

**EMPIRICAL ANALYSIS OF THE CONTRIBUTION
OF VAT FOR ECONOMIC DEVELOPMENT AND
SOCIAL SPENDING IN ETHIOPIA**

*A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS AND PUBLIC
ADMINISTRATION OF ADDIS ABABA UNIVERSITY IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE IN ACCOUNTING AND FINANCE*

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DECLARATION

I HEREBY DECLARE THAT THIS PROJECT IS MY ORIGINAL WORK HAS NOT BEEN PRESENTED FOR A DEGREE IN ANY OTHER UNIVERSITY AND ALL SOURCES OF MATERIALS USED FOR THE PROJECT HAS BEEN DULY ACKNOWLEDGED.

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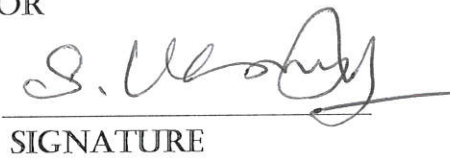
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ABSTRACT

This paper discussed some recent critical literature on value-added tax (VAT) in Ethiopia relating to its contributions for economic development and its impact on the Social Spending in Ethiopia. The study employed the tools of quantitative empirical analysis technique to evaluate the contribution of VAT for the development of Ethiopia economy. The generic central objective is to examine the contribution of VAT for the development of Ethiopia economy and its impact on social spending, equity. The tools of empirical analysis used are multiple regression models as abstractions of the respective sectors considered in the study and also descriptive statistics. The study considered a vector of economic development indicators as dependent variables and regressed each on VAT revenue proceeds and other income (loan, donation, grant, taxes excluding VAT revenue, and others) of Ethiopia State for the study period (1995-2002 E.C. or 2003/04 – 2009/10 G.C.). The state economy is disaggregated into five strategic economic sectors in the development process, and multiple regression models specified to enhance isolated analysis of each sector. Development aspects that are considered include infrastructural development, education sector development, agricultural and natural resource development, health sector development and other development sectors. Moreover, in order to make clear decision and summarize the study, the summation of all capital expenditure on the respective sectors were taken and regressed. The analysis showed that, except education sector, VAT revenue contributed positively for the development of the respective sectors. On the aggregate (model VI), the analysis showed that VAT revenue had a considerable contribution for the development of the economy during the period under study. However, the contributions are statistically significant only to health and agricultural and natural resource development sectors. Therefore, it can be said that, the VAT tax revenue was unable to neutralize the regressivity of VAT tax levy in Ethiopia because its unsystematic exemptions, tax structure, and tax system.

Thus, the study concludes that various sectors of the economy of Ethiopia are yet to benefit significantly from VAT revenue expenditure of the state government. Consequently, the paper calls for equity in sectoral spending of VAT proceeds in Ethiopia State in order to ensure balanced development and sustainability of the emerging mega city status of the state.

LIST OF ACRONYMS

- ✓ **ANR** – Agriculture and Natural Resource Sector Development
- ✓ **CAADP** - Comprehensive Africa Agriculture Development Programme
- ✓ **DIS** – Development Indicator Sectors
- ✓ **EDRI** - Ethiopia Development and Research Institute.
- ✓ **EEPCO** - Ethiopian Electric Power Corporation
- ✓ **ERCA** - Ethiopia Revenue and Custom Authority.
- ✓ **ESD** – Educational Sector Development
- ✓ **ESDP** - Education Sector Development Programme
- ✓ **ESDP** Education Sector Development Programme
- ✓ **FDI** - Foreign Directed Investment

- ✓ **GDP** – Gross Domestic Product
- ✓ **HSD** – Health Sector Development
- ✓ **ISD** – Infrastructure Sector Development
- ✓ **MDGs** - Millennium Development Goals
- ✓ **MoFED** - Ministry of Finance and Economic Development.
- ✓ **ODS** – Other Sector Development
- ✓ **OECD** - Organization for Economic Co-operation and Development
- ✓ **PASDEP** - A Plan for Accelerated and Sustained Development to End Poverty

- ✓ **PRGF** Poverty Reduction and Growth Facility
- ✓ **VAT** - Value-Added Tax

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Chapter - One

1. Introduction

Taxation is as old as government and in ancient times practical considerations such as ease of collection and administration took precedence over the more abstract aims that dominate contemporary tax debates. Adams (1982) reports that the Egyptians imposed general sales taxes at major markets, while in the early Roman Republic Caligula was exalted for abolishing the general sales tax in AD 40. Excises and tariffs were the mainstay of tax systems during mercantilist times and it was not until the early 20th century that governments imposed more coherent and comprehensive sales and income taxes to fund their rapidly expanding activities.

1.1. Background of the Study

Value added tax (VAT) means a tax on sale of goods at every stage when it changes hands with the provision of credits for input tax paid at the time of purchase of goods (intended for resale, to be used as raw material for the purpose of manufacturing or for packing) or capital goods for the purpose of manufacturing. Firstly, tax liability on sale made by the dealer will be calculated on similar lines as is presently being done under the Sales tax and thereafter tax paid on purchases will be deducted and the net amount will be paid or claimed for refund will be made by the dealer. The primary objective of VAT is to remove the cascading effect of taxes levies, which is generally prevailing in other types and manner of levy. The VAT concept is simple, transparent, and consistent in its form, content, structure and approach. It further ensures revenue neutrality and mechanism for self regulated. VAT is intended to tax every stage of sale where some value is added to raw materials, but taxpayers will receive credit

for tax already paid on procurement stages. Thus, VAT will be without the problem of double taxation as prevalent in the earlier Sales tax laws.

Ironically, VATs with their aim of taxing the value added at each stage of the production process, actually had their origins in the United States in the 1920s where national economic statistics were more comprehensive than other countries (Steinmo 1993; Wells and Flesher 1999). If national economic activity could be accurately measured influential tax experts such as T.S. Adams, who drafted the Federal income tax legislation of 1913, argued that the most efficient form of business taxation would be a small uniform tax on each stage of the production process (Wells and Flesher 1999). Despite its American origins, the first modern VAT was introduced in France on 10 April 1954, although it must be noted that the tax only applied up to a wholesale level (Wells and Flesher 1999; Ebrill et al 2001). While the French VAT certainly proved to be an efficient and effective tax base the structural development which served as a catalyst for the diffusion of VATs across Europe was the formation of the European Economic Community as a result of the Treaty of Rome in 1957.

There is a growing recognition among developing countries of the crucial role of VAT revenue as an instrument of economic development. VAT revenues are increasingly accounting for significant proportion of government revenue to finance the required level of public expenditure both at federal, state and local government levels. VAT as a consumption tax has been embraced by many countries worldwide. Because it is a consumption tax, it is relatively easy to administer and difficult to evade. VAT was invented by a French economist in 1954 as *taxe sur la valeur* (TVA in French). He envisioned a sales tax on goods that did not affect the cost of manufacture or distribution but was collected on

the final price charged to the consumer. It did not matter how many transactions the goods went through; the tax was always a fixed percentage of the final price. The tax was finally adopted by France in 1954.

With a foothold in the Economic Commission (EC) VATs spread to all parts of the globe. By 1988, Alan Tait of the IMF calculated that 59 countries had introduced a pure or partially modified VAT tax at a national level (Tait 1988). Sandford calculated that by the late 1990s over 100 countries used VAT systems, leading to the conclusion that VAT is probably unique in fiscal history. A generation ago it was virtually unknown and now it is approaching universal' (Sandford 2001). This trend continues unabated and as of 2004, 29 of 30 of Organization for Economic Co-operation and Development (OECD) member countries had introduced VAT style taxes at a national level (the except United States) (OECD 2004) and 135 countries globally use the tax as a major source of revenue (Keen 2005).

The yield from VAT is fairly accurate measurement of the growth of an economy. VAT is a self-assessment tax that is paid when returns are being rendered. In-built in the new tax is the refund or credit mechanism which eliminates the cascading effect that is a feature of the retail sales tax. The input- output tax mechanism in VAT also makes it self-policing. In essence, it is the output tax less input tax that constitutes the VAT payable. It is the equivalent of the VAT paid by the final consumer of the product that will be collected by the government. VAT, also known as goods and services tax (Behan & Jenkins, 2005) proves to be beneficial for the government. Through implementation of this tax system, government can raise revenue. VAT differs from sales tax in various aspects. While sales tax is to be paid on the total value of the goods and services, VAT is levied on every

exchange of the product, so that consumers do not have to carry the total cost of tax. However, VAT is generally not applied on export goods to avoid double taxation on the final product.

As taxpayers, we may be reluctant to grant a 'good tax' title to any tax we have to pay, but economists often see things differently. Three broad criteria are commonly used to distinguish 'good' taxes from 'bad' ones: (i) Economic costs – the way the tax affects people's behavior and economic efficiency of allocating human and capital resources; (ii) Social costs – how well the tax fares in terms of horizontal and vertical equity, fairness and distribution of income; and, (iii) Administrative and compliance costs – the burden the tax imposes on taxpayers and the government in order to comply with and collect the tax. Naturally, 'good taxes' are those associated with relatively low costs to society.

The VAT replaced the sales tax in Ethiopia as of January 1st, 2003 (Proclamation No. 285/2002). VAT in Ethiopia is a multi-stage tax levied at each stage of the value addition chain, in theory, with a provision to allow input tax credit on tax paid at an earlier stage, which can be appropriated against the VAT liability on subsequent sale. In comparison to the sales tax, the new VAT (1) taxes services in addition to production, (2) grants zero-rating to exports, and (3) gives exemptions to fewer products. The VAT is expected to enhance revenue, improve economic efficiency, promote exports, and foster growth. However, the broadening of the tax base, the increase of the tax rate, and the choice of exemptions will have differential effects on the income/expenditures of different groups of the population. Thus, study is particularly interested in assessing the contribution of value added tax (VAT) revenue for the development Ethiopian economy and its effect on social spending, equity. The paper is

structured into five sections. Following this section (introduction), the next topic discusses about statement of the problem. Section three outlines the objectives of the study where as section four will deals on significance of the study, section five will provide the scope and limitations of the study. Finally, this chapter will highlight the overall contents and organizations of the paper.

1.2. Statement of the Problem

Several studies have been undertaken on the response of VAT tax revenues on changes in economic development using only GDP, which is the indicator of gross (macro) not specific, (Richard M. Bird and Pierre-Pascal Gendron 2006, Muriithi and Moyi 2003). Similarly, in Ethiopia, studies conducted found a positive relationship between VAT tax revenues and GDP. However, these studies overlooked the effect of VAT tax revenues on micro-economic sectors, which are specific, and detail, indicators of economic development, such as Infrastructural Development, Education Sector Development, Agriculture and Natural resource sector Development, Health Sector Development, and others. Moreover, it is also important to assess the response of the respective micro-economic sectors to changes in VAT tax revenues, and other government income (i.e., instead of regressing the contribution of only VAT tax revenue on the development sectors, it is better to include other government income as additional variable which might influence these development sectors). In other word, some of the researchers used only one variable, VAT tax revenue, while evaluating the effect of tax reform on the economy (see Owolabi and Okwu 2010). Finally, some the former researchers employed only either the descriptive statistics or regression model while evaluating the effect of tax reform, which may not be sufficient enough to make strong conclusions about the taxes

(see Sònia Muñoz and Stanley Sang-Wook Cho, 2003).

On the other hand, most analysts think that a VAT is the best form of general consumption tax available. If a country needs such a tax as most developing countries certainly do, then VAT is the one to have in almost all cases. Indeed, most such countries already have a VAT, and those that have not yet leaped on the bandwagon are frequently urged to do so. But is the VAT that most developing countries already have as well designed and implemented as possible? Is it as good as it could be in revenue productivity, and also in equity terms or social spending? There are broad agreements among economists as well as political scientists that many public services should be provided at low level of government in order to enhance the efficiency of the public sector and to increase its responsiveness to voters' preferences and demand for collective services. VAT, levy imposed on business at all levels of the manufacture and production of a good or service is based on the increase in price, or value, provided by each level. Because the consumer ultimately pays a higher price for the taxed commodity, a VAT is essentially a hidden sales tax.

Proponents claim that VAT would replace other forms of taxation and reduce the costs of tax compliance. In fact, some people say that adopting VAT would eliminate tax returns for individuals and make the Internal Revenue obsolete since no or less effort is supposed from the tax authority to collect tax. Conversely, opponents argue that VAT would be more complicated to implement than other tax-reform options, such as a national sales tax. They also worry that it would increase the cost of food, medicine, and other necessities, which would hurt the poor.

1.3. Objective of the Study

1.3.1. General Objective

- ✦ The major objective of the study is to assess the contribution of VAT tax to the development of Ethiopian economy and its impact on social spending, equity.

1.3.2. Specific Objectives

In order to achieve the major objective, the researcher developed the following specific objectives. The specific objectives are:-

- ✦ To provide a detailed understanding of Ethiopia's taxation policy as a tool for equitable, and fair distribution of wealth.
- ✦ To understand the efficiency in allocation of VAT tax revenues towards achievement of economic growth.
- ✦ To identify the specific set of problems associated with VAT in the country.
- ✦ To examine the revenue productivity of VAT.
- ✦ To forward possible recommendations for the concerned government organs.

1.4. Significance of the Study

The study primarily focuses around achieving the broad objective which is to empirically evaluate the contribution of VAT for the development of Ethiopian economy and its impact on social spending. Expectedly, equity in distribution and efficiency in utilization of VAT revenue to the various sectors and subsectors of the economy at any level will enhance optimal development of the economy and reflect in the desirability and output of the specific sectors. Therefore, to checkmate out-crowding effects, the study examined the relevant sectors on individual basis. So that, the study have been a number of implication for the policy makers in order to know the shortcomings as well as effects of VAT in respect to economic development and distribution, equity. In addition to this, given the dearth of research in question in developing countries, the case of Ethiopia will provides important insights into the determinants of VAT tax administration performance and contributions for

economic growth and creating equity in other developing countries. Similarly, the study provides relevant information for government organs. Furthermore, the study will be used as a reference for other researchers for further study in the topic.

1.5. Scope and Limitations of the Study

The study centers on achieving the broad objective which is to empirically evaluate the contribution of VAT for the development of Ethiopian economy and social spending. Since VAT was launched in January 1st, 2003 G.C, study used only eight years comprehensive annual financial report (2003/04 - 2009/10 G.C or 1995 - 2002 E.C.) from Ministry of Finance and Economic Development of Ethiopia (MoFED), Ethiopia Development and Research Institute (EDRI), and Ethiopia Revenue and Custom Authority (ERCA). However, the study comes with a caveat that although economic sectors considered relevant and strategic as well as VAT revenue allocations to each entered the models, some other influencing variables such as general administration and transparency of implementing authorities and officials have been excluded. But those excluded variables might actually be relevant determinants of effectiveness of VAT revenue of development of the sectors and the economy. Moreover, the researcher faced certain limitation with respect to shortage of time given for the study.

1.6. Organization of the paper

The paper is organized in five chapters. Chapter one provides background information and gives a general picture about objective of the study. Chapter two presents review of related literature and the study area description. Chapter three is methodology part. It addresses the

approach used, data collection methods and models that are employed for the purpose of the study. Chapter four devote to result and discussion of the study. Here, data obtained from MoFED, EDRI, and ERCA is organized, interpreted and analyzed. The last chapter is summarized the findings of the study and provides recommendation in line with the finding.

Chapter - Two

2. Review of Related Literature

This part, chapter two, discusses issues regarding to the related literatures on the VAT tax which is sub divided into two parts: the theoretical aspects and the empirical parts. The theoretical section discusses what does mean by VAT and what are characteristics of VAT as said by different scholars whereas, the empirical part discuss about the outcome of the former study on VAT tax.

2.1. Introduction

In taxation, taxpayers are taxed in two forms: whether through direct taxes such as income tax and road tax or through indirect taxes such as the sales tax and the services tax. For direct taxes, taxpayers will definitely realize that they are facing the tax burden since taxpayers are required to declare their income and to pay tax accordingly to the government. However, for indirect taxes, taxpayers usually do not realize that they are being taxed since the amount of tax is already accounted for with the selling price. Goods and services tax (GST) is one type of indirect taxes. GST is also known as value added tax (Behan & Jenkins, 2005). Although GST and VAT have different names, they represent the same system where the cost of tax is actually borne by the end user. However, each step in the supply chain will collect the tax and will be remitted to the government. The supply chain can also claim back the GST included in the products they buy. According to Singh (2007), it is well documented that a GST can be an effective form of indirect tax. Currently, many countries such as the United Kingdom, New Zealand, Australia and Singapore have already implemented the GST.

Value Added Tax (VAT) is a general consumption tax assessed on the value added to goods and services. It is a *general tax* that applies, in principle, to all commercial activities involving the production and distribution of goods and the provision of services. It is a *consumption* tax because it is borne ultimately by the final consumer. It is not a charge on companies. It is *charged as a percentage of prices*, which means that the actual tax burden is visible at each stage in the production and distribution chain. It is collected *fractionally*, via a system of deductions whereby taxable persons (i.e., VAT-registered businesses) can deduct from their VAT liability the amount of tax they have paid to other taxable persons on purchases for their

business activities, which is under credit method. This mechanism ensures that the tax is *neutral* regardless of how many transactions are involved. Since the 1980s, developing countries have undergone frequent tax reforms, gradually replacing trade taxes with domestic consumption taxes, particularly value-added tax (VAT). These reforms were part of two world-wide trends that affected developed countries as well. The first trend was the economic liberalization and adherence to the World Trade Organization (WTO) requirements, which called for the elimination of all barriers to free trade. The other was the rapidly increasing popularity of the VAT all over the world.

The purpose of replacing trade taxes with domestic consumption taxes was mainly to improve macroeconomic stability, and to introduce the benefits of free trade to developing economies. Export taxes are seen as inefficient, because they put the local producers who export their goods at a disadvantage compared with foreign producers. VAT was viewed as more efficient than import taxes, as it does not discriminate between domestic and imported goods. By eliminating import taxes, local consumers benefit from lower prices in the competition created between domestic and foreign producers, and it forces the local producers to become more efficient and concentrate their efforts on their comparative advantage. Equity considerations, namely, reducing poverty or inequality, have been of secondary importance, if considered at all, in the tax reforms. Focusing only on efficiency may result in the adoption of regressive tax policies. For example, taxes on goods with low price elasticities of demand, such as some cereals and domestic fuel, are efficient in that they cause little behavioral response, that is, do not distort behavior. However, since the poor consume these disproportionately, equity considerations will weigh against them.

The economy of Ethiopia is very agrarian, focusing mainly on the production and export of commodities such as coffee. Consequently, the country is particularly vulnerable to drought and the adverse effects of fluctuations in commodity prices. Efforts by the Ethiopian government to reduce poverty are currently being supported by the International Monetary Fund (IMF) under a three-year Poverty Reduction and Growth Facility (PRGF) arrangement approved in March 2001. On the revenue side, the strategy calls for an increase in tax revenue as a share of GDP. Tax policy reforms focus on improving the efficiency and equity of the income tax system, modernizing tax administration by enhancing technical capacities, and reforming indirect taxation. The main reform to indirect taxation was the introduction of a value-added tax (VAT) in January 1st, 2003.

2.2. Taxation and Economic Development

The major aim of most governments in developing countries is to stimulate and guide their economic and social development. These governments continue to reach out for the goal of government promoted and directed development. Kaldor (1980) pointed out the importance of government revenue in accelerating economic development. Whatever the prevailing ideology or political situation of a particular country, it must steadily expand a host of non-revenue yielding services such as education, health, infrastructure, and social security. Toye (1978) asserted that the link between taxation and economic development is a link between a universal desire and a form of government action that is believed to be a means to that end. Wildford and Wilford (1978) asserted that one of the most important policy upon which most economists agree is that emerging nations must increasingly mobilize their own internal

resources to provide economic growth. The most important instrument by which resources are marshaled is through the implementation of an effective tax policy.

There have been major changes in tax systems of countries with a wide variety of economic systems and levels of development during the last two decades. The motivation for these reforms has varied from one country to another and the thrust of reforms has differed from time to time depending on the development strategy and philosophy of the times. In many developing countries, the immediate reason for tax reforms has been the need to enhance revenues to meet impending fiscal crises. As Bird (1993) states, "...fiscal crisis has been proven to be the mother of tax reform". Such reforms, however, are often ad hoc and are done to meet immediate exigencies of revenue. In most cases, such reforms are not in the nature of systemic improvements to enhance the long run productivity of the tax system. One of the most important reasons for recent tax reforms in many developing and transitional economies has been to evolve a tax system to meet the requirements of international competition (Rao 1992). The transition from a predominantly centrally planned development strategy to market based resource allocation has changed the perspective of the role of the state in development. The transition from a public sector based, heavy industry dominated, import substituting industrialization strategy to one of allocating resources according to market signals has necessitated systemic changes in the tax system. In an export-led open economy, the tax system should not only raise the necessary revenues to provide the social and physical infrastructure but also minimize distortions. Thus, the tax system has to adjust to the requirements of a market economy to ensure international competitiveness.



2.3. Infrastructure and Economic Development

“Infrastructure” are many and diverse : roads, tunnels, bridges, railways, airports, harbors, canals, subways and tramways, dams, irrigation networks, water pipes, water purification plants, sewers, water treatment plants, dumps and incinerators, power plants, power lines and distribution networks, oil and gas pipelines, telephone exchanges and networks, district heating equipment, etc. Infrastructure and infrastructure-related services have always been with us, but the word itself is relatively recent, particularly in English. Although The American Heritage Dictionary of the English Language writes that “the term infrastructure has been used since 1927 to refer collectively to [...] roads, bridges rail lines, and similar public works”, it does not appear in the 1952 Concise Oxford Dictionary, nor in the 1950 Real Academia Espanola Diccionario. The word does not appear in the works of the “pioneers in development” (Meier & Seers 1984) writing in the post-war period. It is, for instance, absent from the standard treatises of (Lewis 1955). It was just not used then.

2.3.1. Infrastructure in Trade and Economic Development

This Section discusses how key infrastructure and infrastructural services support trade and how the quality and cost of infrastructure and related services impact on trade. It includes a discussion of transport infrastructure (roads, railways, airports, seaports etc.) and the services provided by the transport and logistics sector, and telecommunications networks and the services provided over such networks. These are the sectors involved in physical infrastructure that are crucial for moving goods and services from exporting to importing countries. Payments for goods and services flow in the opposite direction from importers to exporters. Financial services are therefore also part of the infrastructural services that support trade.

Finally, a number of business services play an important role in intermediating between or matching exporters and importers. They provide logistics services that reduce the transaction costs of international trade and are, therefore, also trade-supporting infrastructural services. Having established that, infrastructure and related services play a crucial role in the flow of international trade. Infrastructural services are, to a varying degree, subject to market imperfections that require government regulation, but technological changes over the past decade or so have changed the competitive environment of these services, particularly in telecommunications. Making infrastructural services more efficient, therefore, may involve government policy measures and possibly regulatory reforms. These are complementary to trade policies because gains from trade often depend on the quality of infrastructure and related services. Physical infrastructure can at least partly be considered a public good and government intervention is necessary for obtaining efficiency.

It is with this thrust that the Government of Ethiopia has intensified its Road Sector Development Programme (RSDP), which tackles the constraints of social development arising from lack of inadequacy of infrastructure. Even though road transport is the major mode of transport in Ethiopia, carrying about 95% of the country's passengers and freight traffic, road density is one of the lowest compared to other Sub-Saharan Countries (SSA) but has shown substantial increase from 29 km/1,000 km² at the beginning of 2001/02 to 33.6 km/1,000 km² in 2004/05 (IMF, 2006). During the period, a total of 5,392 km road rehabilitation/upgrading, construction and maintenance works were completed; of which 1,276 km were new rural roads (ERA 2005). There is a strong link between energy and development. One of the key measures that need to be taken to reduce poverty is to increase access to electricity in all parts of the

country including the rural areas. 94% of the country's electric power generation relies on water resources. Even though Ethiopia's hydroelectric power generation potential is in the range of 15,000 to 30,000 MW, only 663 MW (2 to 4%) has been put in use. Due to that, less than 17% of the population has access to electricity supply. Current per capita electric power generating capacity of the country is about 10 W and the annual per capita electric energy consumption is limited to 28 KW. The share of oil and electric power in the energy consumption of Ethiopia is only 5.5%. A long-term plan is developed by the Ethiopian Electric Power Cooperation (EEPCO) for power system expansion, improving the existing network and construction of two new generation plants (EEPCO, 2007).

With the growth of population of the country, the demand for fuel wood and cattle dung will also increase. This in turn will lead to clearance of the remaining natural vegetation and depletion of the land resource. The ultimate outcome will be an ecological degradation with all its attendant problems. In view of this imminent catastrophe the highest priority should be given to immediate intervention measures to deal with the problem of rural energy supply. Although there is much literature on rates of deforestation in Ethiopia (e.g. Aklog 1990; EFAP 1993), and a few studies on patterns of domestic energy consumption in urban areas of the country (e.g. Denkneh 1984), little has been done on bio-fuel consumption in rural areas of Ethiopia. Particularly, no comprehensive study has been carried out about households' responses to existing scarcity of fuel wood. Further studies in this area, therefore, will have a considerable contribution to designing appropriate strategies and policies in the national energy development sector in particular, and to environmental management in general.

Major steps have been taken by the Government with regard to network expansion, including the mobile network. Accordingly, telephone coverage by Ethiopian Telecommunication Cooperation (ETC) has increased from 400,000 lines at the end of 2004/05. Ethiopia has made huge investment in basic multimedia infrastructure backbone and is executing project to lay fiber optic cables. This has facilitated school net and woreda-net projects and ICT programmes to take off. Furthermore, corporate reforms by the ETC to increase efficiency, the partial liberalization of the ETC in terms of letting the private sector to distribute mobile phones, reducing the cost of international calls as well as Internet connection can be cited as a positive move in bringing development to this sector. In order to overcome the challenges in this sector, upgrading and expanding the backbone infrastructure as well as improving the service of mobile and fixed phones are identified as priority areas in strategic plan (ETC, 2005).

2.4. Implications of Agricultural Growth in Ethiopia

Agriculture is the backbone of the Ethiopian economy in terms of the contribution it makes to GDP, employment creation, foreign exchange generation and food production. Its contribution to development has been challenged by several factors of which drought is one. According to Webb, Brown and Yohannes (1992), “a 10 percent decline in rainfall below the long-term average results in a 4.4 percent fall in national production”. The same study also reveals that fluctuations in rainfall from the long-term average are increasing. This indicates that drought will continue to have more and more impact on national production.

Ethiopia’s national development strategy, A Plan for Accelerated and Sustained Development to End Poverty for 2005/06 to 2009/10 (PASDEP) places a major emphasis on achieving high rates of agricultural and overall economic growth. Consistent with the PASDEP, Ethiopia is

also in the process of implementing the Comprehensive Africa Agriculture Development Programme (CAADP) together with other African governments. As part of CAADP, the country has committed itself to meeting targets of devoting at least 10 percent of public expenditures to agriculture and to achieving a 6 percent growth rate in agricultural GDP. Ethiopia has already met these targets in recent years. The challenge remains, however, to continue to devote these public resources and to achieve high growth rates through 2015.

Composition of agricultural growth matters, though. Additional growth driven by cereals has larger impacts on poverty reduction, because these crops already constitute a large share of rural incomes and so can contribute substantially to achieving broad-based agricultural growth. Yield improvements in these crops not only benefit farm households directly, by increasing incomes from agricultural production, but also by allowing farmers to diversify their land allocation towards other higher-value crops. Increased productivity of cereals that reduces real cereal prices is also effective at raising rural real incomes and reducing poverty, especially amongst the poorest households. Thus, high priority should be afforded to improving cereals yields and opening market opportunities for upstream processing to reduce demand constraints.

Most households are expected to benefit from faster agricultural growth. However, some agro-ecological zones that grow higher-value cereals and export-oriented crops and which are better situated to larger urban markets (e.g., the rainfall sufficient highlands) stand to gain more than other parts of the country. Both rural and urban households benefit from faster agricultural growth (and thereby overall economic growth), as rural producers benefit from increased agricultural productivity and incomes, while net purchasers of food in both rural and urban

areas benefit from moderate declines in real food prices. Rapid agricultural growth also has major benefits for the poor. Achieving agricultural growth of six percent per year would reduce national poverty to 18.4 percent by 2015; lifting an additional 3.7 million people out of poverty compared to a base simulation using medium term growth rates (FAO, 2009)

Studies show that events as big as drought do not happen suddenly. They result from an accumulation of a host of social, political and economic problems, which through time erode the capacity of farmers to cope (Webb, Brown and Yohannes 1992). This could be evidenced by the degree of correlation between the occurrence of drought and the influence of adverse economic situations on agriculture for the past five decades. Between 1974 and 1991 alone, fluctuations in agricultural GDP, attributable solely to weather variability, occurred in nine out of a total of 17 years. Comparisons of coefficients of variations showed that GDP fluctuations were higher between 1974 and 1992 than the period between 1963 and 1974 and 1992, and 1998. These, according to Webb, Brown and Yohannes, could be attributed to social, political and economic factors which gradually weakened the coping abilities of farmers between 1974 and 1992.

2.5. Spending on Primary Education and Health

The development of the education sector in Ethiopia has been at an early stage. On the eve of the ongoing educational reform process, which began in 1994 following the endorsement of the New Education and Training Policy, “enrollment in primary education stood at about 2.81 million. This includes over-age pupils that amount 34 % of the school-age population. Likewise, enrolment ratio in secondary level stood at about 15% and in the third level at 1 %. Compared to African countries, Ethiopia’s enrolment ratios fared among the lowest in primary education and somewhat better though below average in secondary education. Similarly,

enrollment in all levels of education is male biased the tertiary level being worse” (Ministry of Education 1994). Nevertheless, there are encouraging signs that enrolment at all levels is rising. In addition, the equity and quality issues are being addressed that significant result has been recorded. This is by and large an outcome of the Education Sector Development Programme (ESDP).

A comprehensive intervention package developed by the government in order to mobilize national and international efforts to boost the performance of the system, in particular the primary education sub-sector. It is in fact a document that “translates the policy statement into action” comprising the first five years plans within a 20 years perspective plan. (ESDP Action Plan: 1999) Most of this report therefore, dwells on the ESDP as well as the interventions made following the endorsement of the Policy that gradually led to the development of the former action plan is building manpower capacity at each level of the system to insure successful implementation educational management. Thus, the current educational reform has been set within this context. It is a total departure from old approach to educational development that has lingered for over 50 years. Over the last three years, public spending for poverty reduction in Ethiopia has more than doubled as a percentage of GDP, rising from 8 percent in 1999/2000 to nearly 18 percent in 2002/03. The main areas of poverty-targeted public expenditure are health, education, infrastructure, and agricultural services. Out of those, health and education are particularly important in the sense that they not only address the well-being of the current population but also play a significant role in investing for future human capital.

2.6. Accounting Basis and Structure of VAT

VAT is normally payable on the total invoice value of the goods and/or services supplied excluding of course, the amount of the VAT itself (input tax). If more than one rate applies, this will need to be indicated. VAT becomes liable when the sale is invoiced, irrespective of whether it has been paid for or not. However, within certain defined limits, a trader may opt to account on a 'Cash' basis, which is by reference only to those sales which have been paid for. The Commissioners' Guide should be consulted for the relevant parameter in this regard. A statutory obligation to maintain proper records of VAT liability also exists. A VAT, like a retail sales tax, applies to goods and a service sold to consumers and is therefore a tax on consumption. But unlike a retail sales tax, which is collected once on the final sale to a consumer, a VAT is imposed and collected at every stage in the production and distribution of a good or service. This collection structure helps prevent the tax from being evaded at the retail level. The VAT is a "real-based" tax that applies to the sale of goods and services. It does not tax, or provide deductions for, financial transactions such as loans and stock purchases.

The two types or structure of VAT are subtraction and credit methods. A subtraction method VAT and a credit method VAT, also known as a credit-invoice method VAT. Although they differ in administration, both are consumption taxes and both avoid tax cascading (multiple taxation of the same final consumption item). The subtraction method VAT has received attention in the United States, partly because of its similarity in form to the current corporate income tax. The credit method VAT, however, dominates the international landscape. Under a subtraction method VAT, the tax base for each firm is receipts from sales of real goods and

services, minus purchases of real goods and services (including capital goods) from other businesses. Wages and other forms of employee compensation are not deductible. The base - sales minus purchases — is a measure of a firm's valued added, which is the firm's contribution to the overall value of output. For the economy as a whole, the base of a VAT is sales of real goods and services to purchases. Under the credit method, tax cascading is avoided in a different manner. Instead of deducting its purchases from other firms, each firm claims a credit against the tax on its sales for tax paid on its purchases from other firms. This method uses invoices to show the VAT paid on purchases and charged on sales, which creates a paper trail that aids enforcement. Again, there is no tax relief for the payment of employee compensation. Like the subtraction method, the credit method results in a consumption tax base.

2.7. Principles of Tax Systems

This section discusses three public finance concepts used in tax policy analysis: equity, efficiency, and ease of administration. To some extent, all three concepts depend on underlying assumptions and normative values and there is no unanimity regarding their practical application, but they are important terms in evaluating tax systems.

2.7.1. Equity Principle

Equity in taxation expresses the idea that taxes should be “fair,” and is a concept used in all tax policy analysis. However, it should be noted that equity or fairness is a normative, value-based concept and its interpretation differs across individuals, countries, cultures and time. Since it depends on one's particular perspective, as well as the specific circumstances being considered, the concept is difficult to apply in practice. Tax equity is commonly discussed according to four definitions of “fairness”. These definitions are also normative, and sometimes conflict, so they too

are difficult to apply in practice. However, they are a common reference point for discussion. Horizontal equity posits that taxpayers who are equally economically situated should be treated equally for tax purposes. *Vertical equity* posits that taxpayers who are not identical from an economic standpoint, but are differently situated, should be treated differently for tax purposes. Horizontal equity refers to the principle that “equals should benefit from equal treatment”. Two common measures are used for evaluating equity or fairness in the tax system. One measure is the *ability-to-pay* principle, whereby those with more income should bear a larger share of the tax burden than those with less. An alternative measure commonly used for user charges and local taxation is that of *benefits-received*, according to which it is fair to assess taxpayers in proportion to the benefits they receive from public services. From this perspective, those receiving the same benefits should pay the same, and those receiving higher/lower levels of benefits should pay more/less.

2.7.1.1. Importance of Benefit Incidence Analysis

While the tax incidence analysis compares the relative tax burden for different expenditure groups, it provides only half the information necessary to assess the equity of budget policy. Benefit incidence analysis shows the distribution of benefits provided by the government and financed—at least in part—from tax receipts. Even if a tax turns out to be regressive, the overall impact on the poor can be neutralized or reversed if the public expenditure financed by that tax effectively targets the poor. Likewise, even if the tax revenues are collected in a progressive manner, the overall effect on the welfare of the poor can be reversed if the benefit from public expenditure falls disproportionately on the rich. The most commonly accepted idea of fairness in taxation is that taxes should be *progressive* - those with lower incomes should bear a lower share of the tax burden than those with more. Progressive taxes are designed so that those with lower income pay a

lower percentage of their income in taxes than those with more. Taxes that take a greater proportion of income from the poor, than from the rich, are said to be *regressive*. Income taxes can be made progressive by a structure of increasing marginal tax rates applied to higher brackets of income and/or through allowable credits and deductions and no-tax thresholds, which reduce the tax burdens of the poor. Consumption taxes are generally regressive, since the poor spend more of their income on consumption than the rich. Consumption taxes can be made less regressive through targeted exemptions, or lower rates for goods purchased primarily by the poor, and/or through special taxes or higher rates on luxury consumption items primarily purchased by the rich.

2.7.2. Efficiency and Neutrality

Taxes “cost” individuals and businesses through the loss of income that is transferred to government. If the income is “recouped” by the same individual/business through public services, there is no net cost to the individual. However, orthodox public finance theory holds that all taxation, except lump-sum taxes, imposes an “efficiency cost” on society because individuals and businesses change what would otherwise have been “optimal” decisions about labor, investment and production. These non- “optimal” decisions reduce overall economic output and growth. According to the theory, when taxes reduce social welfare – whether directly or indirectly - by more than the amount of revenues they produce, they are considered to be “inefficient.” Orthodox economists argue that good tax policy should aim to produce the desired revenue and/or social goals of redistribution, environmental protection, etc., while minimizing what they claim are distortions to the economic decisions of individuals and businesses, and therefore the “cost” to society. Orthodox economists contend that distortions are impossible to eliminate completely but a good tax system will seek to minimize them.

Feminist economists have especially criticized the orthodox notion of efficiency. Elson Diane (1999), for instance, argues that efficiency is too often conceptualized and measured in ways that focus only on market-oriented production and ignore other important economic and social objectives. She argues for an alternative approach to the one described above, one that defines efficient not in terms of “distortions” but in terms of collectively agreed upon social and economic objectives that encompass human welfare. This broader notion of efficiency would recognize not only that taxes affect individual decisions about behavior and income but would also seek not to jeopardize broader social and economic welfare. Recognizing that taxes have an impact on individual behavior, many economists and tax lawyers often argue for tax *neutrality* by which they mean that the tax system should not provide incentives for one type of behavior over any other type of behavior. Some feminists also support this view. Claire Young (2000), for instance, argues that choices – such as those to marry or remain single – should not be made in response to any preferential tax treatment. Elson Diane (2005) concurs with this view for income taxes, but she also points out that some types of socially desirable behavior – especially behavior that has external and public effects -- could be encouraged through some types of taxes. Consumption taxes – for instance, could encourage health-promoting behavior by taxing cigarettes and alcohol more than fresh fruits and vegetables.

2.7.3. Ease of Tax Administration

The third “E” of tax policy is that taxation should be easy and relatively inexpensive to administer. Administration of a tax system must be funded from public revenue, reducing the amount of revenue available for other public services. In developed countries, the cost of collecting taxes has been estimated at one percent of tax revenues, and in developing countries, at possibly twice this. There may also be compliance costs to taxpayers in time and effort. To reduce the overall cost, the

structure of the tax system should take into account the conditions of the country and its ability to administer and enforce the tax code.

For many developing countries with conditions of low literacy, poor infrastructure, and weak civil service, consideration of the ease of administration is a particularly important factor in the design of tax policy. Achieving greater administrative simplicity is a goal for many governments and external experts who advise on tax reform programs. Simple tax systems are easier to administer and may secure greater compliance from taxpayers. The rules are also likely to be more transparent. But, it also needs to be recognized that the way tax is collected, as well as the design of tax policy, will influence both perceptions of fairness and efficiency of the system.

2.8. Tax Reforms

Both developing and developed countries have engaged in periodic tax reform and fiscal decentralization efforts over the last several decades. Post World War II reforms, which recognized a strong role for the state, included tariff protection for domestic industries (high import taxes), input subsidies, and favorable domestic tax regimes through concessions to business for investment). Natural resource sectors and agriculture were taxed relatively heavily through export taxes. Today's reforms have changed this emphasis. In developing and transition economies, tax reform is frequently driven by international agencies such as the World Bank and the IMF, seeking to address countries' budget deficits and to open markets to globalization. Their recommendations have resulted in the following reforms in most countries: a) simplification eliminating minor taxes and consolidating others so as to reduce the number and complexity of taxes; b) base-broadening - bringing various forms of in-kind income into the base of the income tax and reducing special credits and exemptions; c) rate reduction and harmonization in personal and corporate taxes— reducing top marginal tax rates

and making these consistent across personal and corporate income taxes, and reducing the number of applicable tax rates and/or tax brackets; d) the creation of a single-rate, broad-based VAT that is relatively simple to administer; e) the reduction or elimination of import duties and export tariffs.

In the U.S., Western Europe, and Australia, the emphasis of tax reform has been on reducing tax rates, and especially on providing tax relief to the rich and to businesses on the argument that this will stimulate investment and production (“supply side economics”). Developed countries rely heavily on income taxes, so tax reform has emphasized simplifying personal income tax rate structures, lowering top marginal rates, and bringing personal and corporate top marginal rates in line. In both developing and developed countries, there is concern that tax reform has adversely affected the poor both from the tax and the expenditure side. In developing countries, the increased reliance on indirect taxation such as the VAT has raised concerns about regressivity. Since low- income households generally spend a higher proportion of their income than high- income households, single rates can result in poor families paying a larger share of their income in sales tax than rich families. The standard response by governments is to take steps to exempt or zero-rate key commodities that the poor consume, such as food and fuel.

In developed countries there is evidence of an increase in the tax burden of the lower and lower- middle income groups and a reduction in the tax burden of the highest income groups. In both developing and developed countries, there is also concern that there has been an increase in the relative tax shares paid by individuals through the personal income tax compared to those paid by businesses through corporate income taxes. Finally, in both developing and developed countries, reductions in overall tax revenues have resulted in a

“fiscal squeeze” which can mean the reduction of needed public services with adverse effects in the short-term on the poor and low- income and in the long-term on overall social and economic development.

2.8.1. Paradigms of Tax Reform

The philosophy of tax reform has undergone significant changes over the years in keeping with the changing perception of the role of the state. With the change in the development strategy in favor of market determined resource allocation, the traditional approach of raising revenues to finance a large public sector without much regard to economic effects has been given up. The recent approaches to reform lay emphasis on minimizing distortions in tax policy to keep the economy competitive. Minimizing distortions implies reducing the marginal rates of both direct and indirect taxes. This also calls for reducing differentiation in tax rates to reduce unintended distortions in relative prices. To achieve this, the approach suggests broadening of the tax bases. Thus, over the years, emphasis has shifted from vertical equity in which both direct and indirect taxes are subject to high marginal rates with minute differentiation in rates, to horizontal equity in which, the taxes are broad-based, simple and transparent, and subject to low and less differentiated rates. Equity in general, is taken to mean improving the living conditions of the poor. This has to be achieved mainly through expenditure policy and human resource development rather than reducing the incomes of the rich as was envisaged in the 1950s and 1960s.

Conventional wisdom on tax reforms provides us with at least three different model of tax reform. The optimal tax (OT) model (Ahmad and Stern 1991) is satisfactory in terms of its theoretical soundness, but has been found to be impractical in its applications. Besides the

trade-off between efficiency and equity in tax policy, the information and administrative costs of designing an optimal tax model have been found to be prohibitive and, therefore, as a practical guide to tax policy this has not been useful. The Harberger tax model (HT) like the OT model is well grounded in theory. It, however, draws much more on practical experience. According to this, while efficiency (and distribution weights) is clearly desirable in the design of tax policy, administrative capability is equally, if not more, important. The principal concern, according to this approach, is not to design a system that will be optimal, but emphasize the system that will minimize tax-induced distortions and at the same time be administratively feasible and politically acceptable. In fact, Harberger suggests that tax reformers should pay less attention to the economic methodology and more to best practice experiences. The basic HT reform package for developing countries that are price takers in the international market consists of, *inter alia*, a uniform tariff and a broad-based VAT (value-added tax).

The third is the supply-side tax model (SST). This model emphasizes the need to reduce the role of the state. Reduction in the volume of public expenditures has to be achieved by cutting the tax rates, particularly the direct tax rates to minimize disincentives on work, saving and investment. The proponents of this model emphasize the need to broaden the base with minimal exemptions and preferences and to have low marginal tax rates. Again emphasis is on minimizing distortions in relative prices and, therefore, the approach emphasizes less rate differentiation. The recent reform approaches combine elements of all three models sketched above. This incorporates both theory and past reform experiences and takes into account administrative, political and information constraints in designing and implementing reforms. The thrust of this approach is to enhance the revenue productivity of the tax system while

minimizing relative price distortions. The best practice approach has attempted to make the tax systems comprehensive, simple and transparent. As mentioned earlier, the general pattern of these reforms has been to broaden the base of taxes, reduce the tax rates and lower the rate differentiation both in direct and indirect taxes. A broader base requires lower rates to be levied to generate a given amount of revenues. Lower marginal rates not only reduce disincentives to work, save and invest, but also help to improve tax compliance. More importantly, broadening the tax base helps to ensure horizontal equity, is desirable from the political economy point of view as it reduces the influence of special interest groups on tax policy, and reduces administrative costs.

In the case of indirect taxation, the reform agenda includes the levy of a broad-based VAT with minimal exemptions and supplemented by a few luxury excises. As regards import duties, quantitative restrictions should be replaced by tariffs, export taxes eliminated, and dispersion in tariffs should be minimized. Personal income tax too is to be levied on all but a small number of persons with income levels less than twice the per capita income of the country. Much of the direct taxes should be collected by withholding, but for the “hard-to-tax” groups, presumptive taxation is to be applied. Emphasis on horizontal equity also implies emphasis on strengthening administration and enforcement of the tax and the development of proper information systems and automation.

Gemmell and Morrissey (2003) analyze the distributional impact of the reforms that developing countries are going through. They conclude that the available evidence suggests that sales taxes are slightly more progressive, or less regressive, than taxes on imports. In most developing countries, export taxes were regressive, typically falling on smallholder

agricultural producers (who, if not actually poor, had relatively low incomes). The removal of such taxes, combined with the reduction of other implicit taxes on agriculture, should have had a favorable impact on distribution and the poor. Consequently, Gemmell and Morrissey conclude that it seems likely that the reforms will not have worsened the effects of the tax structure on distribution and the poor. Gemmell and Morrissey add an emphasis on the distributive effects of consumption taxes to the conventional wisdom. They argue that no conclusive evidence exists regarding the impact of replacing tariffs with sales taxes, largely because we do not know enough about economic incidence and the implications of a large informal sector, such as that prevalent in developing countries.

Bird (2003) supports the conventional wisdom by stressing that, despite the extreme inequality in Latin America countries, the best tax system for them is one that produces the most revenue in the least costly and distorting way. Such a system is a broad-based VAT, and not a steeply progressive income tax. It should be supplemented, however, with taxes on land and other property, good user charges, and taxes on motor vehicles and fuel. These ideas are further developed in Bird and Zolt (2005). After again stressing that in developing countries, expenditure policy is much more important for redistribution purposes than is an income tax; that consumption taxes can be progressive; that they should be supplemented with user charges; and that greater fiscal decentralization (moving tax and expenditure authority to lower levels of governments) may enable better matching of those who benefit and those who pay for government activity.

Emran and Stiglitz (2005) argue that the current consensus that favors a reduction and eventual elimination of trade taxes, and almost exclusively relies on VAT as the instrument of

indirect taxation in developing countries, is built on fragile results derived from a partial model that ignores the existence of an informal sector. The results from a more complete model demonstrate that replacing trade taxes with VAT can reduce welfare under plausible assumptions. The authors argue that the results raise serious doubts about the wisdom of the indirect tax reform policies pursued by a large number of developing countries.

In an earlier version, Emran and Stiglitz (2000) show that in the case of revenue neutral radial (across the board) uniform reduction in trade taxes and an increase in VAT, the presence of a large informal sector such as exists in developing countries, may reduce aggregate welfare. While the radial uniform reduction in trade taxes reduces the production distortions and the distortions between tradable and non-tradable sectors, a revenue-neutral radial increase in VAT increases the inter-sectoral distortions between the formal and informal sectors. That is, goods may be produced and sold in both the formal and informal sectors, but the consumption tax is only paid by the formal sector and creates a distortion between formal and informal sectors.

In their 2005 paper, Emran and Stiglitz extended their analysis to the case of a selective reform of trade tax and VAT in an economy with an informal sector. The term selective reform refers to tax changes that apply only to a subset of the commodities falling under the tax net. In the context of selective reform, Michael et al. (1993) show that, in a tradable-only economy with no informal sector, a reduction in the import tariff on the commodity bearing the highest tariff and also the highest total indirect tax burden, increases welfare under suitable assumptions of substitutability, when the lost revenue is compensated for by an increase in the consumption tax on the commodity bearing the lowest indirect tax burden.

The extant literature, however, completely ignores the implications of an informal economy in the efficiency of a consumption tax (VAT) as an instrument of revenue-raising, which can be especially important in developing countries. In an economy with both formal and informal sectors, the best one can do is to select the commodity enjoying the lowest indirect tax burden among the subset of formal commodities as the candidate for VAT increase. Once this restriction placed by the incomplete coverage of VAT is acknowledged, Emran and Stiglitz (2005) show that there are plausible (sufficient) conditions, under which such a selective reform of VAT and import tariff reduces welfare. They also provide plausible, sufficient conditions for worsening of welfare, from a reduction in import tariff with a broadening of the revenue-neutral VAT base.

Also, the extant literature almost exclusively deals with the coordinated reform of import tariffs and consumption taxes, and ignores the case of a coordinated reform of export taxes and consumption taxes, although such reforms are frequently prescribed by the policy advisors. The results on export tax reform in the absence of an informal sector show that the conditions required for welfare improvement from the reduction in export tax on one commodity combined with a revenue neutral increase in VAT on another are much more stringent than in the case of import tariff reform. Unlike the case of import tariff reform, the selective revenue-neutral reform of VAT and export tax can reduce welfare in an economy without an informal sector, even when all commodities are substitutable.

The results of the 2005 paper thus complement and strengthen the conclusions reached in Emran and Stiglitz (2000). In addition, they argue that trade taxes enjoy a clear advantage over VAT, due to administrative costs, which is the usual explanation for the pervasive use of trade

taxes in early stages of development. The informational and compliance costs of VAT are likely to be high, especially in developing countries, because of high rates of illiteracy and scant written record-keeping. Lastly, they argue that trade taxes are not more vulnerable to smuggling than is VAT. However, an increase in the import taxes increases the returns to both domestic production and smuggling, so that the extent of smuggling is constrained by the higher domestic supply of a commodity. A higher VAT, on the other hand, increases the consumer price but leaves the returns to the domestic producers unchanged. This implies a higher return to smuggling relative to domestic production, assuming that the commodity in question is importable.

Baunsgaard and Keen (2005) analyze a panel data for 111 countries over 25 years: from 1975 to 2000. They show that developing countries find it very difficult to replace the revenue lost by trade liberalization with revenue from domestic sources. This reality is especially troubling as revenue recovery has been extremely weak in low-income countries (which are those most dependent on trade tax revenues). These countries have recovered, at best, no more than about 30 cents of each lost dollar. Moreover, the presence of a VAT has not in itself made it easier to cope with the revenue effects of trade liberalization. It may, therefore, seem as if Baunsgaard and Keen (2005) present another challenge to the conventional wisdom that eliminating trade taxes is necessarily good. However, they argue that: "it is perfectly possible for trade reform to be socially beneficial even when accompanied by a reduction in total revenue." There is no support for this argument in the paper (that focuses on income, not welfare, measurement) and there is no explanation why Emran and Stiglitz (2005), which reaches the opposite conclusion, may be wrong. Gordon and Li (2005) criticize the conventional wisdom indirectly, by suggesting

a rationale for the distinct structure of tax systems in developing countries that is fundamentally different from that offered by the IMF and World Bank staff.

Gordon and Li (2005) describe the characteristics of the tax systems in developing countries in the following way. Revenue/GDP is surprisingly small compared with that in developed economies. Taxes on labor income play a minor role. Taxes on consumption are important, but effective tax rates vary dramatically by firm, with many firms avoiding taxes entirely by operating through cash in the informal economy and others facing very high liabilities. Corporate tax is significant, as are tariffs and seignorage (printing money). All contrary to the theoretical literature that analyzes tax policy in developed countries. They suggest that all of these aspects of policy may be explained as a reaction to major tax enforcement difficulties. The key assumption in their theory is that firms in developing countries can evade taxes completely by shifting entirely to cash transactions and not using the financial sector. When firms make use of the financial sector, the government can gain access to their bank records and use this information in enforcing the tax law. Firms then have to choose whether the economic benefits from use of the financial sector are greater or less than the resulting tax liabilities. Losing the ability to impose regular corporate income tax rates on domestic taxpayers might not be too harmful, for the following reason. Shifting from an income to a consumption tax usually is considered efficient but regressive. However, as is now the conventional wisdom consumption taxes are not necessarily regressive. The regressivity is offset able through a more progressive use of the tax revenue generated from other sources, mostly through the expenditure side of the national budget. Another consideration is the potential difference in tax incidences between developed and developing countries.

According to Shah and Whalley (1991), the incidence of corporate income tax in developing countries makes it somewhat regressive. Replacing a regressive corporate income tax with greater reliance on a regressive consumption tax probably adds little, if any, to the overall regressivity of the tax system - even without adjusting the expenditure side of the budget. Hence, a shift to a consumption tax is justified if the tax incentives attract foreign directed investment (FDI) that results in growth-promoting spillovers. Moreover, according to conventional wisdom, developing countries should tax as efficiently as possible (“non-distorting”) and rely on the expenditure policy to take care of inequality and poverty. But if that is the advice, then why use consumption tax? Why not impose a head tax, which is by definition even more efficient? The answer is that a head tax plus an expenditure policy is not necessarily easier to implement than income or consumption taxes. But, exactly how and why is yet to be explored. If the criterion for welfare is income, then there is no difference between an income tax and an expenditure program, which is in fact a negative income tax. If on the other hand, we use other proxies for ability, targeting individuals according to non-income characteristics, there is a difference between expenditure policy and an income tax, and the former could be easier to implement. If we believe in universality, providing public and merit goods of decent quality and possibly providing a cash or in-kind transfer to everyone (“basic income, “demo grant”), expenditure policy could be much more simple and less distortive than an income tax (as it imposes zero marginal tax rate).

The conventional wisdom is further challenged by Emran and Stiglitz (2005) arguing that trade taxes may be superior to VAT. As suggested by them, there is a need for empirical work that explicitly incorporates the role of the informal economy to examine the question whether the proposed move away from trade taxes to domestic consumption taxes is welfare

enhancing, or not. In addition, it is possible that the underlying explanation for a whole set of policies exercised by developing countries is their desire to cultivate a certain type of tax abiding firms. This hypothesis, suggested by Gordon and Li (2005), calls for a close examination of questions such as who is taxed in developing countries and what information flows from banks to tax authorities in developing countries. Lastly, it is still an open question whether offering tax incentives to attract foreign investments is warranted or not.

2.9. The Replacement of Sales Tax with VAT

The VAT has not been introduced, usually, to add to a country's tax revenue. Instead, it has chiefly replaced other types of sales tax that were deemed to have serious defects, defects not to be found in the VAT. Foremost among these defective taxes is the turnover tax, levied as a percentage of sales, not just value added. Thus the miller would pay tax on sales to the bakery, and the bakery would pay tax on its sales to the wholesaler, and so on. The value added by the miller would thus be taxed several times, the retailer's activity only once. This turnover (or cascade) tax puts pressure on the economic system to reduce activity at the earlier stages, manufacturing, for example, and expand it at the last stage, retail.

The turnover tax thus favors the kind of good that is sold in a luxurious shop with a high mark-up, say, a jewelry store or one selling expensive clothing, relative to goods sold in low-margin operations such as supermarkets or by mail order. The value added tax, in contrast, is neutral in this respect. The total accumulated tax, down through the retailer, is the same for every dollar of retail price, no matter how the values added that make up this dollar are distributed among the stages of production and distribution. Such economic neutrality is generally considered desirable. Moreover, equity is an issue.

Under a turnover tax, the rich consumer is taxed more lightly than the poor consumer, because the former buys more of the lavishly retailed goods, the latter of the supermarket types of goods. Turnover taxes have two other serious defects. One is that they encourage vertical mergers between business firms. If the miller and the bakery merge into one concern, total turnover tax decreases, since one stage of sales has been eliminated. Total VAT, in contrast, remains unchanged. The value of milling and the value of baking are still each taxed just once; the only difference is that the tax is collected from one firm, not (in sections) from two. The other defect is the difficulty of exempting exports. The turnover tax will have been levied several times on the constituents of the good that is to be exported, including constituents not physically embodied in the exported good (such as fuels and the wearing out of machinery in production of the good). If this cumulated turnover tax could be estimated fairly closely, a refund of the total could be given, thus freeing the good for export.

In practice, a rough estimate is all that can be offered-which may result in over refunding or under-funding of the actual tax on exports. Countries importing these goods may protest that they have been subsidized, while the exporters are denouncing an export penalty. These misgivings are important if the countries are about to enter into an economic union in which intraunion trade is to be free of import duties. By contrast, the VAT affords a fairly close estimate of the total tax that should be refunded upon export. This is accomplished through the tax credit technique (de-scribed above). Finally, a turnover tax tends to inhibit growth by taxing capital goods, if not directly then through taxation of materials and other inputs entering into the production of such goods.

The VAT can be shaped so that it reaches only consumption goods. In several countries the VAT has replaced, not a general turnover tax, but a manufacturer's sales tax or, less commonly, a wholesaler's sales tax. These taxes have a much smaller base than the VAT, so a higher tax rate is needed to raise the same revenue-and a higher rate provides more temptation for tax evasion. Both taxes favor value added at retail, and the manufacturers tax favors it at wholesale as well. With both taxes it is somewhat more difficult to ensure that the tax strikes only consumption goods, not capital goods, than under the VAT. The VAT has also replaced a retail sales tax, but in only two countries, Sweden and Norway. It did so chiefly because it was considered more likely to ensure exact exemption of all exports (Shoup 1989). The value added tax has not been substituted for the income tax, corporate or personal, anywhere except the state of Michigan in the United States. In the United States some business executives have occasionally urged such a substitution, chiefly on the grounds that the VAT exempts exports and taxes imports, while the income tax does neither, so that a change would improve the balance of trade. This argument is a rather weak one, as noted below.

There are two sets of reasons for freeing from VAT: those to do with the complexities of administration (usually for small firms) and those of social policy. They call for quite different methods of freeing, exemption. If the complexity of administration is the problem, especially for small firms, such firms may be exempted from the tax, but the products they deal in should not be completely unburdened from the VAT at all stages, Zero-rating. If some social policy is to be implemented by freeing a certain good from the VAT, the unburdening should be complete; no VAT should rest on any of the values added in producing and distributing the good at any stage in the production or distribution process. This can be achieved by zero-

rating at the last stage (retail or export), when a tax credit method (not a subtraction method) is being used. In practice, this distinction has not been followed entirely.

In some VAT jurisdictions, certain goods, not only certain types of firm are given exemption rather than zero-rating. The value added for the good at a particular stage is freed from tax, but no effort is made to lift the tax already collected at earlier stages or to be collected at later stages. This narrow type of freeing is accomplished by forbidding the firm to credit against the tentative tax on its sales of taxable goods the VAT shown on the purchase invoices of the exempted good or its constituents. This procedure seems to have little, if any, justification. Administrative problems do not usually occur with respect to a particular type of good, regardless of the size of the firm handling it, and social policy, to repeat, cannot be fully implemented by a freeing from VAT at just one stage. Moreover, a business purchaser of the exempted good, finding no VAT stated on his purchase invoice, is deprived of a credit against the VAT on his own sales for any VAT levied before the exempt stage. Exemption (not zero-rating) is commonly granted to three groups of firms: those with annual sales of less than a specified amount; farmers; and certain service firms.

In some developing countries the first group may embrace much of the retail trade. Absence of accounting records and financial fragility may be so extensive there that the VAT will be restricted to wholesalers and producers. Those developing countries that do have a comprehensive VAT may still exempt most of the retail firms by a size test (sales) applicable to all firms. At least, exemption at the retail stage does not produce over taxation, as it does, paradoxically, when it occurs at an earlier stage under the tax credit method. Farmers are commonly exempted on the same grounds as retailers: lack of records, financial fragility.

Here, economic distortions in the use of machinery, materials, and the like may result. The farmers are not at the last stage; they are intermediates. When they are out of the VAT system, not filing VAT returns, they can make no use of the tax credits on the invoices of their suppliers. A farmer on the verge of using more fertilizer and less direct labor (because, with no tax, this would pay) will be deterred by the VAT from doing so.

In some VAT jurisdictions a "downstream" extra credit is granted to firms that, buying from the farmers, are subject to tax, just to make up for this break in the tax credit chain, but the size of that credit does not vary with the amount of fertilizer the farmer buys, so does not influence such a purchase. A better method is to zero-rate important farm inputs, such as seed, fertilizer, and tractors. All in all, however, farming remains one of the most difficult issues for a VAT jurisdiction, as it is indeed under an income tax. Certain service companies, notably financial institutions, are ex-empted in many VAT jurisdictions chiefly because of the difficulty of measuring the value of certain outputs that are not specifically priced. Accordingly, these are exceptions to the general rule that administrative problems usually do not occur just because of the nature of the product. For the other technique of freeing from VAT, zero-rating, there are three social or economic goals that are deemed to make this kind of freeing worthwhile. One is to gain an alleged advantage in international trade. Another, widely recognized, is to tax the poor either not at all, or relatively less than the well-to-do. A third, hardly recognized but potentially important, is to encourage and facilitate production by not forcing a reduction in certain kinds of personal consumption, as described below. Food absorbs a larger part of a poor household's budget than of a rich one's. Zero-rating of food therefore makes the VAT less regressive than it would otherwise be. The same applies to certain types of clothing.

Industrial countries, notably the United Kingdom, use zero-rating on one or another type of product for this social aim. In a developing country, zero-rating of these necessities might exclude so much of the potential tax base that the tax rate on the remaining sectors would have to be so high as to create formidable administrative problems. As a compromise, a lower rate might be imposed on these necessities, but not a zero rate. In fact, most of the VAT countries do use more than one tax rate. To be effective, the zero rate, or lower positive rate, must apply at the last stage of the production and distribution process.

In some developing countries, many people are on so meager a diet and in such poor health that their ability to work is impaired. If their incomes after tax were increased, the resulting increase in their consumption spending might so increase their productive energy as to make the resulting increment in output exceed the increment in their consumption. Such an increment we may call gainful consumption (see Shoup 1965 and 1970). A decrease in the VAT on such consumption would spur more consumption, hence a more than equivalent increase in total output. This road to economic growth, which calls for zero-rating of certain necessities, seems obvious. But it is rarely mentioned in discussions of tax policy for growth. In developing countries, especially, it seems worth further study. As with progressivity, a slower approach to this goal would be through a lower positive rate, rather than a zero rate, on the goods in question. Ideally, such goods would be zero-rated only when sold to the households with gainful consumption-though trying to distinguish those households might prove impracticable.

Again, if a VAT replaces another type of general sales tax, the net effect on the general price level could be zero, or very small, either way. If it replaces a corporation income tax that has

not been reflected in prices, we might expect a rise in the price level roughly equal to the rate of the VAT, if an accommodating monetary policy is followed. Beyond that one-time rise in prices, there seems little reason to expect the VAT to trigger an inflationary spiral, unless most wages are tightly indexed to cost-of-living data-and, again, monetary policy is accommodating. Recent empirical studies seem to support this conclusion (Tait, forthcoming, and Gillis, Shoup, and Sicut 1987; see also Tait 1979). A VAT imposed to cover an increase in government expenditures should also have only a one-time effect on prices.

As to administration, the value added tax does contain an element of self-enforcement that is lacking in other types of general sales tax. The firm buying from another firm is harmed if its vendor understates the price actually charged, in an effort to deceive the tax administration and reduce its own VAT. The purchasing firm's credit for input tax is correspondingly reduced, and its net VAT payable is increased. This conflict of interests between customers and suppliers is particularly noticeable when the tax administrators check the records of the two firms with respect to particular transactions. A discrepancy between the two firms' tax records rings a warning bell: one of them must be cheating, or at least incorrect. In contrast, the turnover tax and other types of sales tax take no account of what a firm pays for its input, in computing the firm's tax. The VAT will still be far from self-enforcing, however. The task of matching buyer's and seller's records on each particular transaction is an enormous one, perhaps not achievable even with a high degree of computerization.

2.10. VAT and Equity

As anti-VAT protests and demonstrations around the world show, there has always been considerable popular concern about the equity aspects of the VAT. Equity is always and

everywhere a central issue in taxation. Indeed, from one perspective the principal rationale for taxes in the first place may be thought of as an attempt to secure equity. Strictly speaking, governments do not need taxes to secure money: they print the money in the first place. The role of the tax system is thus in a sense to take money away from the private sector in as efficient, equitable, and administratively least costly fashion as possible. One person's conception of what is considered to be equitable (fair) may of course differ from conceptions held by others. In the end, only through the political institutions within which countries reconcile (if they do) such conflicting views and interests is the nature of an equitable tax system be defined and implemented – sometimes with results that may diverge widely from what may be considered fair or equitable in terms of outside normative standards.

Construction of a rational tax system has proved to be a step as difficult as it is delicate. The main reason is that its foundation principles and demands are often contradictory and extremely difficult to harmonize: moral and ethical demands of equity and tax justice, tax efficiency and technical principles of social policy and fiscal policy. Principle that has been given special attention over time is that of fairness, ethical principle par excellence. "Equity should be the rule and taxation objective [...] since we were all created equal. But fairness does not mean that all individuals should be charged as [...] it implies that any tax act to be done correctly, taking into account a particular context or situation." (Henry George, 1881). Achieving ethical goals is very difficult to accomplish. Murray Rothbard pointed out that in this respect "Our conclusions are two: (1) economic science cannot justify any principle of fair taxation and that nobody has managed to establish such a principle and (2) neutral tax, which seems to many an achievable ideal, logically proved unobtainable. Economists should abandon their quest for fair and neutral tax." However the public debate related to finding the optimal tax

system both socially and economically, is becoming increasingly heated. The idea of fairness in taxation was perceived differently from author to author and from one era to another. So over the last century have crystallized three major normative theories that have attempted to define an ideal tax system and fairness of each of these three cases is seen differently.

The first theory on chronological order of their appearance, Equitable Taxation theory, has its origins in the writings of Henry Simons (1938), a recognized advocate of classical liberalism. The role of the State was to create equity through redistribution. Equity is achieved mainly horizontally, by applying the same rates to the same income. Taxation which is solely aiming the fiscal equity, is disregarding efficiency objectives. The second theory was the theory of Optimum Taxation, based on the doctrine of sacrifice and was developed by the classical school. In *The Principles of Political Economy* (1891) John Stuart Mill states that the fairness of taxation is that each taxpayer bears the same burden and the same sacrifice. Modern welfare economics (Pigou), interpreted the sacrifice as a utility loss, claiming that in order to equalize marginal utilities to minimize the sacrifice aggregate caused by taxation. Later, Frank Ramsey (1927), James Mirrless (1971), Peter Diamond (1971) also reiterated the idea that the tax system should involve the smallest sacrifice, but define sacrifice as a reduction in social welfare, and not as simply individual utility loss.

Exchange Theory of taxation, the most recent theory, is looking for a tax system as close to perfect. The idea comes from the old tax theory of voluntary exchange Knut Wicksell's (1896) and the works of James Buchanan (1976-1980). This theory involves narrow, multiple elastic tax bases. Regarding tax rates are recommended fair rules to limit taxation by discrimination.

From the findings above it appears that the three approaches have very different views on the fiscal construction, how tax is levied and how the idea of fairness can be applied in the system.

Regarding their applicability, can be said that all three approaches were used as starting points to build different tax systems. Thus, the theory of fair taxation exercised most pronounced impact on the systems of USA, Sweden and Ireland. Optimal tax theory has exercised a less visible effect in recent years. Theory of tax exchange had a minimal effect at least until now the current tax system; it is visible only as theoretical support for constitutional changes to limit the power of local or state tax in the U.S. So equity in taxation is an easy to pronounce, but difficult to accomplish in practice, and neutralization of taxes is absolutely obvious conflict with their redistributive role and their quality of fiscal levers.

2.11. VAT and Revenue

Recent studies have questioned the capability of VAT to replace revenues from trade liberalization, especial kin lower-income countries. Some countries may want to retain some taxation of international trade simply because of the apparent relative inefficiency of VAT administration compared to the administration of taxes (tariffs) at the border. If VAT can be administered adequately, however, the conventional conclusion that it offers the best way for a country to make up revenue losses from trade liberalization appears generally to hold—though much more convincingly for more developed countries than for the poorer countries in which trade taxes are generally more important and alternative tax bases less accessible. The critical point is that a country must have the capacity to administer VAT adequately. Other things being equal, the average economic cost of collecting revenue is less with VAT simply because the base of VAT is invariably broader than that of the taxes (tariffs, excises or other sales

taxes) that it replaces. Even if increasing the rate of an existing VAT will neither necessarily increase revenues proportionately nor be costless, it is nonetheless often the economically most sensible way to expand revenue share in developing and transitional countries.

A number of empirical studies have examined the relationship between reliance on VAT and the size of government. In the recent U.S. tax reform discussion, for example, the alleged relationship between VAT and government size was one reason for some opposition to VAT although a recent review of the evidence concludes that VAT is not “a money machine that would finance the expansion of government.” In a cross-country analysis, an IMF study in 2001 noted a number of empirical regularities with respect to trade, country size, and government size:

- ✓ Countries without a VAT tend to be small, with the notable exception of the U.S. and India (prior to 2005, when a number of state-level VATs were introduced; the 2006 budget speech announced the intention to adopt a central VAT by 2010).
- ✓ Countries that have implemented a VAT have relatively higher per capita GDP levels and rely less on international trade.
- ✓ Both income and openness (defined as the sum of exports and imports divided by GDP) are positively correlated with the ratio of taxes to GDP.
- ✓ Government consumption and importance of trade are positively correlated, but government consumption as a share of GDP is smaller in larger countries, and small countries tend to be more open to international trade.
- ✓ A relatively high ratio of trade to GDP is conducive to VAT revenue performance presumably due to the relative ease of collecting VAT at the point of import.
- ✓ Economies for which international trade is important tend to have higher tax yields whether or not they operate a VAT.

- ✓ Very small economies may have characteristics that facilitate tax enforcement such as social structure and remoteness.

A subsequent update of this analysis cautiously concluded that “there is some evidence that the presence of a VAT has been associated with a higher ratio of general government revenue and grants to GDP.” The study went on to note that this relationship seems stronger the higher GDP per capita and the lower the share of agriculture in GDP, though the latter relation may simply reflect the common exclusion of most agricultural activity from VAT. Similarly, the study suggested that although the revenue impact of VAT seems smaller the higher the import ratio this may simply reflect the fact that tariffs (or other taxes) may be equally effective in such countries. On the other hand, all else equal, the more important foreign trade, the more revenue can be collected from an existing VAT. The obvious interpretation, as already mentioned, is that border formalities (and, perhaps, an established customs service) make the collection of VAT on imports relatively easy. Perhaps the most important point emerging from these studies is the extreme variation across countries in the revenue performance of VAT, reflecting a very wide range of factors including differences in tax design, differences in economic environment, and different characteristics (e.g. literacy) in different economies. Definitive answers with respect to VAT’s revenue impact are, it seems, considerably more difficult to come by than the simple assertions that characterize political debate everywhere.

The effectiveness of the VAT in raising public revenues has been praised since its introduction almost fifty years ago. Keen (2007) argues that this simple non-distortionary indirect tax has proved itself as a ‘money-making machine’, with over 130 countries having adopted it as of 2007. Yet research on the impact of the VAT as a special kind of indirect tax on poverty and income distribution has been very scarce and mostly inconclusive. World Bank (2003) reviews empirical studies on the incidence of VAT and other indirect taxes in some African and Asian

countries. Most studies find tax structures in these countries to be progressive, as most goods consumed by the poor are zero-rated. Yet the evidence from India and Pakistan reveals that a single-rate VAT system is highly regressive. Prieto-Rodriguez, Romano-Jordan and Sanz-Sanz (2005) use an AIDS model to identify the welfare effects of a VAT cut on cultural goods and find that the potential gains might be regressive.

2.12. Problems in Implementing VAT

This section discusses several problems or factors that might retard the development of the GST or VAT system which should be taken into account by the government before GST become into the force as problems can occur on both sides of taxpayers and administrators.

2.12.1. Computerization and Trained Personnel

Implementation and enforcement of GST will need administrators to have an efficient computerization system which could carry out the task of checking and auditing the revenues from GST. James and Zheshi (2004) proposed three things to enhance the management and supervision of the VAT invoices. Firstly, the printing of the VAT invoices must be further upgraded. It must have the ability of anti-counterfeit. Secondly, the management of the VAT invoices must be based on computers, and then a network, especially for the administration of the VAT invoices and tax collection, must be formed all over the country. Finally, tax collectors must more strictly verify the VAT invoices with large amount. In all, the management and supervision of the VAT invoices must have the instant information processing capability. Apart from this, the administrators should also be ready with well trained personnel to operate the computerization system. The personnel should also be knowledgeable about the GST since in the initial period, the public which does not very

familiar with the new tax system will need extra guidance from the administrators. From the discussion above the implementation of GST needs advance preparation, adequate investment in tax administration because the management of the GST must have efficient computerization system. This requires that the government spend money to buy computers and also train the staff that will operate this computerization system in addition to provide an extensive public education program. These considerations should be taken into account before the GST become effective lest there will be a serious delay in the implementation of this system.

2.12.2. Rate of tax and Exemption

The government should carefully choose the most suitable tax rate so that the tax will not burden the poor. Considerations should be made on whether the GST to be levied at a single rate, or a higher rate to certain products which is considered luxury products. However the government will face some problems when it takes into account these considerations. For example, if the government takes into account the poorest in the country and offers lower tax rate on necessities this will benefit the rich more because they will spend relatively less of their income and receive more benefits from these concessions. But if the government imposes high rate in luxury goods, taxpayers may seek to lower their tax liability through both legal and illegal means. Kelly Edmiston and Bird (2004) argue that imposition of high tax rates on sales of 'luxury' goods are an ineffective means of increasing progressive fiscal system and any minute 'benefit' attained in this fashion is unlikely to suffice to offset the costs in terms of reduced efficiency and effectiveness of the tax. Furthermore, the government will also have to consider products that should be exempted from GST. Usually necessity products such as food should be exempted from tax.

Kenny (2000) examined whether food should be exempted from GST. They found that there is a strong support for GST food exemption. However implementing the GST on a broader base will reduce the administrative cost and increase the revenue. The broader the base the better it is for two reasons. First, with a broader base, the rate required for any revenue is obviously lower, which means that the efficiency cost of raising revenue is correspondingly lower. Second, administration is simpler with a broader base, in part simply because there are fewer avenues of escape and in part because a larger proportion of all activities are encompassed in the tax net to (Kelly Edmiston & Bird, 2004). From this discussion it can be understood that the choice between a single-rate and a multiple-rate VAT depends on balancing tax administration considerations: If the government uses differentiated rates by lowering the tax rate on necessities and imposing high rate in luxury goods this may increase the administration cost and will lead to reduced revenue. However, if the government uses a single rate on broader base this will reduce the administration costs and will increase the revenue but a single rate will affect the poorest in the country .So the government should choose the most suitable tax rate so that the burden of tax will not be too aggressive to the poor and should not lead to reduced revenue. Choose the most suitable tax rate and determine the goods that should exempt are not easy for government and may take long time.

2.12.3. Accounting Records

Most small businesses do not have a proper system to keep accounting records. But the implementation of GST will need businesses to keep their accounting records accordingly. This is because proper documentation and accounting records will influence in determining the exemption threshold of the businesses. Proper documentation and accounting records will also be useful when the government wants to perform audit and investigation. Patterson (1990)

indicates that despite the simplification of the goods and services tax announced by the government, there are no easy solutions for small businesses.

2.12.4. Education

According to Singh (2007), it is essential that the general public, in particular businesses and traders are adequately informed about the features of the VAT and the procedural requirements before the GST legislation comes into force. This is necessary to avoid unwarranted increases in price of goods and services. Knowledge about VAT should be spread to public especially to the businesses parties. This is to avoid any discrepancies in implementing the system and also to avoid the traders from pulling up the sales price which will definitely become a burden to the end consumers. This requires a comprehensive education campaign. The campaign should involve a wide range of stakeholders and distribution of different types of informational materials throughout country and also should be extended to low-volume traders and consumers. From the discussion above there are two important things that taxpayers should have for implementing the VAT which are accounting records and knowledge about the features of the VAT and the procedural requirements before the VAT legislation comes into force. Without these, there is bound to be a delay in the implementation of VAT because it is important that knowledge about the features of the VAT be spread to the public time before the tax becomes effective.

Economists have argued for centuries that taxation should be imposed on consumption not income, in order to avoid the disincentives to paid labor, investment and savings that income taxes create. However, commodity taxes impose a greater tax burden on the poor than on the

rich because the poor spend most or all of their income in basic consumption. Commodity taxes also alter the relative prices of taxed and untaxed goods and thus alter individual and household decisions about consumption, and business decisions about investment and production. Commodity taxes generally seek to apply the lowest rate possible to the broadest possible tax base, with minimal exemptions.

2.13. Impact of VAT on General Price Level

In the early stage of GST implementation, the fact that the price level will be increased cannot be denied. Since the public is still in the transitional process, traders will go for option in pulling up the price. However, according to Singh (2007), the introduction of GST may bring about a one-time increase in the cost of living; the probability of it leading to inflation is not high. GST may lead to increase in consumer price at the early stage of implementation, but GST will not have a huge effect on inflation James and Zheshi (2004) maintain that when the VAT was introduced in China in 1994, it did not cause any inflation. Compared with the taxation reform of 1994, the proposed transformation of the VAT is far less complex. Based on the above discussion, it is clear that the imposition of GST by itself cannot be considered inflationary or deflationary even if sellers able to raise price to cover what they pay since this would constitute one time increase in their prices but would not necessarily lead to inflation which is continuous increase in the average of price over the time.

2.14. Economic and Social Implications of Exemptions

In this section we will discuss the implication of VAT exemptions, zero rating and reducing the standard rate on the social and overall economy y reviewing different books and articles.

2.14.1. VAT Exemptions and Production

To avoid creating economic distortions, the VAT should theoretically be neutral in the production and distribution chain (for the producer, wholesaler, and retailer). Exemptions occur when output is untaxed but input tax is not recoverable. Exemptions break the VAT chain and create a cascading effect. The tax has to be paid by the producer using the exempted item, and no longer by the final consumer. This cascade effect increases production costs and creates distortions in the production choices. Contrary to common belief, the VAT no longer equals a consumption tax when exemptions are granted. The only way for the producer to remain neutral when faced with VAT exemptions would be to be able to charge this additional tax burden to the consumer by raising the sales price. This behavior would be possible if the supply was very elastic and if the producer could fix the price. Likewise, when the zero VAT rate on exported goods is not applied, the VAT credits of exporting firms are not reimbursed by the government and the problem is the same as in the presence of exemptions.

The reduction in exemptions and effective application of the zero VAT rate should enable an increase in the country's economic efficiency and hence improve allocations of resources. From a social standpoint, any additional burden for the producer impacts the poverty level of the country by provoking a slow-down in the production system and a decrease in revenue from the production. Nevertheless, the end of exemptions can have an ambiguous effect in terms of poverty, as the latter also depends on households' ability to access basic goods.

2.14.2. VAT Exemption and Public Revenue

First, the problem of VAT application creates a gap between the VAT nominal rate and the effective VAT rate. Secondly, the tax expenditure brought about by VAT exemptions is difficult to evaluate (Gautier, 1999): “Although the government loses revenues on the sales of

non-taxable firms, it completely reclaims the non-exempted inputs of these same firms.” The effect therefore depends on the net value of the tax base.

In 2004, Department of Finance of Canada undertook a study that compared the impact of seven different tax measures on domestic welfare. The study looked at the degree to which changes in the tax mix affect households’ and businesses’ decisions about consumption, investment and participation in the labor market. The measures were ranked based on the magnitude of improvement they bring to economic well-being; a concept that reflects our level of satisfaction with the amount of goods and services we consume and the amount of leisure time we have. The measures examined by the study included (i) a cut in personal capital income taxes, (ii) a cut in sales taxes on capital goods, (iii) a cut in corporate income taxes, (iv) a cut in personal income taxes, (v) a cut in payroll taxes, (vi) a cut in consumption taxes, and (vii) an increase in capital cost allowances on new capital. Surprising or not, the study found that reducing consumption taxes would bring the smallest improvement to the overall well-being of Canadians. For instance, if the revenue coming from consumption taxes is reduced by \$1 but is compensated from other sources (i.e. the total dollar amount of the government tax revenue is the same before and after the tax cut), the economic well-being would rise by only \$0.13. Instead, if the revenue from taxing personal capital income is reduced by \$1, the economic well-being would improve by \$1.3. Hence, a cut in the GST yields the least optimal economic pay-off. Furthermore, the study concludes that a cut in consumption taxes would have the lowest (compared to other measures) impact on the real GDP and stock of capital both in the short and long run, although it will increase consumption in the first years after the cut. On the other hand, measures such as lower income and capital taxes could create a larger positive impact on GDP and capital in the short run, and would

outperform (over a period of 15 years) the spike in consumption due to lower consumption taxes.

In their study, Bird, Vazquez and Torgler (2007) concentrated on the relevance of demand factors such as corruption, voice and accountability. They opined that not only supply factors matter, but that demand factors matter quite significantly in the determination of tax effort. They concluded that a more legitimate and responsive state is likely an essential precondition for a more adequate level of tax effort in developing countries. This calls for attention to countries' specific factors. Tanz and Davoodi (1997) also found empirical support for the relevance of demand factors. Thus, they argued that the quality of institutions and governance influence tax revenue through their contribution to tax evasion, improper tax exemption and weak administration. This study will observe that in Ethiopia, the institutions and governance may not likely influence VAT revenue through these outlets but rather through corruption, voice and accountability; and also the study will try to address this problem mainly with respect to the contribution of VAT revenue for economic development and its impact on the Social Spending in Ethiopia. Therefore, the purpose of this paper is to examine the implications of implementation of VAT on the revenue productivity, equity principles and its impact on the social spending in Ethiopia. According to Singh (2007), various matters need to be considered carefully before a comprehensive GST system can be introduced.

The research conducted by Sònia Muñoz and Stanley Sang-Wook Cho (2003) in the Case of Ethiopia indicated that the tax reform has not had a major adverse effect on the poorest 40 percent of the population. The VAT is progressive in its incidence, and the higher revenues brought about by the VAT can provide additional funds for poverty-reducing spending, including primary education. At the same time, there is significant scope for making education

spending more pro-poor by increasing the access of low-income households to schools. But the study used some basic data of the neighboring country, Tanzania (Social Accounting Matrix), and also the study is made as soon as the introduction of VAT on January, 2003 without due consideration regarding the trend of the tax reform impact on social study (i.e. the researchers used only one year data of VAT which may not be representative). So that, this study will consider the trend of VAT tax revenue contribution for economic development of Ethiopian state and its impact on social spending by taking the basic micro-economic indicators.

Chapter – Three

3. Research Methodology

The study considered post positivism knowledge claim in which the researcher look to the "what" to research based on its intended objectives. Post positivism reflects a deterministic philosophy in which causes probably determine effects or outcomes. In other word, the study used quantitative research approach. This approach is used since the implication of value added tax (VAT) could be better understood with quantitative data. Furthermore, information generated though this approach can help capture issues regarding the study objectives. Moreover, this approach can help to confirm findings of different sources in line with the

objective of this study. As to Phillips and Bubbles (2000), using this approach can result in well-validated and substantiated findings.

3.1. Research Method

The study employed specific techniques of data collection and analysis methods in a way that seems pertinent to the study. As a result, the paper used specific tool, which is reviewing the existing data that enable to capture information pertinent to the study objectives. That means, the study employed a documentary reviewing method. Thus, time series data were collected from Ministry of Finance and Economic Development (MoFED), Ethiopia Development and Research Institute (EDRI) and Ethiopia Revenue and Custom Authority (ERCA) financial statements and annual reports for the year 1995-2002 E.C or 2003/04-2009/10 G.C. Since VAT was launched in January 1st, 2003 G.C, there is only eight years annual data available which is not sufficient to have normality and to test hypothesis under estimation method of Ordinary Least Square (OLS). In order to resolve the limitation (shortage) of data, the researcher used quarterly data for all variables both dependent and independent. The quarterly data are manipulated using interpolation method suggested by Goldstein.M and M.S.Khan (1976). The method of interpolation is briefly described in Appendix 4.

The study considered a vector of micro-economic development indicators as dependent variables, and regressed each on VAT revenue, and other government income allocation to Ethiopia economy. Micro-economic sectors that are considered include Infrastructural Development (ISD), Education Sector Development (ESD), Agricultural and Natural Resource Development (ANR), Health Sector Development (HSD), and Other Development indicator sector (ODS). After all, in order to generalize the study, the

researcher aggregated all capital expenditure on the respective sectors as a single dependent variable, economic development indicator sector (DIS). These sectors indicate the Ethiopia State economy in which VAT revenues are expended for development purposes. These sets of development indicators were perceived to enhance empirical analysis and drive achievement of the study objective. To this end, a multiple regression model of time series type was employed so as to form the functional relationship between VAT revenue and its allocation to developmental sectors of the economy assuming that other things remain constant.

Each model is estimated and evaluated vis-à-vis a priori expectations and relevant statistics. Method of estimation employed is ordinary least squares (OLS) techniques. In addition to this model, the study used some descriptive statistics such as VAT revenue to GDP, total government income, and total tax revenue. The descriptive statistics is used in addition to the regression model in order to build strong conclusion about the impact of VAT tax revenue for economic development and social spending, equity. However, most of the studies done by former researcher considered only either of the two while evaluating the impact of tax reform which may not be sufficient enough. However, this study employed both the descriptive statistics as well as regression model.

3.2. Models Specification

Guided by the perceived functional relationship between the matrix of development indicators and vector of VAT revenue a link is forged between each set of the relationship by taking the other government income (all government tax revenues excluding VAT tax revenue, loan, donation and grants) as additional variable. From sub-macro perspective, the models theoretically state that development of the economy

depends on VAT revenue allocation to the state. From micro perspective, the models state that development of the respective economic sectors of the Ethiopia depends on VAT revenue allocation spent on each economic sub-sector by the State, keeping other factors constant. The study adopted the model specified by Golit (2008) in his study of Nigeria's Tax Efforts. However, this study modified the model by way of disaggregation for sectors' specific contributions, more or less similar to the study conducted by Owolabi S. A and Okwu A. T (2010), and measures the contribution of VAT to each sectors in terms of logarithm, as a result, the outcome would be interpreted in terms of percentages (i.e. if 1% change in VAT, what is percentage change on development indicators) by taking other government income as other variable (OTR_REV). At this end, the study regress the VAT revenue and other government income over the whole capital expenditure of the respective sectors by taking the total of the expenditure of the respective sectors as a single dependent variable, economic development indicator sectors (DIS). Thus, the functional relationships and resultant models are as specified below.

- HSD = f(VAT_{Rev}, OTR_REV)I
- ESD = f(VAT_{Rev}, OTR_REV)II
- ANR = f(VAT_{Rev}, OTR_REV) III
- ISD = f(VAT_{Rev}, OTR_REV) IV
- ODS = f(VAT_{Rev}, OTR_REV) V

Moreover, to make a clear summery of the study finding, the researcher took the total capital expenditure on each sector as one dependent variable and functional relationship looks as follows:-

$$DIS = f(VAT_{Rev}, OTR_REV) \dots\dots\dots VI$$

Functions I – V, these sectors are considered critical in the development process of the state economy. From the above functional relationships, stochastic models I – V below are the general specification of the model.

$$\text{LogHSD} = \alpha_1 + \beta_1 \log \text{VAT}_{\text{Rev}} + \gamma_1 \log \text{OTR} + \mu_1$$

$$\text{LogESD} = \alpha_2 + \beta_2 \log \text{VAT}_{\text{Rev}} + \gamma_2 \log \text{OTR} + \mu_2$$

$$\text{LogANR} = \alpha_3 + \beta_3 \log \text{VAT}_{\text{Rev}} + \gamma_3 \log \text{OTR} + \mu_3$$

$$\text{LogIND} = \alpha_4 + \beta_4 \log \text{VAT}_{\text{Rev}} + \gamma_4 \log \text{OTR} + \mu_4$$

$$\text{LogODS} = \alpha_5 + \beta_5 \log \text{VAT}_{\text{Rev}} + \gamma_5 \log \text{OTR} + \mu_5$$

$$\text{LogDIS} = \alpha_6 + \beta_6 \log \text{VAT}_{\text{Rev}} + \gamma_6 \log \text{OTR} + \mu_6$$

Furthermore, economic development sector indicators show a tendency to persist over time, reflecting impediments to macroeconomic shocks to the extent that these are serially correlated. Therefore, the paper adopted a specification of a dynamic model by including one period lagged values of dependent variable among the regressors so as to overcome autocorrelation problem. The consequences for the model, if there is autocorrelation, in general, the model could encounter any combination of three problems:

- ✓ The coefficient estimates (β 's) are wrong,
- ✓ The associated standard errors are wrong, and
- ✓ The distributions that were assumed for the test statistics are inappropriate.

Thus, the study augmented with one period lagged values as a result the model becomes dynamic model. Since lagged values are used to regress in order to eliminate autocorrelation, the final models are specified as follows:-

$$\text{LogHSD} = \alpha_1 + \beta_1 \log \text{VAT}_{\text{Rev}} + \square_1 \log \text{HSD1} + \gamma_1 \log \text{OTR} + \mu_1 \quad \text{Model I}$$

$$\text{LogESD} = \alpha_2 + \beta_2 \log \text{VAT}_{\text{Rev}} + \square_2 \log \text{ESD1} + \gamma_2 \log \text{OTR} + \mu_2 \quad \text{Model II}$$

$$\text{LogANR} = \alpha_3 + \beta_3 \log \text{VAT}_{\text{Rev}} + \square_3 \log \text{ANR1} + \gamma_3 \log \text{OTR} + \mu_3 \quad \text{Model III}$$

$$\text{LogIND} = \alpha_4 + \beta_4 \log \text{VAT}_{\text{Rev}} + \square_4 \log \text{ISD1} + \gamma_4 \log \text{OTR} + \mu_4 \quad \text{Model IV}$$

$$\text{LogODS} = \alpha_5 + \beta_5 \log \text{VAT}_{\text{Rev}} + \square_5 \log \text{ODS} + \gamma_5 \log \text{OTR} + \mu_5 \quad \text{Model V}$$

$$\text{LogDIS} = \alpha_6 + \beta_6 \log \text{VAT}_{\text{Rev}} + \square_6 \log \text{DIS1} + \gamma_6 \log \text{OTR} + \mu_6 \quad \text{Model VI}$$

Where

$\log \text{HSD1}$, $\log \text{ESD1}$, $\log \text{ANR1}$, $\log \text{ISD1}$, $\log \text{ODS1}$, and $\log \text{DIS}$ are the one-period lagged value of health, education, agricultural and natural resource management, infrastructure development, and other development indicator sectors respectively; and \square_i is the speed of adjustment to equilibrium. Moreover, α_i is a constant, and β_i , \square_i and γ_i are coefficients, while μ_i is an error term.

Models I - VI, where α_i ($i = 1; 2, 3; 4, 5; 6;$) are models parameters, which is the autonomous expenditures; β_i ($i = 1, 2, 3, 4, 5, \& 6$) are model parameters, which is the measure of responsiveness of developmental indicators to percentage change of VAT (i.e., the coefficient estimates $\beta_1, \beta_2, \dots, \beta_6$ which quantify the effect of each of these explanatory variables on *dependent variables*). The coefficient interpretations are slightly altered in the multiple regression contexts. As a result each coefficient is known as a partial regression coefficient, interpreted as representing the partial effect of the given explanatory variable on the explained variable, after holding other independent variables constant, or eliminating the effect of all other explanatory variables. In other words, each coefficient measures the percentage change in the dependent variable per percentage change in a given independent variable, holding all other independent variables constant at their average values; \square_i ($i = 1; 2, 3; 4, 5; 6;$) are models parameters, which is the measure of responsiveness of developmental indicators to percentage change of lagged value their respective dependent variable (i.e.,

lagged value is used to measure the effect of the previous period expenditures on the current period capital expenditures); γ_i ($i = 1, 2, 3, 4, 5, 6$;) are models parameters, which is the measure of responsiveness of developmental indicators to percentage change of other government income; and μ_i ($i = 1, 2, 3, 4, 5, 7$) are stochastic terms associated with the respective models , which is error term.

A priori, each model parameter is expected to have a positive sign. That is, β_i , α_i , γ_i , and α_i ($i = 1, 2, \dots, 6$) > 0 . By implication, some levels of development are expected in these economic sectors even when no revenue accrues to the state government from VAT. Also, development in each sector is expected to correlate positively with VAT proceeds allocated for its capital expenditure. The sub-sectors included under Agriculture and Natural Resource Development are capital expenditure for Agriculture, water resource management, mining and energy, irrigation, tourism and national park; capital expenditure under Infrastructural Development are construction, information and communication, and transportation and communication; whereas, Other Development indicators include capital expenditure for social security, labor and social affairs, culture and sport, trade and industry, and urban development and housing.

3.3. Method of Data Analysis

After data are gathered through the aforementioned methods, and tools, it is tabulated, analyzed and interpreted. To enhance the attainment of a quantitative measure of the contribution of VAT for the development of the Ethiopian state of research interest, the study employed multiple analysis technique as the tool for empirical analysis. The analysis

centers around achieving the broad objective which is to empirically evaluate the contribution of value added tax revenue for the development of Ethiopian economy and its impact on social spending. Expectedly, equity in distribution and efficiency in utilization of VAT revenue to the various sectors and subsectors of the economy at any level will enhance optimal development of such economy and reflect in the desirability and output of the specific sectors and subsectors. Therefore, to checkmate out-crowding effects, the study examined the relevant sectors on individual basis. Thus, each of the sectors share in tax revenue was regressed on tax revenue allocated to it, since direct measurement of each sectors output proved difficult.

The data used for the study are totally quantitative, and thus quantitative data analysis techniques were employed. The quantitative data were analyzed by using different ratios and regression models using E-views (OLS technique). The analysis involves regression analysis and descriptive statistics such as percentage by categorizing variables or accounts into relevant and understandable manner. Therefore, the results is presented in tabular forms and interpreted accordingly.

3.4. Models Estimation and Research Hypothesis

To estimate the models, data on VAT tax revenue allocation to Ethiopia State economy and disbursement to micro-economic sectors of study interest are elicited from the sources for statistical analysis and discussion. The hypotheses below guide the discussion of the empirical statistical evaluation:

H_0 : VAT has no significant contribution for the development of Ethiopia State Economy.

H_1 : VAT has positive significant contribution for the development of Ethiopia State Economy.

The *t*-test was used to test single hypotheses, i.e. hypotheses involving only one coefficient. The *t*-testing framework is not sufficiently general to cope with multiple model sort of hypothesis test. Instead, a more general framework is employed, centering on an *F*-test. Any hypothesis that could be tested with a *t*-test could also have been tested using an *F*-test, but not the other way around. So, single hypotheses involving one coefficient can be tested using a *t*-test or an *F*-test, but multiple hypotheses can be tested only using an *F*-test. The regression output of both *F*-test and *t*-test for all models are given on the appendix 3. To determine the relevant hypothesis to adopt, the researcher evaluated each of the estimated models for contributions and statistical significance. Model parameters were estimated based on VAT revenue to Ethiopia State and subsequent disbursement for development of the selected micro-economic sectors as shown on appendix 5.

Chapter Four

4. Result and Discussions

Taxation and tax policy are playing important role in the economic development in the last decades. As the principal means by which governments fund their expenditures, taxes are at the foundation of public finances. Taxes have been used throughout the world in the most of their role of regulating the economic issues. A properly designed tax system implies readier taxpayer acceptance of that expenditure burden. It should promote the maintenance of a high and sustainable level of output by minimizing both distortions to market-set prices and disincentives to work, saving and investment. But optimal tax policy goes beyond mere efficiency and funding considerations to encompass inevitable normative judgments about the amount of redistribution, equity. The major aim of most governments in developing countries is to stimulate and guide their economic and social development. These governments continue to reach out for the goal of government promoted and directed development. Kaldor (1980) pointed out the importance of government tax revenue in accelerating economic development. Whatever the prevailing ideology or political situation of a particular country, it must steadily expand a host of non-revenue yielding services such as education, health, infrastructure, and social security. Wilford (1978) asserted that one of the most important policy upon which most economists agree is that emerging nations must increasingly mobilize their own internal resources to provide economic growth. The most important instrument by which resources are marshaled is through the implementation of an effective tax policy and spending the money collected on the basic economic development sectors.

4.1. The VAT Regime in Ethiopia

The VAT proclamation No 285/2002 which has rescinded and replaced the sales and excise tax proclamation No. 68/1993 (as amended) and which has come into force as of January 1st, 2003 is a consumption tax which is levied and paid as value added tax at a rate of 15 percent of the value of every taxable transaction by a registered persons, every import of goods, other than an exempt import and an import service rendered in Ethiopia for a person registered in Ethiopia for VAT or any resident legal person by a non resident person who is not registered for VAT in Ethiopia. (Article 7 (1) (a)-(c) and Article 23 (1) and (2)) A taxable transaction is a supply of goods or a rendition of services in Ethiopia in the course or furtherance of a taxable activity other than an exempt supply. (Article 7(3)) A taxable activity is any activity, which is carried on continuously, or regularly by any person in Ethiopia, or partly in Ethiopia, whether or not for a pecuniary profit that involves, in whole or in part, the supply of goods or services to another person for consideration. (Article 6 (1) and (2)) Supply means the sale of goods or rendition of services or both and rendition of services means anything done, which is not a supply of good or money. (Article 2(17) and Art.4 (1)) For the purpose of the VAT proclamation the following are considered as taxpayers on whom the VAT law is applicable.

These are: -

- (a) A person who is registered or is required to register for VAT;
- (b) A person carrying out a taxable import of goods to Ethiopia;
- (c) A non-resident person who without registration for VAT renders service in Ethiopia for any person registered in Ethiopia for VAT or any resident legal.

4.1.1. VAT Structure in Ethiopia

The VAT law contains two VAT rates. One is the standard 15 percent rate and the other is zero-rated. In terms of design VAT is imposed on the supply of goods and services other than exempted supplies (such as bread and milk). VAT is based on the invoice credit method in which taxpayers are given credit for the VAT paid on inputs when it is supported by the relevant documents. The tax is also based on the destination principle in that imports are taxed but not exports. VAT is chargeable at a standard rate of 15 per cent on all taxable supplies of goods and services other than those zero rated (mainly exports). VAT registration is required by businesses that have annual turnover of Ethiopian Birr (ETB) 500,000 and more. The VAT legislation allows refunds to be made to mainly exporters within two months from the time applications are lodged. Non-exporting taxpayers are required to carry forward excess credits to the next five accounting periods; if there are still unused excess credits it is allowed (at least in the legislation) to be refunded within two months from the time of lodging applications. VAT is administered by the ERCA and the Regional Government's Finance Bureaus.

4.1.2. Analysis of the VAT versus Sales Tax in Ethiopia

As noted above, the VAT replaced the sales tax in Ethiopia as of January 1, 2003. In comparison to the sales tax, the new VAT:-

- ✦ Taxes services in addition to production,
- ✦ Grants zero-rating to exports, and
- ✦ Gives exemptions to fewer basic products.

The VAT is expected to enhance revenue, improve economic efficiency, promote exports, and foster growth. However, the broadening of the tax base, the increase of the tax rate, and the

choice of exemptions will have differential effects on the income or expenditures of different groups of the population. In an important deviation from the basic logic of a VAT, Ethiopia has adopted a VAT exempt certain items and activities. In these cases, output is untaxed and the VAT paid on inputs is not recoverable. Exemptions complicate administration, erode the tax base, distort input-choice decisions and increase selling price of the products; consequently, they will adversely affect poor. Some items are exempted to improve the distributional impact of the tax—a potentially reasonable tradeoff. Others might be exempted for administrative or political reasons.

VAT was initially introduced in January 1, 2003; the sales tax underwent several amendments until its abolition at the end of 2002. Under the latest amendment (January 2001), the sales tax was levied on imports and domestically produced goods at a top rate of 15 percent. However, many goods, primarily agricultural products and food, pharmaceutical products, and printed books—were taxed at a lower 5 percent rate. A few specified services were taxed at the 15 percent rate, and financial services and work contracts were taxed at the lower 5 percent rate. Water, electricity, and medical and educational services were completely exempt. The tax paid on some inputs, including raw materials—narrowly defined to include materials embodied in the final product—was credited against the output tax. However, no credits were given to tax paid on capital equipment or on other inputs in the areas of distribution, warehousing, and administration. In summary, the sales tax base in Ethiopia was narrow because it was limited to imports, manufactured goods, and a few selected services. As a result, the government revenue is not sufficient to finance government expenditures. Since credit was given only for taxes paid on raw materials, the tax had a cascading effect, distorted efficient resource allocation, and thus likely impeded economic growth and equity.

Table 4.1: Comparison of sales tax with VAT in Ethiopia

Sales Tax		Value-Added Tax
Goods	Services	
<i>Tax rate :</i>	<i>Tax rate :</i>	<i>Tax rate :</i>

<p><i>15 percent</i> on the value of all goods and services other than specified below.</p> <p><i>5 percent</i> on the following:</p> <ul style="list-style-type: none"> a. live animals, meat, and fish b. fresh milk, cream, and eggs c. honey d. vegetables, fruits, and nuts e. cereals f. coffee, cocoa, and spices g. milled products h. pharmaceutical products i. hides and skins j. books and newspapers k. cotton l. sales of food in hotels & restaurants m. sales of local food and beverages <p><i>2 Birr/kg</i> on locally sold <i>chat</i></p> <p><u>Exempt items:</u></p> <ul style="list-style-type: none"> a. Bread, <i>Injera</i> b. Fertilizer c. Aviation fuel/ kerosene d. Railway/marine transport e. Equipment for national defense 	<p><i>15 percent</i> including:</p> <ul style="list-style-type: none"> a. telecommunications b. garage, laundry c. tailoring, translation d. photography e. auditing, engineering f. lodging g. consultation h. cinema i. commission agents j. barber/beauty salon k. tourism l. hire of goods <p><i>5 percent</i> on the following:</p> <ul style="list-style-type: none"> a. work contracts b. financial services <p><u>Exempt items:</u></p> <ul style="list-style-type: none"> a. water b. electricity c. medical services d. educational services 	<p><i>15 percent</i> on the value of all goods and services other than specified below.</p> <p><u>Exempt items:</u></p> <ul style="list-style-type: none"> a. sale/ transfer of used dwelling/lease b. financial services c. religious services d. medical services and goods e. educational/child-care services f. humanitarian goods & services g. electricity, kerosene, and water h. post-office supplies i. transportation j. printed books k. permits and license fees l. import of gold, currency <p>Zero rate on exports</p>
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Source: Sales tax proclamation (No.228/2001) and VAT proclamation (No.285/2002).

The newly introduced VAT has a uniform rate of 15 percent on most goods and services, with a zero rate on exports and exempted certain goods and services. The scope of exempted goods and services differs from that under the sales tax. Under the new VAT, the main exempt items are sales of used dwellings, financial services, medical and educational services, electricity,

kerosene, water, and transportation. The above table (table 4.1) presents the comparison of sales tax with VAT with respect to their tax structure and exemptions.

Generally, in comparison to sales taxes, VAT tax exempted mainly those difficult to tax than those benefits more the poor. That means, the VAT tax exemptions prevailing in Ethiopia are not systematically levied as a result, the exemptions are not in favor of creating equity. For example, if we take the exemption of financial services, the benefit goes to the wealthy people since the wealth people are most of the time who use financial institutions as compared to the poor. The same is true in the case of exemptions of ‘sale/ transfer of used dwelling/lease’. Moreover, the tax structure of the former sales tax levied different tax rate for different goods and services. However, the tax structure for VAT is a single tax rate, only 15%, which is explicitly looks proportionally but in reality, the VAT tax is regressive since it costs all individually equal irrespective of their income. Consequently, if the taxes paid by the poor and rich peoples are divided to their respective income, the ratio for the former is greater than the latter one. In conclusion, the VAT tax structure in Ethiopia, 15%, is not rational to create equity through income distributions. Since single rate without systematic exemptions of basic goods and services couldn’t favor the poor.

4.2. VAT Vs General Principles of Good Tax Characteristics

Taxes lower economic welfare. Yet other means of financing lower economic welfare as well, and are on balance worse. Thus, the researcher can paraphrase a famous Winston Churchill assessment of democracy in discussing taxation: "Taxation is the worst form of financing government -- except all others." While taxes in general impose some burden on society in the form of lost individual economic welfare, some taxes are better than others. Policymakers

should try to minimize the economic and social problems that taxation imposes. What criteria should be used in evaluating whether a tax minimizes harm to the members of society? While several have been suggested, only three criteria are universally accepted by experts in public finance. A good tax is:

1. Not costly for either government or taxpayers to calculate or administer; on the other hand, tax avoidance is difficult and risky.
2. Neutral in its impact on resource allocation decisions, minimizing negative effects on economic growth; it does not lead to unproductive economic activity that is tax-induced.
3. Fair; people believe that the tax burden is equitably distributed amongst the tax-paying population.

In comparison to the general principles of good tax characteristics, the prevailing VAT taxes in Ethiopia contradict with the third principle above. Generally, VAT in Ethiopia is costing the taxpayers (the final consumer) since the tax is computed on the selling price rather than the value added in each stage which will increase the price. Moreover, the VAT is not fair since the tax burden is not equitably distributed amongst the taxpaying people. Mainly, the root cause for this problem is lack of awareness of businessmen regarding to the new tax, VAT. Economists have argued for centuries that taxation should be imposed on consumption not on income, in order to avoid the disincentives to paid labor, investment and savings that income taxes create. However, VAT taxes in Ethiopia impose a greater tax burden on the poor than on the rich because the poor spend most or all of their income in basic consumption. Commodity taxes, VAT in Ethiopia, also alter the relative prices of taxed and untaxed goods and thus alter individual and household decisions about consumption (i.e., which is against the second

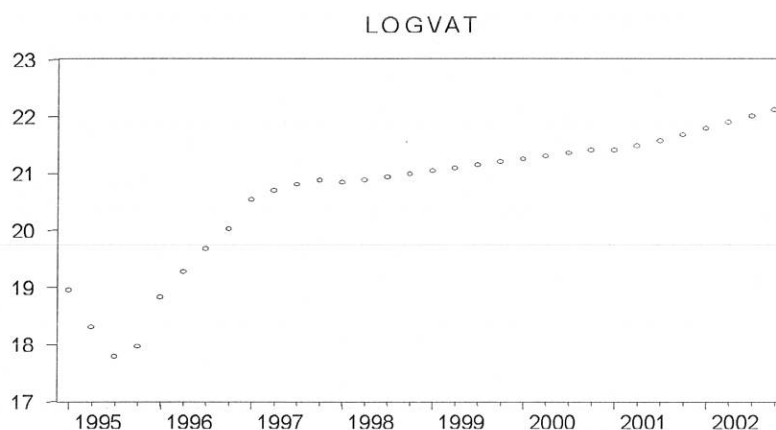
principle above, neutrality). Commodity taxes generally seek to apply the lowest rate possible to the broadest possible tax base, with minimal exemptions. But in Ethiopia, the tax structure is relatively high VAT tax rate, 15%, with no/minimum exemptions which will create inequality between the rich and the poor.

Sales taxes are viewed as inequitable, since the taxes are paid on a single product in different production and distribution channels which in return forces to increase the selling price of the final product mainly to the poor one. Export taxes are seen as inefficient, because they put the local producers who export their goods at a disadvantage compared with foreign producers. VAT was viewed as more efficient than import taxes, as it does not discriminate between domestic and imported goods. By eliminating import taxes, local consumers benefit from lower prices in the competition created between domestic and foreign producers, and it forces the local producers to become more efficient and concentrate their efforts on their comparative advantage. Even though the objective for introduction of VAT taxation is to overcome the shortcomings of sales taxes, the prevailing situation in Ethiopia is against the intended objective, overcoming the tax cascading effect. The existence of a tax cascading effect would have a number of problems on equity which is why taxation exists, "creating equity". Similarly to the former tax, sales taxes, practically the VAT tax system in Ethiopia is creating a cascading effect because of a lack of awareness of tax payers (business men) regarding the VAT tax system.

Moreover, the problem with respect to VAT in the country is a lack of awareness regarding the nature of the tax from the tax payers. On the other hand, the problem from the administration point of view is that the authority is considering VAT as "money machine" and its simplicity to collect tax rather than creating awareness regarding what it means by VAT and how and who is going to pay the tax? In the similar vein, the VAT tax structure, 15%, as well as the tax system, credit method, implemented in Ethiopia are against the intended objectives of tax reform and are in favor of the tax authority. Generally, the tax structure of VAT in Ethiopia is a single tax rate, 15%, which is very high and did not consider the consumption pattern of the poor and the wealthy people and it costs an equal amount of tax irrespective of their income level. That means, the ratio of VAT paid by each

individual household to their respective income is higher for the poor than the wealthy people as indicated by Sònia Muñoz and Stanley Sang-Wook Cho (2003) using the social accounting matrix (SAM) and general equilibrium model (GEM). This implies that, VAT is regressive in Ethiopia. But, if we consider only the administration of tax, VAT is the easiest and also a “money machine” as shown in the graph below.

Graph 1: VAT revenue (in terms of logarithm) for the period 1995 to 2002 E.C.



Source: E-views output

Even if VAT is a money machine, it has to be fair and create equity since the objective of tax is transferring of resource from wealthy people to the poor, which means creating equity. Equity considerations, namely, reducing poverty or inequality, have been of first importance, if considered at all, in the tax reforms. Focusing only on efficiency and revenue productivity may result in the adoption of regressive tax policies. For example, taxes on goods with low price elasticities of demand, such as some cereals and domestic fuel, are efficient in that they cause little behavioral response, that is, do not distort behavior as a result increases government revenue. However, since the poor consume these disproportionately, equity considerations will weigh against them. Generally, the problem of VAT in the context of Ethiopia is the same as to the problem of the former sales taxes, tax cascade. This is mainly

because of misunderstanding of the concept of VAT by the business men and failure by the tax authority create awareness regarding how and who is going to pay VAT tax after all to the government. The businesses men will simply add the input tax of VAT on their cost of production, as part of value added, while determine the selling price of the goods and services. But as per the common understanding (rule of thumb), VAT is supposed to be paid only on the value added by each production as well as distribution chain irrespective of the input tax paid.

In both developing and developed countries, there is concern that tax reform has adversely affected the poor both from the tax and the expenditure side. In developing countries, the increased reliance on indirect taxation such as the VAT has raised concerns about regressivity. This is because of the fact that, low income households generally spend a higher proportion of their income than high income households since single VAT tax rates, 15%, can result in poor families paying a larger share of their income in sales tax than wealthy people especially in Ethiopia were the exemptions are unsystematic.

Consumption taxes are generally regressive, since the poor spend more of their income on consumption than the rich. Consumption taxes can be made less regressive through targeted exemptions, or lower rates for goods purchased primarily by the poor, and/or through special taxes or higher rates on luxury consumption items primarily purchased by the rich and also by public spending which favor the poor. That means, though a VAT turns out to be regressive, the overall impact on the poor can be neutralized or reversed if the public expenditure financed by that tax effectively targets the poor. Likewise, even if the tax revenues are collected in a progressive manner, the overall effect on the welfare of the poor can be reversed if the benefit from public expenditure falls disproportionately on the rich.

4.3. Single-Rate and a Multiple-Rate VAT

There is a strong support for VAT food exemption. However implementing the VAT on a broader base will reduce the administrative cost and increase the revenue. The broader the base the better it is for the following reason. Administration is simpler with a broader base, in part simply because there are fewer avenues of escape and in part because a larger proportion of all activities are encompassed in the tax net too. From this discussion it can be understood that the choice between a single-rate and a multiple-rate VAT depends on balancing tax administration considerations and tax burden. If the government uses differentiated rates by lowering the tax rate on necessities and imposing high rate in luxury goods this may increase the administration cost and will lead to reduced revenue but this creates equity. Conversely, if the government uses a single rate on broader base, like Ethiopian VAT, this will reduce the administration costs and will increase the revenue but a single rate will affect the poorest in the country (high tax burden on the poor). This is basically the main problem is in Ethiopia VAT tax system. So the government is supposed to choose the most suitable tax rate so that the burden of tax will not be too regressive to the poor and should not lead to reduced revenue. Choosing the most suitable tax rate and determine the goods and services that should exempt are not easy for government and may take long time. However, the government of Ethiopia is in favor of reducing the administration cost rather than creating equity that is why the tax authority implemented a single rate, 15%, with broader tax basis and few exemptions which are against the main target of taxation. Though a VAT turns out to be regressive, the overall impact on the poor can be neutralized or reversed if the public expenditure financed by that tax effectively targets the poor.

4.4. Results of Descriptive Statistics

By spreading tax revenues across different tax instruments, ideally the fiscal system can better withstand economic fluctuations and can minimize the tax burden on any particular group of taxpayers or sectors of the economy. A frequently used measure of the effectiveness of a country's tax system, and/or its tax competitiveness relative to other countries, is the ratio of total tax revenue to Gross Domestic Product (GDP). VAT in Ethiopia replaced sales tax in the year 2003 G.C. and it becomes the principal source of revenue for the Ethiopian government. For instance, in 2006–07 fiscal years, federal VAT revenue (on domestic transactions) accounted for about 41 percent of total federal revenues from domestic sources (EFIRA 2007). VAT revenue has become a significant source of government revenue in Ethiopia. Therefore, the primary objective of fiscal policy is to raise more revenue through VAT. The tax authorities have been guided by the need to design efficient VAT system capable of complementing government expenditure and, thus, reduce recourse to public borrowing. VAT rate in Ethiopia has been determined in a way that minimizes disincentive effects on economic activities, efficient, but it is generally regressive since the exemptions are unsystematic. In the following section of the paper analyzed and interpret some of the descriptive statistics. Such as:

4.4.1. Revenue Productivity of VAT

The revenue productivity tax is measured using different tools. The researcher uses different tools both descriptive as well as regression model. One of the descriptive tools used for analysis is VAT tax revenue to Gross Domestic Products (GDP) presented in the following table.

Table 4.2: VAT tax revenue to Gross Domestic Products (GDP)

Year	VAT Revenue	GDP	VAT as %of GDP
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1995	372,200,000	73,432,220,000	0.51%
1996	1,220,700,000	86,660,951,000	1.41%
1997	4,032,050,000	106,472,755,000	3.79%
1998	4,809,150,000	131,641,453,000	3.65%
1999	5,931,480,000	171,989,141,000	3.45%
2000	7,312,890,000	248,302,677,000	2.95%
2001	8,988,180,000	335,379,890,000	2.68%
2002	13,691,850,000	383,364,277,000	3.57%

Source: Annual report of ERCA, EDRI, and MoFED 1995 – 2002 E.C.

The trend of VAT to total GDP are 0.51, 1.41, 3.79, 3.65, 3.45, 2.95, 2.68 and 3.57% for the year 1995, 1996, 1997, 1998, 1999, 2000, 2001, and 2002 respectively, which shows fluctuation. Even if there is a fluctuation the percentage, the contribution of VAT tax revenue to GDP is higher in the year 1997, 1998 and 2002 amounting 3.79%, 3.65% and 3.57% respectively. From this it can be said that, VAT is contributing a lot for the development of the economy as a whole as measured by GDP.

In addition to the above descriptive tool, the researcher employed the following technique, VAT tax revenue to total government income. This ratio is used to compare the VAT tax revenue with total income government revenues. The table below presents the ratio as follows:

Table 4.3: VAT Tax Revenue with Total Government Income.

Year (E.C.)	VAT Revenue	Total Income	VAT/Total Income
1995	372,200,000	17,370,791,908	2.14%
1996	1,220,700,000	22,340,821,875	5.46%
1997	4,032,050,000	26,918,920,539	14.98%
1998	4,809,150,000	33,691,373,580	14.27%
1999	5,931,480,000	41,439,751,688	14.31%

2000	7,312,890,000	39,705,000,000	18.42%
2001	8,988,180,000	54,627,000,000	16.45%
2002	13,691,850,000	66,237,000,000	20.67%

Source: Annual report of ERCA, EDRI, and MoFED 1995-2002 E.C.

The percentage of VAT tax revenue to total government income are 2.14%, 5.46%, 14.98%, 14.27%, 14.31%, 18.42%, 16.45%, and 20.67% for the year 1995, 1996, 1997, 1998, 1999, 2000, 2001, and 2002 respectively, which indicate continuous progress. The contribution of VAT tax revenue as percentage of total government income is very high so that depending on VAT revenue is advisable for the government of Ethiopia since it is a money machine especially it reached its maximum in the year 2002 E.C. Moreover, the researcher employed the following descriptive statistics tools, VAT tax revenue to total tax revenue in order to compare the contribution of VAT tax revenue to total tax revenue.

Table 4.4: VAT to Total Tax Revenue

Year	VAT Revenue	Total Tax Revenue	VAT/ Total Tax Revenue (%)
1995	372,200,000	8,081,131,134	4.61%
1996	1,220,700,000	10,056,471,190	12.14%
1997	4,032,050,000	11,648,039,610	34.62%
1998	4,809,150,000	11,931,393,710	40.31%
1999	5,931,480,000	16,680,795,734.3	35.56%
2000	7,312,890,000	23,801,000,000	30.73%

2001	8,988,180,000	28,998,000,000	31.00%
2002	13,691,850,000	43,315,000,000	31.61%

Source: Annual report of ERCA, EDRI and MoFED 1995-2002 E.C

The VAT tax revenue to total tax revenue percentage are 4.61%, 12.14%, 34.62%, 40.31%, 35.56%, 30.73%, 31% and 31.61% for the year 1995,1996, 1997, 1998, 1999, 2000, 2001, and 2002 respectively, which indicated a continuously increases from 1995-1998 and continues to decline from year 1998 -2002. Even if the trend shows a fluctuation, the contribution is material for the period study. The contribution of VAT tax revenue as percentage of total government income is very high so that depending on vat revenue is advisable for the government of Ethiopia since it is a money machine.

4.5. Empirical Results of the Regression Model

Before proceeding to estimate the regression, now the researcher have imported more than one series, researcher can examine a number of descriptive statistics results of the model together and measures of association between the series. From there you will see that it is possible to calculate the covariance or correlations between series. The table below presents the statistical results of the variable.

Table 4.5: Descriptive statistics of variables und study

	LOGHSD	LOGESD	LOGANR	LOGISD	LOGODS	LOGDIS	LOGVAT
Mean	19.26	20.34	20.74	20.89	18.79	21.94	20.65
Maximum	20.27	21.46	22.09	22.21	20.43	23.14	22.11

Probability	0.16	0.72	0.31	0.17	0.001	0.318	0.02
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Source: E-Views Regression Output.

On average, government capital expenditure on each of the economic development indicator ranges from 18.79793 to 21.94431(in terms of logarithm) for the period under study. Similarly, the average government income from VAT tax revenue ranges between 2.65366 (logarithm) and the 22.54948 (logarithm) for other government income. Moreover, the maximum value of government expenditure on respective economic development indicators is 22.21497 (log) which is on the infrastructure development sector in the year 2002, quarter four. On the other hand, the maximum government income from VAT tax revenue is 22.1087 in the year 2002, and 23.23258 from other government income in the year 2001.

4.5.1. Test for Multicollinearity

All readers will be aware of the notion and definition of correlation. The correlation between two variables measures the degree of linear association between them. If it is stated that y and x are correlated, it means that y and x are being treated in a completely symmetrical way. Thus, it is not implied that changes in x cause changes in y, or indeed that changes in y cause changes in x rather, it is simply stated that there is evidence for a linear relationship between the two variables and that movements in the two are on average related to an extent given by the correlation coefficient. An implicit assumption that is made when using the Ordinary Least Square (OLS) estimation method is that the explanatory variables are not correlated with one another. If there is no relationship between the explanatory variables, they would be said to be orthogonal to one another. If the explanatory variables were orthogonal to one another, adding or removing a variable from a regression equation would not cause the values of the coefficients on the other variables to change. In any practical context, the correlation between explanatory variables will be non-zero, although

this will generally be relatively benign in the sense that a small degree of association between explanatory variables will almost always occur but will not cause too much loss of precision. However, a problem occurs when the explanatory variables are very highly correlated with each other, and this problem is known as multicollinearity.

If the paired correlation coefficient is approximately approaches positive one, it is said that there is positive correlation. On the other hand, if the paired correlation coefficient approaches negative one, the two variables have negative correlation. But if the paired correlation coefficient approaches to zero, it can be said that the two variables do not have correlation. In a similar vein, to measure the multicollinearity between independent variables the researcher employed 'variance inflation factor (VIF)' as a testing tool. The general agreement with respect to VIF is that, if the computed value is less than ten, 10, it is said to be no multicollinearity between the two dependent variables. However, if the resultant of VIF is greater than ten, there is multicollinearity problem in the model so that it needs correction using different tools. A number of alternative estimation techniques have been proposed that are valid in the presence of multicollinearity -- for example, ridge regression, or principal components. Using the paired correlation, given in the appendix 1, the researcher computed or tested multi-collinearity between the independent variables (VAT and other income) as indicated using variance inflation factor formula given below.

$$\begin{aligned} \text{VIF} &= 1 / (1 - R_i^2) \\ &= 1 / (1 - 0.236709^2) = 1.05957 \end{aligned}$$

Where, VIF is -Variance Inflation Factor (VIF).

The measure of the multicollinearity between independent variables (logvat and logotr) is equal to 1.05957. This value indicate that, the resultant is not significant to say that there is multicollinearity since the VIF is less than 10, which is the s. So that it appropriate to use the

independent variables (VAT revenue and other government income excluding VAT) simultaneously in order to run the regression model since there is no multicollinearity problem.

4.5.2. Regression Model Result

We can now proceed to estimate the regression. In regression, the dependent variable (y) and the independent variable(s) (x s) are treated very differently. The y variable is assumed to be random or 'stochastic' in some way, i.e. to have a *probability distribution*. The x variables are, however, assumed to have fixed ('non-stochastic') values in repeated samples. Regression as a tool is more flexible and more powerful than correlation. The estimated models and relevant statistics for evaluation are shown below. Coefficients of VAT [i.e., β_i ($i = 1; 2, 3; 4, 5, 6 ;$)] are the estimates of the respective model parameters (see appendix 3). Each denotes a measure of the effect of VAT revenue allocation to the Ethiopian State spent on the particular state economic sectors (see appendix 3).

Estimated Models 1-6

$\text{LogHSD} = 9.494 + 0.493\text{logVATRev} - 0.016\text{logOTR}$	(Model I)
$\text{LogESD} = 14.538 + 0.473 \text{logVAT Rev} - 0.176\text{logOTR}$	(Model II)
$\text{LogANR} = 9.806 + 0.642\text{logVATRev} - 0.103\text{logOTR}$	(Model III)
$\text{LogIND} = 18.901 + 0.482\text{logVATRev} - 0.353\text{logORR}$	(Model IV)
$\text{LogODS} = 7.080 + 0.517\text{logVATRev} - 0.045\text{logOTR}$	(Model V)
$\text{LogDIS} = 14.683 + 0.517\text{logVATRev} - 0.164\text{logOTR}$	(Model VI)

4.5.3. Testing for Autocorrelation

Assumption 3 that is made of the Classical Linear Regression Model's (CLRM's) disturbance terms is that the covariance between the error terms over time (or cross-sectionally, for that

type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are not uncorrelated with one another, it would be stated that they are 'autocorrelated' or that they are 'serially correlated'. A test of this assumption is therefore required. The lagged value of a variable (which may be y_t , x_t , or u_t) is simply the value that the variable took during a previous period. So for example, the value of y_t lagged one period, written y_{t-1} , can be constructed by shifting all of the observations forward one period in a spreadsheet. The first difference of y , also known as the change in y , and denoted y_t , is calculated as the difference between the values of y in this period and in the previous period. This is calculated as

$$y_t = y_t - y_{t-1}$$

Note that when one-period lags or first differences of a variable are constructed, the first observation is lost. Thus a regression of y_t using the above data would begin with the second quarter of 1995 data point. Of course, a first step in testing whether the residual series from an estimated model are autocorrelated would be to plot the residuals. Graphical methods may be difficult to interpret in practice, however, and hence a formal statistical test should also be applied. The simplest test is due to Durbin and Watson (1951). Durbin--Watson (DW) is a test for first order autocorrelation (i.e. it tests only for a relationship between an error and its immediately previous value). One way to motivate the test and to interpret the test statistic would be in the context of a regression of the time t error on its previous value

$$u_t = \rho u_{t-1} + v_t \quad \text{Where}$$

$$V_t \sim N(0, \sigma_v^2).$$

The *DW* test statistic has as its null and alternative hypotheses

$$H_0: \rho = 0 \quad \text{and} \quad H_1: \rho \neq 0$$

Thus, under the null hypothesis, the errors at time $t-1$ and t are independent of one another, and if this null were rejected, it would be concluded that there was evidence of a relationship between successive residuals (Brook C. 2008).

It is also possible to express the DW statistic as an approximate function of the estimated value of ρ

$$DW \approx 2(1 - \rho)$$

Where, ρ is the estimated correlation coefficient.

So that the DW test statistic is approximately equal to $2(1 - \hat{\rho})$ since $\hat{\rho}$ is a correlation, it implies that $-1 \leq \hat{\rho} \leq 1$. That is, $\hat{\rho}$ is bounded to lie between -1 and $+1$. Substituting in these limits for $\hat{\rho}$ to calculate DW from above formula would give the corresponding limits for DW as $0 \leq DW \leq 4$.

The test for the autocorrelation of the data under study had shown DW ranging from 0.21 to 0.58 for the models. So roughly speaking, the null hypothesis (H_0) would be rejected since DW is near 0 → i.e. there is evidence of autocorrelation. This indicates the existence of autocorrelation (positive autocorrelation) even if it is not perfect autocorrelation. As a result the DW test does not follow a standard statistical distribution such as t , F , or χ^2 . In fact, the consequences of ignoring autocorrelation when it is present are similar to those of ignoring heteroscedasticity. The coefficient estimates derived using OLS are still unbiased, but they are inefficient, i.e. they are not best linear unbiased estimator (BLUE), even at large sample sizes, so that the standard error estimates could be wrong. There exists the possibility that the wrong inferences could be made about whether a variable is or is not an important determinant of variations in y . In the case of positive serial correlation in the residuals, the OLS standard error estimates will be biased

downwards relative to the true standard errors. That is, OLS will understate their true variability. This would lead to an increase in the probability of type I error -- that is, a tendency to reject the null hypothesis sometimes when it is correct. Furthermore, R^2 is likely to be inflated relative to its 'correct' value if autocorrelation is present but ignored, since residual autocorrelation will lead to an underestimate of the true error variance (for positive autocorrelation). Since there existed autocorrelation for all of the models specified under study, the researcher re-regressed in order to solve the autocorrelation by taking the one period lagged value of all dependent variables. In order to adjust misspecification of the model the study employed lagged dependent variables so that, the new result is presented on table 4.6 below and appendix 3.

In order to overcome autocorrelation, the researcher augmented with one period lagged value. If previous model holds at time t , it is assumed to also hold for time $t - 1$, so that the model is lagged one period:

$$\text{LogHSD} = -1.001 + 0.082\text{logVATRev} + 0.901\text{logHSD1} + 0.493\text{logOTR}$$

$$\text{LogESD} = -0.242 - 0.045\text{logVATRev} + 1.073\text{log ESD1} - 0.010\text{logOTR}$$

$$\text{LogANR} = 1.390 + 0.071\text{logVATRev} + 0.916\text{LogANR1} - 0.047\text{logOTR}$$

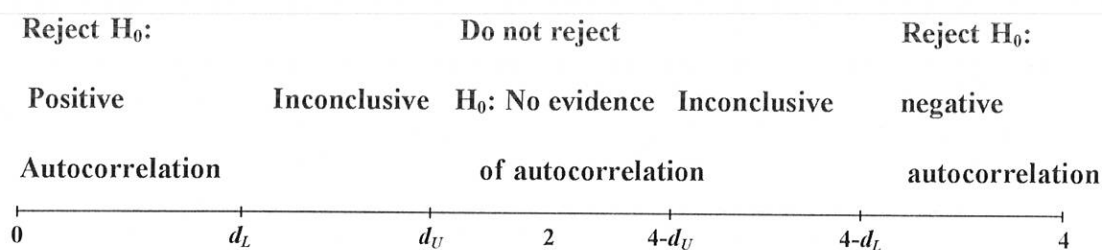
$$\text{LogIND} = 0.368 + 0.039\text{logVATRev} + 0.976\text{logISD1} - 0.028\text{logOTR}$$

$$\text{LogODS} = -1.183 + 0.123\text{logVATRev} + 0.716\text{logODS1} + 0.177\text{logOTR}$$

$$\text{LogDIS} = 0.486 + 0.029\text{logVATRev} + 0.973\text{logDIS1} - 0.019\text{logOTR}$$

DW has two critical values: an upper critical value (d_U) and a lower critical value (d_L), and there is also an intermediate region where the null hypothesis of no autocorrelation can neither be rejected nor not rejected! The rejection, non-rejection, and inconclusive regions are shown on the number line in figure 1 below.

Figure 1: Rejection and non-rejection regions for DW test



In EViews, the *DW* statistic is calculated automatically, and was given in the general estimation output screens that result from estimating any regression model. The DW statistics shown in the appendix 3 are 1.902, 1.234, 1.276, 1.338, 1.427, and 1 for model 1 to model 6 respectively. Except the first model (health sector), all models are in the inclusive region in which H_0 is neither rejected nor accepted, i.e., there is no clear information to show the existence of autocorrelation so that, it is reasonable to rely on these models to estimate the effects of VAT tax revenue on the economic growth of Ethiopia.

Table 4.6: Model/ Adjusted VAT Coefficients and Relevant Statistics

Model	Develop ment Sectors	Coefficient of VAT (β_i)	Std. Error	T-stat	Prob (T- Stat)	R- Squared	DW Test
Model I	HSD	0.08	0.04	2.18	0.03**	95.88%	1.90
Model II	ESD	-0.045	0.02	-1.85	0.07	99.90%	1.24
Model III	ANR	0.07	0.02	2.98	0.005*	99.36%	1.28
Model IV	ISD	0.04	0.03	1.24	0.22	96.96%	1.34
Model V	ODS	0.12	0.16	0.75	0.45	60.89%	1.43
Model IV	DIS	0.03	0.01	2.12	0.04**	99.62%	1.41

* Significant at 1%. ** Significant at 5%.

Source: E-Views Regression Output

A 1% increase or decrease in VAT revenue will cause 0.08%, 0.07%, and 0.12% increase or decrease in health sector development, in agricultural and natural resource and other development sector indicators respectively keeping other variables constant. Similarly, 1% increase or decrease in VAT revenue will cause 0.04% increase or decrease in infrastructure development as indicated by the β_i value in the table 4.6 above. Conversely, 1% increase or decrease in VAT revenue will cause 0.045% decrease or increase in education sector (Model II) keeping other factors constant. Although VAT had contributed positively to the respective economic sectors in Ethiopia State except education sector, the contribution had positive statistically significant effect only on health (Model I) and agricultural and natural resource sector development (Model III) at $\alpha=1\%$ and 5% respectively.

Coefficient of the independent variable, VAT, in health sector development (model I), agricultural and natural resource management (model III), other development sector (model V) and infrastructure development (model IV) are consistent with a priori expectations [i.e., β_i ($i = 1; 3; 4, 5;) > 0$]. This implies that VAT tax revenue allocation to Ethiopia State had positive effect on each of these economic sectors considered in this study except education sector (i.e., coefficient of the independent variable, VAT, for educational sector (model II) is deviated from expectation, which means negative coefficient). Since the coefficients denote the respective effects of VAT on the sectors, the result shows that, perhaps, VAT contributed more positively to other development indicator sectors (Model V with $\beta_5= 0.12$) than any other sector considered in this study. This is followed by health sector development (Model I with $\beta_1= 0.08$), agricultural and natural resource management (Model III with $\beta_3= 0.07$), and infrastructure development (Model IV with $\beta_4 = 0.04$). Conversely, the negative effect of VAT revenue utilization was on education sector development (Model II with $\beta_2= -0.03$).

Generally, VAT had contributed positively to the aggregate (overall) economic sectors in the country, Ethiopia, as shown in Model VI (with $\beta_6 = 0.03$).

The following table shows the effects of lagged value of the respective dependent variables on each sector (i.e. the previous value on the next period economic growth).

Table 4.7: Adjusted Coefficients and Relevant Statistics of lagged variables.

Models	Development Sectors (lagged variables)	Coefficient of lagged vari., $\hat{\alpha}_i$	Std. Error	T-stat	Prob (T-Stat)	Adjusted R-Square
Model I	HSD	0.90	0.05	15.92	0.00*	95.42%
Model II	ESD	1.07	0.05	22.32	0.00*	98.8%
Model III	ANR	0.91	0.03	26.35	0.00*	9.28%
Model IV	ISD	0.98	0.055	17.78	0.00*	96.62%
Model V	ODS	0.71	0.13	5.34	0.00*	56.54%
Model IV	DIS	0.97	0.02	40.73	0.00*	99.58%

* Significant at 1%.

Source: E-Views Regression Output.

As shown in the above table, the coefficient of all the lagged value of the respective economic sector shows positive statistically significant (even at $\alpha= 1\%$) effect on each sectors. The coefficient of each lagged value are 0.90, 1.07, 0.91, 0.98, 0.72, and 0.97 for HSD1 (Model I), ESD1 (Model II), ANR1 (Model III), ISD1 (Model IV), ODS1 (Model V), and DIS1 (Model VI) respectively. In the similar vein, the contribution of lagged value is more significant on education sector as shown by the coefficient ($\square_2 = 1.07$) and followed by infrastructure ($\square_4 = 0.98$) and agriculture and natural resource development ($\square_3 = 0.92$). The coefficient of lagged value indicates that, the previous period government expenditure has a positive and

statistically significant effect on the current period capital expenditures on the respective development indicator sectors.

On the other hand, other government income (all tax revenues excluding VAT, grant, donation, loan, and other revenues) had a positive contribution only on health sector (Model I), and other development indicator sector (Model V). Conversely, it has a negative contribution for education sector (Model II), agriculture and natural resource (Model III), and infrastructure development (Model V). Generally, other government income was negative contribution on the overall economic sectors (Model). But in either of the case, it is statistical insignificant (both at $\alpha= 1\%$ and 5%) as shown in the appendix 2. Moreover, the explanatory variables (VAT revenue, lagged value and other income) were more relevant in explaining dependent variables, especially, in the agricultural and natural resource sector (Model III) than the other sectors as indicated by the coefficients of determination (Adjusted R-Squared) equal to 99.28% and followed by 98.98% in education sector (Model II); 96.62% in infrastructure development sector (Model IV); 95.42% in health sector (Model I); and 56.54% in other development indicator sectors (Model V). This shows that, relative to other sectors, VAT revenue and other income least explained the model (other development indicator sectors, model V). However, within the models as a whole, all the independent variables explained over 55% of the dependent variables (the five sectors of the State economy). Therefore, on the aggregate, the coefficients of determination (Adjusted R-Square statistics) indicate that revenue from value added tax and other income accounted for considerable proportion of the development of the Ethiopia State economy.

Chapter Five

5. Conclusion and Recommendations

5.1. Conclusion

The value added to a product by a business is the sale price charged to its customer, minus the cost of materials and other taxable inputs. A VAT is like a sales tax in that ultimately only the end consumer is taxed. It differs from the sales tax in that, with the latter, the tax is collected and remitted to the government only once, at the point of purchase by the end consumer. With the VAT, collections, remittances to the government, and credits for taxes already paid occur each time a business in the supply chain purchases products from another business. The designers of the VAT law intended it to be a tax on the final consumer. In other words, a business buying goods or services would generally not suffer VAT because it could pass on the burden of the tax to its customers, either directly by charging them VAT on taxable sales or indirectly by raising its prices to cover the cost of any VAT that it had paid on purchases used to produce goods or services that were exempt from VAT.

VAT was conceived as a tax on the final consumer of goods and services: in most cases this will be an individual member of the public buying from a retail outlet for his or her private use. Businesses can usually pass on the VAT that they pay on their purchases of similar goods and services to their own customers so that the only costs they incur as taxpayers are the costs of recording, administering and collecting the tax from their customers for the benefit of the government. Therefore, VAT will cost the final customer and will harm the consumption ability of the poor since VAT in Ethiopia is regressive by its nature. This is because of the fact that, VAT tax structure in Ethiopia is a single rate, 15%, and broad bases with very few

number of exemptions which are by itself not systematic (i.e., the exemptions is not only in favor of the poor).

This paper has employed the tools of quantitative empirical analysis technique to evaluate the contribution of value-added tax to the development of Ethiopia State economy over an eight-year period (1995 - 2002 E.C. or 2003/04 – 2009/10 G.C.). The state economy was disaggregated into five strategic economic sectors in the development process, and models are specified to enhance isolated analysis of each sector. In order to generalize the study, the capital expenditure on respective development indicator sectors is aggregated as a single dependent variable, development indicator sectors, DIS, (Model VI).

The analysis had shown that, with the exception of education sector (Model II), VAT revenue has positively contributed to the development of the rest of four sectors (health, agricultural and natural resource, infrastructure development, and other development indicators such as, urban development and housing, culture and sport, social welfare, and disaster trade and industry) which are met the prior expectation that β_i , ($i = 1, 2 - - -, 6$) > 0 , keeping other factors constant.

Although VAT had contributed positively to the respective economic sectors in Ethiopia State economy except education sector, the contribution had positive significant effect only on health (Model I) and agricultural and natural resource sector development (Model III), at $\alpha=1\%$ and 5% , since in economics significance test is more appropriate only on these two alpha values. On the aggregate, the analysis showed that VAT revenue had a considerable positive contribution to development of the economy during the study period except the education sector, model II, (i.e., VAT tax revenue has negative contribution to education

sector development but it is statistically insignificant). Generally, VAT tax revenue had positive contribution on the overall economic sectors (Model VI) and also it was statistical insignificant (at $\alpha = 5\%$) as shown in (table 4.6). In the similar vein, the results of the descriptive analysis shown that, VAT has contributed a lion share in the overall government tax revenue, which is periodically increasing. Also the contribution of VAT tax revenue as a percentage of GDP, total government income, and total tax revenue were somewhat increased as shown in table 4.2, table 4.3, and table 4.4 on chapter four (discussion and analysis part). Thus, the study concludes that VAT tax revenue was contributed for economic development of Ethiopia for the period under study, keeping other variable constant, even if it is regressive.

Moreover, the study come up with the conclusion that the lagged values of the dependent variables ($y-1$) had a positive and statistical significance contribution on their respective sectors for the study period (at $\alpha=1\%$). On the other hand, other government income (grant, donation, loan, other revenues and all tax revenues excluding VAT) was positively contributed only to health sector (Model I), and other development indicator sector (Model V). Conversely, it has a negative contribution for education sector (Model II), agriculture and natural resource (Model III), and infrastructure development (Model V). Generally, other government income was negative contribution on the overall economic sectors (Model VI) even if it is statistical insignificant (both at $\alpha= 1\%$ and 5%) as shown in the appendix 2.

Although VAT in Ethiopia is regressive, the study concludes that VAT tax revenue had positively contributed for economic development of Ethiopia for the period under study (as shown by model VI as well as the descriptive statistics table 4.2, 4.3, and 4.4), keeping other variable constant. However, the contribution is statistically significant only on health and

agriculture and natural resource sector. As a result, it can be concluded that, the VAT tax revenue allocation to micro-economic sectors are unable to neutralize the regressivity of VAT tax levy.

5.2. RECOMMENDATION

Even though VAT has positive contribution for the country, Ethiopia, economy development, it has certain pitfalls that needs due consideration. As a result, in order to overcome the shortcomings (regressivity of VAT tax levy), the researcher forward the following recommendation for the tax authority, government of Ethiopia.

- ❖ The State should allocate more VAT revenue to education and health sectors, especially education sector in which VAT had contributed the least as compared to other economic sectors considered in the study. Although the revenue contributed positively to all the sectors except education sector, the effects of such contributions were statistically significant only in health and agricultural and natural resource development. This makes it necessary for increased allocation to such sectors where the contribution effects were insignificant. Out of all micro-economic sectors, health and education are particularly important in the sense that they not only address the well-being of the current population but also play a significant role in investing for future human capital.
- ❖ Like sales taxes, VAT is creating tax cascade effect on the taxpayers in the country. So that, in order to eliminate or reduce this problem, the prevailing VAT tax rate should be adjustment (down ward) from the existing tax rate, 15%, by taking the prevailing rate as a nominal tax rate and determining the real tax rate to be levied on the goods and services and also introducing different tax rates based on the demand elasticity as well as

consumption patterns the poor though it create complexity to tax authority and revenue productivity of the government. But how much and how to adjust the VAT to the real VAT rate needs further study so that the paper is not going to talk about the adjustment of the VAT rate;

✦ Moreover, the regressivity of VAT can be reduced if the government implemented subtraction method instead of credit method even though subtraction method is difficult from the administration point of view. Under a subtraction method, the tax base for each firm is receipts from sales of real goods and services, minus purchases of real goods and services (including capital goods) from other businesses. In other word, under this approach, VAT tax is applied only on the values added by each stage of production and distributions channels unlike credit approach which applies VAT tax on the selling price of the goods and services. Even if both approach will come up with the same amount of tax, if applied properly, in Ethiopia context, the businessmen do not know how much value they added on the product they are selling since they don't have proper accounting records and educational background so that they will added the VAT input tax on the as a purchase price while determining their selling price. As a result they create tax cascading even though they are refunded for the input tax.

✦ Alternatively, instead of reducing tax rate or introducing different tax rate, it should be better to spend to tax revenues on basic social activities which induce economic growth and also benefits more the poor people, such as health and education sectors. Since reductions in overall tax revenues have resulted in a “fiscal squeeze” which can mean the reduction of needed public services with adverse effects in the short-term on the poor and low- income and in the long-term on overall social and economic development, so that it is

better to spend the tax revenue on basic activities such health, education, agriculture and infrastructure since expenditure policy is much more important for redistribution purposes than is an income tax; that consumption taxes can be progressive; and that greater fiscal decentralization (moving tax and expenditure authority to lower levels of governments) may enable better matching of those who benefit and those who pay for government activity.

- ✦ The government should grant zero rates on important farm products. In some VAT jurisdictions a "downstream" extra credit is granted to firms that, buying from the farmers, are subject to tax, just to make up for this break in the tax credit chain, but the size of that credit does not vary with the amount of fertilizer the farmer buys, so does not influence such a purchase. A better method is to zero-rate important farm inputs, such as seed, fertilizer, and tractors.
- ✦ Moreover, the government should grant zero rates on some basic food items. In some developing countries, many people are on so meager a diet and in such poor health that their ability to work is impaired. If their incomes after tax were increased, the resulting increase in their consumption spending might so increase their productive energy as to make the resulting increment in output exceed the increment in their consumption. Such an increment may be called gainful consumption (see Shoup 1965 and 1970). A decrease in the VAT on such consumption would spur more consumption, hence a more than equivalent increase in total output. This road to economic growth, which calls for zero-rating of certain necessities, seems obvious.
- ✦ Finally, the paper recommends equity in sectoral spending of VAT proceeds in Ethiopia State in order to ensure balanced development and sustainability of developing country.

5.3. Research Limitations and further study areas

- The study comes with a caveat that although economic sectors considered relevant and strategic as well as VAT revenue allocations to each entered the models, some other influencing variables such as general administration and transparency of implementing authorities and officials have been excluded. But those excluded variables might actually be relevant determinants of effectiveness of VAT revenue of development of the sectors and the economy so that this needs further study on the topic.
- Moreover, the researcher forward suggestion to interested researcher to conduct study on the estimation of the actual VAT tax rate assuming the existing tax rate, 15%, as nominal tax rate in order to create equity.

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	LOGHSD1	LOGESD1	LOGANR1	LOGISD1	LOGODS1	LOGDIS1	LOGVAT	LOGO'
LOGHSD1	1							
LOGESD1	0.863345	1						
LOGANR1	0.894352	0.970571	1					
LOGISD1	0.883677	0.881599	0.897601	1				
LOGODS1	0.420455	0.391345	0.427556	0.649575	1			
LOGDIS1	0.925788	0.96185	0.979464	0.963378	0.541956	1		
LOGVAT	0.708902	0.916027	0.892995	0.741023	0.448545	0.860166	1	
LOGOTR	0.136552	0.091297	0.175569	-0.02518	0.05367	0.110243	0.236709	

APPENDICES

Appendix-1: Paired Correlation Table for Independent Variable

Appendix-2: Model/Adjusted Other Revenue excluding VAT Coefficients and Relevant Statistics.

Models	Coefficient of other income, γ_i	Std. Error	T-stat	Prob (T-Stat)	R-Squared
Model I	0.056040	0.075219	0.745018	0.4627	0.958808
Model II	-0.010476	0.001322	-1.565246	0.1296	0.999046
Model III	-0.047447	0.030943	-1.533359	0.1368	0.993567
Model IV	-0.028584	0.060602	-0.471668	0.6410	0.969607
Model V	0.177382	0.592728	0.359655	0.7219	0.537675

Source: E-Views Regression Output

Appendix-3. E-views regression output (Models)

Model I

Dependent Variable: LOGHSD
 Method: Least Squares
 Date: 05/08/11 Time: 13:46
 Sample (adjusted): 1995Q2 2002Q4
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.000554	1.766085	-0.566538	0.5757
LOGVAT	0.081957	0.037620	2.178549	0.0383
LOGHSD1	0.900692	0.056550	15.92735	0.0000
LOGOTR	0.056040	0.075219	0.745018	0.4627
R-squared	0.958808	Mean dependent var	19.28230	
Adjusted R-squared	0.954232	S.D. dependent var	0.773357	
S.E. of regression	0.165449	Akaike info criterion	-0.640398	
Sum squared resid	0.739077	Schwarz criterion	-0.455368	
Log likelihood	13.92618	Hannan-Quinn criter.	-0.580083	
F-statistic	209.4913	Durbin-Watson stat	1.902344	
Prob(F-statistic)	0.000000			

Model II

Dependent Variable: LOGESD
 Method: Least Squares
 Date: 05/08/11 Time: 13:47
 Sample (adjusted): 1995Q2 2002Q4
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.242041	0.913078	-0.265082	0.7930
LOGVAT	-0.045084	0.024309	-1.854658	0.0746
LOGESD1	1.073182	0.048071	22.32490	0.0000
LOGOTR	-0.010476	0.027497	-0.380996	0.7062

R-squared	0.990897	Mean dependent var	20.38135
Adjusted R-squared	0.989885	S.D. dependent var	0.569913
S.E. of regression	0.057318	Akaike info criterion	-2.760494
Sum squared resid	0.088704	Schwarz criterion	-2.575464
Log likelihood	46.78766	Hannan-Quinn criter.	-2.700179
F-statistic	979.6370	Durbin-Watson stat	1.233978
Prob(F-statistic)	0.000000		

Model III

Dependent Variable: LOGANR
 Method: Least Squares
 Date: 05/08/11 Time: 13:52
 Sample (adjusted): 1995Q2 2002Q4
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.393428	0.756292	1.842448	0.0764
LOGVAT	0.071964	0.024102	2.985855	0.0059
LOGANR1	0.916400	0.034771	26.35538	0.0000
LOGOTR	-0.047447	0.030943	-1.533359	0.1368

R-squared	0.993567	Mean dependent var	20.78741
Adjusted R-squared	0.992853	S.D. dependent var	0.803188
S.E. of regression	0.067903	Akaike info criterion	-2.421560
Sum squared resid	0.124492	Schwarz criterion	-2.236529
Log likelihood	41.53417	Hannan-Quinn criter.	-2.361244
F-statistic	1390.126	Durbin-Watson stat	1.276107
Prob(F-statistic)	0.000000		

Model IV

Dependent Variable: LOGISD
 Method: Least Squares
 Date: 05/08/11 Time: 13:53
 Sample (adjusted): 1995Q2 2002Q4
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.368270	1.650426	0.223136	0.8251
LOGVAT	0.039894	0.032127	1.241751	0.2250
LOGISD1	0.976842	0.054938	17.78091	0.0000
LOGOTR	-0.028584	0.060602	-0.471668	0.6410

R-squared	0.969607	Mean dependent var	20.91593
Adjusted R-squared	0.966230	S.D. dependent var	0.690942
S.E. of regression	0.126971	Akaike info criterion	-1.169796
Sum squared resid	0.435287	Schwarz criterion	-0.984765
Log likelihood	22.13183	Hannan-Quinn criter.	-1.109480
F-statistic	287.1226	Durbin-Watson stat	1.337963
Prob(F-statistic)	0.000000		

Model V

Dependent Variable: LOGODS
 Method: Least Squares
 Date: 05/08/11 Time: 13:55
 Sample (adjusted): 1995Q2 2002Q4
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.183358	9.172810	-0.129007	0.8983
LOGVAT	0.123061	0.163618	0.752120	0.4585
LOGODS1	0.716216	0.133875	5.349863	0.0000
LOGOTR	0.177382	0.411267	0.431307	0.6697
R-squared	0.608921	Mean dependent var		18.82788
Adjusted R-squared	0.565468	S.D. dependent var		1.371209
S.E. of regression	0.903888	Akaike info criterion		2.755691
Sum squared resid	22.05935	Schwarz criterion		2.940721
Log likelihood	-38.71321	Hannan-Quinn criter.		2.816006
F-statistic	14.01327	Durbin-Watson stat		1.426988
Prob(F-statistic)	0.000011			

Model VI

Dependent Variable: LOGDIS
 Method: Least Squares
 Date: 05/05/11 Time: 06:43
 Sample (adjusted): 1995Q2 2002Q4
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.486033	0.566596	0.857813	0.3985
LOGVAT	0.029852	0.014103	2.116689	0.0436
LOGDIS1	0.973188	0.023894	40.73014	0.0000
LOGOTR	-0.019785	0.020324	-0.973502	0.3389
R-squared	0.996273	Mean dependent var		21.97592
Adjusted R-squared	0.995858	S.D. dependent var		0.682895
S.E. of regression	0.043948	Akaike info criterion		-3.291718
Sum squared resid	0.052148	Schwarz criterion		-3.106687
Log likelihood	55.02163	Hannan-Quinn criter.		-3.231403
F-statistic	2405.542	Durbin-Watson stat		1.413327

Prob(F-statistic) 0.000000

Table 1: Model/VAT Coefficients and Relevant Statistics

Models	Development Sector	Coefficient of VAT(β_i)	Std. Error	T-stat	Prob(T-Stat)	R-Squared	DW- test
Model I	HSD	0.493741	0.081619	6.049338	0.0000*	0.576145	0.212375
Model II	ESD	0.473394	0.040965	11.55605	0.0000*	0.824993	0.335339
Model II	ANR	0.642949	0.053661	11.98158	0.0000*	0.839093	0.225071
Model IV	ISD	0.482491	0.068993	6.993352	0.0000*	0.627874	0.219232
Model V	ODS	0.517142	0.197583	2.61734	0.013*	0.20686	0.584207
Model IV	DIS	0.531651	0.053098	10.01264	0.0000*	0.78093	0.206998

* Significant at 1%,5%, and 10%. ** Significant only at 5%, and 10%.

Source: E-Views Regression Output.

Table 2: Model/ Adjusted VAT Coefficients and Relevant Statistics

Model	Development Sectors	Coefficient of VAT(β_i)	Std. Error	T-stat	Prob (T-Stat)	R-Squared	DW Test
Model I	HSD	0.081957	0.037620	2.178549	0.0383**	95.88%	1.902344
Model II	ESD	-0.045084	0.024309	-1.854658	0.0746**	99.90%	1.233978
Model III	ANR	0.071964	0.024102	2.985855	0.0059*	99.36%	1.276107
Model IV	ISD	0.039894	0.032127	1.241751	0.2250	96.96%	1.337963
Model V	ODS	0.123061	0.163618	0.75212	0.4585	60.89%	1.426988
Model IV	DIS	0.029852	0.014103	2.116689	0.0436**	99.62%	1.413327

* Significant at 1%. ** Significant at 5%. *** Insignificant even at 10%.

Source: E-Views Regression Output

Appendix-4: Interpolation method suggested by Goldstein.M and M.S.Khan (1976)

Since VAT was launched in 2002 G.C, there is only eight years annual data available which is not sufficient to have normality and to test hypothesis under estimation method of OLS. In order to resolve the limitation (shortage) of data, the researcher used quarterly data for all variables both dependent and independent. Since quarterly data are not available, interpolation is made from annual series using a technique suggested by Goldstein.M and M.S.Khan (1976). The method of interpolation is briefly described below (as reproduced from the work of the above authors):

If x_{t-1} , x_t , and x_{t+1} are three successive annual observations of a flow variable $x(t)$, the quadratic function passing through the three points is such that:

$$\int_0^1 (as^2 + bs + c)ds = x_{t-1}$$

$$\int_{\frac{1}{2}}^{\frac{3}{2}} (as^2 + bs + c)ds = x_t$$

$$\int_2^3 (as^2 + bs + c)ds = x_{t+1}$$

Integrating and solving for a, b and c gives:

$$a = 0.5 x_{t-1} - 1.0 x_t + 0.5 x_{t+1}$$

$$b = -2.0 x_{t-1} + 3.0 x_t - 1.0 x_{t+1}$$

$$c = 1.8333 x_{t-1} - 1.1666 x_t + 0.333 x_{t+1}$$

The first two quarterly figures within any year can be interpolated by

$$\int_{\frac{1}{4}}^{\frac{1.25}{4}} (as^2 + bs + c)ds = 0.0548 x_{t-1} + 0.2343 x_t - 0.390 x_{t+1}$$

$$\int_{\frac{1.25}{4}}^{\frac{1.50}{4}} (as^2 + bs + c)ds = 0.0077 x_{t-1} + 0.2657 x_t - 0.0235 x_{t+1}$$

and corresponding formulas give the 3rd and 4th quarter interpolation (Goldstein.M and M.S.Khan 1976).

Appendix 5: VAT Proceeds, Total Government Income excluding VAT and Capital Expenditure Allocation to the Economic Sectors.

Year	VAT Revenue	Total Income	HSD	ESD	ANR	ISD	ODS	DIS
1995	372,200,000	17,370,791,908	488000000.0	1017020000	1,167,777,354	2,321,420,433	240,300,000	5,234,439,787
1996	1,220,700,000	22,340,821,875	346,300,000	1665914000	1,625,882,905	2,425,645,871	220,400,000	6,284,142,776
1997	4,032,050,000	26,918,920,539	505,400,000	1895586774	2,201,619,343	2,666,000,466	889,400,000	8,158,006,583
1998	4,809,150,000	33,691,373,580	519,200,000	2478953853	4,410,661,629	4,005,947,397	798,000,000	12,212,762,879
1999	5,931,480,000	41,439,751,688	1341200,000	3514464000	5,864,875,409	3,443,696,483	1,141,900,000	14,165,377,792
2000	7,312,890,000	39,705,000,000	1920571800	3390769900.0	7,147,500,000	8,261,000,000	2,840,864,000	22,881,195,700
2001	8,988,180,000	54,627,000,000	2136252000	4752234000.0	8,224,600,000	10,075,100000	3,691,900,000	28,029,050,000
2002	13691850000	66,237,000,000	2,431,650,00	7215800000	13253870000	15257630000	1,087,850,000	39,246,800,000

Source: Annual report of ERCA and MoFED for the year 1995-2002 E.C. (2002/03- 2009/10)