Chapter: 6

Fiscal System: Structural and Empirical Analysis

Fiscal policy is an instrument of economic development and stabilization, concerned with the government policy regarding taxation, public debt and public expenditure – which constitute the government's budget with special objectives in view. These objectives are aimed to produce desirable effects and avoid undesirable effects on production, employment, general price level and national income. Fiscal policy in short refers to the budgetary policy of the government.

The modern economy recognized the importance of fiscal policy as an economic instrument during the period of the Great Depression of the 1930s and as a consequence to the writings of J.M. Keynes. Prior to that, the role of the government in economic activities had been neglected or restricted to the maintenance of law and order and the provision of certain essential services to the economy.

Keynes had argued that government could control both deflationary and inflationary phenomenon in the economy simply by controlling the levels of spending and taxation. "*An increase in government expenditure or a reduction in taxation means an increase in the circular flow of income which would expand aggregate demand and hence could produce a sustained rise in economic activity by increasing physical production and employment and thus eliminating a deflationary gap in the economy. In contrast, a cut in government expenditure or an increase in taxation will reduce aggregate demand and level of economic activity and hence could eliminate an inflationary gap in the economy*" [Keynes, 1936].

The term, fiscal policy, embraces the tax and expenditure policies of the government. Thus fiscal policy operates through the control of government expenditures and tax receipts. It encompasses two separate but related decisions; public expenditures and the level and structure of taxes. This operation is done through the budget.

This chapter has been divided into two sections. Section: 6.1, on Structural Analysis deals with an in-depth analysis of Eritrea's fiscal system where the growth, trend and composition of all the important constituents and variables of the Eritrean fiscal sector have been examined. Section: 6.2, on Empirical Analysis investigates the responsiveness of Eritrea's fiscal variables to the changes in its macro economic variables. It mainly attempts to estimate the tax buoyancy and to test for the validity of 'Wagner's Law' of increasing state activities in Eritrea.

Data used in this chapter has been derived from three sources. They are:

1. Bank of Eritrea, "Unpublished Documents", 2001
2. The World Bank, "Eritrea: Options and Strategies for Growth", 1994
3. The IMF, "Eritrea: Selected Issues", 1998

6.1 Structural Analysis

In order to properly plan the fiscal system of a country and to formulate proper policies, it is necessary to have a complete picture of the fiscal structure. In order to properly understand the fiscal system of Eritrea, the present section deals with the Structural Analysis of its fiscal system.

The discussion on Structural Analysis of Eritrea's fiscal system has been divided into five sections, as follows:

a. Government Budget,
b. Public Revenue,
c. Public Expenditure,
d. Fiscal Deficits,
e. Deficit Finance and Public Debt.

a. Government Budget

Budget is an important instrument of fiscal policy. It is a statement by the government of the level of its own planned expenditure and expected revenue in the forthcoming financial year and the subsequent borrowing requirement if any.

In recent years, however, the scope and purpose of the budget have undergone tremendous changes. The decision of the government regarding taxation, borrowings, expenditures and other fiscal measures forms a part of the overall objectives of the economic policy. As such, the budget is not only the financial statement; it is also a plan embodying the economic programmes of the government [Misra, 1995].

The relation between the two main components of the budget - revenue and expenditure, is the indicator that shows whether a government runs a balanced budget or an unbalanced budget. A balanced budget is one in which total receipts exactly equals total government expenditure excluding any receipts from borrowing.

When the budget is not balanced, there is either budgetary surplus or budgetary deficit. A budget surplus occurs when total receipts exceed total expenditure. Many economists consider surplus budget to depress economic activity. Therefore, it is used sometimes to reduce excessive aggregate demand in the economy when it is generating inflation. A budget deficit on the other hand occurs when total government expenditure exceeds total government receipts. Keynesian economists consider budget deficit to stimulate economic activity when there is spare capacity and unemployment in the economy, while other economists believe that persistent budget deficits can only cause inflation and / or crowd out private investment in the long run, thus worsening the unemployment problem in the economy

a1. <u>The Structure of Eritrea's Budget</u>

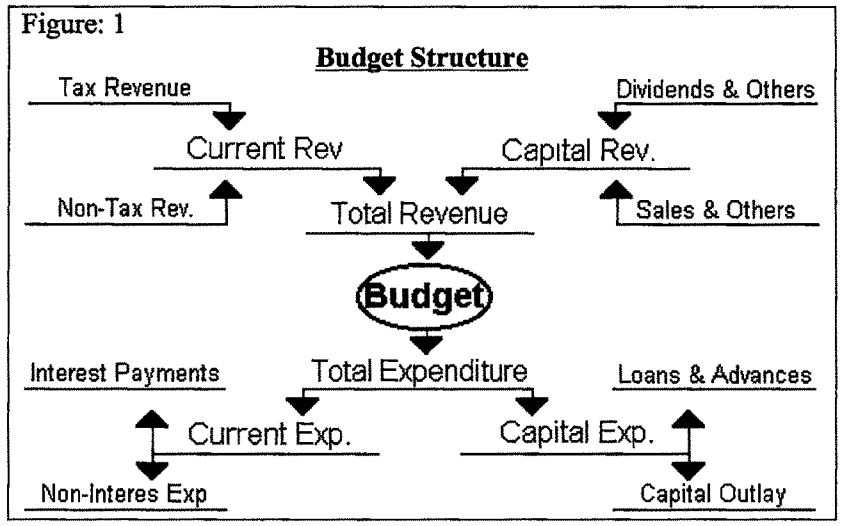
Before independence, Eritrea did not experience budget formulation. The entire process including indication of objectives, fiscal policy analysis, and distribution of funds between

recurrent and development operations, allocation of funds to different sectors, external aid budgeting and budget review was undertaken by the Ethiopian Government. The Eritrean role was simply restricted in the budget execution area, i.e., the collection of revenues and payment of expenditure.

After liberation, the preparation of the budget became the task of the Ministry of Finance and Development [MFD]. The MFD issues an annual budget call to all ministries, provinces and other relevant government units to submit a recurrent and capital budget application which provides a detailed financial and physical information regarding the programs they intend to undertake. The information contains current situation of the economic sectors, financial and physical input requirements of the projects to be undertaken, sources of financing and required foreign currency, and details on the regional distribution of the projects. Based on this information, the MFD distributes the resources to the different sectors and projects. The amount of resources assigned to each budgeting unit, sector or project is based on a provisional sector allocation.

The Eritrean budget may be classified into two parts: revenue budget and expenditure budget. The revenue budget deals with the government current receipts from taxation and non-tax sources, and the capital receipts of the government. While the expenditure budget deals with the expenditures on current account and expenditures on capital account. Figure: 1 shows the classification of the budget.

Figure: 1



b. Public Revenue

Government revenues come from various sources and take different forms. The government income through all sources is called public receipts or public revenue. According to Dalton [1968], the term public receipt is wider than the term public revenue in a sense that the former includes income from all sources, while the latter is a narrower concept and dose not include public borrowings, income from the sale of public assets, and income generated by printing additional money. Let us start our discussion with the overall structure and sources of the Eritrean Public Revenue.

b.1 Composition and Growth of Public Revenue

The income of the Government of Eritrea is derived from two main sources:

1. Current revenues
2. Capital revenues.

Current public revenue is an important source of income for the government of Eritrea. It is composed of tax revenues and non-tax revenues. On the other hand, capital revenue is mainly generated from dividends, sales of property, privatization and other income revenues. In the Eritrean context, capital revenue plays a marginal role in the total revenue of the government.

Table: 1, 2 and 3 display the composition, growth and GDP share of Eritrea's public revenue. The following main findings are drawn from these tables:

i. The annual percentage change in total public revenue has been highly fluctuating. As percentage of total GDP, total revenue has also shown great fluctuations ranging from 21.9 percent in 1992 to 41.4 percent in 1997 to 29.1 percent by 2000. The rise and fall tendencies were observed every alternative years from 1992 to 1997, after which a continuous fall was observed till 2000.

ii. The current revenue dominates a big share of the total public revenue. As percentage of total revenue, it varied from 80.2 percent to 100 percent throughout 1994 to 2000, leaving a marginal role for the capital revenue in the total revenue receipts of the government.

Table: 1 **Total Public Revenue**
In Millions of Nakfa and Annual % Change

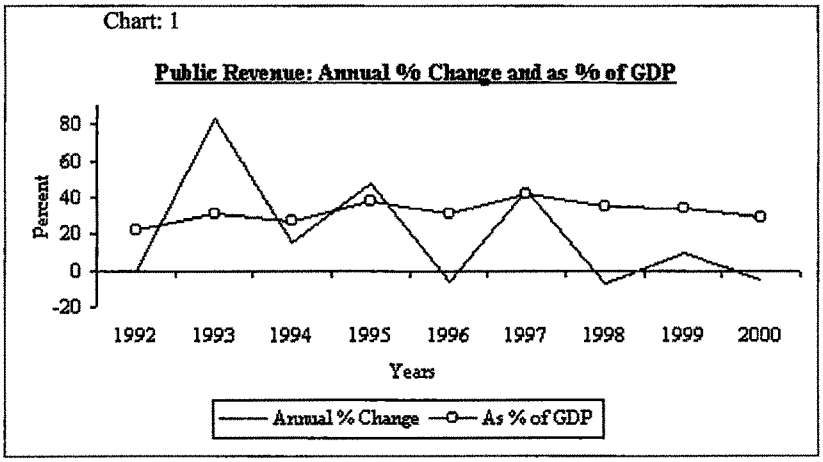
Years	Total Public Revenue			*Annual % Change in*		
	Current	Capital	Total	*Current*	*Capital*	*Total*
1992	488.8	0	488.8	--	--	--
1993	890.6	2.6	893.2	*82.2*	*0*	*82.7*
1994	950.7	75.8	1026.50	*6.7*	*2815.4*	*14.9*
1995	1408.90	112.4	1521.30	*48.2*	*48.3*	*48.2*
1996	1375.10	45.2	1420.30	*-2.4*	*-59.8*	*-6.6*
1997	1641.60	403.9	2045.50	*9.4*	*793.6*	*44*
1998	1587.70	311.5	1899.20	*-3.3*	*-22.9*	*-7.1*
1999	1850.20	230.3	2080.50	*16.5*	*-26.1*	*9.5*
2000	1717.00	250.6	1967.60	*-7.2*	*8.8*	*-5.4*
Average	1323.4	159.144	1482.54	18.7625	444.6625	22.525

Table: 2 **Composition of Public Revenue**
In percentage

Years	Current	Capital
1992	100	0.0
1993	100	0.0
1994	92.7	7.3
1995	92.6	7.4
1996	96.8	3.2
1997	80.2	19.8
1998	83.6	16.4
1999	88.9	11.1
2000	87.3	12.7

Table: 3 Public Revenue as Percentage of GDP			
Years	Current	Capital	Total
1992	21.9	0	21.9
1993	31.1	0.1	31.2
1994	25.5	2	27.5
1995	34.9	2.8	37.7
1996	30.3	0.1	31.3
1997	33.2	8.2	41.4
1998	29	5.7	34.7
1999	30.4	3.8	34.2
2000	25.4	3.7	29.1
Average	29.1	2.9	32.1

Chart: 1



iii. The annual percentage change in current revenue has also been highly fluctuating. As percentage of total GDP, current revenue has also shown great fluctuations. In 1992, it was 21.9 percent and then reached its highest rate of 34.9 percent in 1995, then after it started falling, reaching to 25.4 percent by 2000.

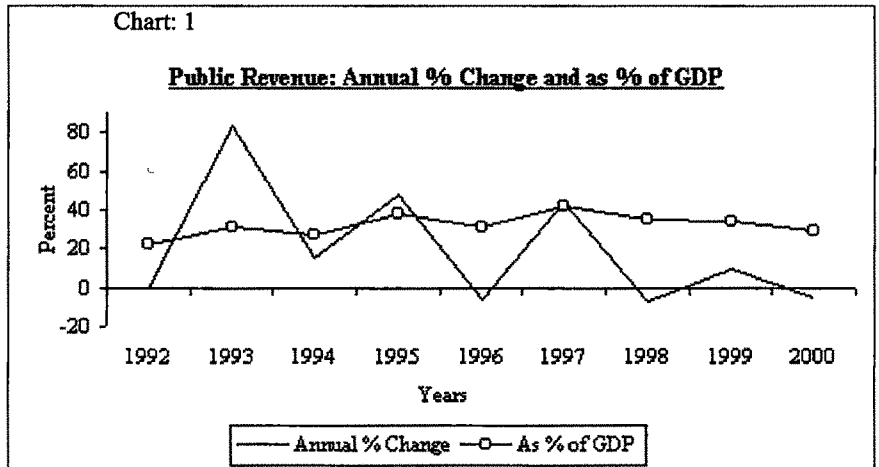
iv. The capital revenue contributes a small share to the total revenue. As percentage of total revenue, it remained in the range 3.2 to 19.8 percent throughout 1992 – 2000. The government revenue is significantly dominated by current revenue.

v. The annual percentage change in capital revenue has also been highly fluctuating. As percentage of total GDP, capital revenue has shown a fluctuating behavior. In 1993, it was 0.1 percent and then reached its highest rate of 8.2 percent in 1997, after which it started falling reaching to 3.7 percent by 2000.

Let us now discuss the behavior of current and capital revenues more in detail.

Table: 3 Public Revenue as Percentage of GDP			
Years	Current	Capital	Total
1992	21.9	0	21.9
1993	31.1	0.1	31.2
1994	25.5	2	27.5
1995	34.9	2.8	37.7
1996	30.3	0.1	31.3
1997	33.2	8.2	41.4
1998	29	5.7	34.7
1999	30.4	3.8	34.2
2000	25.4	3.7	29.1
Average	29.1	2.9	32.1

Chart: 1



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Let us now discuss the behavior of current and capital revenues more in detail.

of public undertakings and other revenues such as national insurance contribution; rent and direct charges to users of government services. Broadly, the non-tax revenue sources are of two types: administrative revenues and state enterprises revenues.

The non-tax revenues of the government of Eritrea may be classified into five categories: port fees and charges, sales of goods and services, fines and penalties, extra ordinary revenue and other fees and charges. As compared to tax revenues, the contribution of non-tax revenues to the income of the government of Eritrea is marginal.

b.2.1 *Composition of Current Revenues*

The percentage share of tax revenue and non-tax revenue in total current revenue is given in Table: 4. The table reveals that tax revenues account for a big share of the current revenues. As percentage of current revenues, during 1992-2000, tax revenues ranged from 50.7 percent to 69.0 percent.

Table: 4 Composition of Current Revenue
In percentage

Years	Tax	Non-Tax
1992	60.7	39.3
1993	58.2	41.8
1994	69	31
1995	50.7	49.3
1996	60.4	39.6
1997	58.4	41.6
1998	61.4	38.6
1999	54.9	45.1
2000	66.1	33.9

b.2.2 Growth and Trend in Current Revenues

Table: 5 and Table: 6 present the figures of current revenue and as a percent to GDP respectively. The following important points could be observed:

i. The annual percentage change in tax revenue has been highly fluctuating. As percentage of total GDP, tax revenues have shown some stability. In 1992, it

recorded 13.3 percent and then reached its highest rate of 19.4 percent in 1997, after which it started falling marginally, reaching to 16.7 percent by 2000. Throughout 1992-2000, it has been in the range of 13.0 to 19.4 percent, which is far bellow the required target of 30 to 40 percent.

ii. The annual percentage change in non-tax revenues has shown a series of high fluctuations. Non-Tax revenue as a percentage of total GDP has shown slight fluctuations. In 1992, it recorded 8.6 percent and then reached its highest rate of 17.2 percent in 1995, and then got back to 8.6 percent in 2000.

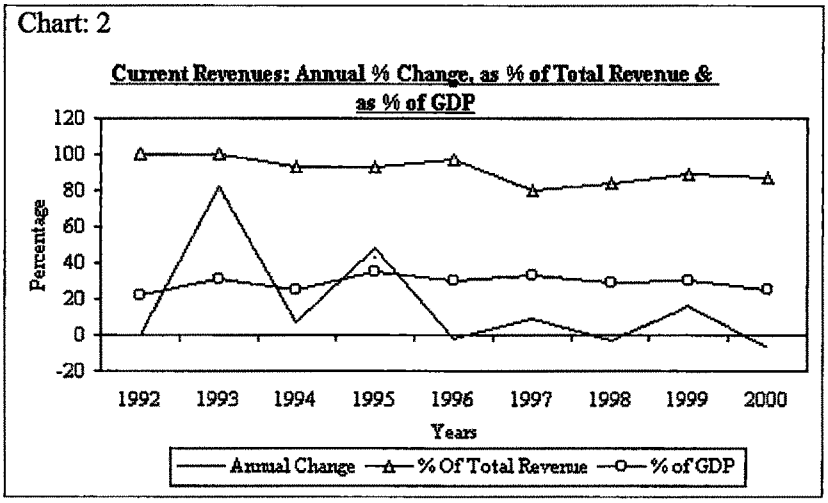
Table: 5 Total Current Revenue
In Millions of Nakfa and Annual % Change

Years	Total Current Revenue			*Annual % Change in*		
	Tax	Non-Tax	Total	*Tax*	*Non-Tax*	Total
1992	297.6	191.2	488.8	-	-	--
1993	517.6	373	890.6	*73.9*	*95.1*	*82.2*
1994	657.5	293.2	950.7	*27*	*-21.4*	*6.7*
1995	715.6	693.3	1408.9	*8.8*	*136.5*	*48.2*
1996	830.4	544.7	1375.1	*16*	*-21.4*	*-2.4*
1997	959.3	682.3	1641.6	*15.5*	*15.3*	*9.4*
1998	977.1	610.6	1587.7	*1.8*	*-10.5*	*-3.3*
1999	1,018.90	831.3	1850.2	*4.3*	*36.1*	*16.5*
2000	1,134.50	582.5	1717.0	*11.3*	*-29.9*	*-7.2*

Table: 6 Current Revenue as Percentage of GDP

Years	Tax	Non-Tax	Total
1992	13.3	8.6	21.9
1993	18	13	31.1
1994	17.6	7.9	25.5
1995	17.7	17.2	34.9
1996	18.3	12	30.3
1997	19.4	13.8	33.2
1998	17.8	11.2	29
1999	16.7	13.7	30.4
2000	16.7	8.6	25.4

Chart: 2



b.3 Composition and Growth of Tax Revenue

The tax revenue in Eritrea is derived from direct taxes and indirect taxes.

Direct Taxes are those levied directly on individuals or firms. They are paid directly to the tax authorities and usually are taxes on income, wealth and profits. They are regarded as socially just in a sense that they can be levied according to the ability of the public to pay, if government desires to do so. The category of direct taxes in Eritrea includes:

1. Taxes on personal income,
2. Taxes on business income,
3. Taxes on rental income,
4. Taxes on agricultural income,
5. Taxes on land use,
6. Taxes on dividend and other incomes and
7. Taxes on recovery and rehabilitation.

Indirect Taxes: are those levied on particular commodities and services. Eritrea's indirect taxes consist of:

1. Sales and excise taxes,

2. Import Tax:
   - Customs duty on imports,
   - Sales tax on imports,
   - Excise tax on imports.
3. Export tax.

b.3.1 Composition of Tax Revenue

Figures for the percentage share of direct taxes and indirect taxes in total tax revenues are given in Table: 7. As regards the changing share of direct and indirect taxes in total tax revenues, we can observe the following trends:

i. As percentage of tax revenue, direct tax has shown a rise with little fluctuations. It rose from 21.0 percent in 1992 to 50.3 percent in 2000.

ii. The share of indirect tax has shown a decline with little fluctuations. It declined from 79 percent in 1992 to 49.7 percent in 2000.

Table: 7 Composition of Tax Revenues
In percentage of Tax Revenues

Years	Direct Tax	Indirect Tax
1992	21	79
1993	34.4	65.6
1994	48.3	51.7
1995	47.5	52.5
1996	45.9	54.1
1997	46.9	53.1
1998	52.2	47.8
1999	50.3	49.7
2000	50.3	49.7

b3.2 Growth and Trend in Tax Revenue

Table: 8 and Table 9 show figures for tax revenues in millions of Nak'fa and as a percentage to GDP respectively. The observations on the tendencies of direct and indirect taxes are as follows:

i. The annual percentage change in direct tax revenues has been highly fluctuating. It fell down from as high rate as 76.1 percent in1994 to just 0.3 percent in 1999.

ii. As percentage of total GDP, direct tax revenue remained below 10 percent throughout 1992–2000. It has also shown some fluctuations. In 1992, direct tax was 2.8 percent of GDP, reaching its highest rate of 9.3 percent in 1998, after which resting at 8.4 percent in 1999 and 2000

iii. The annual percentage change in indirect tax revenue has also been highly fluctuating. It has fallen from as high a rate as 44.7 percent in 1993 to –9.1 percent in 1998.

iv. As percentage of total GDP, indirect tax revenue has shown some fluctuations. In 1993, it reached its highest rate of 11.8 percent, and recorded its lowest rate of 8.3 percent, in year 2000.

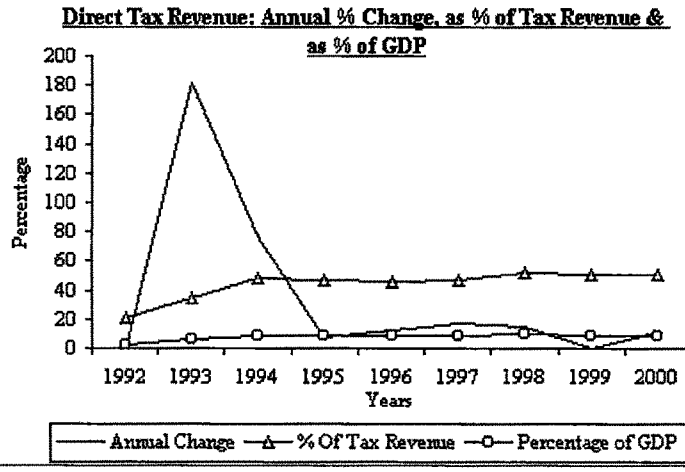
Table: 8 Total Tax Revenues
In Millions of Nakfa and Annual % Change

Years	Total Tax Revenue			*Annual % Change in*		
	Direct Tax	Indirect Tax	Total	Direct Tax	Indirect Tax	Total
1992	63.8	233.8	297.6	-	-	-
1993	179.3	338.3	517.6	181	44.7	73.9
1994	315.8	341.7	657.5	76.1	1	27.0
1995	339.7	375.9	715.6	7.6	10	8.8
1996	380	450.4	830.4	11.9	19.8	16
1997	447.9	511.4	959.3	17.9	13.5	15.5
1998	512.4	464.7	977.1	14.4	-9.1	1.8
1999	513.8	505.1	1,018.90	0.3	8.7	4.3
2000	570.7	563.8	1,134.50	11.1	11.6	11.3

Table: 9 Tax Revenue as % of GDP

Years	Direct Tax	Indirect Tax	Total
1992	2.8	10.5	13.3
1993	6.3	11.8	18
1994	8.5	9.1	17.6
1995	8.4	9.3	17.7
1996	8.4	9.9	18.3
1997	9.1	10.3	19.4
1998	9.3	8.5	17.8
1999	8.4	8.3	16.7
2000	8.4	8.3	16.7

Chart: 3



c. Public Expenditure

Public expenditure is considered as the most important instrument of fiscal policy. It refers to the expenditure incurred by central, state and local governments either for the satisfaction of collective needs of the citizens or for stabilizing the economy and hence promoting their economic and social welfare. However, in spite of the growing role and importance of public expenditure in national economies, it remains relatively unexplored and a highly controversial area because of the role of the government in the economy.

According to Harris [1959], economists have generally concentrated their attention on the theory of taxation. The theory of public expenditure has been more or less confined to that of generalities in terms of the effects of public expenditure on employment and prices. The area of public expenditure has since long been a field of dispute between traditional and modern economists. The traditional thinking and philosophy did not favor the state interference in the general economic activity and thus stood against the growth of public expenditure. Instead, it considered market mechanism as a better guide in working of the economy and allocation of its resources. It was argued that each economic unit was the best judge of its own economic interests and the government was certainly not able to decide on behalf of others.

Modern economists hold the view that public expenditure has a positive role to play in achieving definite ends. Its goal is to promote maximum social welfare, and its significance lies in the supply of those essential goods and services by the government for the satisfaction of collective wants, which might not otherwise be provided economically and efficiently by the private sector.

Based on historical facts, the German economist Adolph Wagner [1835-1917] advanced his "Law of rising public expenditures". According to Wagner, there are inherent tendencies for the activities of different levels of a government to increase both intensively and extensively. He argued that the development of modern industrial society would give rise to increasing political pressure for social progress and call for increased allowance for social consideration in the conduct of industry. In consequence, continual expansion of the public sector and its share in the economy should be expected [Musgrave and Musgrave, 1989]. As such, the argument states a functional relationship between the growth of an economy and the growth of the government activities so that the government sector grows faster than the economy.

The development of developing economies requires huge expenditure to be incurred in various sectors of the economy. The private sector does not undertake such investments, either being unable to finance these huge investments or being unwilling to risk on uncertain or long delved investment returns. Moreover, in the modern world, state is regarded as a Welfare State, which is expected to promote the welfare of its citizens by fulfilling certain social and economic obligations. Therefore, state has to provide not only social security but also to participate directly in the economy to maintain growth and stability and to secure essential goods; which all call for ever increasing investment expenditure.

Public expenditure has a significant role in the growth and stabilization of the economy. An increase or a decrease in public expenditure can cause significant variations in income, output and employment. Through the multiplier effect, any increase in public expenditure which is not spent on imported goods and services leads to an ever increase in the demand for the output of the business sector, boosting aggregate demand as a whole. Similarly, any decline in public expenditure will have multiplier effect in the opposite direction.

What has been the growth and composition of public expenditure in Eritrea? Is the role of the government increasing with the growth of the economy? Answer to the former question has been explored in the following section whereas the second question has been dealt with in Section: 6.2 of the present chapter.

c.1 Composition and Trend of Public Expenditure

The expenditure of the Government of Eritrea is classified in two ways.

First, it is divided into two broad categories: current expenditure and capital expenditure. Current expenditure is Further classified as interest payments and non-interest expenditures also known as consumption expenditure. The non-interest expenditure is made of personal services, material and supplies, purchase of motor vehicles and military constructions and equipments. The expenditure on capital account consists of loans and grants, and capital outlay.

Second, total public expenditure is also classified into developmental and non-development expenditures. The developmental expenditure may further be classified into economic, social and general services expenditures. This section of the study provides the analysis of the expenditure of the Government of Eritrea as classified in both the ways.

c.2 Current vs Capital Expenditure

c.2.1 Composition:

The percentage share of current and capital expenditure in total expenditure is given in Table: 10. From the figures in the table, we observe that:

i. Except for the years 1999 and 2000, the current expenditure dominated a bigger share of the total public expenditure. As percentage of total expenditure, current expenditure ranged from 87.6 percent in 1992 to 53.6 percent in 1998. While for the years 1999 and 2000, it fell to 40.4 percent and 41.5 percent respectively.

ii. Overall, the composition of public expenditure is undergoing a change, where the share of current expenditure is falling and that of capital expenditure increasing.

iii. The share of interest payments in total public expenditure has been quite interesting. It grew continuously from 0.8 percent in 1992 to 26.8 percent in 1995 and then after slided down to reach 13.9 percent in year 2000. The share of non-interest payment in total public expenditure has also shown the similar pattern.

iv. The share of capital expenditure in the total expenditure has been consistently going up from 12.4 percent in 1992 to 58.5 percent in 2000

Table: 10 Current vs. Capital Expenditure
In Percentage of Total Expenditure.

Public Expenditure	1992	1993	1994	1995	1996	1997	1998	1999	2000
Current Expenditure	**87.6**	**67.8**	**72.2**	**77.4**	**66.8**	**55.3**	**53.6**	**40.4**	**41.5**
Interest Payments	0.8	20.5	24.4	26.8	15.4	14.8	14.4	13.0	13.9
Non – Interest Expenditure	86.7	47.3	47.8	50.6	51.4	40.5	39.2	27.4	27.6
Capital Expenditure	**12.4**	**32.2**	**27.8**	**22.6**	**33.2**	**44.7**	**46.4**	**59.6**	**58.5**
External Loans & Grants	0.0	25.8	20.9	13.2	13.4	18.0	23.6	38.6	37.9
Capital Outlay	12.4	6.4	6.9	9.4	19.8	26.7	22.8	21.0	20.6

c.2.2 Growth and Trend:

Table: 11 shows the public expenditure outlay in Eritrea from 1992 to 2000 as well as its annual growth rates. Table: 12 shows the figures of public expenditure as a percentage to GDP. A careful assessment of the given expenditure figures brings the following observations:

Total Public Expenditure

i. In nominal values, total public expenditure grew from 734.8 million of Nak'fa in 1992 to 4,347.8 million of Nak'fa in 2000 – a six times increase in eight years.

ii. The annual percentage change in total public expenditure has been highly fluctuating. It rose from 9.4 percent in 1994 to 63.5 percent in 1995 and then sharply fell to –0.2 percent in 1996 before rising again to 50.9 percent in 1998 and resting at –14.0 percent by 2000, indicating an annual average growth rate of 29 percent.

iii. As percentage of total GDP, total expenditure has also shown great fluctuations. In 1992, total public expenditure was 32.9 percent of GDP, reaching its highest rate of 83.0 percent in 1999 and then finally settling down at 64.2 percent in 2000.

Current Expenditure

i. Current expenditure increased from 643.4 million of Nak'fa in 1992 to 1,804.6 million of Nak'fa in 2000. The annual percentage change in current expenditure has been highly fluctuating.

ii. As percentage of total GDP, current expenditure has also shown great fluctuations. In 1992, it recorded 28.8 percent and then reaching its highest rate of 48.6 percent in 1995, after which it started falling, reaching to 26.6 percent in 2000.

Capital Expenditure

i. In nominal values, capital expenditure rose from 91.4 million Nak'fa in 1992 to 3,011.0 million Nak'fa in 1999, then fell down to 2,543 Nak'fa in 2000.

ii. The annual percentage change in capital expenditure has been highly fluctuating. It rose from as low a rate as -5.5 percent in 1994 to as high as 68.4 percent in 1999, before sharply falling again to -15.5 percent by 2000.

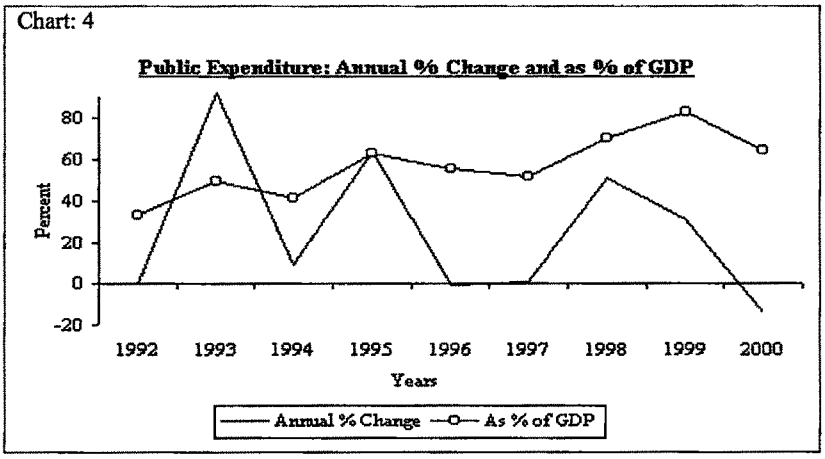
iii. As percentage of total GDP, capital expenditure has also shown a fluctuating behavior. In 1992, it was 4.1 percent and then reached its highest rate of 49.5 percent in 1999, after which it fell to 37.6 percent in 2000.

Table: 11 Public Expenditure
In Millions of Nakfa and Annual % Change

Years	Total Public Expenditure			*Annual % Change in*		
	Current Expenditure	Capital Expenditure	Total	Current Expenditure	Capital Expenditure	Total
1992	643.4	91.4	734.8	-	-	-
1993	960.1	455.2	1415.3	49.2	398	92.6
1994	1118.1	430.3	1548.4	16.5	-5.5	9.4
1995	1960.5	571.9	2532.4	75.3	32.9	63.5
1996	1688.6	839.2	2527.8	-13.9	46.7	-0.2
1997	1412.8	1143.5	2556.3	-16.3	36.3	1.1
1998	2069.9	1788.3	3858.2	46.5	56.4	50.9
1999	2042.8	3011.0	5053.8	-1.3	68.4	31
2000	1804.6	2543.2	4347.8	-11.7	-15.5	-14

Table: 12	Public Expenditure [As percentage of GDP]		
Years	Current Expenditure	Capital Expenditure	Total
1992	28.8	4.1	32.9
1993	33.5	15.9	49.4
1994	30	11.5	41.5
1995	48.6	14.2	62.8
1996	37.2	18.5	55.7
1997	28.6	23.2	51.8
1998	37.8	32.6	70.4
1999	33.5	49.5	83
2000	26.6	37.6	64.2

Chart: 4



C.3 Development vs. Non-development Expenditure

The total expenditure of the Eritrean government can as well be divided into developmental and non-development expenditures. The developmental expenditure may further be classified into economic, social and general services expenditures.

The following important conclusions are made from the Tables: 13 and 14

i. It is evident that except for the last two years, the non-development expenditure has always been higher than the development expenditure all throughout the post-independence period. On an average, the development and non-development

expenditures as percentage to total expenditure were 37.5 percent and 62.5 percent for the period 1992 to 2000, respectively.

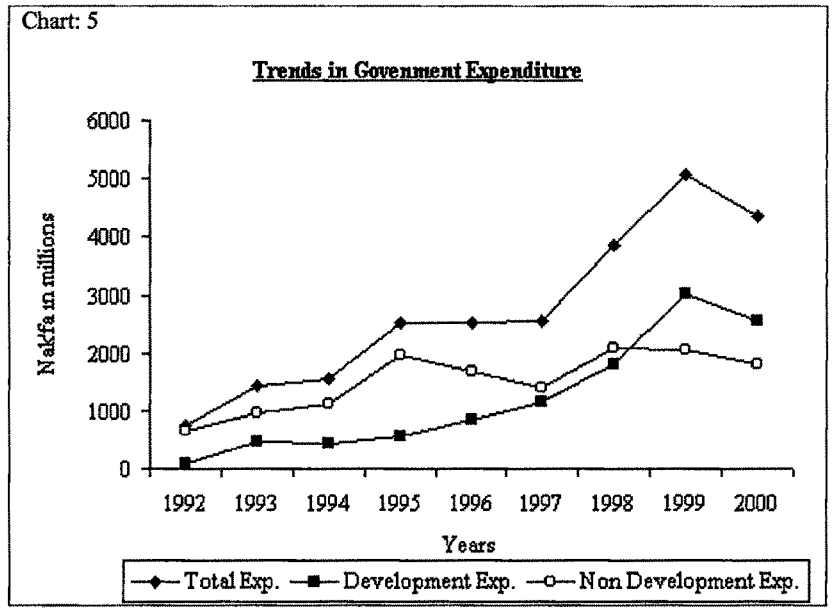
ii. Within the three components of development expenditure, the government spends maximum on economic expenditure [18.1 percent], followed by general services [12.3 percent]. The average social expenditure as percentage to total expenditure is quite low at 7 percent.

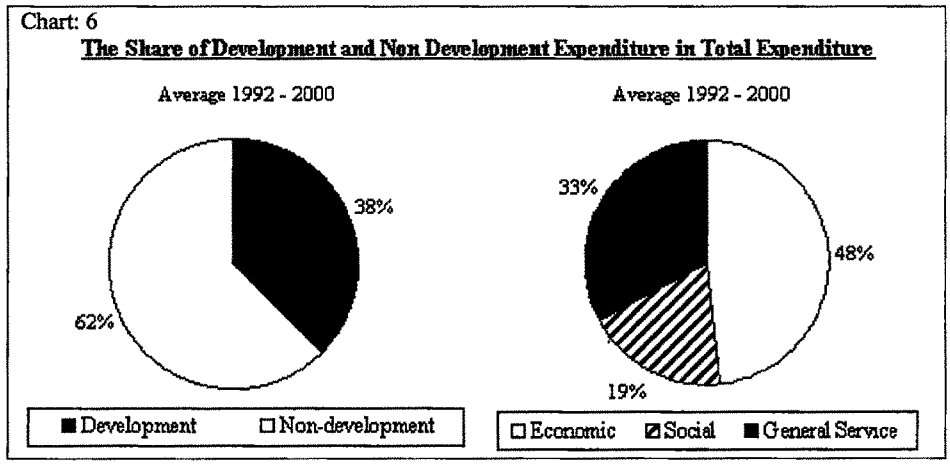
Table: 13 Trends in Expenditure of the Government
In Millions of Nak'fa

Years	Economic Exp. [1]	Social Exp. [2]	General Service Exp. [3]	Development Exp. [1+2+3]	Non-development Exp.	Total Exp
1992	78.7	12.1	0.6	91.4	643.4	734.8
1993	372.5	41.1	41.6	455.2	960.1	1415.3
1994	339.4	73.4	17.5	430.3	1118.1	1548.4
1995	410.4	83.9	77.6	571.9	1960.5	2532.4
1996	471.4	202.9	164.9	839.2	1688.6	2527.8
1997	581.5	334	228	1143.5	1412.8	2556.3
1998	600	361.7	826.6	1788.3	2069.9	3858.2
1999	688.2	433.2	1889.6	3011.0	2042.8	5053.8
2000	755.6	504.7	1282.9	2543.2	1804.6	4347.8

Table: 14 Development and Non-development Expenditure
As % of Total Expenditure

Years	Economic Exp. [1]	Social Exp. [2]	General Service Exp. [3]	Development Exp. [1+2+3]	Non-development Exp
1992	10.7	1.6	0.1	12.4	87.6
1993	26.3	2.9	2.9	32.2	67.8
1994	21.9	4.7	1.1	27.8	72.2
1995	16.2	3.3	3.1	22.6	77.4
1996	18.6	8.0	6.5	33.2	66.8
1997	22.7	13.1	8.9	44.7	55.3
1998	15.6	9.4	21.4	46.4	53.6
1999	13.6	8.6	37.4	59.6	40.4
2000	17.4	11.6	29.5	58.5	41.5
Average	18.1	7.0	12.3	37.5	62.5





d. Fiscal Deficits

Fiscal deficit is defined as the excess of the total government expenditure over its total revenues. Fiscal deficit may be sub-divided into a number of deficits, such as: revenue deficit, capital deficit, fiscal deficit, net fiscal deficit, primary deficit and net primary deficit. This classification of the fiscal deficit is very important from the economic point of view. Each deficit has its own concept, implications and effects on the economy. In practice, the concept of budget deficit admits of many variations and yield. However, as

the 1989 World Development Report points out, the choice of the "correct" measure would depend upon the purpose of analysis [WDR, 1989].

A given measure of deficit may be referred to by different names; similarly a given term may be used to represent different measures of budgetary deficit. The existence of such a large number of measures is explained by the fact that each measure has analytical and policy relevance, and there is no single measure which may be universally preferred over all others for all time to come. There is no single "correct" measure to opt for [Bhatia, 1976].

The budgetary framework of the government of Eritrea enables us to define some of the deficits and accordingly, this section restricts the analysis of the following deficit concepts:

i. Revenue Deficit [RD]
ii. Capital Deficit [CD]
iii. Fiscal Deficit [FD]
iv. Net Fiscal Deficit [NFD]

d.1 Eritrea's Deficit Classification

i. Revenue Deficit [RD]

Revenue deficit refers to the excess of expenditure on current account over the revenue current account.

Revenue Deficit = Total Current Expenditure > Total Current Revenues

Current revenue includes both tax and non-tax revenues, while expenditure on current account includes both interest payments and non-interest expenditure. Current expenditure is generally covered partly through the Central Bank credit to the government and partly through borrowings. Borrowings in fact add to the aggregate expenditure in the economy, creating interest burden for the public and the economy.

As such, the revenue deficit represents the negative savings of the government and it implies that the government instead of contributing partially to finance its capital expenditure meets even its current expenditure by borrowing and increasing public debt.

ii. Capital Deficit [CD]

Capital deficit refers to the excess of expenditure on capital account over the capital revenues on capital account.

Capital Deficit = Total Capital Expenditure > Total Capital Revenues

The existence of capital deficit implies that the government investments exceed its capital revenues. However, unlike current deficit, capital deficit is somehow justified because capital expenditure is considered as an investment. In spite of spending on health, education, development and industrial training and research which involve a considerable capital outlay; they are arbitrarily classified as current spending. Therefore, they might be regarded as investment although they are never classified as such in economic figures.

iii. Fiscal Deficit:

Fiscal deficit refers to net deficit incurred to fill up the gap between the total expenditure [on both revenue and capital accounts] and the total revenues [both revenue and capital account].

Fiscal Deficit = Aggregate Expenditure > Aggregate Revenues

Or

Fiscal Deficit = Revenue Deficit + Capital Deficit

The fiscal deficit is generally financed partially through borrowings and partially through Central Bank credit to the government. Central Bank credit to the government leads to increase in the money supply which in turn leads to secondary expansion of credit through the banking sector and has an inflationary impact on the economy.

iv. Net Fiscal Deficit

Net fiscal deficit is obtained when fiscal deficit [FD] is reduced by loans and advances.

Net Fiscal Deficit = Fiscal Deficit – Loans & Advances

This measure of deficit implies the fact that some payments by the government are not considered as part of 'spending away' but for acquisition of assets.

d2. Trends in Eritrea's Deficit

Table: 15 shows the figures of public deficit in nominal millions of Nak'fa. Table: 16 shows the annual percentage change in Eritrea's public deficit and Table: 17 provides public deficit as percentage to GDP. From all these Tables, the following conclusions may be made:

i. It is seen that there has been a continuous revenue deficit except for the year 1997, which recorded revenue surplus of 228.8 million Nak'fa. The revenue deficit has been highly fluctuating as percentage of GDP. It ranged from as high as 13.7 percent in 1995 to as low as 1.3 percent in 2000. The annual change in revenue deficit has also been fluctuating and showed highest increase of 229.5 percent in 1995 while its maximum fall was –310.7 percent in 1998.

ii. As well, on capital account, there has always been a deficit during the same period. The capital deficit has also shown the same tendencies as witnessed in revenue deficit. It is also noticed that the gap between current deficit and capital deficit continued to grow during this period.

iii. Fiscal deficit continued to rise from 246.0 million Nak'fa in 1992 to 2,380.2 million Nak'fa in 2000. It showed a highly fluctuating annual percentage growth. As percentage of GDP, it has been in the range of 10.3 percent and 48.8 percent during 1992 – 2000.

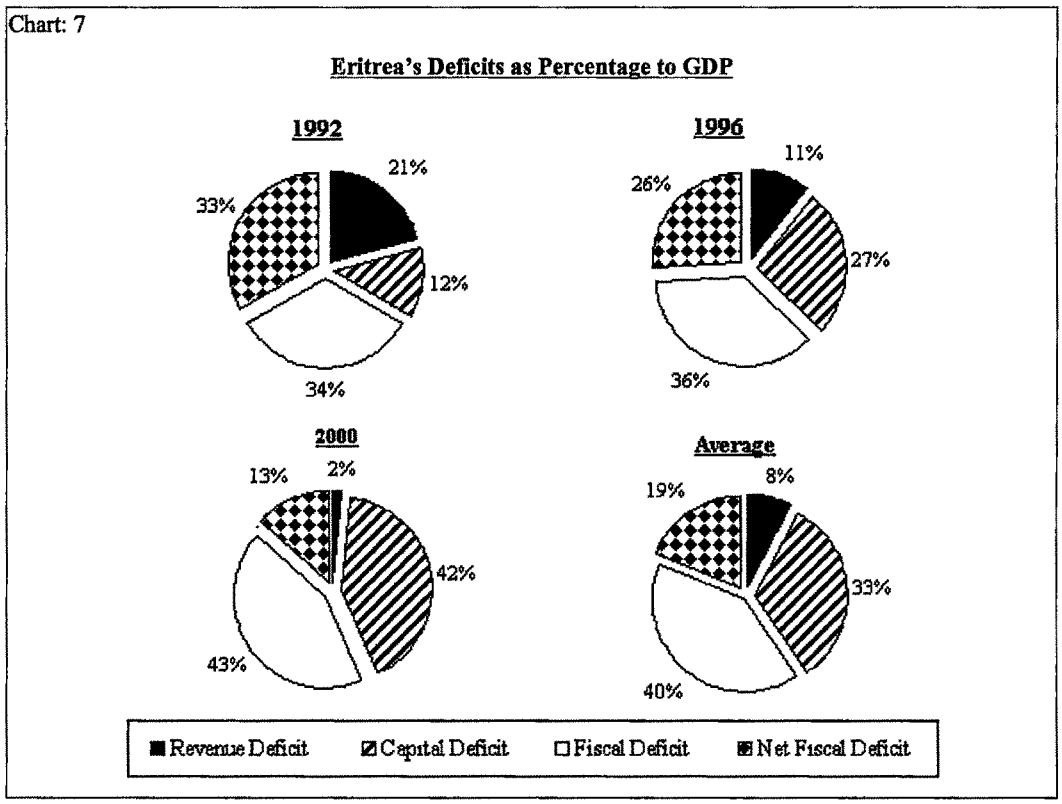
Table: 15 Deficits [Nominal]
In millions of Nak'fa

Deficit	Revenue Deficit	Capital Deficit	Fiscal Deficit	Net Fiscal Deficit
1992	154.6	91.4	246	246
1993	69.5	452.6	522.1	156.5
1994	167.4	354.5	521.9	198
1995	551.6	459.5	1011.10	677.9
1996	313.5	794	1107.50	767.7
1997	-228.8	739.6	510.8	50.7
1998	482.2	1476.80	1959.00	1047.50
1999	192.6	2780.70	2973.30	1020.30
2000	87.6	2292.60	2380.20	730.6

Table: 16 Annual % Change in Deficits				
Deficit	Revenue Deficit	Capital Deficit	Fiscal Deficit	Net Fiscal Deficit
1992	--	--	--	--
1993	-55	395.2	112.2	-36.4
1994	140.9	-21.7	-0.04	26.5
1995	229.5	29.6	93.7	242.4
1996	-43.2	72.8	9.5	13.2
1997	-173	-6.8	-53.9	-93.4
1998	-310.7	99.7	283.5	1966.10
1999	-60.1	88.3	51.8	-2.6
2000	-54.5	-17.5	-19.9	-28.4

Table: 17 Deficits as percentage to GDP				
Deficit	Revenue Deficit	Capital Deficit	Fiscal Deficit	Net Fiscal Deficit
1992	6.9	4.1	11	11
1993	2.4	15.8	18.2	5.5
1994	4.5	9.5	14	5.3
1995	13.7	11.4	25.1	16.8
1996	6.9	17.5	24.4	16.9
1997	-4.6	15	10.3	1
1998	8.8	26.9	35.7	19.1
1999	3.2	45.7	48.8	16.8
2000	1.3	33.9	35.2	10.8

Chart: 7



e. Deficit Finance and Public Debt

e.1 Concept and Implications of Deficit Finance

Keynes popularized deficit financing during the period of the Great Depression of the 1930s. It refers to the policy of creating or increasing an existing deficit in the balance between the government's expenditure and revenue. In other words, the government's expenditure is planned to exceed revenues.

Dr. V.K.R.V. Rao defines deficit financing as "the financing of a deliberately created gap between public revenue and public expenditure or a budgetary deficit, the method of financing resorted to being borrowing or a type that result in a net addition to national outlay or aggregate expenditure". Hence, deficit financing implies creation of additional money supply [Mithani, 1996].

Generally such deficit is financed by borrowing and/or grants. Usually, government borrows to finance deficit from external and domestic sources. The external sources may

be international institutions, foreign governments or foreign private institutions. Government's domestic borrowing comes from bank and non-bank sources.

In most developing countries, the great masses of people are living at the subsistence level or in extreme poverty. This makes the margin between income and consumption below zero or very low so that the voluntary savings cannot by themselves provide sufficient resources for development. Also, for the same reason, any attempt to increase the volume of resources by additional taxation beyond a certain limit creates difficult economic, social and political problems in the country. Therefore, in the absence of sufficient foreign aid, the gap between expenditure and revenue has to be filled through deficit financing. In this sense, deficit financing can help in accelerating the economic growth in developing countries.

As pointed out already, deficit financing in many developing countries results in the creation of the additional currency notes. The increase in money supply tends on one hand to increase the people's purchasing power and to raise prices on the other hand. The supply of goods cannot be increased in the short run in proportion to the rise in aggregate demand. This rises the prices resulting in increasing profits. The rise of profits induces entrepreneurs to increase investments. As a result investment in the private sector starts increasing.

Deficit financing also provides the government with huge resources, which it can spend in building up the essential infrastructure in the country, launch public enterprises and to carry out multipurpose projects. All these increase the investments in the public sector add accelerate economic development. Here, it is important to mention that since deficit financing involves the creation of additional currency notes, it almost invariably results in inflation. Inflation is the main adverse effect of deficit financing besides increasing the public debt, which must be guarded against to ensure economic growth with stability.

e.2 Public Debt

Public debt refers to the total indebtedness of the government, as result of deficit financing. It includes the government's borrowing from within the country or abroad, from private individuals or business organizations or from banking and non-banking financial institutions. Public debt may be classified as: [i] internal and external debts, [ii] productive

and unproductive, [iii] redeemable and irredeemable debts, or [iv] short-term and long-term debts.

In recent years, with the expansion in the functions of the government, its expenditure has increased at a much faster rate than its tax revenues. In the absence of better alternations to meet this deficit, the government is obliged to raise loans. As such, public debts become a common phenomenon in both developed and developing countries. The necessity of rising public loans is more in developing countries rather than in developed countries because developing countries require massive resources for carrying out development programs. Therefore developing countries must utilize such loans in productive projects such as the construction of roads, railways, irrigation facilities, installation of power plants, communication facilities, establishment of social overheads, and building up of necessary and capital goods industries. The expenditure of public loans in all these projects is justified because all such expenditures are productive and help in building up the repaying capacity of the government.

e.3 Eritrea's Deficit Financing and Public Debt

The government of Eritrea finances its deficits from three sources, namely: domestic loans, external loans and external grants. Domestic and external loans form the public debt of the Government of Eritrea. A close analysis for the figures presented in the tables below brings out the following observations:

Deficit Finance

i. The contribution of domestic loans in financing the public deficit has fluctuated between 9.9 percent of total deficit to 69.3 percent. As percentage of GDP, deficit finance through domestic loans has increased from 3.2 percent in 1992 to 18.6 percent in 1999, recording its highest level of 19.1 percent in 1998.

ii. The share of external loans has fluctuated in the range of 0.2 to 40.1 percent of total deficit. While as percent of GDP, it increased from 0 percent in 1993 to 13.5 percent in 2000, reaching its highest level of 17.8 percent in 1999.

iii. Eritrean Government has heavily resorted to external assistance to take care of its deficits. The share of external grants has fluctuated in the range of 21.7 to 73.7 percent of total deficit. As percent of GDP, external grants have shown a rising trend, increasing from 9.1 percent in 1992 to 17.8 percent in 1999, then finally settling down at 13.5 percent in 2000.

Public Debt

i. In general, Eritrea's public debt is in a continuous rise since 1992. It has increased from 64.6 million Nak'fa in 1992 to 1,555.7 million Nak'fa in 2000.

ii. The Debt - GDP ratio may be a more accurate measure of the "true" size of the public debt. As percentage of GDP, total public debt has increased from 3.2 percent in 1992 to 25.5 percent in 2000, reaching its highest level of 36.3 percent in 1999. The domestic debt rose from 3.2 percent in 1992 to 12.0 percent in 2000, recording its highest level of 21.1 percent in 1998. As for the external debt, it increased from 0 percent in 1993 to 13.5 percent in 2000.

Table: 18 Sources of Deficit Finance and Public Debt
In Millions of Nakfa

Years	Domestic Loans [1]	External Loans [2]	External Grants [3]	Total [1+2+3]	Public Debt [1+2]
1992	64.6	0	181.4	246.0	64.6
1993	156	1.1	365.0	522.1	157.1
1994	198	154.2	169.7	521.9	352.2
1995	677.9	46.0	287.2	1011.1	723.9
1996	767.7	55.7	284.1	1107.5	823.4
1997	50.5	204.9	255.4	510.8	255.4
1998	1047.50	485.7	425.8	1959.0	1533.2
1999	1020.30	977.0	976.0	2973.3	1997.2
2000	730.4	825.3	824.5	2380.2	1555.7

Table: 19 Deficit Finance as % of Fiscal Deficit

Years	Domestic Loans	External Loans	External Grants
1992	26.3	0	73.7
1993	29.9	0.2	69.9
1994	37.9	29.6	32.5
1995	67.0	4.6	28.4
1996	69.3	5.0	25.7
1997	9.9	40.1	50.0
1998	53.5	24.8	21.7
1999	34.3	32.9	32.8
2000	30.7	34.7	34.6

Table: 20 Sources of Deficit Finance and Public Debt as Percentage of GDP					
Years	Domestic Loans	External Loans	External Grants	Total	Public Debt
1992	3.2	0.0	9.1	12.3	3.2
1993	6.2	0.0	14.4	20.7	6.2
1994	5.8	4.6	5.0	15.4	10.4
1995	18.5	1.3	7.9	27.7	19.8
1996	18.8	1.4	6.9	27.1	20.1
1997	1.1	4.6	5.7	11.4	5.7
1998	21.1	9.8	8.6	39.5	31.0
1999	18.6	17.8	17.8	54.1	36.3
2000	12.0	13.5	13.5	39.0	25.5

6.2 Empirical Analysis of Eritrea's Fiscal System

The first part of this chapter dealt with an in-depth analysis of Eritrea's fiscal system, where the growth, trend and composition of all the important constituents and variables of the Eritrean fiscal sector were examined.

The conclusions on the structural analysis of Eritrea's fiscal sector raise certain pertinent questions:

i. *Why is there such a fluctuating trend in the values of fiscal variables over a period of time?*

ii. *How responsive are the fiscal variables to the macro economic changes in the Eritrean economy?*

iii. *How sensitive are the tax revenues to national income?*

iv. *Is the role of the government increasing with the growth of the economy?*

The proper fiscal planning and policy formulations require the answers to these questions. This chapter deals with the empirical analysis and modeling of Eritrea's fiscal system.

Objectives of the Study:

The objective of the present section of the research study is to empirically investigate the issues raised above. The specific objectives are:

1. To find out the responsiveness of Eritrea's fiscal variables to the changes in its macro economic variables.
2. To estimate the tax buoyancy.
3. To test for the validity of 'Wagner's Law' of increasing state activities in Eritrea.

a. Empirical Analysis:

a1. Responsiveness of Fiscal Variables

How responsive or sensitive are the fiscal variables to the changes occurring in the Eritrean economy? For proper fiscal planning and control, this question needs serious consideration. It is very important from the Government point of view to identify the extent of relationship of fiscal variables with major macro economic variables. Such exercise helps the fiscal policy regulators and planners to have a long-term perspective of the fiscal system of the country.

The economic growth and rate of inflation are two important macro variables which affect the variations in almost all the other economic variables, including the fiscal variables. In this section of the study on the fiscal sector modeling, we empirically examine the responsiveness of fiscal variables to economic growth and the price level. This analysis would give us the income and price elasticities of respective fiscal variables

In fact, this kind of empirical exercise forms a part of macro economic modeling in the literature. The fiscal sector modeling forms a part of larger macro economic modeling where the three macro economic sectors of the economy- fiscal, monetary and external, are examined for their interrelationship.

The present study is based upon the pioneer work in this area of research by Rangarajan and Mohanty [1997]. In fact Rangarajan and Mohanty [1997] study explores the interrelationship between fiscal deficit, external balances and monetary growth in India and this study only adopts the fiscal model from therein.

The transmission channel starting with the determination of fiscal deficit [budget constraint] and ending with its eventual financing constitutes the central theme of the fiscal sector model. Such models focus on the income and price channels of the transmission. The evolution of fiscal deficit is a process of determination of government revenue and expenditure. The disaggregated macro economic analysis of government revenue and government expenditure constitutes the first part of the model on fiscal sector in the present study. The fiscal deficit is financed by government borrowing. The empirical analysis of government borrowing constitutes the second part of the fiscal sector modeling in this study.

a.1.1 Methodological Specifications

1. The major components of fiscal system can be explained as follows:

Budget Constraint = *Public Revenue [PR] - Public Expenditure [PE]*

i. *Public Revenue [PR]*

Public Revenue [PR] = Current Revenue [TR] + Capital Revenue [CR]
Current Revenue [TR] = Tax Revenue [TX] + Non-Tax Revenue [NTX]
Tax Revenue [TX] = Direct Taxes [DT] + Indirect Taxes [IT]
Indirect Taxes [IT] = Domestic Indirect Taxes [DIT] + Import Taxes [TM]

Hence,

$TR = DT + DIT + TM + NTX$ .....[eq. 1]

ii. *Public Expenditure [PE]*

Public Expenditure [PE] = Consumption Expenditure [CON] + Interest Payments [IP] + Public Investments [PI] + Transfer Payments [TRP]

hence,

$PE = IP + CON + PI + TRP$ .....[eq. 2]

iii. *Fiscal Deficit [FD]*

Fiscal Deficit [FD] = Public Expenditure [PE] - Public Revenue [PR]

Fiscal Deficit [FD] = Total Borrowing [external & external] + Grants

Total Outstanding Debt [TDBT] = Total Debt of current year + Total Debt of previous year.

2. The fiscal variables, like all economic variables, are of two types.
   i. Endogenous variables, which are determined endogenously in the model.
   ii. Exogenous variables, which are policy determined.

This analysis takes only the endogenous fiscal variables into consideration. Exogenous variables are policy driven and are largely based upon the discretion of the government rather than determined by other variables.

3. There are three explanatory variables included in the equations.
   i. Income variable, represented by GDP
   ii. Price variable, represented by Inflation Rate as measured by Wholesale Price Index.
   iii. Lag [one year] of respective dependent variable in the equation, to find out the long-run income and price elasticities, as described in the following Box 1.

4. The time series annual data for the period 1992 to 2000 has been used for the study, applying Ordinary Least Square method of regression analysis. The statistical tests used in the analysis are t-values, R Square, Adjusted R Square, standard error of the model and F-value. The significance levels of t-tests have been given in Appendix I.

5. All the equations are in double-log, where the co-efficients of the explanatory variables give the respective short-run elasticities.

b. Estimation

b.1 Public Revenues:

The usual classification of public revenue [PR] is:

Public Revenue [PR] = Current Revenue [TR] + Capital Revenue [CR]

However, in this analysis, following the earlier studies surveyed on the subject, PR has been re-classified into tax and non-tax revenue.

Public Revenue [PR] = Tax Revenue [TX] + Non-Tax Revenue [NTX]
Tax Revenue [TX] = Direct Taxes [DT] + Indirect Taxes [IT]
Indirect Taxes [IT] = Domestic Indirect Taxes [DIT] + Import Taxes [TM]

Here, Total revenue consists of tax revenue [TX] and non-tax revenue [NTX]. Tax revenue is further divided into direct [DT]and indirect taxes [IT]. Indirect taxes consist of domestic indirect taxes [DIT] and import taxes [TM].

Hence,

$$PR = DT + DIT + TM + NTX \qquad \text{.....[eq. 1]}$$

All the four components of public revenue [PR] are endogenously determined as follows:

i. Direct Taxes [DT]

The revenue from the direct taxes [DT] is hypothesized to be a function of non-agriculture real income at factor cost [Ynar], domestic price level [P] and lag of dependent variable DT [DT_{-1}].

The function used for DT is:

$$DT = f[Y_{nar}, P, DT_{-1}]$$

The reason for using Ynar rather than GDP is that the tax revenue from the agriculture sector in Eritrea constitutes a meager amount where as the income from agriculture sector is comparatively high. In the section on tax buoyancy in this chapter, it was noticed that the agriculture tax-income estimates were statistically not significant. That major source of direct taxes in Eritrea is non-agriculture income [Y_{nar}].

The nominal tax collections are hypothesized to increase proportionately to domestic prices. Or putting it the other way, the inflation is expected to increase the tax collection including DT.

The lag of DT [DT_{-1}] has been introduced in the function to estimate long-run income and price elasticities. [See following box for the details].

Under the partial adjustment frame work, the following equation in double-log provides the estimates of relative income and price elasticities of direct taxes [DT].

$$Log\ DT = a + b\ log\ Y_{nar} + c\ log\ P + d\ log\ DT_{-1} \quad .....[eq.1]$$

$$Log\ DT = \underset{[0.02]}{0.019} + \underset{[1.58]}{0.495\ log\ Y_{nar}} + \underset{[1.39]}{0.082\ log\ P} + \underset{[2.33]}{0.306\ log\ DT_{-1}}$$

R Square	Adj. R Square	St. Error	F
0.978	0.961	0.031	59.982

All the explanatory variables- income, price and lag of DT, are quite significantly listed in the equation. The short-run income elasticity of direct taxes is 0.495 whereas the price elasticity of direct taxes is negligible at 0.082. It implies inelastic price elasticity of direct taxes, meaning thereby that the inflation is not an important variable in the determination of the direct tax revenue to the government in Eritrea.

The long-run income and price elasticities workout at 0.713 and 0.118 respectively, which are higher in values than the respective short-run elasticities. [see Box for the long-run elasticity calculation]

Box 1

In the partial adjustment formulation, as is the case with the present study, the long-run elasticities are given by dividing the corresponding short-run elasticities by k, where k= 1-coefficient of the lagged dependent variable.

Consider the following specialized equation-

$$Y = a + b\,X + C\,Y_{t-1}$$

The long-run elasticity in of Y with respect to X in the above equation would be-

el. = b/ (1-c)

Source: Jadhav [1994]

ii. Domestic Indirect Taxes [DIT]

Domestic indirect taxes [DIT] are hypothesized to be a function of income and prices. The income here refers to real income at factor cost [Yr] and prices refer to inflation [P]. Lag of DIT [DT_{-1}] has been used to find out the long run income and price elasticities as used in DT equation.

The function used for DIT is:

$$DIT = f\,[Y_r, P, DIT_{-1}]$$

The estimated DIT equation in double-log is:

$$\underset{}{Log\ DIT} = \underset{[0.31]}{0.224} + \underset{[1.29]}{0.721\ log\ Y_r} + \underset{[0.65]}{0.059\ log\ P} - \underset{[-0.15]}{0.086\ log\ DIT_{-1}}$$

R Square	Adj. R Square	St. Error	F
0.836	0.836	0.045	6.799

The above DIT equation is statistically not significant. The explanatory variables P and DT_{t-1} are listed in the equation with very insignificant t-values. However, the overall explanatory power of the equation, as judged by the high values of R Square [0.836] and Adjusted R Square [0.881], is quite high. The short-run real income elasticity of domestic indirect taxes [DIT] in the above equation is 0.721 whereas the short-run price elasticity is very low at 0.059.

The long-run real income and price elasticities of DIT workout to be 0.788 and 0.064 respectively, which are close to the short-run elasticities.

iii. Import Taxes [TM]

Import tax revenue has been identified as an identity. Import tax revenue is basically determined in the following manner:

Import Tax = Import duty x Amount of Imports

In the regression equation with amount of import [IMP] as independent variable and total import tax revenue [TM] as dependent variable, the coefficient of IMP without the constant term would give the average import duty.

$$TM = 0.073\ IMP$$
[14.27]

R Square	Adj. R Square	St. Error	F
0.614	0.489	50.698	12.726

The above equation implies that for 100 Nak'fa increase in imports [IMP] in Eritrea, the tax collection from imports [TM] would increase by 7 Nak'fa. Hence, the average import duty in Eritrea for the time period 1992 to 2000 works out to 7.3 percent.

d. Non-Tax Revenue [NTX]

The non-tax revenue [NTX] is hypothesized to be a function of overall economic activity measured by GDP at current market price [YM] and price level.

$$NTX = f[YM, P, NTX_{t-1}]$$

The estimated non-tax revenue equation is:

$$Log\ NTX = \underset{[2.176]}{-4.922} + \underset{[3.04]}{3.065\ log\ YM} - \underset{[1.96]}{0.475\ log\ P} - \underset{[2.25]}{1.174\ log\ NTX_{t-1}}$$

R Square	Adj. R Square	St. Error	F
0.771	0.599	0.094	4.499

All the three determinants of non-tax revenue, namely nominal income, price level and lag of NTX are significantly listed in the above equation with high t-values. The short-run income elasticity of non-tax revenue is quite high at 3.065, signifying the fact that the non-tax revenue collection in Eritrea is highly sensitive to the nominal income. The price elasticity of non-tax revenue [-0.475] is negative suggesting that the increase in the rate of inflation suppresses the non-tax revenue collections to the government in Eritrea.

The long-run income and price elasticities of non-tax revenue workout to 1.401 and – 0.218 respectably.

ii. Public Expenditure [PE]

Public expenditure [PE] is classified in several ways, depending upon the objective of the study. The most common classifications of public expenditure are: current and capital, economic and non-economic, developmental and non-developmental. In current study, economic classification has been used as follows:

Public Expenditure [PE] = Interest Payments [IP] + Consumption Expenditure [CON] + Public Investments [PI] + Transfer Payments [TRP]

Hence,

$$PE = IP + CON + PI + TRP \qquad \text{.....[eq. 2]}$$

Public Investments [PI] and Transfer Payments [TRP] are exogenous variables in the system. As pointed out by Rangarajan and Mohanty [1997], in developing countries, public investment outlay subsumes several policy objectives and at times could be a residual item in the budget given the revenue constraint and expenditure in the current account of the budget. It could be argued, however, that in the case where deficit is monetized to a large extend; the financing may not seem to be a binding constraint on the level of investment outlay in the budget. Transfer Payments [TRP] are largely influenced by the social and economic factors of the country.

Hence, only two components of total expenditure; consumption expenditure [CON] and interest payments [IP], both endogenously determined, are accordingly included in the analysis.

a. Consumption Expenditure [CON]

Consumption Expenditure of the government [CON] is hypothesized to be determined by country's economic activity, price level and lagged consumption expenditure [CON-1] as follows:

$$CON = f[\, YM, P, CON_{t-1}]$$

CON has been defined as real consumption expenditure for the reason that government desires to maintain a real level of consumption in each period. Economic activity is measured by GDP at market prices [YM].

The estimated consumption expenditure equation of Eritrean government is:

$$Log\ CON = \underset{[0.60]}{-0.677} + \underset{[2.41]}{1.433\ log\ YM} - \underset{[2.36]}{0.420\ log\ P} - \underset{[0.92]}{0.402\ log\ CON_{t-1}}$$

R Square	Adj. R Square	St. Error	F
0.774	0.606	0.081	4.590

Consumption expenditure of the government [CON] significantly gets influenced by the economic growth and level of inflation. The nominal income affects the consumption expenditure of the government positively and more than proportionately. Eritrea's government consumption expenditure rises by 1.433 percent for one percent increase in its GDP. The price elasticity of consumption expenditure is negative and inelastic in the short-run in Eritrea.

The long-run income elasticity of consumption expenditure is unity [1.022] whereas long-run price elasticity of consumption expenditure is inelastic [-0.299] in Eritrea.

b. Interest Payments [IP]

Interest Payments [IP] is hypothesized to be a function of Real Income at factor Cost [Yr] and Inflation [P], giving income and price elasticities of Interest Payments [IP].

$$IP = f[Y_r, P]$$

The estimated equation is as follows:

$$\log IP = \underset{[-2.47]}{-9.423} + \underset{[3.13]}{3.403} \log Y_r - \underset{[0.24]}{0.198} \log P$$

R Square	Adj. R Square	St. Error	F
0.622	0.496	0.455	4.946

The income elasticity of interest payments is positive and very high at 3.403 whereas price elasticity of interest payment is negative and very low at -0.198.

c. Total Outstanding Debt [TDBT]

Total Outstanding Debt [TDBT] is nothing but Public Debt. Change in TDBT [$TDBT_{change}$] is related to the total Fiscal Deficit in a given year.

$$TDBT_{change} = f[FD]$$

The estimated equation is:

$$log\ TDBT_{change} = \underset{[-2.12]}{-0.958} + \underset{[8.42]}{1.244}\ log\ FD$$

R Square	Adj. R Square	St. Error	F
0.922	0.909	0.12	71.00

Theoretically, the elasticity of change in TDBT [$TDBT_{change}$] with respect to fiscal deficit should be unitary for the obvious reason that both should be equal to each other. However, possibly due to the data adjustments, in the above equation, this elasticity is marginally higher than unitary.

Table: 21 below, summarizes the empirical results on income and price elasticities with respect to various fiscal variables.

Table: 21 Elasticity Variables

Variable	Income Elasticity		Price Elasticity	
	Short-Run	Long-Run	Short-Run	Long-Run
Revenue				
Direct Taxes [DT]	0.495	0.713	0.082	0.118
Domestic Indirect Taxes [DIT]	0.721	0.788	0.059	0.064
Non Tax Revenue [NTX]	3.065	1.401	-0.475	-0.218
Expenditure				
Consumption Expenditure [CON]	1.433	1.022	-0.420	-0.299
Interest Payments [IP]	3.403	--	-0.198	--

$$TDBT_{change} = f[FD]$$

The estimated equation is:

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R Square	Adj. R Square	St. Error	F
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Interest Payments [IP]	3.403	--	-0.198	--

There are two concepts used to measure the responsiveness of tax revenues to a change in national income. These are:

i. *Tax Elasticity:* This measures the response of the tax revenue to national income net of the effects of any discretionary changes in the tax system. In the estimation of tax elasticity, the data on tax revenue is adjusted to eliminate the effects of discretionary measures on tax revenue. A high income elasticity of tax implies higher tax revenue to the government without resorting to the raising of the tax rates.

ii. *Tax Buoyancy:* This measures the total response of tax revenue to changes in national income. Unlike tax elasticity, it includes both natural growth through tax elasticity as well as growth due to the discretionary measures.

In the estimation of tax buoyancy, actual tax receipts are taken without any adjustments. The estimation of tax elasticity requires netting out the effects of discretionary changes on tax receipts. Due to the absence of detailed data and information on tax policy changes in Eritrea, this study restricts itself to the estimation of tax buoyancy.

b. Methodology and Coverage

This study estimates the size of tax buoyancy for both, aggregate tax revenue as well as individual tax revenues. The aggregate tax revenue has been related with GDP. As for the individual tax revenues, their respective income sources have been identified, and then related accordingly as exhibited in Table 22 below.

Table: 22 Tax Buoyancy Variables

Allocation of Tax Revenues to Respective Income Sources $T_r = f[Y_i]$				
Sr. No.	***Dependent Variables*** Tax Revenue (T_r)	**Code**	***Independent Variables*** Source in National Income (Y_i)	Code
1.	Total Tax (2 + 7)	T_{tot}	Gross Domestic Product [GDP]	Y
2.	Direct Taxes	T_{dt}	Gross Domestic Product [GDP]	Y
3.	Business Income Tax	T_{bit}	Industrial Income	Y_{ind}
4.	Agricultural Income Tax	T_{agr}	Agricultural Income	Y_{agr}
5.	Rental Income Tax	T_{rent}	Income from Real Estate and Housing	Y_{estate}
6.	Personal Income Tax	T_{pit}	Personal Income	Y_{pers}
7.	Indirect Taxes	T_{indt}	Gross Domestic Product [GDP]	Y
8	Sales and Excise Tax	T_{sales}	Income from Service & Manufacturing	Y_{sales}
9.	Import Tax	T_{imp}	Total Imports	imp

Where, Y_{pers} = $Y - (Y_{ind} + Y_{agr} + Y_{estate})$

Y_{sales} = Distribution + Transportation & Communication + Industry (excluding Construction & Building)

T_{imp} = Custom duty on imports + Sales tax on imports + Excise tax on imports.

The equation used to estimate the tax buoyancy is –

$$\textit{Log } T = \textit{log } a + b \textit{ log } Y$$

Where T refers to respective tax revenue and Y refers to corresponding income.
The co-efficient of Y [b] is the measure of tax buoyancy.

The OLS method of regression has been used to estimate the above equation for Eritrea's post-independence [1992-2000] annual data.

c. Empirical Results

Table 23 displays the results on the estimated tax buoyancy in Eritrea.

As is evident from the table, the tax revenue is highly buoyant in the case of business ncome tax [1.163], indirect taxes [1.243], sales and excise tax [1.364] and import tax [1.270]. The tax revenue is moderately buoyant in the case of direct taxes [0.488] and personal income tax [0.794].

Agriculture tax [0.017] and rental tax [0.127] show almost no buoyancy.

The total tax buoyancy is moderate at 0.830.

Table: 23 Estimated Tax Buoyancy Equations

Tax Variable	Intercept	Co-efficient *(Tax Buoyancy)*	R Square	Adj. R Square	SE	F Value	No. of Obs
T_{tot}	1.251 *(6.139)*	**0.830** *(11.699)*	0.951	0.944	0.037	136.874	9
T_{dt}	2.412 *(15.419)*	**0.488** *(7.853)*	0.898	0.883	0.053	61.662	9
T_{bit}	0.125 *(0.512)*	**1.163** *(11.516)*	0.964	0.956	0.033	132.627	7
T_{agr}	2.876 *(203.771)*	**0.017** *(0.695)*	0.088	-0.094	0.023	0.483	7
T_{rent}	2.118 *(56.151)*	**0.127** *(4.045)*	0.719	0.719	0.046	16.365	7
T_{pit}	1.879 *(7.030)*	**0.794** *(6.087)*	0.881	0.857	0.038	37.055	7
T_{indt}	0.386 *(1.083)*	**1.243** *(9.105)*	0.922	0.911	0.046	82.894	9
T_{sales}	0.174 *(0.164)*	**1.364** *(2.906)*	0.547	0.482	0.112	8.446	9
T_{imp}	0.455 *(1.364)*	**1.270** *(8.899)*	0.919	0.907	0.096	79.196	9

3. 'Wagner's Law' of Increasing State Activities

In the field of public finance, the relationship between economic growth and public expenditure occupies the central stage.

One of the main features of the contemporary world has been the continued growth in the relative size of the public sector in both developing and developed countries. In particular, after the Second World War, the phenomenon of public expenditure growth happened almost universally and regardless of the nature of either the political or economic system concerned. Thus, the growth of public expenditure as a proportion of GNP (or GDP) has received considerable attention from economists, who have mainly directed their attention to the analysis of the reasons for the permanent growth of public expenditure [Safa, 1999].

Eritrea appears to follow this universally observed "rule" of permanent growth of public expenditure. During a short period between 1992 and 2000, Eritrea's economic growth was accompanied by a sharp increase in its government spending. The ratio of total public expenditure to GDP was 32.9 percent in 1992, it increased to 64.2 percent in 2000.

For a long time, there was no model of the determination of public expenditures. Of course, some classical economists, e.g. Adam Smith, paid attention to tendencies in the long-term trend in public expenditures, but there was no attempt to translate such observations into a general theory (Tarschys, 1975). However, over one hundred years ago, a simple model of the determination of public expenditures was offered by Adolph Wagner, a leading German economist of the time. On the basis of empirical findings, Wagner formulated a 'law' of expanding state expenditures; which pointed to the growing importance of government activity and expenditure as an inevitable feature of 'progressive state' (Bird, 1971). He was the first scholar to recognize the existence of a positive correlation between the level of economic development and the size of the public sector.

a. Wagner's Law

Wagner (1883) offered a model of the determination of public expenditure in which public expenditure growth was a natural consequence of economic growth. Later, his views were formulated as a law and are often referred to as "Wagner's Law". His main contribution in

this field was that he tried to establish generalizations about public expenditures, not from postulates about the logic of choice, but rather by direct inference from historical evidence.

The growth in the size of public sector has received considerable attention for several decades. After the publication of English translations of Wagner's works in 1958, Wagner's Law has become very popular in academic circles and it has been analyzed and tested by many researchers. In particular, the relationship between public expenditure and national income has been tested empirically for various countries using both time-series and cross-sectional data sets within the context of 'Wagner's Law'. Among the several interpretations, the most popular interpretation of the Law states that the increases in economic activities cause an increase in government activities, which in turn raises public expenditure.

Some of the important and often referred studies on Wagner's Law are, Musgrave (1969), Bird (1971), Krzyzaniak (1972, 1974), Mann (1980), Sahni and Singh (1984), Abizadeh and Gray (1985), Ram (1986, 1987), Henrekson (1992), Courakis et al. (1993), Murthy (1993), Oxley (1994) Ansari et al. (1997) and Chletsos and Kollias (1997).

Some of these researchers have applied traditional regression analysis, while some others have used causality testing. More recently, cointegration analysis has also appeared in the literature. Empirical tests of Wagner's Law have yielded results that differ considerably from country to country and period to period.

A number of explanations lie at the foundations of Wagner's law. First, as a country industrializes, public sector activity, it is asserted, is substituted for private activities. This reflects the need for public protection as society becomes more complex through urbanization. Commerce and the increasing complexity of contracts require supporting publicly funded legal system. Second, a number of public services are income elastic. For example, education and cultural activities, as Wagner argued, fall into this category - as do health services. Third, the importance of natural monopolies, especially infrastructure services, increases as the economy grows [Safa, 1999].

It follows from the above discussion that public expenditure in Wagner's Law can be treated as an outcome, or an endogenous factor, not a cause of growth in national income. Conversely, there is another approach which is associated with Keynes. Here, public

expenditure is seen as an exogenous factor which can be used as a policy instrument. The former requires the causality to run from national income to public expenditure whereas in the latter from expenditure to national income. The Keynesian proposition on public expenditure is supported by developing countries which strongly base their economic growth on the growth in their public sector.

b. Model Specification to Test Wagner's Law

There are at least six versions of Wagner's law which have been empirically investigated. However, there is no objective criterion or convincing test to decide which of the six versions is the most appropriate. Six versions of the hypotheses on Wagner's Law are as given below.

1 Peacock-Wiseman Traditional Version [1968]
E = f [GDP]

2 Pryor Version [1969]
C = f [GDP]

3 Goffman Version [1968]
E = f [GDP/P]

4 Musgrave [1969]
E/GDP = f [GDP/P]

5 Gupta/Miches Version [1967]
E/P = f [GDP/P]

6 "Modified" Peacock-Wiseman Share Version suggested by Mann [1980]
E/GDP = f [GDP]

Where,
E = Government total expenditure
P = Population
C = Government consumption expenditure
GDP = Gross Domestic Product

The difference in the above versions basically lies in the definition of dependent variable, i.e. the role of government as defined in terms of government expenditure. The dependent variables used are total expenditure, consumption expenditure, per capita total expenditure and ratio of expenditure to GDP. The growth variables used in the above models are total GDP and per capita GDP.

All the above functions are in log form, where the slope co-efficient gives the elasticity of government expenditure with respect to growth. *If the elasticity is greater than one, then it would mean that the government expenditure increases faster than the economic growth, implying thereby that there is increasing role of the government in the economy.* And, in that case, Wagner's hypothesis holds true.

In the present section, we propose to test the Wagner's hypothesis. For this purpose, all the six versions of Wagner's law have been tested for Eritrea. As mentioned earlier, the precise formulation of Wagner's hypothesis is subject to disagreement among researches. There is no objective criterion or convincing test to decide which of the six versions is the most appropriate. This study uses the advanced model selection tests as discussed and used in Chapter 4 on Growth Estimates and Forecasting, for making-up the best-suited version in Eritrea's case.

c. Empirical Results

The empirical regression results on all the six versions of Wagner's law, along with the relevant test statistics and model selection criterion tests are as given below. The study covers the time period 1992-2000. The significance levels of D-W and t-tests are given in Appendix I.

1 **Peacock-Wiseman Traditional Version [1968]**

$E = f[GDP]$

$$\textit{Log } E = \underset{[4.57]}{-2.661} + \underset{[10.39]}{1.661}\ \textit{log GDP}$$

Mean of dep. var.		3.372	S.D. of dep. variable		0.266
Error Sum of Sq (ESS)		0.0346	Std Err of Resid. (sgmahat)		0.0703
Unadjusted R-squared		0.939	Adjusted R-squared		0.930
F-statistic (1, 7)		107.951	p-value for		0.000017
Durbin-Watson stat.		2.944	First-order autocorr. coeff		-0.622
MODEL SELECTION STATISTICS					
SGMASQ	0.00494103	AIC	0.00599367	FPE	0.00603904
HQ	0.00545278	SCHWARZ	0.0062622	SHIBATA	0.00555104
GCV	0.00635276	RICE	0.00691745		

2 Pryor Version [1969]

$C = f[GDP]$

Log C = 0.181 + 0.780 log GDP
[0.26] [4.09]

Mean of dep. var.		3.015	S.D. of dep. variable		0.144
Error Sum of Sq (ESS)		0.0491	Std Err of Resid. (sgmahat)		0.0838
Unadjusted R-squared		0.705	Adjusted R-squared		0.663
F-statistic (1, 7)		16.7583	p-value for		0.004609
Durbin-Watson stat.		2.044	First-order autocorr. coeff		-0.130
MODEL SELECTION STATISTICS					
SGMASQ	0.00702101	AIC	0.00851677	FPE	0.00858123
HQ	0.00774817	SCHWARZ	0.00889834	SHIBATA	0.0078878
GCV	0.00902701	RICE	0.00982941		

3 Goffman Version [1968]

$E = f[GDP/P]$

Log E = -2.975 + 2.070 log GDP/P
[4.69] [10.02]

Mean of dep. var.		3.372	S.D. of dep. variable		0.266
Error Sum of Sq (ESS)		0.0370	Std Err of Resid. (sgmahat)		0.0727
Unadjusted R-squared		0.935	Adjusted R-squared		0.926
F-statistic (1, 7)		100.473	p-value for		0.000021
Durbin-Watson stat.		2.895	First-order autocorr. coeff		-0.509
MODEL SELECTION STATISTICS					
SGMASQ	0.00528483	AIC	0.00641072	FPE	0.00645924
HQ	0.00583218	SCHWARZ	0.00669793	SHIBATA	0.00593728
GCV	0.00679478	RICE	0.00739876		

4 Musgrave [1969]

E/GDP = f[GDP/P]

Log E/GDP = -2.784 + 0.823 log GDP/P
[4.51] [4.09]

Mean of dep. var.	-0.260	S.D. of dep. variable	0.122
Error Sum of Sq (ESS)	0.0351	Std Err of Resid. (sgmahat)	0.0708
Unadjusted R-squared	0.705	Adjusted R-squared	0.663
F-statistic (1, 7)	16.7533	p-value for	0.004613
Durbin-Watson stat.	2.951	First-order autocorr. coeff	-0.586

MODEL SELECTION STATISTICS

SGMASQ	0.00501344	AIC	0.0060815	FPE	0.00612753
HQ	0.00553268	SCHWARZ	0.00635397	SHIBATA	0.00563238
GCV	0.00644585	RICE	0.00701881		

5 Gupta/Miches Version [1967]

E/P = f[GDP/P]

Log E/P = -2.784 + 1.823 log GDP/P
[4.51] [9.06]

Mean of dep. var.	2.807	S.D. of dep. variable	0.236
Error Sum of Sq (ESS)	0.0351	Std Err of Resid. (sgmahat)	0.0708
Unadjusted R-squared	0.922	Adjusted R-squared	0.910
F-statistic (1, 7)	82.1732	p-value for	0.000041
Durbin-Watson stat.	2.951	First-order autocorr. coeff	-0.586

MODEL SELECTION STATISTICS

SGMASQ	0.00501324	AIC	0.00608127	FPE	0.0061273
HQ	0.00553246	SCHWARZ	0.00635372	SHIBATA	0.00563216
GCV	0.0064456	RICE	0.00701854		

6 "Modified" Peacock-Wiseman Share Version suggested by Mann [1980]

E/GDP = f[GDP]

Log E/GDP = -2.661 + 0.661 log GDP
[4.57] [4.13]

Mean of dep. var.		-0.260	S.D. of dep. variable		0.122
Error Sum of Sq (ESS)		0.0346	Std Err of Resid. (sgmahat)		0.0703
Unadjusted R-squared		0.710	Adjusted R-squared		0.668
F-statistic (1, 7)		17.1013	p-value for		0.004374
Durbin-Watson stat.		2.944	First-order autocorr. coeff		-0.622
MODEL SELECTION STATISTICS					
SGMASQ	0.00494104	AIC	0.00599368	FPE	0.00603905
HQ	0.00545278	SCHWARZ	0.00626222	SHIBATA	0.00555105
GCV	0.00635277	RICE	0.00691746		

d. Inferences and Conclusions

The following inferences and conclusions can be made from the above results, which are summarized in Table: 24 below

1. All the six versions of Wagner's Law have given statistically quite significant results with high t-values and R Square. The advanced model selection statistics are also very low in values [suggesting high level of model significance] in all the equations.

2. Among all the versions, the Peacock-Wiserman [P-G] traditional version has given comparatively the best results, closely followed by Goffman version.

   The Peacock-Wiserman [P-G] traditional version describes the total expenditure as a function of GDP whereas Goffman version describes total expenditure as a function of per capita income [GDP/P].

3. Based upon the above observations, it may be concluded that the Wiseman-Peacock traditional version of the Wagner's Law holds true in the case of Eritrea.

4. The co-efficient of the dependent variable, the growth elasticity of public expenditure, is more than one in the Peacock-Wiserman [P-G] traditional version equation [1.66] as well as Goffman version equation [2.07].

5. These findings suggest that in the case of Eritrea, we accept the Peacock-Wiseman and Goffman hypotheses of Wagner's Law and conclude that there is increasing role of the state activity in Eritrea.

Table: 24 Summary of Results

Models	P-W	Pryor	Goffman	Musgrave	Gupta/Miches	Mann
Dep. Var.	*E*	*C*	*E*	*E/GDP*	*E/P*	*E/GDP*
Indep. Var	*GDP*	*GDP*	*GDP/P*	*GDP/P*	*GDP/P*	*GDP*
Constant	-2.6612 (-4.579)	0.1815 (0.262)	-2.9759 (-4.696)	-2.7846 (4.511)	-2.7846 (-4.511)	-2.6612 (-4.579)
Elasticity Co-efficient	**1.6612** (10.390)	**0.7802** (4.094)	**2.0700** (10.024)	**0.8233** (4.093)	**1.8233** (9.065)	**0.6612** (4.135)
R2	0.939	0.705	0.935	0.705	0.922	0.710
D-W	2.944	2.044	2.895	2.951	2.951	2.944
F	107.951	16.7583	100.473	16.7533	82.1732	17.1013
SGMASQ	0.004941	0.007021	0.005285	0.005013	0.005013	0.004941
AIC	0.005994	0.008517	0.006411	0.006082	0.006081	0.005994
FPE	0.006039	0.008581	0.006459	0.006128	0.006127	0.006039
HQ	0.005453	0.007748	0.005832	0.005533	0.005532	0.005453
SCHWARZ	0.006262	0.008898	0.006698	0.006354	0.006354	0.006262
SHIBATA	0.005551	0.007888	0.005937	0.005632	0.005632	0.005551
GCV	0.006353	0.009027	0.006795	0.006446	0.006446	0.006353
RICE	0.006917	0.009829	0.007399	0.007019	0.007019	0.006917

6.3 Conclusions

The following conclusions can be made from this chapter:

a. Structural Analysis

a.1 Public Revenue

i. The Eritrean budget may be classified into two parts: revenue budget and expenditure budget. The revenue budget deals with the government current receipts from taxation and non-tax sources, and the capital receipts of the government. While the expenditure budget deals with the expenditures on current account and capital account.

ii. The growth of total public revenue as well as its components has been highly erratic in the post–independence Eritrea. Moreover, the various revenues as percent to GDP have also shown very fluctuating trends. On an average, total expenditure as a percentage to GDP was 32.1. In case of current and capital expenditure, it was 29.1 percent and 2.9 percent respectively.

iii. The current revenue dominates a big share of the total public revenue. As percentage of total revenue, it varied from 82 percent to 100 percent throughout 1994 to 2000, leaving a marginal role for the capital revenue in the total revenue receipts of the government.

iv. Though current public revenues are derived from a variety of tax and non-tax sources, tax revenues are the most important sources of income for almost all governments. In fact, the size of the government's development program in a developing country depends largely on the economic and administrative capacity of its tax system to marshal the necessary resources. For this reason, governments in many developing countries are trying to increase the proportion of national income collected in taxes from 10-15 percent to 30-40 percent levels, as reached in developed countries like USA, UK, Austria, France, Germany, Netherlands, etc.

v. As percentage of total GDP, tax revenues have shown some stability in Eritrea. In 1992 it recorded 13.3 percent and then reached its highest rate of 19.4 percent in 1997, after which it has started falling marginally reaching to 16.7 percent by 2000. Throughout 1992-2000, it has been in the range of 13.0–19.4 percent, which is far bellow the required target range of 30–40 percent.

Non-Tax revenue as percentage of total GDP has shown slight fluctuations. In 1992, it recorded 8.6 percent and then reached its highest rate of 17.2 percent in 1995, and then got back to 8.6 percent in 2000.

vi. The Tax revenue is divided into direct and indirect taxes. The share of direct taxes in total tax collections, which was very less at the time of independence, has been continuously increasing in Eritrea at the cost of indirect taxes. It rose from 21.0 percent in 1992 to 50.3 percent in 2000.

vii. As percentage of total GDP, direct tax revenue remained below 10 percent throughout 1992 – 2000. It has also shown some fluctuations. In 1992, direct tax was 2.8 percent of GDP, then reaching its highest rate of 9.3 percent in 1997, after which resting at 8.4 percent in 1999 and 2000

viii. As percentage of total GDP, indirect tax revenue has shown some fluctuations. In 1993, it reached its highest rate of 11.8 percent and recorded its lowest rate of 8.3 percent in year 2000.

ix. Like all the components of Public revenue, the direct and indirect taxes have shown very volatile tax collections, as evident from erratic annual growth rates.

a.2 Public Expenditure

i. The expenditure of the Government of Eritrea is classified in two ways. First, total expenditure is divided into two broad categories: current expenditure and capital expenditure. Current expenditure is further classified as interest payments and non-interest payments. The non-interest expenditure is made of personal services, material and supplies, purchase of motor vehicles and military constructions and equipments. The expenditure on capital account consists of loans, grants, and capital outlay.

Second, total expenditure is also classified into developmental and non-development expenditures. The developmental expenditure may further be classified into economic, social and general services expenditures.

ii. In Eritrea, total expenditure has increased by six times in a span of eight years of post–independence, though with high fluctuations in annual growth rates.

As percentage of total GDP, total expenditure has shown great fluctuations. In 1992, total public expenditure was 32.9 percent of GDP, reaching its highest rate of 83.0 percent in 1999 and then finally settling down at 64.2 percent in 2000.

iii. Overall, the composition of public expenditure is undergoing a change, where the share of current expenditure is falling and that of capital expenditure increasing.

iv. Both, current and capital expenditure as a percentage to GDP have shown quite volatile behavior.

v. The share of interest as well as non-interest expenditure in total public expenditure have been falling in the recent years, where as the share of capital expenditure is consistently increasing.

vi. It is evident that except for the last two years, the non-development expenditure has always been higher than the development expenditure all throughout the post-independence period. On an average, the development and non-development expenditures as percentage to total expenditure were 37.5 percent and 62.5 percent for the period 1992 to 2000, respectively.

vii. Within the three components of development expenditure, the government spends maximum on economic expenditure [18.1 percent], followed by general services [12.3 percent]. The average social expenditure as percentage to total expenditure is quite low at 7 percent.

viii. As percentage of total GDP, indirect tax revenue has shown some fluctuations. In 1993, it reached its highest rate of 11.8 percent and recorded its lowest rate of 8.3 percent in year 2000.

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recording its highest level of 21.1 percent in 1998. As for the external debt, it increased from 0 percent in 1993 to 13.5 percent in 2000.

b. Empirical Analysis of Eritrea's Fiscal System

b.1 Responsiveness of Fiscal Variables

The economic growth and rate of inflation are two important macro variables, which affect the variations in almost all the other economic variables, including the fiscal variables. In this section of the study on the fiscal sector modeling, we empirically examine the responsiveness of fiscal variables to economic growth and the price level. This analysis would give us the income and price elasticities of respective fiscal variables

The transmission channel starting with the determination of fiscal deficit [budget constraint] and ending with its eventual financing constitutes the central theme of the fiscal sector model. Such models focus on the income and price channels of the transmission.

i. The empirical results on the responsiveness of various fiscal variables to two important macro variables – economic growth and price level are statistically quite significant.

ii. Economic growth has turned out to be comparatively more important explanatory variable in the change of fiscal variables than the price level.

iii. In fact, price variable has either appeared to be statistically a weak variable or listed with very low elasticity values.

iv. Income elasticity is lower in tax revenue than in non–tax revenue, implying thereby that non-tax revenue is more sensitive to the economic growth than the tax revenue.

v. Public expenditure in Eritrea is found to be highly sensitive to the growth of the economy, as indicated by the high values of the income elasticity with respect to the expenditures.

b.2 Estimation of Tax Buoyancy

i. It was observed in the earlier section of this chapter that the individual tax revenues had a fluctuating trend during almost the entire period of study. In view of this, it is important to empirically find out the responsiveness of these tax revenues to their respective sources. A quantitative measure of responsiveness of tax revenue is useful for having a better understanding of the tax structure and its behavior in the country. It may, perhaps, prove to be a useful tool for framing appropriate tax policy.

Tax buoyancy is one such tool which measures the responsiveness of tax revenue. Here, in this section, the extent of tax buoyancy in Eritrea has been estimated.

ii This study estimates the size of tax buoyancy for both, aggregate tax revenue as well as individual tax revenues. The aggregate tax revenue has been related with GDP. As for the individual tax revenues, their respective income sources have been identified, and then related accordingly.

iii. The equation used to estimate the tax buoyancy is:

$$Log\ T = log\ a + b\ log\ Y$$

Where T refers to respective tax revenue and Y refers to corresponding income. The co-efficient of Y [b] is the measure of tax buoyancy. The OLS method of regression has been used to estimate the above equation for Eritrea's post-independence [1992-2000] annual data.

iv. In Eritrea, as empirical results point out, the tax revenue is highly buoyant in the case of business income tax [1.163], indirect taxes [1.243], sales and excise tax [1.364] and import tax [1.270]. The tax revenue is moderately buoyant in the case of direct taxes [0.488] and personal income tax [0.794]. Agriculture tax [0.017] and rental tax [0.127] show almost no buoyancy. The total tax buoyancy is moderate at 0.830.

b.3 Wagner's Law of Increasing State Activities

i. *Is the role of the Government increasing with growth of the Eritrean economy?* The answer to this question requires to test for the validity of Wagner's law of increasing state activities. Among the several interpretations, the most popular interpretation of the Law states that the increases in economic activities cause an increase in government activities, which in turn raises public expenditure.

ii. There are at least six versions of Wagner's law which have been empirically investigated. However, there is no objective criterion or convincing test to decide which of the six versions is the most appropriate. Six versions of the hypotheses on Wagner's Law are: *Peacock-Wiseman Traditional Version [1968], Pryor Version [1969], Goffman Version [1968], Musgrave [1969], Gupta/Miches Version [1967], "Modified" Peacock-Wiseman Share Version as suggested by Mann [1980].*

iii. The difference in the above versions basically lies in the definition of dependent variable, i.e. the role of government as defined in terms of government expenditure. The dependent variables used are total expenditure, consumption expenditure, per capita total expenditure and ratio of expenditure to GDP. The growth variables used in the above models are total GDP and per capita GDP.

iv. All the above functions have been estimated in log form, where the slope co-efficient gives the elasticity of government expenditure with respect to growth. *If the elasticity is greater than one, then it would mean that the government expenditure increases faster than the economic growth, implying thereby that there is increasing role of the government in the economy.* And, in that case, Wagner's hypothesis holds true.

v. All the six versions of Wagner's law have been tested for Eritrea. As mentioned earlier, the precise formulation of Wagner's hypothesis is subject to disagreement among researches. There is no objective criterion or convincing test to decide which of the six versions is the most appropriate. This study uses the advanced model selection tests for making-up the best-suited version in Eritrea's case.

All the six versions of Wagner's Law have given statistically quite significant results with high t-values and R Square. The advanced model selection statistics are also very low in values [suggesting high level of model significance] in all the equations.

vi. Among all the versions, the Peacock-Wiserman traditional version has given comparatively the best results, closely followed by Goffman version.

. The Peacock-Wiserman traditional version describes the total expenditure as a function of GDP whereas Goffman version describes total expenditure as a function of per capita income.

vii. The co-efficient of the dependent variable, the growth elasticity of public expenditure, is more than one in the Peacock-Wiserman traditional version equation [1.66] as well as in Goffman version equation [2.07].

viii. These findings suggest that in the case of Eritrea, we accept the Peacock-Wiserman and Goffman hypotheses of Wagner's Law and conclude that there is increasing role of the state activity in Eritrea.

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