LOG(INF)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.271732	0.0035
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(INF),2)
Method: Least Squares
Date: 04/19/18 Time: 15:37
Sample (adjusted): 1996 2016

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(INF(-1)))	-1.007318	0.235810	-4.271732	0.0004
C	-0.073726	0.119750	-0.615664	0.5454

R-squared	0.489901	Mean dependent var	0.014747
Adjusted R-squared	0.463054	S.D. dependent var	0.737606
S.E. of regression	0.540493	Akaike info criterion	1.697722
Sum squared resid	5.550518	Schwarz criterion	1.797200
Log likelihood	-15.82608	Hannan-Quinn criter.	1.719311
F-statistic	18.24770	Durbin-Watson stat	1.709468
Prob(F-statistic)	0.000412		

(ix)VATR: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(VATR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.537114	0.4966
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(VATR))
Method: Least Squares
Date: 04/19/18 Time: 15:43
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(VATR(-1))	-0.075022	0.048807	-1.537114	0.1399
C	2.172454	1.259128	1.725363	0.0999

R-squared	0.105654	Mean dependent var	0.239997
Adjusted R-squared	0.060937	S.D. dependent var	0.337318
S.E. of regression	0.326879	Akaike info criterion	0.688054
Sum squared resid	2.136996	Schwarz criterion	0.787240
Log likelihood	-5.568594	Hannan-Quinn criter.	0.711419
F-statistic	2.362720	Durbin-Watson stat	2.631565
Prob(F-statistic)	0.139936		

Null Hypothesis: D(LOG(VATR)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.368348	0.0000
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(VATR),2)
Method: Least Squares
Date: 04/19/18 Time: 15:46
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(VATR(-1)))	-1.380994	0.187422	-7.368348	0.0000
C	0.302352	0.078119	3.870379	0.0010

R-squared	0.740765	Mean dependent var	-0.038878
Adjusted R-squared	0.727121	S.D. dependent var	0.551903
S.E. of regression	0.288302	Akaike info criterion	0.440778
Sum squared resid	1.579245	Schwarz criterion	0.540256
Log likelihood	-2.628165	Hannan-Quinn criter.	0.462367
F-statistic	54.29256	Durbin-Watson stat	2.665135
Prob(F-statistic)	0.000001		

(x)DR: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(DR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.676244	0.8330
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(DR))
Method: Least Squares
Date: 04/19/18 Time: 15:49
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(DR(-1))	-0.031006	0.045850	-0.676244	0.5066
C	-0.087309	0.126359	-0.690964	0.4975

R-squared	0.022354	Mean dependent var	-0.001862
Adjusted R-squared	-0.026528	S.D. dependent var	0.003792
S.E. of regression	0.003842	Akaike info criterion	-8.199057
Sum squared resid	0.000295	Schwarz criterion	-8.099871
Log likelihood	92.18962	Hannan-Quinn criter.	-8.175692
F-statistic	0.457306	Durbin-Watson stat	1.331849
Prob(F-statistic)	0.506631		

Null Hypothesis: D(LOG(DR)) has a unit root
Exogenous: None
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.612660	0.0117
Test critical values:	1% level	-2.679735	
	5% level	-1.958088	
	10% level	-1.607830	

*MacKinnon (1996) one-sided p-values.
Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(DR),2)
Method: Least Squares
Date: 04/19/18 Time: 15:56
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(DR(-1)))	-0.537169	0.205602	-2.612660	0.0167

R-squared	0.252701	Mean dependent var	0.000213
Adjusted R-squared	0.252701	S.D. dependent var	0.004493
S.E. of regression	0.003884	Akaike info criterion	-8.217246
Sum squared resid	0.000302	Schwarz criterion	-8.167506
Log likelihood	87.28108	Hannan-Quinn criter.	-8.206451
Durbin-Watson stat	1.773881		

(xi)SAV: SECOND DIFF. STATIONARY

Null Hypothesis: LOG(SAV) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.817662	0.3626
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(SAV))
Method: Least Squares
Date: 04/19/18 Time: 16:02
Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(SAV(-1))	-0.039456	0.021707	-1.817662	0.0841
C	1.305841	0.602736	2.166523	0.0425

R-squared	0.141774	Mean dependent var	0.212201
Adjusted R-squared	0.098863	S.D. dependent var	0.176709
S.E. of regression	0.167747	Akaike info criterion	-0.646211
Sum squared resid	0.562781	Schwarz criterion	-0.547025
Log likelihood	9.108323	Hannan-Quinn criter.	-0.622846
F-statistic	3.303897	Durbin-Watson stat	1.495558
Prob(F-statistic)	0.084129		

Null Hypothesis: D(LOG(SAV)) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.784728	0.0774
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(SAV),2)
Method: Least Squares
Date: 04/19/18 Time: 16:07
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(SAV(-1)))	-0.714571	0.256603	-2.784728	0.0118
C	0.146665	0.071114	2.062401	0.0531

R-squared	0.289845	Mean dependent var	-0.018419
Adjusted R-squared	0.252468	S.D. dependent var	0.208187
S.E. of regression	0.179998	Akaike info criterion	-0.501348
Sum squared resid	0.615587	Schwarz criterion	-0.401870
Log likelihood	7.264158	Hannan-Quinn criter.	-0.479759
F-statistic	7.754711	Durbin-Watson stat	1.881958
Prob(F-statistic)	0.011810		

Null Hypothesis: D(LOG(SAV),2) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=4)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.807338	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOG(SAV),3)
Method: Least Squares
Date: 04/19/18 Time: 16:11
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(SAV(-1)),2)	-1.460868	0.214602	-6.807338	0.0000
C	-0.024019	0.043807	-0.548280	0.5902

R-squared	0.720236	Mean dependent var	-0.010475
Adjusted R-squared	0.704693	S.D. dependent var	0.360144
S.E. of regression	0.195710	Akaike info criterion	-0.329724
Sum squared resid	0.689445	Schwarz criterion	-0.230151
Log likelihood	5.297242	Hannan-Quinn criter.	-0.310286
F-statistic	46.33985	Durbin-Watson stat	2.209264
Prob(F-statistic)	0.000002		

PHILLIPS-PERRON TEST STATISTIC

(i)PCHC: FIRST DIFF. STATIONARY
Null Hypothesis: LOG(PCHC) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.251693	0.1952
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.018956
HAC corrected variance (Bartlett kernel)	0.015371

Phillips-Perron Test Equation
Dependent Variable: D(LOG(PCHC))
Method: Least Squares
Date: 04/21/18 Time: 09:09
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(PCHC(-1))	-0.345428	0.148723	-2.322627	0.0309
C	2.495854	1.069298	2.334106	0.0301

R-squared	0.212431	Mean dependent var	0.013304
Adjusted R-squared	0.173052	S.D. dependent var	0.158793
S.E. of regression	0.144401	Akaike info criterion	-0.945934
Sum squared resid	0.417034	Schwarz criterion	-0.846748
Log likelihood	12.40528	Hannan-Quinn criter.	-0.922569
F-statistic	5.394598	Durbin-Watson stat	2.518675
Prob(F-statistic)	0.030863		

Null Hypothesis: D(LOG(PCHC)) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.232663	0.0000
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.018697
HAC corrected variance (Bartlett kernel)	0.019045

Phillips-Perron Test Equation
Dependent Variable: D(LOG(PCHC),2)
Method: Least Squares
Date: 04/21/18 Time: 09:15
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(PCHC(-1)))	-1.547637	0.213171	-7.260083	0.0000
C	0.026512	0.031856	0.832241	0.4156

R-squared	0.735040	Mean dependent var	-0.013765
Adjusted R-squared	0.721094	S.D. dependent var	0.272200
S.E. of regression	0.143753	Akaike info criterion	-0.951048
Sum squared resid	0.392633	Schwarz criterion	-0.851570
Log likelihood	11.98600	Hannan-Quinn criter.	-0.929459
F-statistic	52.70881	Durbin-Watson stat	1.694302
Prob(F-statistic)	0.000001		

(ii) CHFC: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(CHFC) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.842944	0.0694
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.068868
HAC corrected variance (Bartlett kernel)	0.071122

Phillips-Perron Test Equation
Dependent Variable: D(LOG(CHFC))
Method: Least Squares
Date: 04/21/18 Time: 09:18
Sample (adjusted): 1995 2015
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CHFC(-1))	-0.197891	0.069035	-2.866524	0.0099
C	-0.672613	0.194629	-3.455870	0.0026

R-squared	0.301906	Mean dependent var	-0.142067
Adjusted R-squared	0.265164	S.D. dependent var	0.321845
S.E. of regression	0.275894	Akaike info criterion	0.352789
Sum squared resid	1.446228	Schwarz criterion	0.452268
Log likelihood	-1.704288	Hannan-Quinn criter.	0.374379
F-statistic	8.216958	Durbin-Watson stat	1.809962
Prob(F-statistic)	0.009878		

Null Hypothesis: D(LOG(CHFC)) has a unit root
Exogenous: Constant
Bandwidth: 14 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.229093	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.066606
HAC corrected variance (Bartlett kernel)	0.019101

Phillips-Perron Test Equation
Dependent Variable: D(LOG(CHFC),2)
Method: Least Squares
Date: 04/21/18 Time: 09:21
Sample (adjusted): 1996 2015
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(CHFC(-1)))	-0.997035	0.192668	-5.174889	0.0001
C	-0.099643	0.067825	-1.469129	0.1591

R-squared	0.598030	Mean dependent var	0.055591
Adjusted R-squared	0.575698	S.D. dependent var	0.417636
S.E. of regression	0.272042	Akaike info criterion	0.328916
Sum squared resid	1.332120	Schwarz criterion	0.428490
Log likelihood	-1.289164	Hannan-Quinn criter.	0.348354
F-statistic	26.77947	Durbin-Watson stat	2.089193
Prob(F-statistic)	0.000064		

(iii)SHFC: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(SHFC) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.905624	0.7659
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.038474
HAC corrected variance (Bartlett kernel)	0.031650

Phillips-Perron Test Equation
Dependent Variable: D(LOG(SHFC))
Method: Least Squares
Date: 04/21/18 Time: 09:29
Sample (adjusted): 1995 2015

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(SHFC(-1))	-0.030803	0.034877	-0.883174	0.3882
C	0.231853	0.074710	3.103379	0.0059

R-squared	0.039434	Mean dependent var	0.179183
Adjusted R-squared	-0.011123	S.D. dependent var	0.205077
S.E. of regression	0.206214	Akaike info criterion	-0.229412
Sum squared resid	0.807960	Schwarz criterion	-0.129934
Log likelihood	4.408826	Hannan-Quinn criter.	-0.207823
F-statistic	0.779996	Durbin-Watson stat	2.179653
Prob(F-statistic)	0.388181		

Null Hypothesis: D(LOG(SHFC)) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.616045	0.0018
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.041562
HAC corrected variance (Bartlett kernel)	0.041562

Phillips-Perron Test Equation
Dependent Variable: D(LOG(SHFC),2)
Method: Least Squares
Date: 04/21/18 Time: 09:32
Sample (adjusted): 1996 2015
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(SHFC(-1)))	-1.102826	0.238911	-4.616045	0.0002
C	0.200286	0.065762	3.045599	0.0070

R-squared	0.542076	Mean dependent var	-0.006958
Adjusted R-squared	0.516636	S.D. dependent var	0.309094
S.E. of regression	0.214896	Akaike info criterion	-0.142688
Sum squared resid	0.831244	Schwarz criterion	-0.043114
Log likelihood	3.426877	Hannan-Quinn criter.	-0.123250
F-statistic	21.30787	Durbin-Watson stat	1.954448
Prob(F-statistic)	0.000215		

(iv)HFC: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(HFC) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.191706	0.6579
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.019862
HAC corrected variance (Bartlett kernel)	0.010958

Phillips-Perron Test Equation
Dependent Variable: D(LOG(HFC))
Method: Least Squares
Date: 04/21/18 Time: 12:18
Sample (adjusted): 1995 2015
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(HFC(-1))	-0.120918	0.092926	-1.301224	0.2087
C	3.184121	2.407396	1.322641	0.2017

R-squared	0.081823	Mean dependent var	0.051842
Adjusted R-squared	0.033498	S.D. dependent var	0.150710
S.E. of regression	0.148165	Akaike info criterion	-0.890592
Sum squared resid	0.417103	Schwarz criterion	-0.791113
Log likelihood	11.35121	Hannan-Quinn criter.	-0.869002
F-statistic	1.693184	Durbin-Watson stat	3.025728
Prob(F-statistic)	0.208741		

Null Hypothesis: D(LOG(HFC)) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-8.364237	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.015229
HAC corrected variance (Bartlett kernel)	0.013872

Phillips-Perron Test Equation
Dependent Variable: D(LOG(HFC),2)
Method: Least Squares
Date: 04/21/18 Time: 12:21
Sample (adjusted): 1996 2015

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(HFC(-1)))	-1.574862	0.193322	-8.146323	0.0000
C	0.082322	0.030887	2.665278	0.0158

R-squared	0.786635	Mean dependent var	-0.002313
Adjusted R-squared	0.774782	S.D. dependent var	0.274102
S.E. of regression	0.130081	Akaike info criterion	-1.146678
Sum squared resid	0.304580	Schwarz criterion	-1.047105
Log likelihood	13.46678	Hannan-Quinn criter.	-1.127240
F-statistic	66.36257	Durbin-Watson stat	1.941999
Prob(F-statistic)	0.000000		

(v)IMP: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(IMP) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.919535	0.0591
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.078365
HAC corrected variance (Bartlett kernel)	0.078365

Phillips-Perron Test Equation
Dependent Variable: D(LOG(IMP))
Method: Least Squares
Date: 04/21/18 Time: 12:24
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(IMP(-1))	-0.152352	0.052184	-2.919535	0.0085
C	4.542263	1.496183	3.035902	0.0065

R-squared	0.298828	Mean dependent var	0.177930
Adjusted R-squared	0.263770	S.D. dependent var	0.342177
S.E. of regression	0.293601	Akaike info criterion	0.473317
Sum squared resid	1.724029	Schwarz criterion	0.572502
Log likelihood	-3.206483	Hannan-Quinn criter.	0.496682
F-statistic	8.523687	Durbin-Watson stat	1.847338
Prob(F-statistic)	0.008476		

Null Hypothesis: D(LOG(IMP)) has a unit root
Exogenous: Constant
Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.341576	0.0003
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.079631
HAC corrected variance (Bartlett kernel)	0.047632

Phillips-Perron Test Equation
Dependent Variable: D(LOG(IMP),2)
Method: Least Squares
Date: 04/21/18 Time: 12:31
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(IMP(-1)))	-0.951963	0.193905	-4.909422	0.0001
C	0.127496	0.074866	1.703001	0.1049

R-squared	0.559190	Mean dependent var	-0.057098
Adjusted R-squared	0.535989	S.D. dependent var	0.435522
S.E. of regression	0.296670	Akaike info criterion	0.498001
Sum squared resid	1.672250	Schwarz criterion	0.597479
Log likelihood	-3.229009	Hannan-Quinn criter.	0.519590
F-statistic	24.10243	Durbin-Watson stat	2.156708
Prob(F-statistic)	0.000097		

(vii)EVR:: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(EVR) has a unit root
Exogenous: Constant
Bandwidth: 20 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.946623	0.3062
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.107039
HAC corrected variance (Bartlett kernel)	0.021797

Phillips-Perron Test Equation
Dependent Variable: D(LOG(EVR))
Method: Least Squares
Date: 04/21/18 Time: 12:33
Sample (adjusted): 1995 2015
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EVR(-1))	-0.103766	0.071647	-1.448289	0.1638
C	0.308893	0.356094	0.867447	0.3965

R-squared	0.099421	Mean dependent var	-0.195248
Adjusted R-squared	0.052022	S.D. dependent var	0.353269
S.E. of regression	0.343957	Akaike info criterion	0.793792
Sum squared resid	2.247822	Schwarz criterion	0.893271
Log likelihood	-6.334821	Hannan-Quinn criter.	0.815382
F-statistic	2.097541	Durbin-Watson stat	2.449927
Prob(F-statistic)	0.163838		

Null Hypothesis: D(LOG(EVR)) has a unit root
Exogenous: Constant
Bandwidth: 17 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-15.49875	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.085725
HAC corrected variance (Bartlett kernel)	0.009334

Phillips-Perron Test Equation
Dependent Variable: D(LOG(EVR),2)
Method: Least Squares
Date: 04/21/18 Time: 12:39
Sample (adjusted): 1996 2015

Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(EVR(-1)))	-1.379028	0.202117	-6.822921	0.0000
C	-0.229149	0.077590	-2.953323	0.0085

R-squared	0.721156	Mean dependent var	0.012824
Adjusted R-squared	0.705665	S.D. dependent var	0.568868
S.E. of regression	0.308626	Akaike info criterion	0.581268
Sum squared resid	1.714503	Schwarz criterion	0.680841
Log likelihood	-3.812678	Hannan-Quinn criter.	0.600706
F-statistic	46.55225	Durbin-Watson stat	2.512080
Prob(F-statistic)	0.000002		

(vii) RIR: LEVEL DIFF. STATIONARY

Null Hypothesis: RIR has a unit root
Exogenous: Constant
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.875700	0.0008
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	317.5749
HAC corrected variance (Bartlett kernel)	172.7730

Phillips-Perron Test Equation
Dependent Variable: D(RIR)
Method: Least Squares
Date: 04/21/18 Time: 12:42
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RIR(-1)	-1.033132	0.221838	-4.657134	0.0002
C	3.277504	4.023984	0.814492	0.4250

R-squared	0.520256	Mean dependent var	0.669079
Adjusted R-squared	0.496269	S.D. dependent var	26.33419
S.E. of regression	18.69044	Akaike info criterion	8.780409
Sum squared resid	6986.647	Schwarz criterion	8.879595
Log likelihood	-94.58450	Hannan-Quinn criter.	8.803774
F-statistic	21.68890	Durbin-Watson stat	1.840756
Prob(F-statistic)	0.000152		

(viii) INF: LEVEL STATIONARY

Null Hypothesis: LOG(INF) has a unit root
Exogenous: Constant
Bandwidth: 8 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.187624	0.0040
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.176159
HAC corrected variance (Bartlett kernel)	0.030129

Phillips-Perron Test Equation
Dependent Variable: D(LOG(INF))
Method: Least Squares
Date: 04/21/18 Time: 12:45
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(INF(-1))	-0.449289	0.148589	-3.023708	0.0067
C	1.091542	0.391796	2.785999	0.0114

R-squared	0.313724	Mean dependent var	-0.058643
Adjusted R-squared	0.279411	S.D. dependent var	0.518566
S.E. of regression	0.440198	Akaike info criterion	1.283325
Sum squared resid	3.875489	Schwarz criterion	1.382510
Log likelihood	-12.11657	Hannan-Quinn criter.	1.306690
F-statistic	9.142807	Durbin-Watson stat	1.857646
Prob(F-statistic)	0.006708		

(ix) VATR: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(VATR) has a unit root
Exogenous: Constant
Bandwidth: 21 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.977578	0.0528
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.097136
HAC corrected variance (Bartlett kernel)	0.013121

Phillips-Perron Test Equation
Dependent Variable: D(LOG(VATR))
Method: Least Squares
Date: 04/21/18 Time: 12:55
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(VATR(-1))	-0.075022	0.048807	-1.537114	0.1399
C	2.172454	1.259128	1.725363	0.0999

R-squared	0.105654	Mean dependent var	0.239997
Adjusted R-squared	0.060937	S.D. dependent var	0.337318
S.E. of regression	0.326879	Akaike info criterion	0.688054
Sum squared resid	2.136996	Schwarz criterion	0.787240
Log likelihood	-5.568594	Hannan-Quinn criter.	0.711419
F-statistic	2.362720	Durbin-Watson stat	2.631565
Prob(F-statistic)	0.139936		

Null Hypothesis: D(LOG(VATR)) has a unit root
Exogenous: Constant
Bandwidth: 9 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-11.33960	0.0000
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.075202
HAC corrected variance (Bartlett kernel)	0.021229

Phillips-Perron Test Equation
Dependent Variable: D(LOG(VATR),2)
Method: Least Squares
Date: 04/21/18 Time: 13:04
Sample (adjusted): 1996 2016

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(VATR(-1)))	-1.380994	0.187422	-7.368348	0.0000
C	0.302352	0.078119	3.870379	0.0010

R-squared	0.740765	Mean dependent var	-0.038878
Adjusted R-squared	0.727121	S.D. dependent var	0.551903
S.E. of regression	0.288302	Akaike info criterion	0.440778
Sum squared resid	1.579245	Schwarz criterion	0.540256
Log likelihood	-2.628165	Hannan-Quinn criter.	0.462367
F-statistic	54.29256	Durbin-Watson stat	2.665135
Prob(F-statistic)	0.000001		

(ix) DR: FIRST DIFF. STATIONARY

Null Hypothesis: LOG(DR) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.676244	0.8330
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.34E-05
HAC corrected variance (Bartlett kernel)	1.34E-05

Phillips-Perron Test Equation
Dependent Variable: D(LOG(DR))
Method: Least Squares
Date: 04/21/18 Time: 13:08
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(DR(-1))	-0.031006	0.045850	-0.676244	0.5066
C	-0.087309	0.126359	-0.690964	0.4975

R-squared	0.022354	Mean dependent var	-0.001862
Adjusted R-squared	-0.026528	S.D. dependent var	0.003792
S.E. of regression	0.003842	Akaike info criterion	-8.199057
Sum squared resid	0.000295	Schwarz criterion	-8.099871
Log likelihood	92.18962	Hannan-Quinn criter.	-8.175692
F-statistic	0.457306	Durbin-Watson stat	1.331849
Prob(F-statistic)	0.506631		

Null Hypothesis: D(LOG(DR)) has a unit root
Exogenous: None
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.638912	0.0110
Test critical values:	1% level	-2.679735	
	5% level	-1.958088	
	10% level	-1.607830	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	1.44E-05
HAC corrected variance (Bartlett kernel)	1.48E-05

Phillips-Perron Test Equation
Dependent Variable: D(LOG(DR),2)
Method: Least Squares
Date: 04/21/18 Time: 13:19
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(DR(-1)))	-0.537169	0.205602	-2.612660	0.0167

R-squared	0.252701	Mean dependent var	0.000213
Adjusted R-squared	0.252701	S.D. dependent var	0.004493
S.E. of regression	0.003884	Akaike info criterion	-8.217246
Sum squared resid	0.000302	Schwarz criterion	-8.167506
Log likelihood	87.28108	Hannan-Quinn criter.	-8.206451
Durbin-Watson stat	1.773881		

(XI) SAV: SECOND DIFF. STATIONARY

Null Hypothesis: LOG(SAV) has a unit root
Exogenous: None
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		4.468255	1.0000
Test critical values:	1% level	-2.674290	
	5% level	-1.957204	
	10% level	-1.608175	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.031585
HAC corrected variance (Bartlett kernel)	0.045382

Phillips-Perron Test Equation
Dependent Variable: D(LOG(SAV))
Method: Least Squares
Date: 04/21/18 Time: 13:23
Sample (adjusted): 1995 2016
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(SAV(-1))	0.007490	0.001397	5.362566	0.0000

R-squared	-0.059643	Mean dependent var	0.212201
Adjusted R-squared	-0.059643	S.D. dependent var	0.176709
S.E. of regression	0.181903	Akaike info criterion	-0.526299
Sum squared resid	0.694861	Schwarz criterion	-0.476707
Log likelihood	6.789294	Hannan-Quinn criter.	-0.514617
Durbin-Watson stat	1.267382		

Null Hypothesis: D(LOG(SAV)) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.746839	0.0831
Test critical values:	1% level	-3.788030	
	5% level	-3.012363	
	10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.029314
HAC corrected variance (Bartlett kernel)	0.028371

Phillips-Perron Test Equation
Dependent Variable: D(LOG(SAV),2)
Method: Least Squares
Date: 04/21/18 Time: 13:25
Sample (adjusted): 1996 2016
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(SAV(-1)))	-0.714571	0.256603	-2.784728	0.0118
C	0.146665	0.071114	2.062401	0.0531

R-squared	0.289845	Mean dependent var	-0.018419
Adjusted R-squared	0.252468	S.D. dependent var	0.208187
S.E. of regression	0.179998	Akaike info criterion	-0.501348
Sum squared resid	0.615587	Schwarz criterion	-0.401870
Log likelihood	7.264158	Hannan-Quinn criter.	-0.479759
F-statistic	7.754711	Durbin-Watson stat	1.881958
Prob(F-statistic)	0.011810		

Null Hypothesis: D(LOG(SAV),2) has a unit root
Exogenous: Constant
Bandwidth: 14 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-9.002942	0.0000
Test critical values:	1% level	-3.808546	
	5% level	-3.020686	
	10% level	-2.650413	

*MacKinnon (1996) one-sided p-values.

Residual variance (no correction)	0.034472
HAC corrected variance (Bartlett kernel)	0.013069

Phillips-Perron Test Equation
Dependent Variable: D(LOG(SAV),3)
Method: Least Squares
Date: 04/21/18 Time: 13:28
Sample (adjusted): 1997 2016
Included observations: 20 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(SAV(-1)),2)	-1.460868	0.214602	-6.807338	0.0000
C	-0.024019	0.043807	-0.548280	0.5902

R-squared	0.720236	Mean dependent var	-0.010475
Adjusted R-squared	0.704693	S.D. dependent var	0.360144
S.E. of regression	0.195710	Akaike info criterion	-0.329724
Sum squared resid	0.689445	Schwarz criterion	-0.230151
Log likelihood	5.297242	Hannan-Quinn criter.	-0.310286
F-statistic	46.33985	Durbin-Watson stat	2.209264
Prob(F-statistic)	0.000002		

Appendix 7: ARDL Result for Model 1; Impact of VAT on per capita household consumption

Dependent Variable: LOG(PCHC)
Method: ARDL
Date: 03/10/18 Time: 04:32
Sample (adjusted): 1998 2015
Included observations: 18 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LOG(EVR) LOG(DR)
Fixed regressors: C
Number of models evalulated: 100
Selected Model: ARDL(2, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(PCHC(-1))	-0.027340	0.324068	-0.084365	0.9360
LOG(PCHC(-2))	0.307705	0.253208	1.215226	0.2785
LOG(EVR)	0.163929	0.130213	1.258928	0.2636
LOG(EVR(-1))	-0.166407	0.123451	-1.347964	0.2355
LOG(EVR(-2))	-0.123993	0.075791	-1.635986	0.1628
LOG(EVR(-3))	-0.210898	0.078769	-2.677433	0.0440
LOG(EVR(-4))	0.223752	0.094060	2.378834	0.0633
LOG(DR)	-25.61978	8.261688	-3.101034	0.0268
LOG(DR(-1))	28.62074	10.32082	2.773107	0.0392
LOG(DR(-2))	-13.02008	9.304641	-1.399311	0.2206
LOG(DR(-3))	2.079734	8.939549	0.232644	0.8253
LOG(DR(-4))	6.952763	5.878370	1.182771	0.2901
C	2.933483	22.03513	0.133128	0.8993

R-squared	0.963673	Mean dependent var	7.244002
Adjusted R-squared	0.876489	S.D. dependent var	0.187221
S.E. of regression	0.065797	Akaike info criterion	-2.440971
Sum squared resid	0.021646	Schwarz criterion	-1.797924
Log likelihood	34.96874	Hannan-Quinn criter.	-2.352303
F-statistic	11.05334	Durbin-Watson stat	1.747807
Prob(F-statistic)	0.007766		

ARDL Bounds Test For Model 1

ARDL Bounds Test
Date: 03/10/18 Time: 04:34
Sample: 1998 2015
Included observations: 18
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	1.437337	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Unrestricted Vector Autoregressive for model 1

VAR Lag Order Selection Criteria
Endogenous variables: PCHC EVR DR
Exogenous variables: C
Date: 06/29/18 Time: 14:32
Sample: 1994 2016
Included observations: 19

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-134.7972	NA	400.0663	14.50497	14.65409	14.53021
1	-97.02705	59.63709	19.72871	11.47653	12.07302	11.57748
2	-90.79941	7.866493	28.89797	11.76836	12.81221	11.94502
3	-62.77931	26.54536*	4.977518*	9.766244*	11.25746*	10.01862*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Vector Autoregression Estimates
Date: 06/29/18 Time: 14:35
Sample (adjusted): 1997 2015
Included observations: 19 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	PCHC	EVR	DR
PCHC(-1)	0.105794	0.256727	-6.14E-07
	(0.30937)	(0.15578)	(3.6E-07)
	[0.34197]	[1.64798]	[-1.69886]
PCHC(-2)	0.521439	-0.032425	-8.93E-07
	(0.38590)	(0.19432)	(4.5E-07)

	[1.35121]	[-0.16686]	[-1.98208]
PCHC(-3)	-0.088709	-0.262973	-6.37E-07
	(0.34470)	(0.17358)	(4.0E-07)
	[-0.25735]	[-1.51503]	[-1.58099]
EVR(-1)	-0.487655	0.111316	9.35E-07
	(0.36777)	(0.18519)	(4.3E-07)
	[-1.32596]	[0.60108]	[2.17581]
EVR(-2)	-0.588726	0.231198	7.25E-07
	(0.37180)	(0.18722)	(4.3E-07)
	[-1.58344]	[1.23488]	[1.67044]
EVR(-3)	-0.260480	0.495127	1.98E-07
	(0.20834)	(0.10491)	(2.4E-07)
	[-1.25027]	[4.71956]	[0.81568]
DR(-1)	311552.6	110118.5	0.474264
	(293495.)	(147790.)	(0.34280)
	[1.06153]	[0.74510]	[1.38352]
DR(-2)	-127490.2	-244661.5	-0.589198
	(318257.)	(160259.)	(0.37172)
	[-0.40059]	[-1.52666]	[-1.58507]
DR(-3)	-51853.20	87016.46	0.388286
	(192137.)	(96751.2)	(0.22441)
	[-0.26988]	[0.89938]	[1.73024]
C	-7433.208	3020.541	0.048493
	(13069.4)	(6581.16)	(0.01526)
	[-0.56875]	[0.45897]	[3.17679]
R-squared	0.797214	0.902640	0.985259
Adj. R-squared	0.594427	0.805280	0.970517
Sum sq. resids	231058.2	58588.39	3.15E-07
S.E. equation	160.2284	80.68346	0.000187
F-statistic	3.931296	9.271185	66.83629
Log likelihood	-116.3167	-103.2814	143.2278
Akaike AIC	13.29649	11.92436	-14.02398
Schwarz SC	13.79357	12.42143	-13.52691
Mean dependent	1403.073	145.5647	0.063341
S.D. dependent	251.5968	182.8436	0.001090

Determinant resid covariance (dof adj.)	1.399844
Determinant resid covariance	0.148781
Log likelihood	-62.77931
Akaike information criterion	9.766244
Schwarz criterion	11.25746

Estimation Proc:

==========

LS 1 3 PCHC EVR DR

VAR Model: For Model 1

==========

PCHC = C(1,1)*PCHC(-1) + C(1,2)*PCHC(-2) + C(1,3)*PCHC(-3) + C(1,4)*EVR(-1) + C(1,5)*EVR(-2) + C(1,6)*EVR(-3) + C(1,7)*DR(-1) + C(1,8)*DR(-2) + C(1,9)*DR(-3) + C(1,10)

EVR = C(2,1)*PCHC(-1) + C(2,2)*PCHC(-2) + C(2,3)*PCHC(-3) + C(2,4)*EVR(-1) + C(2,5)*EVR(-2) + C(2,6)*EVR(-3) + C(2,7)*DR(-1) + C(2,8)*DR(-2) + C(2,9)*DR(-3) + C(2,10)

DR = C(3,1)*PCHC(-1) + C(3,2)*PCHC(-2) + C(3,3)*PCHC(-3) + C(3,4)*EVR(-1) + C(3,5)*EVR(-2) + C(3,6)*EVR(-3) + C(3,7)*DR(-1) + C(3,8)*DR(-2) + C(3,9)*DR(-3) + C(3,10)

VAR Model - Substituted Coefficients:
==========
PCHC = 0.105793592321*PCHC(-1) + 0.521438577688*PCHC(-2) - 0.0887085092575*PCHC(-3) - 0.487655176652*EVR(-1) - 0.588726177225*EVR(-2) - 0.26047968293*EVR(-3) + 311552.632569*DR(-1) - 127490.227726*DR(-2) - 51853.2000014*DR(-3) - 7433.20760409

EVR = 0.256726950522*PCHC(-1) - 0.0324252873434*PCHC(-2) - 0.262973204173*PCHC(-3) + 0.111315952966*EVR(-1) + 0.231197919041*EVR(-2) + 0.495127164877*EVR(-3) + 110118.497818*DR(-1) - 244661.545729*DR(-2) + 87016.4588682*DR(-3) + 3020.54097569

DR = - 6.13852403701e-07*PCHC(-1) - 8.9337727388e-07*PCHC(-2) - 6.36513682133e-07*PCHC(-3) + 9.34620950795e-07*EVR(-1) + 7.25398138534e-07*EVR(-2) + 1.98482741587e-07*EVR(-3) + 0.474264087796*DR(-1) - 0.589197611857*DR(-2) + 0.388286442128*DR(-3) + 0.0484929777583

Appendix 8: Post Diagnostic Tests for model 1

Serial correlation Test for Model 1

Breusch-Godfrey Serial Correlation LM Test:

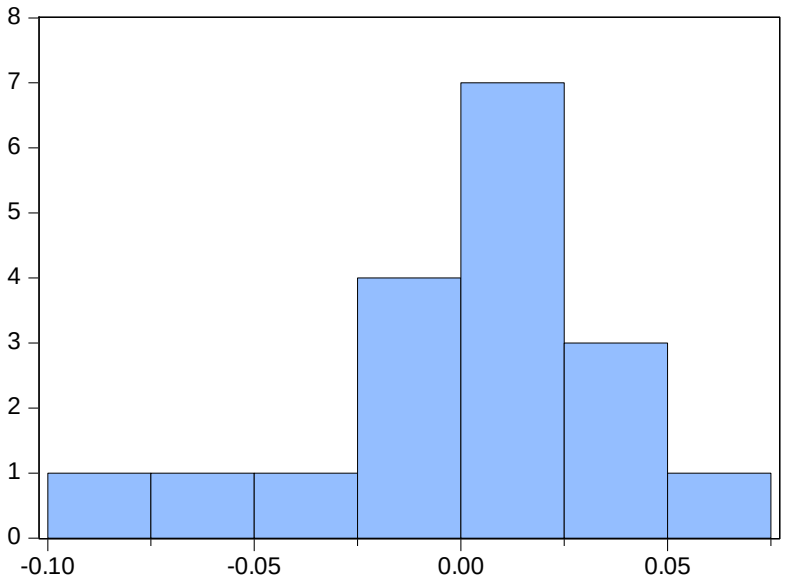
F-statistic	0.527009	Prob. F(2,3)	0.6366
Obs*R-squared	4.679880	Prob. Chi-Square(2)	0.0963

Heteroskedasticity Test for model 1

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.250211	Prob. F(12,5)	0.4294
Obs*R-squared	13.50057	Prob. Chi-Square(12)	0.3337
Scaled explained SS	1.468950	Prob. Chi-Square(12)	0.9999

Normality Test for model 1



Series: Residuals	
Sample 1998 2015	
Observations 18	
Mean	9.47e-15
Median	0.003620
Maximum	0.066756
Minimum	-0.088604
Std. Dev.	0.035683
Skewness	-0.706144
Kurtosis	3.820265
Jarque-Bera	2.000545
Probability	0.367779

Ramsey RESET Test for model 1

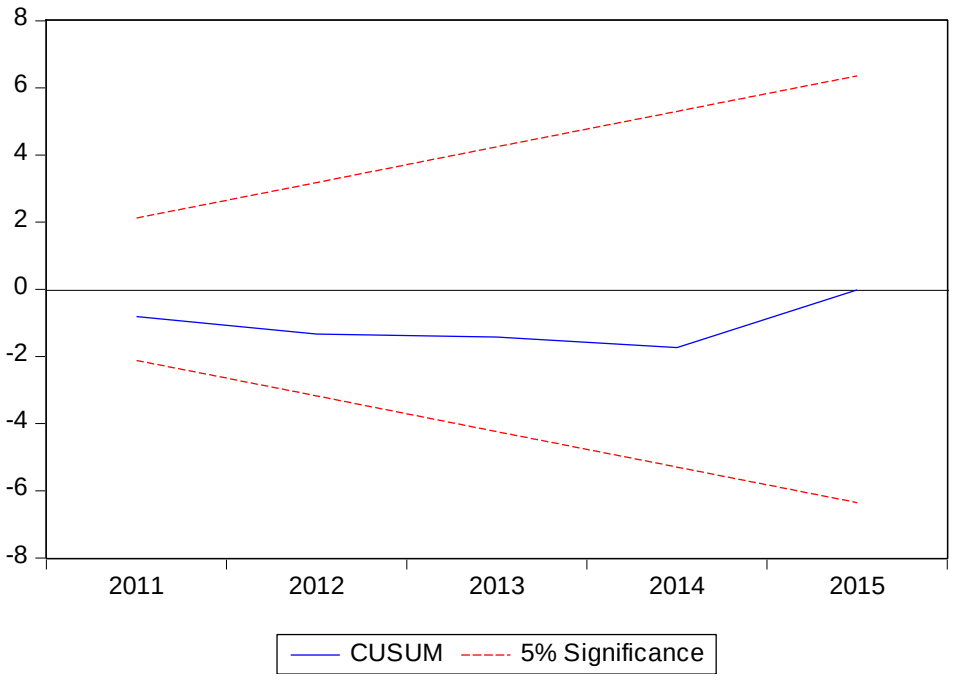
Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(PCHC) LOG(PCHC(-1)) LOG(PCHC(-2)) LOG(EVR) LOG(EVR(-1)) LOG(EVR(-2)) LOG(EVR(-3)) LOG(EVR(-4)) LOG(DR) LOG(DR(-1)) LOG(DR(-2)) LOG(DR(-3)) LOG(DR(-4)) C
Omitted Variables: Squares of fitted values

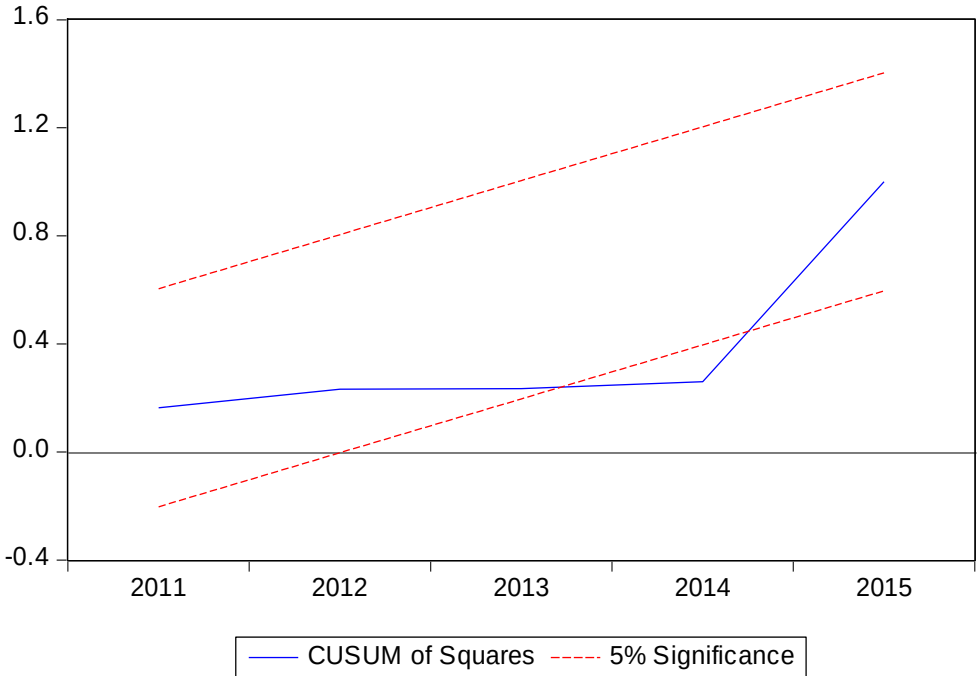
	Value	df	Probability
t-statistic	0.949763	4	0.3960
F-statistic	0.902049	(1, 4)	0.3960

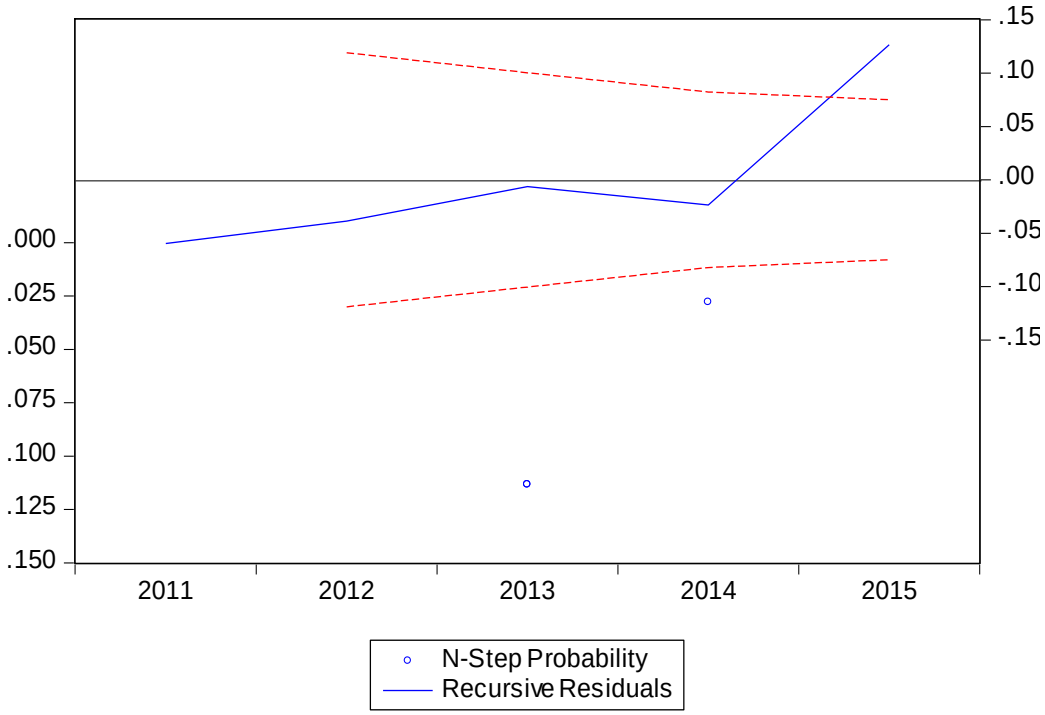
F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.003983	1	0.003983
Restricted SSR	0.021646	5	0.004329
Unrestricted SSR	0.017663	4	0.004416

Stability tests for model 1




1.6
1.2
0.8
0.4
0.0
-0.4
2011
2012
2013
2014
2015
CUSUM of Squares
5% Significance


.000
.025
.050
.075
.100
.125
.150
.15
.10
.05
.00
-.05
-.10
-.15
2011
2012
2013
2014
2015
N-Step Probability
Recursive Residuals

Variance Inflation Factor for Model 1

Variance Inflation Factors
Date: 04/17/18 Time: 21:35
Sample: 1994 2016
Included observations: 18

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LOG(PCHC(-1))	0.105020	22784.02	15.52301
LOG(PCHC(-2))	0.064114	13831.43	9.426325
LOG(EVR)	0.016955	1401.734	43.27538
LOG(EVR(-1))	0.015240	1387.044	48.26457
LOG(EVR(-2))	0.005744	552.8749	18.86166
LOG(EVR(-3))	0.006205	634.7095	21.18263
LOG(EVR(-4))	0.008847	982.6595	34.91184
LOG(DR)	68.25539	2163353.	69.62578
LOG(DR(-1))	106.5191	3369397.	118.7617
LOG(DR(-2))	86.57627	2733584.	101.7687
LOG(DR(-3))	79.91552	2519249.	94.34805
LOG(DR(-4))	34.55524	1087627.	39.91023
C	485.5470	2018786.	NA

Appendix 9: ARDL RESULT for model 2: Impact of VAT on the composition of consumption

Dependent Variable: LOG(CHFC)
Method: ARDL
Date: 02/17/18 Time: 06:48
Sample (adjusted): 1998 2015
Included observations: 18 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LOG(VATR) LOG(EVR)
Fixed regressors: C
Number of models evalulated: 100
Selected Model: ARDL(3, 2, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(CHFC(-1))	0.093435	0.319201	0.292714	0.7796
LOG(CHFC(-2))	-0.073149	0.264832	-0.276210	0.7917
LOG(CHFC(-3))	-0.342631	0.314158	-1.090631	0.3173
LOG(VATR)	2.081475	0.891916	2.333712	0.0583
LOG(VATR(-1))	-0.808396	0.635948	-1.271167	0.2507
LOG(VATR(-2))	-1.377568	0.543429	-2.534954	0.0444
LOG(EVR)	1.755911	0.715896	2.452747	0.0496
LOG(EVR(-1))	0.065213	0.595428	0.109523	0.9164
LOG(EVR(-2))	-0.616433	0.459344	-1.341985	0.2282
LOG(EVR(-3))	0.285190	0.338059	0.843609	0.4312
LOG(EVR(-4))	-0.634332	0.268159	-2.365504	0.0559
C	-5.175273	32.48144	-0.159330	0.8786

R-squared	0.969836	Mean dependent var	-2.993790
Adjusted R-squared	0.914535	S.D. dependent var	0.680099
S.E. of regression	0.198823	Akaike info criterion	-0.158079
Sum squared resid	0.237184	Schwarz criterion	0.435502
Log likelihood	13.42271	Hannan-Quinn criter.	-0.076232
F-statistic	17.53737	Durbin-Watson stat	2.186178
Prob(F-statistic)	0.001107		

*Note: p-values and any subsequent tests do not account for model selection.

ARDL Bounds Test for Model 2

ARDL Bounds Test
Date: 02/17/18 Time: 06:50
Sample: 1998 2015
Included observations: 18
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	2.982302	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Urrestricted Vector Autoregression for model 2

VAR Lag Order Selection Criteria
Endogenous variables: CHFC VATR EVR
Exogenous variables: C
Date: 06/29/18 Time: 14:47
Sample: 1994 2016
Included observations: 19

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-612.0489	NA	2.63e+24	64.74199	64.89111	64.76722
1	-576.1696	56.65143	1.58e+23	61.91259	62.50908	62.01354
2	-552.0332	30.48806	3.52e+22	60.31929	61.36314	60.49595
3	-517.2487	32.95380*	2.97e+21*	57.60512*	59.09634*	57.85750*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Vector Autoregression Estimates
Date: 06/29/18 Time: 14:53
Sample (adjusted): 1997 2015
Included observations: 19 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	CHFC	VATR	EVR
CHFC(-1)	0.161361	-2.08E+12	783.4243
	(0.32448)	(2.4E+12)	(550.999)
	[0.49730]	[-0.86281]	[1.42182]
CHFC(-2)	-0.188730	7.27E+10	15.76973
	(0.23953)	(1.8E+12)	(406.747)
	[-0.78792]	[0.04086]	[0.03877]
CHFC(-3)	-0.074405	3.73E+10	1272.745
	(0.07734)	(5.7E+11)	(131.334)
	[-0.96204]	[0.06501]	[9.69090]
VATR(-1)	-2.10E-13	-3.320742	2.21E-10
	(1.6E-13)	(1.19257)	(2.7E-10)
	[-1.30904]	[-2.78452]	[0.81078]
VATR(-2)	-1.47E-13	6.169244	9.25E-11
	(2.8E-13)	(2.08421)	(4.8E-10)
	[-0.52435]	[2.95999]	[0.19410]
VATR(-3)	3.41E-13	-1.659913	-2.32E-10
	(2.5E-13)	(1.84350)	(4.2E-10)
	[1.37471]	[-0.90042]	[-0.54945]
EVR(-1)	2.59E-05	-2.87E+08	0.056130
	(3.2E-05)	(2.4E+08)	(0.05497)
	[0.79938]	[-1.19533]	[1.02101]
EVR(-2)	9.39E-05	1.97E+08	0.010856
	(3.1E-05)	(2.3E+08)	(0.05316)
	[2.99841]	[0.84807]	[0.20423]

EVR(-3)	4.33E-05	71332355	0.010550
	(4.4E-05)	(3.3E+08)	(0.07459)
	[0.98693]	[0.21869]	[0.14144]
C	0.071653	2.67E+11	-110.0143
	(0.03097)	(2.3E+11)	(52.5887)
	[2.31373]	[1.16239]	[-2.09198]
R-squared	0.948836	0.963486	0.991856
Adj. R-squared	0.897672	0.926972	0.983712
Sum sq. resids	0.001700	9.37E+22	4900.978
S.E. equation	0.013742	1.02E+11	23.33566
F-statistic	18.54490	26.38686	121.7861
Log likelihood	61.59727	-501.4871	-79.71097
Akaike AIC	-5.431292	53.84075	9.443260
Schwarz SC	-4.934218	54.33782	9.940333
Mean dependent	0.065197	3.84E+11	145.5647
S.D. dependent	0.042959	3.78E+11	182.8436

Determinant resid covariance (dof adj.)	8.36E+20
Determinant resid covariance	8.89E+19
Log likelihood	-517.2487
Akaike information criterion	57.60512
Schwarz criterion	59.09634

Estimation Proc:
==========
LS 1 3 CHFC VATR EVR

VAR Model:
==========
CHFC = C(1,1)*CHFC(-1) + C(1,2)*CHFC(-2) + C(1,3)*CHFC(-3) + C(1,4)*VATR(-1) + C(1,5)*VATR(-2) + C(1,6)*VATR(-3) + C(1,7)*EVR(-1) + C(1,8)*EVR(-2) + C(1,9)*EVR(-3) + C(1,10)

VATR = C(2,1)*CHFC(-1) + C(2,2)*CHFC(-2) + C(2,3)*CHFC(-3) + C(2,4)*VATR(-1) + C(2,5)*VATR(-2) + C(2,6)*VATR(-3) + C(2,7)*EVR(-1) + C(2,8)*EVR(-2) + C(2,9)*EVR(-3) + C(2,10)

EVR = C(3,1)*CHFC(-1) + C(3,2)*CHFC(-2) + C(3,3)*CHFC(-3) + C(3,4)*VATR(-1) + C(3,5)*VATR(-2) + C(3,6)*VATR(-3) + C(3,7)*EVR(-1) + C(3,8)*EVR(-2) + C(3,9)*EVR(-3) + C(3,10)

VAR Model - Substituted Coefficients:
==========
CHFC = 0.161361460105*CHFC(-1) - 0.188729571653*CHFC(-2) - 0.074404717485*CHFC(-3) - 2.10221277793e-13*VATR(-1) - 1.47164368636e-13*VATR(-2) + 3.41265910488e-13*VATR(-3) + 2.58791367442e-05*EVR(-1) + 9.38583322747e-05*EVR(-2) + 4.33492503335e-05*EVR(-3) + 0.0716534209385

VATR = - 2.0790204573e+12*CHFC(-1) + 72681292579.3*CHFC(-2) + 37338246040.6*CHFC(-3) - 3.3207415356*VATR(-1) + 6.16924382872*VATR(-2) - 1.65991315593*VATR(-3) - 287371319.27*EVR(-1) + 197139089.175*EVR(-2) + 71332355.2961*EVR(-3) + 267323739591

EVR = 783.424290953*CHFC(-1) + 15.7697303572*CHFC(-2) + 1272.74525721*CHFC(-3) + 2.21103228741e-10*VATR(-1) + 9.25061157695e-11*VATR(-2) - 2.31619848119e-10*VATR(-3) + 0.0561298825762*EVR(-1) + 0.0108559544194*EVR(-2) + 0.0105495198312*EVR(-3) - 110.014324915

Appendix 9 Post Diagnostic Test for model 2

Serial Correlation Test for Model 2

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.207106	Prob. F(2,4)	0.2260
Obs*R-squared	9.443050	Prob. Chi-Square(2)	0.0089

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 02/17/18 Time: 06:52
Sample: 1998 2015
Included observations: 18
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(CHFC(-1))	0.097463	0.304299	0.320288	0.7648
LOG(CHFC(-2))	0.220021	0.266070	0.826932	0.4548
LOG(CHFC(-3))	-0.112319	0.275677	-0.407429	0.7046
LOG(VATR)	-0.060888	0.753812	-0.080774	0.9395
LOG(VATR(-1))	0.279198	0.559110	0.499361	0.6437
LOG(VATR(-2))	0.004491	0.466817	0.009621	0.9928
LOG(EVR)	0.022241	0.621059	0.035812	0.9731
LOG(EVR(-1))	0.322835	0.536515	0.601726	0.5798
LOG(EVR(-2))	-0.010784	0.388157	-0.027783	0.9792
LOG(EVR(-3))	-0.084301	0.293528	-0.287201	0.7882
LOG(EVR(-4))	-0.084776	0.230614	-0.367610	0.7318
C	-5.862433	27.57019	-0.212637	0.8420
RESID(-1)	-0.308908	0.487907	-0.633129	0.5610
RESID(-2)	-0.999539	0.485045	-2.060716	0.1084

R-squared	0.524614	Mean dependent var	2.86E-15
Adjusted R-squared	-1.020391	S.D. dependent var	0.118119
S.E. of regression	0.167894	Akaike info criterion	-0.679485
Sum squared resid	0.112754	Schwarz criterion	0.013027
Log likelihood	20.11536	Hannan-Quinn criter.	-0.583997
F-statistic	0.339555	Durbin-Watson stat	2.042871
Prob(F-statistic)	0.938243		

Heteroskedasticity Test for Model 2

Heteroskedasticity Test: Breusch-Pagan-Godfrey

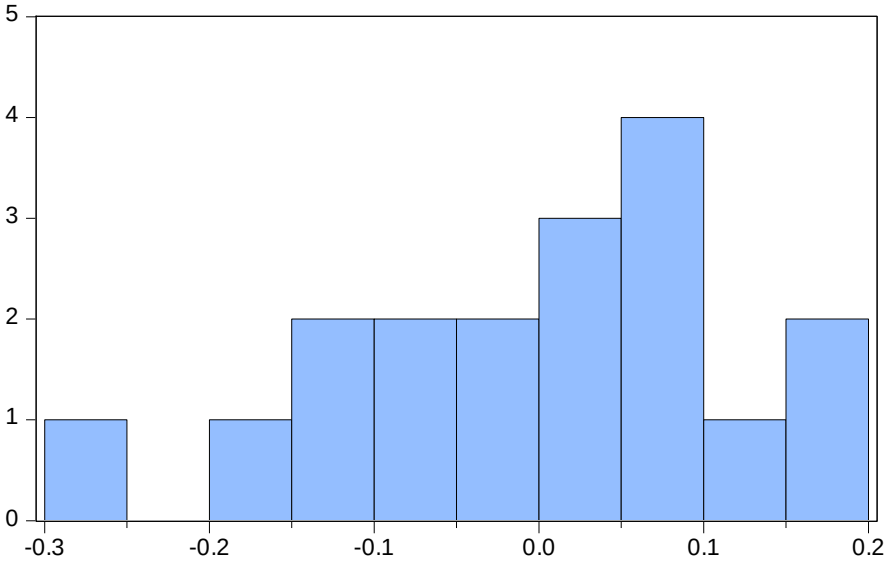
F-statistic	0.590928	Prob. F(11,6)	0.7873
Obs*R-squared	9.360144	Prob. Chi-Square(11)	0.5887
Scaled explained SS	0.889150	Prob. Chi-Square(11)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/17/18 Time: 06:52
Sample: 1998 2015
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.942315	3.377859	-1.463150	0.1938
LOG(CHFC(-1))	-0.055624	0.033195	-1.675685	0.1448
LOG(CHFC(-2))	0.015722	0.027541	0.570861	0.5888
LOG(CHFC(-3))	-0.027912	0.032670	-0.854337	0.4257
LOG(VATR)	0.119388	0.092753	1.287158	0.2455
LOG(VATR(-1))	0.068899	0.066134	1.041803	0.3376
LOG(VATR(-2))	-0.047257	0.056513	-0.836215	0.4351
LOG(EVR)	0.133196	0.074448	1.789096	0.1238
LOG(EVR(-1))	0.079057	0.061921	1.276745	0.2489
LOG(EVR(-2))	-0.020547	0.047769	-0.430124	0.6821
LOG(EVR(-3))	0.056497	0.035156	1.607039	0.1592
LOG(EVR(-4))	-0.013625	0.027887	-0.488589	0.6425

R-squared	0.520008	Mean dependent var	0.013177
Adjusted R-squared	-0.359977	S.D. dependent var	0.017730
S.E. of regression	0.020676	Akaike info criterion	-4.684932
Sum squared resid	0.002565	Schwarz criterion	-4.091351
Log likelihood	54.16439	Hannan-Quinn criter.	-4.603086
F-statistic	0.590928	Durbin-Watson stat	2.461668
Prob(F-statistic)	0.787276		

Histogram and Normality Test for model 2



Series: Residuals	
Sample 1998 2015	
Observations 18	
Mean	2.86e-15
Median	0.030103
Maximum	0.196346
Minimum	-0.254526
Std. Dev.	0.118119
Skewness	-0.364016
Kurtosis	2.709878
Jarque-Bera	0.460650
Probability	0.794275

Ramsey RESET Test for model 2

Ramsey RESET Test

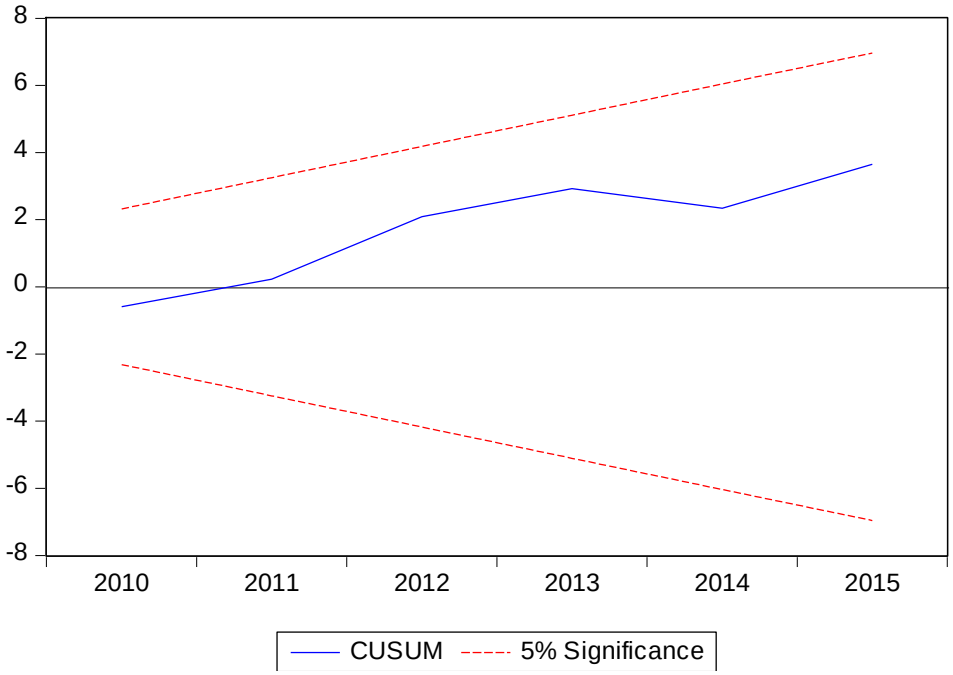
Equation: UNTITLED
Specification: LOG(CHFC) LOG(CHFC(-1)) LOG(CHFC(-2)) LOG(CHFC(-3)) LOG(VATR) LOG(VATR(-1)) LOG(VATR(-2)) LOG(EVR) LOG(EVR(-1)) LOG(EVR(-2)) LOG(EVR(-3)) LOG(EVR(-4)) C
Omitted Variables: Squares of fitted values

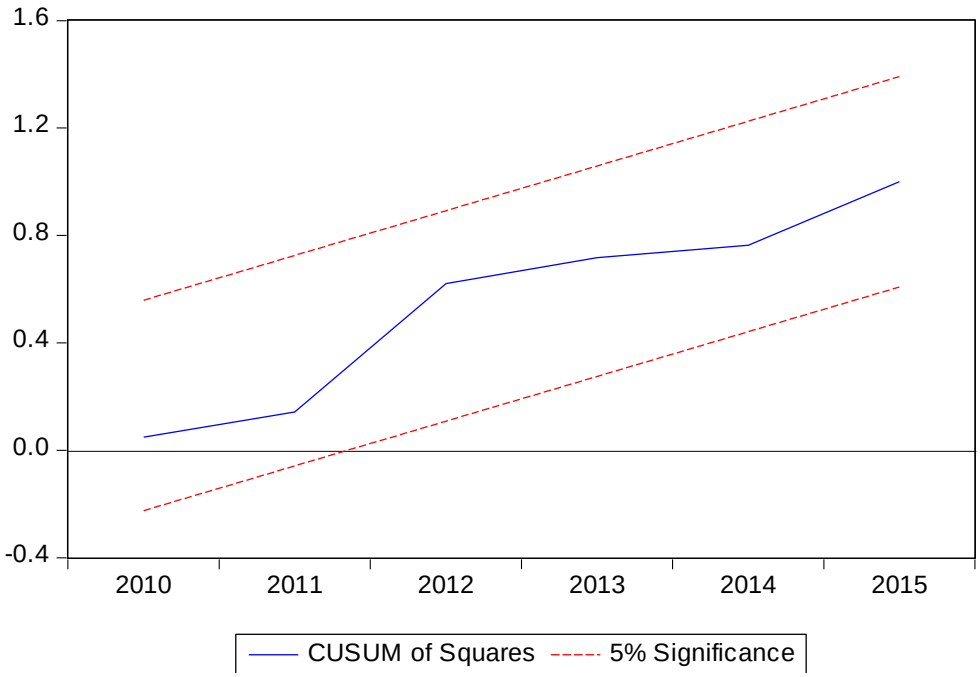
	Value	df	Probability
t-statistic	0.03	5	0.98
F-statistic	0.00	(1, 5)	0.98

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	4.75E-05	1	4.75E-05
Restricted SSR	0.24	6	0.04
Unrestricted SSR	0.24	5	0.05

Stability Test for model 2





Variace Inflation Factors for Model 2

Variance Inflation Factors
Date: 04/17/18 Time: 21:54
Sample: 1994 2016
Included observations: 18

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LOG(CHFC(-1))	0.101890	415.6435	21.16201
LOG(CHFC(-2))	0.070136	267.6654	15.68224
LOG(CHFC(-3))	0.098695	350.0602	23.97790
LOG(VATR)	0.795514	250006.2	400.4445
LOG(VATR(-1))	0.404429	124678.3	241.9478
LOG(VATR(-2))	0.295315	89803.41	181.3650
LOG(EVR)	0.512506	4640.210	143.2560
LOG(EVR(-1))	0.354535	3533.779	122.9639
LOG(EVR(-2))	0.210997	2224.077	75.87573
LOG(EVR(-3))	0.114284	1280.360	42.73039
LOG(EVR(-4))	0.071909	874.7061	31.07648
C	1055.044	480405.8	NA

Appendix 11: ARDL Result for Model 3:Impact of VAT on Saving-Consumption Ratio of Household

ARDL Bounds Test for model 3

Date: 02/17/18 Time: 06:59
Sample: 1998 2015
Included observations: 18
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	50.35198	2

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.63	3.35
5%	3.1	3.87
2.5%	3.55	4.38
1%	4.13	5

Co-integrating and Long-run form of Model 3

ARDL Cointegrating And Long Run Form
Dependent Variable: LOG(SHFC)
Selected Model: ARDL(4, 4, 4)
Date: 02/17/18 Time: 07:02
Sample: 1994 2016
Included observations: 18

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(SHFC(-1))	0.489419	0.054949	8.906805	0.0030
DLOG(SHFC(-2))	-0.224725	0.054069	-4.156282	0.0253
DLOG(SHFC(-3))	0.645905	0.061070	10.576458	0.0018
DLOG(VATR)	-0.675284	0.089402	-7.553376	0.0048
DLOG(VATR(-1))	-1.250703	0.115180	-10.858638	0.0017
DLOG(VATR(-2))	-1.903030	0.130198	-14.616407	0.0007
DLOG(VATR(-3))	-0.527372	0.068204	-7.732264	0.0045
DLOG(EVR)	-0.663834	0.076827	-8.640646	0.0033
DLOG(EVR(-1))	-0.984447	0.102118	-9.640267	0.0024
DLOG(EVR(-2))	-1.569947	0.107881	-14.552576	0.0007
DLOG(EVR(-3))	-0.539024	0.070218	-7.676486	0.0046
CointEq(-1)	-0.723690	0.036058	-20.070273	0.0003

Cointeq = LOG(SHFC) - (1.4342*LOG(VATR) + 0.7360*LOG(EVR) -38.2290

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(VATR)	1.434159	0.651615	2.200931	0.1151
LOG(EVR)	0.735951	0.882327	0.834103	0.4654
C	-38.228993	20.936565	-1.825944	0.1653

ARDL Result for Model 3

Dependent Variable: LOG(SHFC)
Method: ARDL
Date: 02/17/18 Time: 06:58
Sample (adjusted): 1998 2015
Included observations: 18 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LOG(VATR) LOG(EVR)
Fixed regressors: C
Number of models evalulated: 100
Selected Model: ARDL(4, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(SHFC(-1))	0.765729	0.094150	8.133088	0.0039
LOG(SHFC(-2))	-0.714144	0.123602	-5.777789	0.0103
LOG(SHFC(-3))	0.870631	0.145952	5.965195	0.0094
LOG(SHFC(-4))	-0.645905	0.112537	-5.739476	0.0105
LOG(VATR)	-0.675284	0.177835	-3.797259	0.0321
LOG(VATR(-1))	0.462468	0.251276	1.840477	0.1630
LOG(VATR(-2))	-0.652327	0.189434	-3.443566	0.0411
LOG(VATR(-3))	1.375658	0.187489	7.337289	0.0052
LOG(VATR(-4))	0.527372	0.111302	4.738198	0.0178
LOG(EVR)	-0.663834	0.179276	-3.702858	0.0342
LOG(EVR(-1))	0.211988	0.220340	0.962093	0.4070
LOG(EVR(-2))	-0.585499	0.168454	-3.475720	0.0402
LOG(EVR(-3))	1.030922	0.177180	5.818506	0.0101
LOG(EVR(-4))	0.539024	0.147018	3.666396	0.0351
C	-27.66595	10.61675	-2.605877	0.0800

R-squared	0.999814	Mean dependent var	2.201545
Adjusted R-squared	0.998944	S.D. dependent var	1.118529
S.E. of regression	0.036346	Akaike info criterion	-3.916575
Sum squared resid	0.003963	Schwarz criterion	-3.174598
Log likelihood	50.24917	Hannan-Quinn criter.	-3.814266
F-statistic	1149.817	Durbin-Watson stat	2.242169
Prob(F-statistic)	0.000037		

*Note: p-values and any subsequent tests do not account for model selection.

Appendix 12: Post Diagnostic Tests for model 3

Breusch-Godfrey Serial Correlation LM Test for Model 3

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.318967	Prob. F(2,1)	0.3221
Obs*R-squared	16.13238	Prob. Chi-Square(2)	0.0003

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 02/17/18 Time: 07:04
Sample: 1998 2015
Included observations: 18
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(SHFC(-1))	0.066242	0.062301	1.063244	0.4805
LOG(SHFC(-2))	-0.008595	0.081891	-0.104952	0.9334
LOG(SHFC(-3))	0.022630	0.116953	0.193496	0.8783
LOG(SHFC(-4))	0.191158	0.090411	2.114332	0.2812
LOG(VATR)	0.240502	0.198723	1.210238	0.4396
LOG(VATR(-1))	0.567698	0.244827	2.318767	0.2592
LOG(VATR(-2))	-0.103812	0.155522	-0.667510	0.6253
LOG(VATR(-3))	-0.223676	0.141724	-1.578256	0.3595
LOG(VATR(-4))	0.111473	0.074084	1.504673	0.3734
LOG(EVR)	0.225553	0.196669	1.146866	0.4565
LOG(EVR(-1))	0.527223	0.228900	2.303289	0.2608
LOG(EVR(-2))	0.103101	0.110293	0.934793	0.5214
LOG(EVR(-3))	0.016654	0.141750	0.117486	0.9255
LOG(EVR(-4))	0.248306	0.121620	2.041656	0.2900
C	-21.15798	11.06542	-1.912082	0.3068
RESID(-1)	-1.054687	0.678321	-1.554851	0.3639
RESID(-2)	-1.621401	0.571437	-2.837411	0.2157

R-squared	0.896243	Mean dependent var	-5.92E-15
Adjusted R-squared	-0.763863	S.D. dependent var	0.015268
S.E. of regression	0.020278	Akaike info criterion	-5.960059
Sum squared resid	0.000411	Schwarz criterion	-5.119153
Log likelihood	70.64054	Hannan-Quinn criter.	-5.844110
F-statistic	0.539871	Durbin-Watson stat	2.348792
hProb(F-statistic)	0.807621		

Heteroskedasticity Test for Model 3

Heteroskedasticity Test: Breusch-Pagan-Godfrey

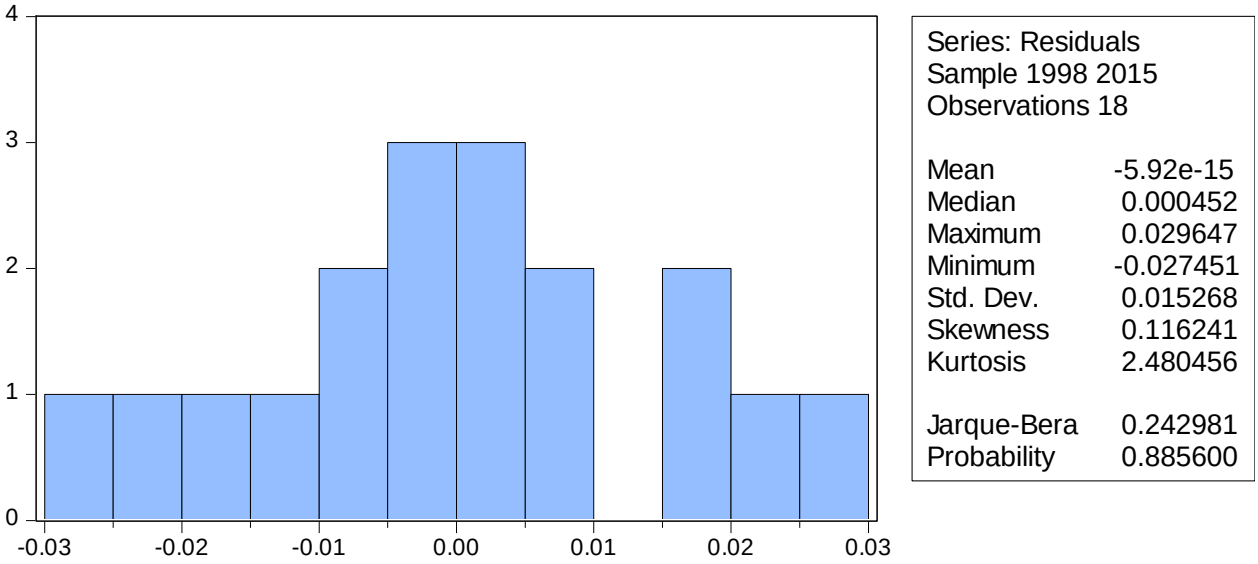
F-statistic	2.317273	Prob. F(14,3)	0.2663
Obs*R-squared	16.47638	Prob. Chi-Square(14)	0.2852
Scaled explained SS	0.338785	Prob. Chi-Square(14)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/17/18 Time: 07:04
Sample: 1998 2015
Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.014441	0.055766	-0.258953	0.8124
LOG(SHFC(-1))	-5.62E-05	0.000495	-0.113715	0.9166
LOG(SHFC(-2))	-0.000581	0.000649	-0.894292	0.4371
LOG(SHFC(-3))	0.001239	0.000767	1.616481	0.2044
LOG(SHFC(-4))	-0.001205	0.000591	-2.038166	0.1343
LOG(VATR)	0.001000	0.000934	1.070211	0.3630
LOG(VATR(-1))	0.000373	0.001320	0.282297	0.7961
LOG(VATR(-2))	-0.002056	0.000995	-2.066232	0.1307
LOG(VATR(-3))	0.001745	0.000985	1.771516	0.1746
LOG(VATR(-4))	-0.000465	0.000585	-0.796156	0.4841
LOG(EVR)	0.001030	0.000942	1.093362	0.3542
LOG(EVR(-1))	0.000508	0.001157	0.439331	0.6901
LOG(EVR(-2))	-0.002199	0.000885	-2.485032	0.0889
LOG(EVR(-3))	0.001396	0.000931	1.500442	0.2305
LOG(EVR(-4))	-0.000684	0.000772	-0.886375	0.4407

R-squared	0.915354	Mean dependent var	0.000220
Adjusted R-squared	0.520341	S.D. dependent var	0.000276
S.E. of regression	0.000191	Akaike info criterion	-14.41462
Sum squared resid	1.09E-07	Schwarz criterion	-13.67265
Log likelihood	144.7316	Hannan-Quinn criter.	-14.31232
F-statistic	2.317273	Durbin-Watson stat	2.147946
Prob(F-statistic)	0.266313		

Histogram and Normality Test for Model 3



Ramsey RESET Test for Model 3

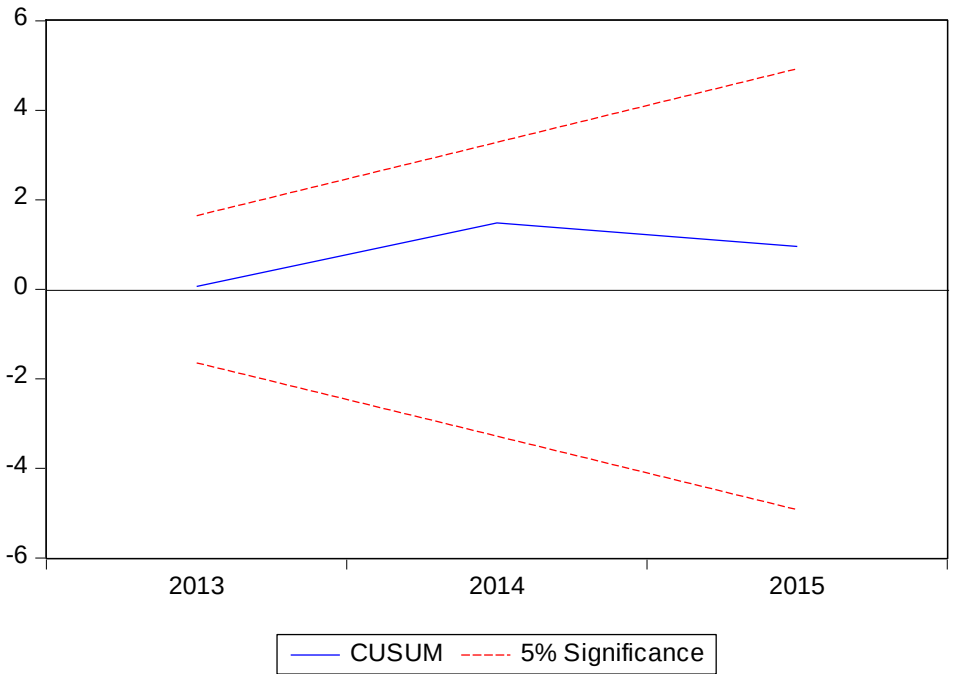
Ramsey RESET Test
Equation: UNTITLED
Specification: LOG(SHFC) LOG(SHFC(-1)) LOG(SHFC(-2)) LOG(SHFC(-3)) LOG(SHFC(-4)) LOG(VATR) LOG(VATR(-1)) LOG(VATR(-2)) LOG(VATR(-3)) LOG(VATR(-4)) LOG(EVR) LOG(EVR(-1)) LOG(EVR(-2)) LOG(EVR(-3)) LOG(EVR(-4)) C
Omitted Variables: Squares of fitted values

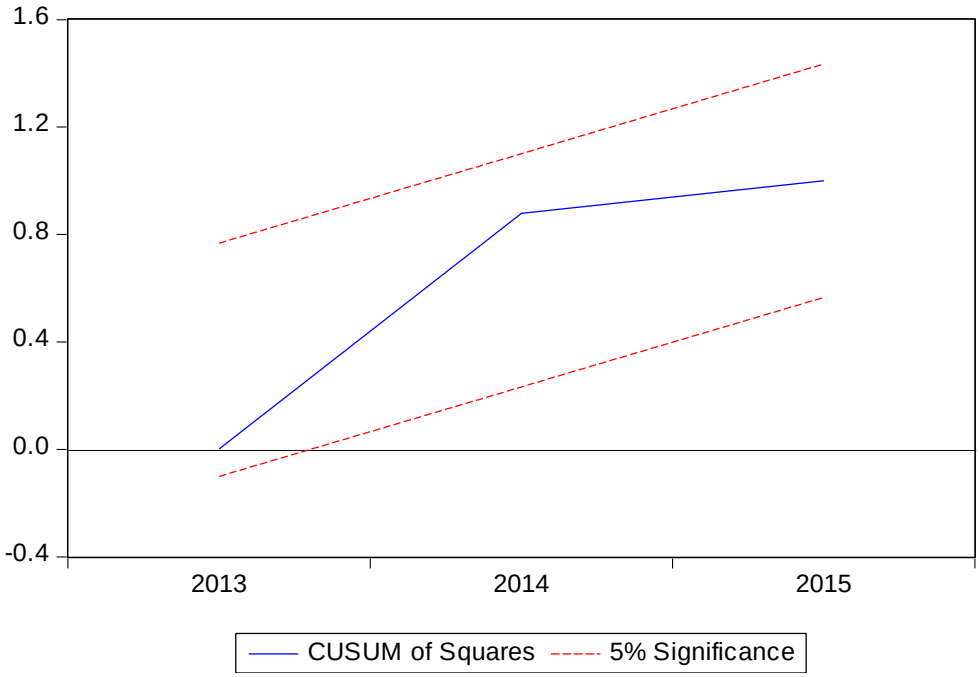
	Value	df	Probability
t-statistic	3.695250	2	0.0661
F-statistic	13.65487	(1, 2)	0.0661

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.003457	1	0.003457
Restricted SSR	0.003963	3	0.001321
Unrestricted SSR	0.000506	2	0.000253

Stability Test for Model 3





Variance Inflation Factors for Model 3
Variance Inflation Factors
Date: 04/18/18 Time: 08:45
Sample: 1994 2016
Included observations: 18

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
LOG(SHFC(-1))	0.008864	646.0092	153.1227
LOG(SHFC(-2))	0.015277	971.6353	281.4562
LOG(SHFC(-3))	0.021302	1168.279	401.3069
LOG(SHFC(-4))	0.012665	575.8366	230.1885
LOG(VATR)	0.031625	297416.1	476.3829
LOG(VATR(-1))	0.063140	582478.8	1130.345
LOG(VATR(-2))	0.035885	326550.3	659.4939
LOG(VATR(-3))	0.035152	314875.4	673.6538
LOG(VATR(-4))	0.012388	108870.8	273.3838
LOG(EVR)	0.032140	8707.871	268.8358
LOG(EVR(-1))	0.048550	14480.93	503.8886
LOG(EVR(-2))	0.028377	8950.874	305.3644
LOG(EVR(-3))	0.031393	10524.56	351.2439
LOG(EVR(-4))	0.021614	7867.614	279.5199
C	112.7155	1535855.	NA

Appendix 13: DataSet

Year	PCHC	HFC(billion US$)	RIR (%)	INF (%)	GDP(billion US$)	Dependency Ratio(Young)% of working Population(DR)
1994	933.711	98,400,000,000	-8.03441	57.03171	18,100,000,000	84.46592
1995	967.1854	104,000,000,000	-43.5727	72.8355	28,500,000,000	83.64536
1996	1133.313	125,000,000,000	-9.71197	29.26829	35,000,000,000	83.38903
1997	1067.16	121,000,000,000	16.61355	8.259874	35,800,000,000	82.97038
1998	1048.226	122,000,000,000	25.28227	9.996378	32,000,000,000	82.45055
1999	960.9057	115,000,000,000	2.767927	6.618373	35,900,000,000	81.90076
2000	954.3644	117,000,000,000	-10.3198	6.933292	46,400,000,000	81.37119
2001	1316.336	165,000,000,000	23.83785	18.87365	44,100,000,000	81.49841
2002	1291.454	166,000,000,000	-10.8121	12.87658	59,100,000,000	81.54546
2003	1452.538	192,000,000,000	8.613594	14.03178	67,700,000,000	81.54506
2004	1526.139	207,000,000,000	19.36914	14.99803	87,800,000,000	81.51959
2005	1624.11	226,000,000,000	-3.34037	17.86349	112,000,000,000	81.48378
2006	1285.687	183,000,000,000	-0.3731	8.239527	145,000,000,000	81.93575
2007	1723.758	252,000,000,000	11.61433	5.382224	166,000,000,000	82.25394
2008	1353.541	204,000,000,000	4.190484	11.57798	208,000,000,000	82.47214
2009	1736.007	268,000,000,000	23.7065	11.53767	169,000,000,000	82.62152
2010	1538.843	244,000,000,000	-42.3102	13.7202	369,000,000,000	82.71414
2011	1452.445	237,000,000,000	5.941526	10.84079	412,000,000,000	83.0378
2012	1414.149	237,000,000,000	6.883106	12.21701	461,000,000,000	83.2606
2013	1666.884	286,000,000,000	10.24735	8.475827	515,000,000,000	83.35299
2014	1612.738	288,000,000,000	11.35621	8.057383	568,000,000,000	83.27066
2015		292,000,000,000	13.59583	9.017684	481,000,000,000	83.00269
2016			6.685325	15…69685	405,000,000,000	82.9248

Year	Dependency Ratio(Old)% of working Population	SAVINGS (Household)	IMPORT (billion US$)	VAT REVENUE (billion #)
1994	5.483221	110,970,000,000	170,000,000,000	8,200,000,000
1995	5.430772	108,490,000,000	482,000,000,000	20,230,000,000
1996	5.430853	134,500,000,000	712,000,000,000	32,470,000,000
1997	5.407834	177,650,000,000	1,020,000,000,000	14,740,000,000
1998	5.367131	200,070,000,000	1,030,000,000,000	38,280,000,000
1999	5.314242	277,670,000,000	728,000,000,000	47,680,000,000
2000	5.253503	385,190,000,000	927,000,000,000	60,680,000,000
2001	5.258376	488,050,000,000	1,790,000,000,000	91,750,000,000
2002	5.242961	592,090,000,000	1,950,000,000,000	108,600,000,000
2003	5.21115	655,740,000,000	3,100,000,000,000	131,420,000,000
2004	5.167114	797,520,000,000	2,130,000,000,000	163,300,000,000
2005	5.114292	13,169,600,000,000	2,810,000,000,000	192,700,000,000
2006	5.15363	1,739,640,000,000	4,020,000,000,000	232,700,000,000
2007	5.175068	2,693,550,000,000	6,440,000,000,000	312,600,000,000
2008	5.179668	4,118,170,000,000	6,190,000,000,000	401,700,000,000
2009	5.168191	5,763,510,000,000	7,830,000,000,000	481,400,000,000
2010	5.142528	5,954,260,000,000	9,640,000,000,000	564,890,000,000
2011	5.181907	653,191,000,000	13,700,000,000,000	659,150,000,000
2012	5.201311	8,062,900,000,000	9,600,000,000,000	710,500,000,000
2013	5.20169	8,656,120,000,000	10,500,000,000,000	802,670,000,000
2014	5.183248	9,062,900,000,000	11,200,000,000,000	802,950,000,000
2015	5.148165	9,531,260,000,000	9,990,000,000,000	1,470,000,000,000
2016	5.167136	943,023,000,000,000	8,530,000,000,000	