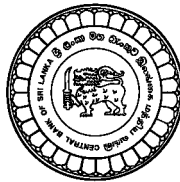


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CENTRAL BANK OF SRI LANKA

A Policy Rule for the Liberalization of Agriculture in Sri Lanka

Dr. H. N. Thenuwara

Abstract

Economic liberalization enhances the productivity and efficiency of productive resources of a country to the extent that the economy has room to grow. In high growth and developed countries the contribution of agriculture to the per capita income has decreased with increasing per capita income in recent decades. In Sri Lanka, the productivity in the agriculture sector has been negative, while industry and services sectors have contributed positively. This paper argues that liberalization of agriculture by way of lower tariff barriers may not result in productive gains in the sector, but that may incur serious losses arising from political economy dimensions. The paper also shows that the continuing phenomenon of falling global commodity prices may result in endogenous generation of price competition in agriculture sector, that may replace any exogenous tariff reductions intended for ensuring price competition, provided non-tariff barriers are removed. Liberalization of industry and services sectors may also bring in pressure on agriculture sector by way of wage increases which force agriculture sector to become competitive. Thus, an optimal policy for the liberalization of agriculture is to remove all non-tariff barriers while maintaining tariff and para-tariff barriers at fixed levels to allow the evolution of endogenous price competition which may eliminate costs arising from political economy dimensions. (JEL F13, 013)

I. Introduction

Agriculture assumes an important place in a country. Agriculture is often discussed with passion and emotional attachment with overwhelming power to overturn any economic arguments for liberalization. Economic liberalization allows countries to develop productive sectors while allowing creative

destruction of unproductive sectors. In sectors where emotional attachments are strong, such destruction seems brutal. Such perceptions could generate costs offsetting benefits from liberalization. Thus, agriculture has assumed a central role in strategic political plans in both developed and developing countries. There could be serious economic and social costs if agricultural policies are not handled prudently. Taking above into consideration, this paper recommends a policy rule for the liberalization of agriculture in Sri Lanka. The rest of the paper is structured as follows. Part II explains role of agriculture in economic growth of countries. Extent of technological progress in agriculture and the impact on agriculture through terms of trade effect are discussed in Part III. Part IV explains political economy aspects, and Part V concludes with policy prescription and justification.

II. Role of Agriculture in Economic Growth

Global production (value added) of agriculture increased at 2 percent per annum from 1977 to 1996, a rate lower than the growth rate of global Gross Domestic Product (GDP).¹ Global GDP grew at 5.1 percent during this period. As a result, the share of agriculture in GDP declined gradually from 7.8 percent in 1977 to 4.3 percent in 1996 (Table 1). The share declined in countries in all income categories; high, middle and low. In 1996 the shares in those countries were 2, 12 and 29 respectively.

Table 1 – Share of Agriculture in GDP

Year	World	High Income Countries	Middle Income Countries	Low Income Countries	Year	World	High Income Countries	Middle Income Countries	Low Income Countries
1965	11.5	7.3	24.0	42.6	1981	6.6	3.8	16.3	35.1
1966	10.9	7.0	22.4	42.4	1982	6.5	3.6	16.0	34.5
1967	10.7	6.6	22.7	44.5	1983	6.3	3.3	16.3	34.9
1968	10.5	6.0	23.3	43.7	1984	6.3	3.4	16.2	33.7
1969	9.9	5.6	21.8	43.2	1985	6.0	3.3	15.5	32.9
1970	9.1	5.3	20.8	41.8	1986	5.9	3.1	15.4	32.2
1971	8.8	5.0	20.4	40.4	1987	5.9	3.0	15.3	31.8
1972	8.8	5.1	19.8	40.9	1988	5.7	2.9	15.0	33.2
1973	9.4	5.8	20.1	42.5	1989	5.8	2.9	14.6	32.0
1974	8.9	5.3	19.6	40.4	1990	5.6	2.8	14.4	31.7
1975	8.6	5.2	18.6	38.6	1991	5.0	2.5	13.3	32.0
1976	8.3	4.9	18.7	37.0	1992	4.7	2.4	12.2	31.3
1977	7.7	4.5	18.3	38.0	1993	4.5	2.2	11.7	30.9
1978	7.3	4.4	17.1	36.9	1994	4.6	2.2	12.0	30.7
1979	7.2	4.3	16.9	35.4	1995	4.4	2.1	12.0	29.2
1980	6.6	3.7	16.1	35.7	1996	4.3	2.0	11.6	28.9

Source: World Bank (1999)

1/ World Bank (1999)

The declining share of agriculture in the global economy signals the limitations of agriculture to fuel continuing economic growth. Limitations arise from the nature of the demand for agricultural products, ability to generate new products and innovative ways of production in agriculture sector. Thus, agriculture sharply contrasts with industrial and services sectors' ability to generate new products and innovations, that could enhance consumer demand and firms' supply. Quah (1997) provides a finer analysis where he distinguishes between the ability to fuel up economic growth by 'products with weight' and 'products without weight'. Weightless products are mostly the products of services industry and information technology industry.

Many developed and fast growing countries have experienced rapid expansion in the services sector compared to the agriculture and industrial sectors. The expansion in services sector reflects the evolution of consumer tastes and tools of production. Back in 1857, the German economist Ernst Engel observed that as families grew richer, they allocated a smaller portion of household budget to food.² Engle's law is applicable to a nation as a whole. A nation with growing income would spend increasingly smaller share of that income on food, shelter and other goods with physical manifestation. They demand more and more services to make life more secure and enjoyable. The economy supplies more and more such services to fulfil that demand raising the services sector output.

Expansion in the services sector is also a result of efforts by firms in the agriculture and industrial sectors to raise value and price of their goods. Production of goods in agriculture and industrial sectors are constrained by demand. To secure a better price, producers in those sectors add more features to the goods making them more appealing to consumers. For example, a modern motor car delivers more features such as secure breaks, high quality seating and music than an old car, which are essentially products of service industries.

Experience in developed countries and high growth economies in Asia in recent decades shows that the economic growth and high levels of per capita income have been fuelled by the growth in the services sector. To investigate this claim, overall growth of an economy is divided into sectoral contributions as shown in Quah (1997). According to this decomposition, overall economic growth is the sum of the contribution by the growth in different sectors weighted by the share of each sector's output in the overall GDP.³

2/ Federal Reserve Bank of Dallas (1994)

3/ Assume that GDP growth g arises from different sectors. GDP is denoted Y and j^{th} sector output is denoted Y_j . Thus,

$$Y = \sum_j Y_j; g = \frac{\dot{Y}}{Y} = \frac{Y_j \dot{Y}_j}{Y Y_j}; = \sum_j g_j$$

where g_j is the share of the j^{th} sector and g_j is the growth in j^{th} sector.

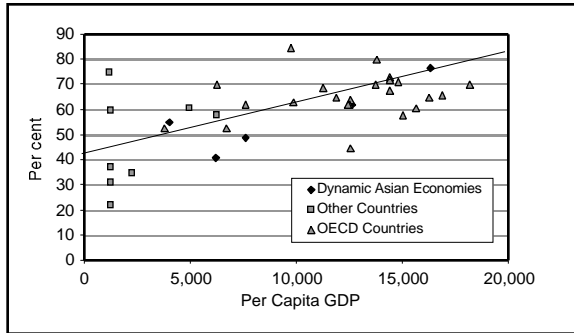
Table 2 – Per Capita Income, GDP Growth and Sectoral Contribution to GDP Growth in Selected Countries

Country	Per Capita Income in 1997 USD	Time Span	GDP Growth (percent)	Sectoral Contribution to the GDP Growth		
				Agriculture	Industry	Services
Singapore	32,810	1972-77	17.7	1.6	35.0	63.4
		1977-82	18.4	0.5	39.4	60.1
		1982-87	5.8	-1.1	40.0	61.1
		1987-92	19.6	0.0	35.0	65.0
		1992-97	7.3	0.0	29.2	70.9
USA	29,080	1972-77	10.3	-5.0	48.3	56.8
		1977-82	9.8	2.1	30.3	67.6
		1982-87	7.4	0.8	22.1	77.1
		1987-92	5.9	1.8	17.3	81.0
		1992-97	2.6	2.0	33.2	64.8
UK	20,870	1972-77	9.8	2.2	39.7	58.1
		1977-82	13.1	2.0	42.1	55.8
		1982-87	7.2	1.0	26.9	72.1
		1987-92	9.0	1.4	21.3	77.3
		1992-97	2.5	2.0	24.5	73.5
Korea	10,550	1972-77	28.1	20.3	39.4	40.4
		1977-82	15.3	6.7	43.7	49.6
		1982-87	12.5	5.0	47.3	47.8
		1987-92	17.7	5.3	45.4	49.2
		1992-97	5.9	18.7	25.0	56.3
Philippines	1,200	1972-77	19.6	29.0	38.4	32.6
		1977-82	13.6	17.4	41.9	40.7
		1982-87	-2.2	18.0	75.5	6.4
		1987-92	9.8	17.6	30.6	51.7
		1992-97	3.7	6.6	23.7	70.2
Sri Lanka	800	1972-77	2.5	10.6	27.8	62.0
		1977-82	5.2	19.7	32.6	48.3
		1982-87	3.8	21.0	23.0	56.1
		1987-92	3.1	16.3	33.0	50.8
		1992-97	4.3	6.1	41.9	52.2
Pakistan	500	1972-77	10.2	25.0	25.4	49.6
		1977-82	15.0	29.9	22.2	47.9
		1982-87	1.6	-35.3	43.8	91.5
		1987-92	7.7	26.0	28.8	45.2
		1992-97	2.5	18.7	25.0	56.3

Sources : Quah (1999) and the author

Table 2 shows the relative contribution from different sectors to the overall growth of GDP in a group of selected countries. The table shows that agriculture contributed to GDP growth significantly less than the services sector in those economies. The contribution of the services sector has increased since 1972. The decreasing contribution from the agricultural sector has been offset by the increasing contribution from industry and services sectors. Figure 1 shows that per capita GDP is positively associated with the contribution from the services sector.

Figure 1 – Sectoral Contribution from the Services Sector to GDP Growth Selected Countries



Source – Quah (1997)

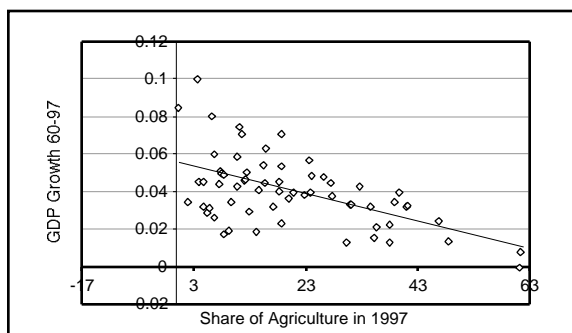
Table 3 – Contribution from Agriculture and Services to Per Capita Income Regression Results

Dependent Variable: Per Capita Income

	Eq 1	Eq 2	Eq 3
Constant	4931.23 (5.19)	1264.93 (0.66)	1913.90 (0.92)
Contribution from Agriculture	-25.92 (-1.24)		-17.55 (-0.82)
Contribution from Services		51.09 (1.89)	45.51 (1.63)

Standard errors are in parentheses ()

Table 3 and Figure 2 show the relationships between the contribution by agriculture and services sectors to economic growth, and per capita GDP.

Figure 2 – Share of Agriculture Vs. GDP Growth – Cross Country Data

Agriculture sector has shown a strong negative relationship with per capita GDP, whereas services sector has shown a strong positive relationship with per capita GDP.

A. Agriculture Prices

Agricultural and other commodity prices continued to fall throughout the last century relative to other goods (World Bank, 2000). This is primarily due to dramatic increases in production, higher productivity and lower production costs from technical innovations, and lower transport costs, as well as limitations in demand for agriculture products. The organized efforts by governments and other organizations could not arrest the declining trend in commodity prices.⁴ An extract of data given in World Bank (2000) is reproduced in Table 4.

III. Extent of Technical Progress and Impact from Terms of Trade

A. Technological Progress

Growth of a production sector arises in response to demand for its goods and services. The technology and innovations play a dominant role in increasing supply and lowering the cost of production. Agriculture in Sri Lanka suffers from limitations imposed by both demand and supply.

^{4/} According to the World Bank (2000), US used to idle crop land to reduce supplies, Brazil initiated the International Coffee Organization in 1962, and petroleum producing countries established the Organization of Petroleum Exporting Countries. The International Cocoa Agreement established in 1972 was abandoned in 1988. The International Natural Rubber Organization collapsed in 1999.

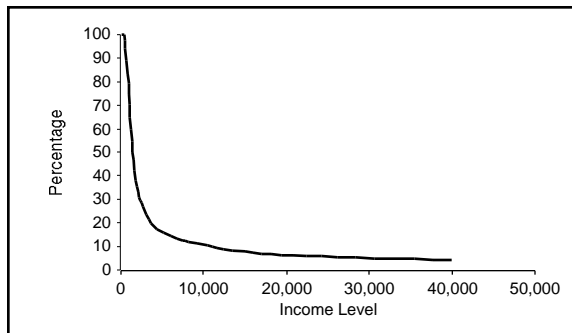
Table 4 – Global Commodity Prices in Constant 1990 Dollars

Commodity	1970	1980	1990	1998	1999
Tea	332.9	230.5	205.8	196.4	177.6
Coconut Oil	1583.7	936.1	336.5	631.5	711.8
Palm Oil	1036.9	810.9	289.8	644.1	421.0
Rice	503.6	570.6	270.9	291.9	239.9
Wheat	218.9	240.0	135.5	121.1	108.2
Sugar	32.8	87.8	27.7	18.9	13.3
Beef	520.1	383.4	256.3	165.6	178.0

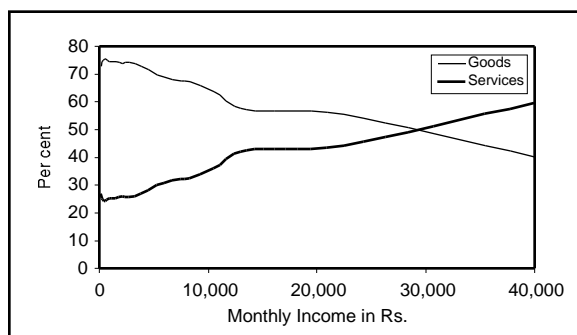
Source : World Bank (2000)

Limitations on demand arise from the nature of agricultural products. In Sri Lanka Engel's Law is clearly in operation. Expenditure patterns on food, and all goods and services illustrated in Figure 3 show that as a person grows richer her share of expenditure on food and other goods decline and consumption of services increases sharply. Thus, a higher income cannot generate a strong demand for agriculture products.

The technological improvement in a sector can be evaluated using Solow Residuals. The neo-classical growth model (NCGM) developed by Solow (1956) is assumed to explain the growth of a sector or an economy. The model is based on the following production function.

Figure 3 – Household Expenditure**3a. Share of Expenditure on Food per Person**

3b. Shares of Expenditure on Goods and Services Incurred by Spending Units at Different Income Levels



Source: Central Bank of Sri Lanka, Consumer Finance and Socio-Economic Survey Data, 1996/97

$$Y = AK^\alpha L^{1-\alpha}$$

where, Y is the output, A is the technology, K is the capital stock, L is labour force and α is the intensity of capital. Usually α is calibrated as 0.4. Thus, the output growth can be written as follows.

$$\frac{\dot{Y}}{Y} = \frac{\dot{A}}{A} + \alpha \frac{\dot{K}}{K} + (1 - \alpha) \frac{\dot{L}}{L}$$

and, the technological progress is given as

$$\frac{\dot{A}}{A} = \frac{\dot{Y}}{Y} - \alpha \frac{\dot{K}}{K} - (1 - \alpha) \frac{\dot{L}}{L}$$

Technological progress in the agricultural sector was estimated using the performance of major agricultural products, paddy, tea, rubber and coconut. Land and labor were taken as major inputs, with the assumption that land plays the role of capital in agriculture. Estimation results are given in Table 5. The technological progress has averaged to -0.1 percent per annum over the period of 1990-1998. This contrasts with productivity growth in the economy as a whole, averaging to 2 percent per annum as shown in Table 6.⁵

^{5/} In estimating the technological progress, the capital stock of the country was estimated using the investment flows. An annual depreciation of 10 percent was applied on the capital stock. The Technological progress is the Solow Residual which includes developments in technology and human capital.

Table 5 – Productivity in the Agriculture Sector

Year	Level			Growth			Productivity Growth
	Labor Force (Mn.)	Land ('000 hectares)	Output (Rs. Mn. at 1996 prices)	Labor	Land	Output	
1990	2.36	728.14	50,495.15				
1991	2.13	736.93	47,307.25	-0.098	-0.022	-0.063	0.004
1992	2.09	748.19	45,011.41	-0.019	-0.016	-0.049	-0.031
1993	2.16	775.88	48,690.64	0.034	-0.002	0.082	0.062
1994	2.08	815.28	52,558.84	-0.034	0.047	0.079	0.081
1995	1.97	852.12	54,637.68	-0.057	-0.001	0.040	0.074
1996	2.07	888.13	47,073.00	0.054	-0.142	-0.138	-0.114
1997	2.03	929.07	50,244.00	-0.019	0.025	0.067	0.069
1998	2.68	994.09	53,641.00	0.321	0.099	0.068	-0.164
Avg. 90-98				0.014	-0.003	0.007	-0.001

Table 6 – Technological Progress in the Economy

	Level			Growth			
	Labour Force (Mn.)	Capital Stock (Rs.Bn. at 1996 prices)	Output (Rs.Bn. at 1996 prices)	Labour Force	Capital Stock	Production	Productivity Growth
1990	5.05	728.14	569.54				
1991	5.02	736.93	595.74	-0.006	0.012	0.046	0.045
1992	4.96	748.19	621.35	-0.011	0.015	0.043	0.043
1993	5.20	775.88	664.23	0.048	0.037	0.069	0.025
1994	5.28	815.28	701.43	0.015	0.051	0.056	0.026
1995	5.36	852.12	740.01	0.014	0.045	0.055	0.028
1996	5.54	888.13	768.13	0.034	0.042	0.038	0.001
1997	5.61	929.07	817.29	0.013	0.046	0.064	0.038
1998	6.04	994.09	855.70	0.076	0.070	0.047	-0.027
Avg. 90-98				0.020	0.035	0.046	0.020

*A. Feedback Effects from the Liberalization of Other Sectors
(Terms of Trade Effect)*

Many countries in the world have liberalized non-agriculture sectors to a higher degree than agriculture. In Sri Lanka agriculture has received special

protection. At present, agricultural products are protected by a high tariff rate of 35 percent, and some important products are also subject to licensing. In the Indo-Lanka Free Trade Agreement, entire agriculture sector has been placed in the 'no-concession category'.⁶ Most non-agriculture products are subject to lower tariff rates, and are free from non-tariff barriers.

The liberalization of some sectors could have an impact on less-liberalized sectors similar to the effects of liberalization. This occurs through the pressure on wages similar to the Balssa-Sameulson effect.⁷ Balssa (1964) and Samuelson (1964) showed that when the productivity in the tradable sector increases product prices and wages will increase in the non-tradable sector. If agriculture is protected, it may not face direct price competition leading to productivity improvements. However, when liberalized sectors face price competition and become increasingly more productive the wages in those sectors will also rise. Thus, the competition for labor and wage bargaining will exert pressure on wages in the agriculture sector. Hence, only the more productive sub-sectors of agriculture could survive in the long run due to those terms of trade effects.

IV. Political Economy Aspects

A. Sequencing the Liberalization Process

Some agricultural products in Sri Lanka such as tea, rubber and coconut are operating in rigid labor markets. Organized labor movements enter into wage contracts periodically. Labor retrenchment is made difficult by the strength of labor unions. Thus, some sub sectors in agriculture may have difficulties in facing price competition until the labor market is liberalized and labor laws are relaxed.

B. Popularity and Voter Consent

The dependence of large rural masses on agriculture and the emotional attachment of the public to national agricultural products have made agricultural policies designed around voter consent. It is conceivable that agricultural policies designed with long-run economic objectives may lead to short-run political problems.

6/ Jayatissa and Thenuwara (2000)

7/ Balassa (1964) and Samuelson (1964)

C. International Practices

Agriculture is generally protected in many countries. The intervention in the agriculture began shortly after World War I.⁸ Agricultural prices in the US rose during the war period due to disturbances to production in Europe. After the production was resumed, prices in the US began to fall. In 1929 the US established the Federal Farm Board to stabilize agricultural prices through purchase and storage of excess supplies. However, the Board failed on account of financial constraints during the Great Depression. In 1929, agricultural sector was also granted tariff protection. In 1933, protection reemerged as the Agricultural Adjustment Act (AAA) with a price support program, a production and adjustment program and a loan and storage program. The AAA was later declared illegal, but much of its contents have been preserved in other forms of support programs. Since then the US has intervened in the market for agricultural products to support farmers with price support and financial relief.

Six countries in European Union (EU) in 1957 established the Common Agricultural Policy (CAP). It aimed at maintaining equality between farm and non-farm incomes, a common internal price, a common external tariff, and common financing for the CAP. Those objectives were achieved through import levies, export subsidies, export taxes, and purchase and storage programs.

Similar protection policies are found in other countries. In view of this widespread culture of protection the World Trade Organization (WTO) treats agriculture as a special sector where protection is justified to a certain degree.

V. Policy Prescription and Justification

Sectoral liberalization is achieved through the removal of trade barriers such as tariff, non-tariff and para-tariff. Tariff barriers are taxes imposed on trade. Non-tariff barriers are restrictions imposed on trade such as quotas and licensing. Para-tariff barriers are other charges such as exercise duty, and defence levy. The liberalization policy could be a plan for imposing certain levels of tariff, non-tariff and para-tariff barriers.

There are many economic arguments for not imposing any non-tariff barriers. Non-tariff barriers preclude any imports coming into a country and could grant absolute protection to domestic products, while tariff and

8/ As reported in World Bank (2000). The primary source is a background paper prepared by Prof. Dale E. Hathaway, Director of the National Center for Food and Agriculture Policy. The paper is entitled 'Government Intervention and Commodity Price Stabilization: An Overview of the 20th Century'.

para-tariff barriers cannot grant absolute protection. Absolute protection cultivates inefficiencies indefinitely. In view of this, at the Uruguay Round Agreements of the WTO it was decided to convert non-tariff barriers to tariff.⁹ Thus, gradual abolition of non-tariff barriers should be an integral part of any liberalization policy.

Governments use para-tariff barriers as revenue raising means. Para-tariff should not discriminate against types of products. Discriminatory treatment is usually found in the imposition of tariff.

The optimum tariff policy should derive endogenous price competition rather than imposing price competition by removing tariff, to avoid costs arising from political unrest. Endogenous price competition is derived by freezing tariffs at existing levels and allowing changes in the external environment to generate pressure on prices.

Thus, the optimum policy is to remove all non-tariff barriers, and to freeze tariffs at existing levels with regard to agricultural products, and maintain the consistency of para-tariff barriers across all products.

Removal of non-tariff barriers will ensure that agricultural products are subject to international market pressures when international prices fall below the protection granted. Freezing of tariffs will contain any unrest due to possible intervention in tariffs.

Low growth of productivity in the agriculture sector indicates that the sector either does not contain room for further growth or that it has not been subject to sufficient competition to derive higher productivity gains. Demand constraints and the international experience discussed in the paper indicate that agriculture sector cannot produce growth required to propel the country to a higher level of development. If there are any gains, those may be realized through endogenous price competition.

^{9/} The process is called tariffication.

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Financial Deepening and its Implications on Savings and Investments in Sri Lanka

Dr. W. M. Hemachandra

Abstract

This paper investigates (a) the validity of financial deepening paradigms in the context of Sri Lanka and (b) the effects of financial deepening on savings and investment that promote growth. In investigating financial deepening in Sri Lanka the paper uses three paradigms i.e., Keynesian, McKinnon-Shaw and neo-structuralist. After examining these three versions the paper argues that an improved model which combines both Keynesian and McKinnon-Shaw versions produces a model more successful in explaining the characteristics of financial deepening in Sri Lanka. The effects of financial deepening on savings and investment were studied using this improved model. Results show that there are several factors other than interest rate influencing financial deepening in Sri Lanka. The study confirms the neo-structuralists' hypothesis which claims that financial deepening has reduced provision of credit to the informal sector. The paper also evaluates the effects of policy changes introduced since 1977 on financial deepening in Sri Lanka.

I. Introduction

This paper investigates the validity of rival paradigms that claim to explain financial deepening in Sri Lanka during the period 1965.1-1997.4. According to the Keynesian paradigm, financial deepening occurs due to autonomous spending by the government. In the McKinnon-Shaw paradigm, financial deepening occurs with high interest rates, credit expansion and removal or reduction in statutory reserve requirement (SRR). It advocates financial liberalization policies in order to achieve economic objectives, particularly in the developing countries. Neostucturalists argue that in the presence of unorganized money markets (UMM), financial liberalization leads to a reduction in investment, as the credit available in the system declines. This decline in credit is a result of substitution of loans of the UMM for deposits in the organized market. The main objectives of this study are (i) to test these

three hypotheses in the case of Sri Lanka in order to evaluate the factors that are responsible for financial deepening and (ii) to evaluate the effects of financial deepening on savings and investment in Sri Lanka.

Based on empirical results it can be argued that financial deepening models can be improved by amalgamating Keynesian and McKinnon-Shaw paradigms together. Sri Lankan time series data supports this position.

The financial liberalization policies implemented in 1977¹ have been held responsible for financial deepening in Sri Lanka. In order to test this hypothesis a step dummy is introduced to represent financial liberalization policies of 1977 and thereafter. The value 0 is assigned to the dummy variable for the period prior to 1977.4 and the value 1 is assigned for the period thereafter. The study covers the period 1965.1 to 1997.4. Time series data are obtained from the Central Bank's publications cited in the article. Quarterly data for the variables for which data were not available were obtained by disaggregating annual data using statistical procedures.² The equations were cast in log form and results are in percentage terms. The reduced form equations were tested using OLS procedures.

II. Theoretical Background

Although financial deepening concepts were brought into salience with the seminal work of McKinnon (1973) and Shaw (1973), these ideas can be found in the Keynesian theories. In the Keynesian theory, financial deepening occurs due to an expansion in government expenditure. In order to reach full employment, the government should inject money into the economy by increasing government expenditure. An increase in government expenditure increases aggregate demand and income, thereby raising demand for money. This disequilibrium is resolved by reducing private investments resulting from higher interest rates. Since higher interest rates lower private investment, an increase in government expenditure promotes investments and reduces private investments concurrently (Dornbusch and Fischer 1978, Chap.4).

1/ In 1977 the Sri Lankan economy underwent a series of major policy changes towards economic liberalization including changes in pricing mechanism, interest rate, exchange rates and external trade, and foreign investments. As a result, a number of foreign banks commenced operations in the country and important changes occurred in the financial sector in liberalized atmosphere.

2/ The procedure adopted to obtain 1997 quarterly data was as follows;

$$\begin{aligned} 1997 \quad 1st \text{ Quarter} &= (3 \times 1996 + 1 \times 1997)/16 \\ &2nd \text{ Quarter} = (2 \times 1996 + 2 \times 1996)/16 \\ &3rd \text{ Quarter} = (1 \times 1996 + 3 \times 1997)/16 \\ &4th \text{ Quarter} = (1997 \times 4)/16 \end{aligned}$$

Some other quarterly data were obtained by assuming that growth of those variables has been constant throughout the year.

McKinnon and Shaw came up with a rival hypothesis that depicts a positive relationship between interest rate and financial deepening. According to them, developing countries have repressed economies with ceilings on interest rates and limitations in credit availability which impose restrictions on growth. Various economists (Fry 1978, Gupta 1984, Lanyi and Saracoglu 1983) have empirically tested the McKinnon-Shaw hypothesis on the positive relationship between interest rates and financial deepening and found mixed results. Kapur (1976) and Matheison (1980) studied constraints on the working capital provided by the banking sector for economic growth. The availability of credit can be taken as the second instrument for financial deepening. Developing countries have been advised to increase the availability of funds by removing restrictions in the financial sector. The third financial deepening instrument that can be identified from the theory is the SRR. A reduction in the reserve ratio or a payment for reserves based on a market clearing loan rate is growth enhancing (Fry 1995).

A group of Neostructuralists (Van Wijnbergen 1982, 1983 and Taylor 1983) demonstrated characteristics that are opposite to the position highlighted by McKinnon and Shaw by analysing the effects on curb markets.³ Wijnbergen (1982, 1983) concludes that financial liberalization is likely to reduce the rate of economic growth by reducing the total real supply of credit available to investors due to the effects on the curb market. Accordingly, an increase in interest rate will reduce credit available to the informal sector due to substitution of deposits in the organized sector. Further, they stated that reserve requirement in the banking sector may constraint credit supply and that this could not happen in the curb market, which is not subject to reserve requirements. Consequently, the curb market is able to provide more efficient financing. Hence, interest rates, bank credit and reserve requirement can be used to achieve financial deepening.

The relationship between these instruments and financial deepening has been studied empirically by a number of investigators. Atukorala and Rajapathirana (1993) tested the McKinnon-Shaw hypotheses using Sri Lankan time series data on an annual basis for the period 1960-1987 with a dummy variable to represent policy changes in 1977. They confirmed the McKinnon-Shaw hypothesis that there is a positive relationship between interest rate and financial deepening. However they did not test the time series properties of data such as stationarity and cointegration.

For this paper, the stationarity condition of time series data was examined using unit root tests. According to these tests all series are stationary in their first differences. Therefore, the equations were tested using first differences

3/ This is an unorganized market in which financial transactions take place on an informal basis.

rather than the level of time series data (Thornton 1994).⁴ Equations were tested using general-to-specific method (known as DHSY procedure (Davidson et al 1978)). Diagnostic tests were conducted using the LaGrange multiplier test of residual serial correlation (LM), Ramsey's, RESET using the square of the fitted values (RESET), Jarque-Bera test for normality of residuals (JB) and White's Heteroscedasticity (W.H.). The test results are indicated under each equation.

While studying the factors responsible for financial deepening and its effects on savings and investment, a combined model representing both Keynesian and Mckinnon-Shaw propositions was evaluated. Model selection criterion was adopted to find out the best model to explain the Sri Lanka case. The best model was selected using J-test (Davidson and Mackinnon, 1981) and JA-tests (Mizon and Richard, 1986) from the reduced form equations tested on DHSY method. In order to evaluate the models Akaike information criterion and Schwarz Bayesian criterion (Judge *et al* 1985, pp.245-246) were used. Each time, two types of models *i.e.* one is with Keynesian hypotheses and the other is on Mckinnon-Shaw hypotheses were also tested.

This study will first test the causes of financial deepening and thereafter test the effects of financial deepening on savings and investment in Sri Lanka using the same techniques.

III. Financial Deepening in Sri Lanka

As is evident from the financial deepening indicators there has been financial deepening in Sri Lanka over time. Although there are a number of indicators, which can be used to measure financial deepening, only two indicators are used for estimations in this study.

Table 1 presents some selected statistics to show the nature of financial deepening in Sri Lanka. The share of the financial sector in GDP grew from 0.82 per cent in 1960 to 6.30 per cent in 1997. Per capita M_3 and the ratio of assets of the financial sector to GDP also grew substantially, as shown in the table. The rise of banking density index shows that the number of financial institutions increased, especially in the rural sector. The structure of nominal interest rates has moved up over time, especially with liberalization policies in 1977. According to these indicators there has been financial deepening in the country during the period under review.

4/ Thornton (1994, p.43) has indicated that "If the set of variables are stationary in their first differences (*i.e.*, integrated of order one or I (1) in their terminology) but do not cointegrate, then the only valid relationship that can exist between them is in terms of their first differences. If, however, they do cointegrate, then the modeled relationship should be estimated in levels".

Table 1
Financial Deepening Indicators for Sri Lanka

Indicator	1960	1965	1970	1977	1980	1985	1990	1995	1997
1. Share of the Financial Sector in GDP (a)	0.82	1.19	1.21	1.83	2.05	4.55	5.07	5.78	6.30
2. Real Per Capita M3 (b) (Rs.)	204	254	294	788	1,338	3,949	5,775	16,544	20,699
3. M3/GDP Ratio	30.1	35.1	28.5	30.5	37.1	39.1	37.1	48.9	42.2
4. Total assets of the Financial Sector (c)/GDP Ratio	43.8	–	64.3	78.5	101.8	–	112.5	132.5	127.6
5. Banking Density Index (d)	0.0455	–	0.1398	0.2510	0.3587	0.4867	0.5402	0.6636	0.7239
6. Advances of Commercial Banks to Private sector/GDP	8.4	9.4	11.3	16.3	25.8	23.5	25.2	27.5	24.3
7. Private Sector Credit/Total Domestic Credit	74.2	69.7	75.9	75.5	86.8	84.7	81.0	88.0	83.2
8. Nominal Interest Rate (e) % p.a.	2.50	2.88	4.62	14.50	20.00	15.00	16.00	13.50	12.75

a = At Constant Prices

b = M1 plus Time & Savings Deposits of Commercial Banks and the National Savings Bank

c = Includes the Central Bank, Commercial Banks, Deposit Taking Institutions and Long-Term Lending Institutions

d = $\frac{\text{No. of Bank Branches} * 10,000}{\text{Mid Year Population}}$

Mid Year Population

e = Average of minimum and maximum fixed deposit rates of commercial banks.

1977 has been treated as the turning point in the process of financial deepening. Along with the liberalization policies, key variables such as interest rates, other prices and institutional set up of the financial sector were subjected to transformation. These changes moved up financial deepening indicators, as measured in nominal terms.

IV. Empirical Estimations

Empirical estimations were carried out to identify factors responsible for financial deepening and the effects of financial deepening on savings and investment. The indicator used to measure financial deepening is the ratio of

broad money supply to GDP, (M3/Y). Estimations were made based on two models: the McKinnon-Shaw model and an improved model incorporating both McKinnon-Shaw and Keynesian interpretations. This second model is preferred in explaining the Sri Lankan experience with regard to financial deepening. After estimating the causes of financial deepening, the next step is to estimate the effects of financial deepening on savings and investment. In addition to financial deepening there are other factors responsible for the behaviour of savings and investment. The definitions of variables used in the estimations are given in Appendix 1.

A. Causes of financial deepening

Reduced form equations were estimated to measure the causes of financial deepening. Model 1 represents McKinnon-Shaw paradigm while the Model 2 is an improved model which incorporates the Keynesian paradigm as well. The regression results on the financial deepening indicator are given below.

Model 1- (Eq.1)

$$\begin{aligned} \ln (M3/Y)_t = & 0.846 \ln (M3/Y)_{t-1} - 0.347 \ln (M3/Y)_{t-4} + 0.346 \ln (M3/Y)_{t-5} + \\ & (15.50) \qquad \qquad \qquad (-4.41) \qquad \qquad \qquad (4.56) \\ & 0.070 \ln d_{t-4} - 0.429 \ln i_t - 0.413 \ln PERY_t + 0.921 \ln PERY_{t-3} \\ & (2.75) \qquad \qquad \qquad (-3.11) \qquad \qquad \qquad (-2.22) \qquad \qquad \qquad (3.71) \\ & - 0.862 \ln PERY_{t-4} + 0.017 D1 \\ & (3.69) \qquad \qquad \qquad (2.04) \end{aligned}$$

$$R^2=0.76 \quad D.W=1.84 \quad LM=2.15^* \quad RESET=0.95^* \quad JB=3.52^* \quad WH=0.93^{***}$$

- * The null hypothesis is rejected at 5 per cent level of significance.
- ** The null hypothesis is rejected at one per cent level of significance.
- *** The null hypothesis is not rejected.
- t* statistics are given in parentheses.

The form of the equation is somewhat similar to that of the equation estimated by Atukorala and Rajapathirana (1993). However, the dummy variable identified as positive in their study⁵ is significant in this study too. According to the regression results the nominal interest rate (d) positively

5/ Atukorala and Rajapathirana (1993) have confirmed an existence of positive relationship between dummy variable for policy changes and financial deepening as measured by the indicators of M1 and STD (Savings and Time deposits).

influenced the financial deepening indicator M3/Y, confirming the McKinnon-Shaw hypothesis.⁶ Inflation () has negative effects while real income (PERY) has mixed effects.

In addition to interest rates there are additional factors⁷ that determine financial deepening in the country. Activities of government (a variable from the Keynesian paradigm), external sector performance and developments in the infrastructural facilities are other factors to be taken into account. While capturing these variables, the following equation was tested on Sri Lankan data.

Model 2- (Eq.2)

$$\begin{aligned} \ln (M3/Y)_t = & 0.776 \ln (M3/Y)_{t-1} - 0.396 \ln (M3/Y)_{t-4} + 0.368 \ln (M3/Y)_{t-5} + \\ & (12.93) \qquad \qquad \qquad (-5.03) \qquad \qquad \qquad (4.71) \\ & 0.082 \ln d_{t-4} - 0.382 \ln \text{ }_t - 0.747 \ln \text{PERY}_t + \\ & (3.22) \qquad \qquad \qquad (-2.74) \qquad \qquad \qquad (-4.40) \\ & 0.008 \ln \text{DEF/Y} + 0.031 \ln (\text{RES/Y})_{t-1} + 0.027 \text{D1} \\ & (2.12) \qquad \qquad \qquad (2.16) \qquad \qquad \qquad (2.65) \end{aligned}$$

R²=0.75 D.W=1.93 LM=1.72* RESET=1.72* JB=10.73* WH=6.53*

The variable used for government activities was the budget deficit.⁸ When monetized, the government budget deficit adds to inflation by increasing the money supply. Non- market borrowing, treasury bills and foreign financing have been the major sources of budgetary financing in Sri Lanka. One of the main contributing factors to the budget deficit is increased government

6/ McKinnon-Shaw have used the real interest rate which is covered in this equation by using nominal interest rate along with inflation. Nominal interest rate with inflation rate taken together covers the effect of real interest rate.

7/ Some investigators (King and Levine, 1992) use indices of civil liberties, number of revolutions and number of assassinations in their models that evaluate the growth and financial depth.

8/ Sri Lankan government budget is in a deficit traditionally and the sources of budgetary finance are external sources (foreign loans and grants) and internal sources (market and non-market borrowing). Non market borrowing includes administrative borrowing from major financial institutions and the issuance of treasury bills. The treasury bill limit has been raised from time to time reaching Rs.125,000 million in 1997 from Rs.1,500 million in 1965. Almost the entire amount specified by the limit has been utilized for budgetary finance by 1997.

expenditure.⁹ According to the Keynesian version, government expenditure increases the demand for money. Accordingly, the variable used to represent government activities in the equation has rightly shown a positive effect on financial deepening. External reserves have positive and negative effects on the lagged variables in determining M3/Y.

According to Akaike information criterion and Schwarz Bayesian criterion the second specification is favoured. Therefore, the introduction of 'budget deficit' improves the set up of the equation in measuring financial deepening. This confirms that in countries like Sri Lanka, it is not only the prices (interest rates) that matter for financial deepening, but also other factors such as government activities and changes in reserves.

B. Implications of Financial Deepening on Savings and Investments

(a) Savings

There is no common acceptance among economists on the relationship between interest rate and savings. Inconsistency of measurements for savings is one of the factors contributing to this situation. Financial savings in the formal sector do not represent total domestic savings of a country. In Sri Lanka, financial savings (a stock) as could be obtained from monetary statistics represents the savings in the organized financial sector. But the statistics on domestic savings (a flow) has to be collected from the National Accounts. In the literature, there is no common agreement to identify what saving statistics has to be used for estimations. As noted by Arreata (1988, p.593) "*Testing the proposition of a positive interest responsiveness of savings as stated by Mckinnon-Shaw models should ideally be based on domestic private savings rather than domestic aggregate savings as the dependent variable. However, the limited domestic private savings data available in LDCs is also subject to serious inaccuracies as gross domestic private savings are generally derived by subtracting government savings from gross domestic savings. In this regard, for instance, Fry (1978) points out that it is possible (though improbable) that Mckinnon's complementarity hypothesis might fare better were a true measure of domestic private savings available*".

In Sri Lanka private savings are estimated in same manner indicated above. The following reduced form equation was tested for private domestic savings in Sri Lanka.

9/ Since the 1980s, the government had to spend more on defence, public sector rationalization programmes and development activities in the country. Defence expenditure increased due to the civil war while rationalization programmes were initiated to make major changes in the administrative system. Massive development programmes such as the Mahaweli Development Project has also contributed towards the higher expenditures of the government.

Eq. 3

$$\begin{aligned}
 \ln(PVS_d/Y)_t = & 0.495 \ln(PVS_d/Y)_{t-1} - 0.051 \ln(d-)_{t-1} - 0.079 \ln(d-)_{t-3} + \\
 & (5.57) \qquad (2.59) \qquad (3.55) \\
 & 0.085 \ln(d-)_{t-4} + 0.112 (M3/Y)_{t-2} - 1.748 \ln(DR)_{t-5} + 0.136 \ln(DEF/Y)_t - \\
 & (3.75) \qquad (0.56) \qquad (-1.79) \qquad (9.81) \\
 & 0.041 \ln(DEF/Y)_{t-1} + 0.048 \ln(DEF/Y)_{t-5} - 0.011 D1 \\
 & (-2.27) \qquad (2.93) \qquad (-0.72) \\
 R^2=0.58 \quad D.W=2.18 \quad LM=2.98^{**} \quad RESET=2.02^* \quad JB=5.00^* \quad WH=2.78^*
 \end{aligned}$$

In the above regression results, financial deepening as measured by $M3/Y$, is not significant for private savings (PVS_d). As predicted by McKinnon-Shaw the real interest rate ($d-$) is significant. Private savings have been determined by various factors other than financial deepening. Lagged values of private savings,¹⁰ dependency ratio (DR) and government saving ratio (DEF/Y) (=budget deficit/ Y) are the other factors affecting private savings. DR has a negative effect on private savings confirming, a priori, expectations that a higher dependency ratio reduces savings. There is a highly significant effect from government budgetary activities. According to regression results, initially, higher the government deficit, higher the private savings. Since private savings are derived by subtracting government savings from domestic savings, private savings are higher than domestic savings because of negative savings of the government. Later, since the government has to borrow from domestic sources to fill the budget deficit, private savings are converted into investments in the public sector. Therefore, private savings will decline with budget deficit. For instance, the major savings institutions in the private sector such as the Employees' Provident Fund and the National Savings Bank invest their savings in government paper such as treasury bills and bonds. This leads to a reduction in private savings. The negative coefficient on lagged variable of DEF/Y in the regression confirms this proposition.

Real income and economic growth were not significant in the estimations. The policy variable too was not significant.

The following reduced form equation was tested for domestic savings. Real interest rate ($d-$) and financial deepening ($M3/Y$) are not significant in this specification. However, the bank branch expansion (BBR),¹¹ dependency

10/The lag value of savings on domestic saving function has been found to be significant in studies (see Mapalad (1998).

11/As Fry (1995, p.164) estimated, an increase in branch proximity is responsible for raising national savings ratio. Further, as Lewis (1955) claims that "Experiences show that the amount of savings depends partly on how widespread these facilities (*i.e.*, savings institutions) are; if they are pushed right under the individual's nose ... people save more than if the nearest institution is some distance away".

ratio (DR) and government savings to domestic savings ratio (DEF/Sd) are significant. Financial deepening indicator (M3/Y) has an insignificant effect on domestic savings. Accordingly, there are other factors, in addition to financial deepening, that determine domestic savings in the country.

Eq.4

$$\begin{aligned} \ln (S_d/Y)_t = & 0.714 \ln (S_d/Y)_{t-1} - 0.139 \ln (S_d/Y)_{t-4} + 0.024 \ln (d-)_{t-5} + \\ & (11.92) \quad (-2.31) \quad (1.46) \\ & 0.054 \ln (M3/Y)_{t-1} - 2.704 \ln DR_{t-5} + 0.034 \ln (DEF/S_d)_{t-4} - \\ & (0.31) \quad (-3.27) \quad (2.52) \\ & 0.002 BBR_t + 0.002 BBR_{t-1} - 0.016 D1 \\ & (-2.21) \quad (2.80) \quad (-1.10) \end{aligned}$$

$$R^2=0.67 \quad D.W=1.88 \quad LM=0.57^* \quad RESET=0.04^* \quad JB=225.24^* \quad WH=0.005^{***}$$

Domestic savings include savings from the organized as well as unorganized sectors. Financial deepening has affected the activities in the organized sector significantly while in the unorganized sector, its influence is insignificant. The following equation on savings in the organized sector shows the positive effects from financial deepening and real interest rate. Though the real interest rate in above estimation is insignificant, the real interest rate is positive and significant for organized sector savings (in Eq 5), which are the savings included in the measurements of M3/Y. The factors responsible for the organized sector saving ratio as measured by total deposits in the banking system to GDP ratio (DEPO/Y) are shown in the Eq.5. In the equation, DEPO represents demand deposits plus time and saving deposits.

Eq.5

$$\begin{aligned} \ln DEPO/Y_t = & 0.721 \ln DEPO/Y_{t-1} - 0.178 \ln DEPO/Y_{t-3} + 0.362 \ln DEPO/Y_{t-4} + \\ & (12.30) \quad (-4.96) \quad (4.70) \\ & 0.009 \ln d- - 1.920 \ln DEPY_{t-3} + 2.007 \ln PERY_{t-4} + \\ & (2.35) \quad (-9.83) \quad (11.05) \\ & 0.039 \ln (RES/Y)_{t-1} + 0.992 \ln (M3/Y)_t - 0.756 \ln (M3/Y)_{t-1} - 0.006 D1 \\ & (2.14) \quad (5.02) \quad (2.28) \quad (0.84) \end{aligned}$$

$$R^2=0.93 \quad D.W=1.91 \quad LM=2.02^* \quad RESET=1.02^* \quad JB=1.83^* \quad WH=6.68^*$$

Financial deepening has highly significant positive and negative effects on organized sector savings. McKinnon-Shaw hypotheses on positive effects from financial deepening and real interest rate on savings is valid for savings in the organized sector in Sri Lanka. However, the interest rate is not the only factor that determines savings in the organized sector. Other factors include the changes in real income and external reserves. In selecting a model for savings in Sri Lanka, the influence of the other factors has to be considered.

(b) Investments

Investment is crucial for economic growth. In the estimations this is measured by the investment output ratio (I/Y). According to Keynesian interpretation real interest rate has positive as well as negative effect on investments. The positive impact comes from increased income due to higher government expenditure. The increase in aggregate demand increases interest rates as well as investment in the government sector. These positive as well as negative influences of interest rate on investment can be interpreted from the dynamics in investment function (Eq.6). Eq.6 includes government activities too. Government activities (DEF/Y) have a positive impact on investment while at the same time, they have a negative impact on private investments arising from interest rates. This model includes both Mckinnon-Shaw and Keynesian interpretations with regard to private investment. The Mckinnon-Shaw school assumes a positive relationship between real interest rates and private investment. The following reduced form equation produces the regression results on this relationship with other variables that are significant.

Eq.6

$$\begin{aligned} \ln (PTI/Y)_t = & 0.980 \ln (PTI/Y)_{t-1} - 0.167 \ln (PTI/Y)_{t-4} - 0.006 \ln (d-)_{t-2} + \\ & (23.52) \quad (-4.50) \quad (-2.00) \\ & 0.007 \ln (d-)_{t-4} + 0.004 \ln DEF/Y - 0.015 \ln (DCP/DC)_{t-4} + \\ & (2.26) \quad (1.69) \quad (-0.40) \\ & 0.171 \ln (DCP/DC)_{t-4} - 0.158 \ln (DCP/DC)_{t-5} - 0.158 (FDI/Y)_t + \\ & (2.98) \quad (-3.03) \quad (1.75) \\ & 0.002 (AID/Y)_t + 0.076 (COM)_t - 0.137 (COM)_{t-1} + 0.062 (COM)_{t-2} + \\ & (2.46) \quad (3.83) \quad (-4.16) \quad (2.86) \\ & 0.083 \ln (M3/Y)_t - 0.152 \ln (M3/Y)_{t-1} + 0.106 \ln (M3/Y)_{t-2} \\ & (1.92) \quad (-2.59) \quad (2.47) \end{aligned}$$

$$R^2=0.88 \quad D.W=1.57 \quad LM=3.43^{**} \quad RESET=0.71^* \quad JB=31.42^* \quad WH=0.41^{***}$$

Hence, the ratio of domestic credit to private sector in domestic credit (DCP/DC) and the real interest rate (d_t) are influential in determining private investment. Private investment (PVTI/Y) in Sri Lanka cannot be explained alone by the behaviour of real interest rates. There are numerous other factors affecting the investment ratio. Among these, there are foreign direct investments (FDI/Y), foreign aid (AID/Y) and communications developments (COM) which have influenced the private investment behaviour. These other factors are significant in explaining the Sri Lankan private investment behaviour as is the real interest rate. Financial deepening indicator (M3/Y) has positive as well as negative influences on private sector investments. Therefore, unlike in the private savings function, financial deepening has an effect on private investments. Financial deepening has encouraged the private investment. The reason is that most investment originates from the facilities extended by the formal sector such as bank credit. Since these are widely affected by financial deepening activities, private investment that originates from them are also sensitive to the behaviour of interest rates and financial development.

Real interest rate has a positive impact on the total domestic investment function too. Other factors that affect the investment ratio (I/Y) are the private sector credit ratio (DCP/DC), foreign direct investments (FDI/Y), foreign aid (AID/Y), government activities (DEF/Y) and financial deepening. Some dynamics are shown in the negative and positive values of the variables. The dummy and the constant term are not significant in this specification either. Total investment estimated in National Accounts include not only private investment but also the government and other public enterprises, which have a link to interest rates. Impact of the interest rate in the total domestic investment is also positive. The following regression results show the factors that explain the behaviour of domestic investment ratio of the country.

Eq.7

$$\begin{aligned} \ln(I/Y)_t = & 0.956 \ln(I/Y)_{t-1} - 0.668 \ln(I/Y)_{t-4} + 0.513 \ln(I/Y)_{t-5} + \\ & (23.69) \quad (-11.31) \quad (9.09) \\ & 0.020 \ln(d_t)_{t-5} + 0.205 \ln(DCP/DC)_{t-1} + 0.010 (FDI/Y)_{t-4} + \\ & (3.44) \quad (3.62) \quad (2.97) \\ & 0.005 \ln(AID/Y) + 0.234 \ln(COMLA/Y) - 0.217 \ln(COMLA/Y)_{t-1} + \\ & (3.24) \quad (4.35) \quad (-3.53) \\ & 0.202 \ln(COMLA/Y)_{t-3} + 0.011 \ln(DEF/Y)_{t-1} - 0.006 (DEF/Y)_{t-2} - \\ & (4.05) \quad (2.33) \quad (1.20) \\ & 0.220 \ln(M3/Y)_{t-1} + 0.187 \ln(M3/Y)_{t-2} \\ & (-2.49) \quad (2.14) \end{aligned}$$

$R^2=0.91$ D.W=1.54 LM=3.35** RESET=1.62* JB=0.02** WH=0.06***

Accordingly, the government's budgetary activities, loans from commercial banks, foreign direct investments and foreign aid significantly influence the domestic investment.

According to above analysis, there is an extensive influence from the activities of the informal sector on savings and investment behaviour in the country. This helps to confirm the Neostructuralists' hypotheses about the unorganized market. During the period covered in the study, development programmes initiated by government have largely contributed to transform the rural sector to handle its activities in a more organized manner. With rural development programmes, the rural sector was provided with banking facilities among other things, which led to increase the monetization of this sector. This has been confirmed by the highly significant variable for bank branch expansion (BBR) in the equation for domestic savings (Eq.4). As these branches were established mainly in the rural sector, financial deepening has led to attracting deposits from the informal sector to the formal or organized sector. An equation was tested to see whether there has been a reduction in credit provided in the unorganized sector due to financial deepening. Although there is no complete set of data relating to financial activities of the unorganized sector, a variable was selected to represent the credit availability in the unorganized sector. This is the ratio of credit from the commercial banks to agricultural sector/GDP (AGLN/Y). As evident from Eq.8 financial deepening has negatively affected credit to the agricultural sector. The equation tested for the period 1977.4 - 1997.4 is as follows.

Eq.8

$$\begin{aligned}
 (AGLN/Y)_t = & 0.798 (AGLN/Y)_{t-1} - 0.500 (AGLN/Y)_{t-4} + 0.426 (AGLN/Y)_{t-5} - \\
 & (12.25) \qquad \qquad \qquad (-5.31) \qquad \qquad \qquad (4.62) \\
 & 0.122 (d)_{t-4} + 0.079 (i)_{t-1} + 0.051 (DEF/Y)_{t-3} - 0.042 (M3/Y)_{t-3} \\
 & (-0.64) \qquad \qquad (2.03) \qquad \qquad (2.24) \qquad \qquad (-2.64)
 \end{aligned}$$

$$R^2=0.70 \quad D.W=2.01 \quad LM=1.99* \quad RESET=1.09* \quad JB=1.90* \quad WH=0.02***$$

The financial deepening indicator (M3/Y) has a highly significant negative coefficient confirming that financial deepening reduces credit to the informal sector. There is no effect from interest rate. Notably, government activities measured by DEF/Y have a positive effect on credit availability to the informal sector.

V. Conclusions and Policy Implications

In the study, the financial deepening was studied using two types of rival models *i.e.*, Mckinnon-Shaw and Keynesian.

According to these results, it is not only the interest rate that affects financial deepening in Sri Lanka but also, various other factors such as government activities, external sector activities, and bank branch expansion and communications development. The test results of the study showed that there is a positive relationship between these variables and financial deepening indicators and that of savings and investment in Sri Lanka.

The Mckinnon-Shaw hypothesis on the positive relationship between the reduction of SRR and financial deepening is rejected in the light of the regression results. However, the influence of availability of credit for financial deepening and for investment has been confirmed by the positive results in the regressions. Improvements in the availability of highly interest sensitive credit to the private sector from the banking sector during the period under study in Sri Lanka have been the main causal factor for this. In the savings function, the interest rate is not significant due to many factors other than interest rates affecting savings in the country. However, the positive interest rate-saving relationship can be observed for savings in the organized sector, in particular. Although financial deepening has influenced savings in the organized sector, it has not influenced domestic savings, which includes government savings as well.

In the equations that were tested for causes of financial deepening the dummy variable was significant. Therefore, it has to be concluded that policy changes in 1977 made some contribution to financial deepening. However, this hypothesis has to be rejected in the case of savings and investment behaviour.

As hypothesized by Neostructuralists, it is confirmed that financial deepening has acted negatively in providing credit to the informal sector. This may be because government paid more attention to develop the industrial and service sectors than to the informal sector. During the last three decades Sri Lanka has been providing extensive credit facilities to industrial and services sectors. Further, commercial banks are more willing to provide credit to organized sector since there is a lower credit risk associated with such lending when compared to the informal sector.

From this study, it can be concluded that policies relating to the financial sector should be persuade on a continuous basis rather than responses to short term developments in the monetary sector. The insignificant dummy variable in the savings and investment functions proposes that the policy changes have not resulted on savings and investment.

The transformation of the rural sector into a more organized sector involving banking activities has improved banking habits among the people and helped to reduce the dependency on informal markets for financial needs. This transformation has helped reduce high interest costs of borrowing in the informal sector.

It indicates that government activities still play a predominant role in the financial sector although the reforms relating to privatization are in progress. A more developed financial sector can be expected from high-level private sector development. The government sector too can be benefited from a developed financial sector since it could be used to satisfy government's financial needs. This does not mean that the concentration on the real sector should be reduced. Real sector development should be undertaken hand in hand with financial sector development for sustained growth, which is the ultimate objective of the financial sector developments.

Appendix 1

Variables used in the study are as defined below.

- AGLN/Y = Commercial banks' loans for agricultural purposes/GDP ratio
- AID/Y = Foreign aid to GDP ratio
- BBR = No of bank branches
- COM = Proxy for communication developments (No of telephones)
- COMLA/Y = Commercial banks loans and advances to GDP ratio
- d = Nominal interest rate for savings deposits of commercial banks
- DCP/DC = Domestic credit to private sector/Total domestic Credit ratio
- DEF/S_d = Government deficit to domestic savings Ratio
- DEF/Y = Government deficit to GDP ratio
- DEPO/Y = Total deposits of banking sector to GDP ratio
- DR = Dependency Ratio
- D1 = Dummy variable to measure policy changes in 1977
(The value 0 was assigned for the period prior to 1977.4 and the value 1 was assigned for the period thereafter)
- FDI/Y = Foreign direct investments to GDP ratio
- M3/Y = Broad money supply to GDP ratio
- = Inflation Rate
- PERY = Per capita real income
- PTI/Y = Private investments to GDP ratio
- PVTS_d/Y = Private domestic savings to GDP ratio
- RES/Y = External reserves to GDP ratio
- S_d/Y = Domestic savings to GDP ratio
- SRR = Statutory reserve requirement ratio
- Y = GDP at current prices

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Garment Industry in Sri Lanka Challenges, Prospects and Strategies¹

Rupa Dheerasinghe

Abstract

Garment industry has been the Sri Lanka's largest gross export earner since 1986 and accounted for more than 52 per cent of total export earnings of the country. It is also the country's largest net foreign exchange earner since 1992. Sri Lanka as a garment exporter has shown signs of improvement in many respects yet even at present, the quota system covers more than 52 per cent of the country's garment exports. However, Sri Lanka depends on quotas much less than other South Asian countries. Besides, dependence on the quota system, there are weaknesses in the domestic industrial and export structure, labour markets rigidities and strong competition in international markets. They need urgent attention for survival in a quota free market. Therefore, the future of the garment industry will depend on the competitive edge that Sri Lanka has over her competitors in Asia, Latin and Central America and emerging producers in Africa and Eastern Europe who benefit from favourable trading arrangements with major markets.

This analysis shows that, phasing out of quotas will close down nearly fifty per cent of existing garment factories, as they lose that protection. However, some of the medium and large scale factories are expected to survive exploiting opportunities in the free market. Sri Lanka's garment industry is highly concentrated in large scale factories. That concentration will save a large part of export earnings while preserving job opportunities. However, in the short-run there will be an adverse impact on employment. (JEL F14, L11)

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1. Introduction

Garment industry has an important place in Sri Lanka's economy. It has become Sri Lanka's largest export industry since 1986. It is also the country's largest net foreign exchange earner since 1992. Total value of export earnings in the sector was at US dollars 2,424 million accounting for 52 per cent of the total export earnings in 2002. The contribution to the Gross Domestic Product (GDP) was 5.3 per cent in 2002. This industry provides more than 330,000 direct employment or 5 per cent of country's total employment in more than 1,060 garment factories.

Sri Lanka's garment exports have been largely governed by the Multi-fibre Arrangement (MFA) since 1978. The MFA is a system of export restrictions imposed by developed countries on textiles and garment exports originating in developing countries to protect the garment industry in developed countries. The Uruguay Round Agreement on Textiles and Clothing (ATC) of WTO succeeded MFA in 1995. According to the new rules, the sector is to be fully integrated into normal rules of WTO by phasing out MFA in four phases by 2005. Sri Lanka has already fulfilled its commitments under Phase I and Phase II of the elimination of MFA phasing out procedures. The government submitted to the Textiles Monitoring Body of WTO in 1996 and 1998 lists of items on which Sri Lanka is ready to accept the removal of quota. The third phase of integration became effective on January 2002.

The MFA, by providing a ready market, has restricted Sri Lanka's exports but has protected it from competitors. Phasing out of MFA will open up more markets to Sri Lanka's exports, and at the same time will intensify competition from other developing countries. The future of the garment industry depends, to a large extent, on the ability to compete in free market where both garment producing developed and developing countries in the world will be players in the market. Over the last 20 years, a strong foundation has been laid for the industry, on which the future of this sector could be strengthened further and safeguarded. Yet there is much to be done to meet the challenges of intense competition in the coming years. This paper identifies the threats and challenges faced by the industry and assesses the capabilities and prospects of the sector to face them.

The rest of the paper is structured as follows. Section II of this paper discusses the international and domestic trade policy relating to textiles and garment industry. Section III examines the nature of Sri Lanka's textiles and garment industry and its challenges. Section IV provides the challenges that the garment industry face in the global environment and possible challenges in the post-MFA period. Section V evaluates the impact of liberalisation of world textiles and garment industry and Section VI identifies the areas in

which the textiles and garment sector could maximize existing capacity to achieve its goals and objectives.

II. Impact of International and Domestic Policies on Textiles and Garment Industry

A. International Policy

In the world economy, the textiles and garment sector contributed nearly 6 per cent to world merchandise exports. However, world trade in textiles and garments takes place in a highly protected market with tariffs and quantitative restrictions. The main impediment to trade in the past has been the quantitative restrictions that have been in force for several decades.

The restrictions on the textile and garment industry have a long history tracing back to the 1930s, when USA and UK took action to limit textile imports from Japan. The emergence of some less developed countries as producers of garments together with excess capacity in many developed countries resulted in UK and USA negotiating Voluntary Export Restraints (VERs) with emerging economies. A series of short term and long term trading arrangements were then followed by MFA.

The Multi-fibre Arrangement

The MFA had four successive phases consisting of about 100 bilateral agreements negotiated under a multilateral framework and covering about 80 per cent of world textiles and garment exports. The MFA was intended to provide temporary protection to domestic textiles and garment industry to adjust to foreign competition and to provide developing countries with 'orderly access' to industrial country markets. In addition to the restrictions imposed by MFA, there are various other restrictions on developing countries relating to countries who do not participate in MFA and textiles and garment items that are not included in MFA. Thus, in 1992 the textiles and clothing trade was subjected to 127 MFA and non-MFA restraints agreements. The industrial countries as well as many developing countries which export textiles and clothing used extensive and high protection through both high tariffs and quantitative restrictions to limit foreign competition.

The arguments for the benefits of restrictive markets, emphasis that these bilateral agreements provided opportunities to small exporting countries to access large market and enable them to increase earnings from market share

Table 1 – Voluntary Export Restraints on Textiles and Garments

Name of the Agreement	Effective Period
Short-Term Arrangement Regarding International Trade in Cotton Textiles	1961-62
Long-Term Arrangement Regarding International Trade in Cotton Textiles	1962-73
Multi-Fiber Arrangement I	1974-77
Multi-Fiber Arrangement II	1978-81
Multi-Fiber Arrangement III	1982-86
Multi-Fiber Arrangement IV	1986-July 1991 and extended 3 times, until December 1994.

Source: IMF, The Uruguay Round and Arab Countries

for textiles and clothing exports. However, protection against foreign competition resulted in substantial welfare costs to industrial as well as developing countries. Although some developing countries were able to achieve efficiency in many product lines in these sectors due to protection against international competition, the trade barriers impeded growth in the textiles and clothing industry, causing substantial losses in potential export earnings.

The Uruguay Round Agreement on Textile and Clothing

The Uruguay Round Agreement on Textiles and Clothing of 1994 envisaged the phased elimination of MFA over a ten year transition period. The process was to be implemented in four phases, starting with the entry into force of WTO on 1 January 1995. The importing industrial countries agreed to initially integrate at least 16 per cent of total import volume (1990) in 1995 followed by an additional 17 per cent and 18 per cent, respectively in January 1998 and January 2002. The remaining 49 per cent was to be integrated at the end of ten years. In addition, the Uruguay Round Agreement provided for an average reduction of 22 per cent in industrial countries' bound tariff on textiles and clothing. Efficient producers who are currently constrained by quotas are likely to gain the most from this liberalization. However, with the removal of barriers, the reverse may be true for exporting countries whose industry cannot become competitive and acquire the benefits of quota free markets, or if markets in importing countries do not expand as expected.

Progress in Sri Lanka towards the elimination of MFA

In 1996, Sri Lanka fulfilled its commitments under Phase I of MFA phasing out procedures by submitting a list of items to the Textile Monitoring

Body of WTO. Sri Lanka submitted a second list of items to be integrated under phase II in 1998. The third stage of integration came into effect on 1 January 2002. However, so far, the process of removing quota in USA and EU has been slow. The number of quota actually eliminated during the first two stages in USA and EU were 2 out of 291 in USA and 14 out of 750 in EU quota.²

Under the third stage of integration in force USA has fully integrated 20 categories of garments, 5 categories of fabric, 7 categories of made up articles and 4 categories of yarn and partially integrated 4 categories of garments and one category of made up articles. However, this covers only 8 of Sri Lanka quota categories. As a majority of the items are to be phased out in a latter stage, when industrial countries postpone liberalization of sensitive items to the end, exporting countries like Sri Lanka may face difficulties in phasing out the last stage of implementation.

There are positive developments in Sri Lanka, in several areas indicating that the garment industry is preparing for thrive in quota-free markets. The share of non-quota exports increased in the recent past. The importance of quota categories declined gradually and reached 61 per cent in 2000 from 67 per cent in 1990. Quota restrictions imposed by EU on Sri Lanka garment exports were fully withdrawn in 2001. Dependence on quota markets fell by about 8 percentage points to 53 per cent in 2002. During 1996-2002, value of exports to non-restricted markets increased by 11 per cent while garment trade has diversified to more than 80 countries. However, the value of garment exports to these countries accounted for not more than 4 per cent until 2000. Nevertheless, removal of quota restrictions on garment exports to EU countries helped to increase the share of non restricted markets to 35 per cent in 2002. Another development is that the country has moved towards higher value added product lines, increasing net foreign exchange earnings.

B. Domestic Export Policy relating to Textile and Garment industry

The textiles and garment industry began in 1950's when the government took steps to promote the textiles industry as an import substitution industry. At this stage Sri Lanka imported raw material and produced yarn, raw fabrics and finished fabrics mainly in a few large scale textile mills established under government ownership. Power-loom and hand loom centres largely owned by private sector too engaged in the production of yarn and fabric. The textiles produced in these industries were fully utilised in the domestic market. Domestic industries were highly protected by the government by controlling the imports of finished products. Importation and distribution of raw material

^{2/} IMF/World Bank (2001), Market Access for Developing Countries Exports.

too were controlled by the government. Local products were limited to a few standard items. In a highly protected environment, no incentives for quality improvement and not much progress were seen. They were sold mainly in the lower end domestic market. Garments industry began in the mid 1960s, was mainly run by a few large private companies. As importation of textiles was banned or highly restricted, these industries had to depend on local raw material. Almost the entirety of garments produced by these industries was sold in domestic market. There were hardly any exports of textiles and garments.

Economic liberalisation policies in 1977 paved the way for local handloom and garment industry to enter the world market. The market friendly economic environment created by liberalisation and supportive measures such as subsidy and duty rebate schemes, duty free import of raw material and machinery, lower taxes and tax holidays as well as the implementation of the Katunayaka Industrial Processing Zone in 1978 encouraged export led industries. The other important factor that was responsible for the rapid expansion in the textiles and garment industry were the changes in the world garments and textile markets, particularly the introduction of MFA which provided opportunities to enter the world markets under the quota system.

Even at present, more than 52 per cent of textiles and garment exports from Sri Lanka are governed by MFA. Under the quota system, garment are exported to USA and Canada. Until January 2001, a part of the garment exports to EU was also under the quota system. In 2002, 34 per cent of garments was directly exported to non-quota countries. The balance (about 14 per cent) was non-quota categories and was exported to the countries which imposed quotas.

Management of Textile Quota System in Sri Lanka

Export of textiles and garments from Sri Lanka under the quota system started in 1978 under the purview of the Secretary to the Ministry of Textiles Industry. In July 1, 1992, the administration of the quota system became the responsibility of the Textiles Quota Board (TQB) which was initially established as an inter-agency ad-hoc committee with the responsibility of allocating textile quotas. Later, in 1996, TQB was constituted as a statutory body by the Textile Quota Board Act, No. 33 of 1996. TQB consists of five ex-officio members and five others representing associations involved in the industry.

The objective of this scheme was to maximize the utilization of textile quotas available to the country. To serve this purpose, TQB allocates Textile Quotas (TQs) annually on the basis of past export performance. This is done in two stages during each year. The first allocation is made at least four weeks

before the commencement of the year and is based on the export performance during the first ten months of that year. After verification of export performance for the whole year, the final allocation is made in February of the succeeding year. Allocation on the basis of past performances is referred to as 'Main Quota' or 'Performance Quota' allocation.

Secondly, three per cent of quotas are allocated to small quota holders who have less than 4000 dozens in all categories on a pro-rata basis. Thirdly, approximately 50 per cent of the Quotas that are available in a year on account of growth and flexibility are earmarked for new investors and existing manufacturers who expand capacities by investment in new machinery and equipment.

In order to provide flexibility to the industry, exporters who hold Performance Quota are permitted to transfer unutilized quotas to other exporter through TQB on permanent or temporary basis. However, the sale or purchase of quota is not legally permitted. Yet, quotas allocated for hot categories are traded in the black market. The relevant serving agency can also authorize temporary transfers within a minimum period of two working days. Performance quota holders are encouraged to surrender the unutilized quota to TQB and credit for surrenders will be allocated on the basis of the time of surrendering the quota. Quota allocated under the 200 Garment Factories Programme (200-GFP) and small quota holder categories are not transferable during the first year. Re-transfer of transferred quota to another party is not permitted.

TQs that remain after the allocation on the criteria discussed above, TQs allocated and not accepted by exporters, unutilized TQs and quotas forfeited from exporters are transferred to a pool and allocated after calling for applications. This scheme is referred to as the "Main Pool Scheme" and generally starts before 31 March, and allocation will be on the basis of the number of employees. If the rate of utilization of TQs in any category was substantially low in the preceding year, a certain quantity of TQs are allocated to the pool named Cold Category Pool Quota Scheme (CCPQS) based on the extent of under utilization. TQB declares such CCPQS categories, at least one month before the end of quota year.

In the first instance, the quantity and basis of the allocation are decided by TQB. Remaining quotas are allocated to applicants on condition that shipments will be made within seven working days. If the exports under Seven Days Quotas (SDQs) did not take place by the end of the seventh day or a grace period of additional three days, the quotas will be added back to the pool and reallocated. In order for the SDQs to be effective, careful monitoring was required to optimise allocation while avoiding over-utilisation. A Special Pool Quota Scheme was also operated, if necessary towards the end of the

quota year. Applications were to be supported by firm orders valid on the date of application and quotas were allocated on a first come first served basis.

The Board of Investment (BOI) and the Textile Division of the Ministry of Enterprise Development, Industrial Policy and Investment Promotion issue export licences (export visas) against the TQs. Once exports are ready to be shipped under the TQs, the exporters should go to the BOI or the Ministry, depending on whether they hold of BOI or non-BOI status, in order to get the export licences. The licences are issued on the submission of shipping documents and are required by buyers to clear the export consignments from their Custom offices. Shipment of products against performance quota allocations is allowed only on proof of payment of Employees Provident Funds and Employees Trust Fund contributions. Exports made under the TQs are recorded in the BOI or the Textile Division of the Ministry, while issued TQs are recorded in the TQB. The BOI services about 82 per cent of the country's quota, while the Ministry services the balance. In order to keep a proper record of the utilization rate of the TQs and also to take timely action, exchange of accurate and up to date information between TQB and the other two authorities is essential.

However, this practice of issuing paper visas is vulnerable to counterfeiting, forging of signatures and illegal routing. The increasing number of visa forgeries in recent years has caused great difficulties to exporters as a whole and the TQB, and has threatened the integrity of the entire textiles and garment industry in Sri Lanka. To overcome such difficulties, Sri Lanka joined the Electronic Visa Information System (ELVIS)³ which was designed in 1999 to transmit key statistics on textiles and garment export directly to the US Customs through electronic media.

The full operation of ELVIS minimizes forgeries, simplifies export documentation, and increases efficiency in issuing a visa. It also increases accuracy, security and reliability of transmitted information and speeds up the import clearance process in USA. A more accurate and updated database will be built-up with TQB providing a comparable source of information to exporters as well as the public. These are some of the basic necessities of the garment export industry today, which has to find ways and means to compete in a highly competitive international market and particularly to face the quota free market by 2005.

Even though quota requirements for an exports to EU had been eliminated, exporters to EU have to obtain export visa from BOI or the Textiles Division of the Ministry of Industrial Development because they want to

3/ For further information on ELVIS refer article on Electronic Visa Information System, News Survey March/April 2000, Vol. 21/No.2 .

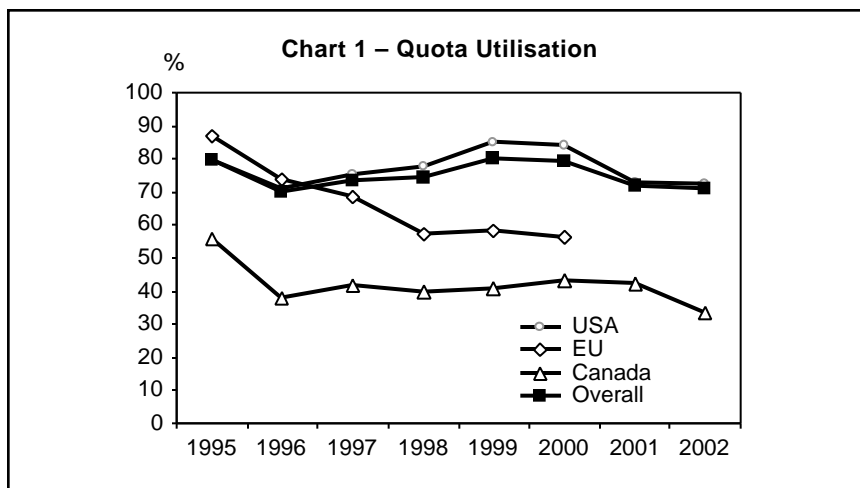
monitor exports and ensure that the export items have been produced in Sri Lanka. In addition to the four categories under quota, three new categories were brought under the visa requirements in 2001. With the objective of preventing forgeries of export visas and Certificates of Origin, TQB introduced an Electronic Data Exchange System in co-ordination with the European Commission on 1 September 2001. When export visas are issued to exporters to the EU, TQB transmits all relevant information to the European Commission in Brussels through the Electronic Data Exchange System. This system enables the European Commission to monitor the country of origin, product category and other relevant information instantaneously and prevent importing misclassified products and those not produced in Sri Lanka. As Sri Lanka has access to the EU market without quota restrictions, forgeries of this nature are to be expected.

Utilization of Textile Quota

Under the quota system, approximately 30 quota categories were opened for export to USA and 11 categories were Canada in 2001. Until end 2000, 4 categories were available for export to EU countries. From 1996 to 2000, quota allocations by these three countries were increased by 8 per cent. Overall quota availability to USA and Canada increased by 6.8 per cent in 2001. However, overall quota allocation in 2001 declined by 7.5 per cent due to the absence of EU quota. This will minimize the risk associated with the removal of a large number of quotas at the last stage of the phasing out process in 2005.

Under-utilization of Quota

Over the last decade overall utilization ratios varied between 70-80 per cent indicating an under utilization of quota. Under-utilization may occur because of (a) lower demand for a particular category from importing countries, (b) competition from other countries holding a quota, (c) local producers using their capacity to produce high value added garments under other quota categories or non quota categories or to meet demand from non quota countries and (d) mis-allocation of quota. However, under-utilization does not necessarily imply that the industry is not performing well. Exporters may have used their full production capacity to produce garments to non quota areas as Sri Lanka responds to phased elimination of quotas, shifting from quota to non quota items. However, maximum utilization of available quotas is a prime objective under quota system as it ensures the non-competitive access to industrial country markets. Once a market is acquired, it may provide access even under a non quota regime.



Over-utilization of Quota

Over-utilization occurs when exports under a particular category exceed its quota allocation. In general, when exports of a particular category exceed its quota allocation for the year, the importing country may impose an embargo by constraining the entry of these products to the country. In 1989, USA embargoed the entry trousers (category 347) and skirts (category 342) exported to that country in excess of permitted quantities. In 1994, following the 200-GFP, excess items were produced but the government was able to handle the situation by obtaining increased quota allocations. Similarly in mid September 1998, TQB announced that men's and boy's shirts not knit (categories 340/640) and men's and boy's coats non-suit *i.e.* jackets (categories 334/634) had been over-utilized, and requested exporters to defer their subsequent exports until December 1998. This decision was taken in order to avoid the possible imposition of an embargo by USA government on Sri Lanka's future exports.

Over-utilization may occur mainly because of (a) poor coordination between issuing and servicing authorities and mismanagement and poor monitoring of TQs. Conscious over-allocation of quota of low performing categories under CCPQS has been a practice in order to maximize the utilization of quota. This is done in the best interests of the industry but needs to be carefully monitored. If TQB does not monitor carefully and manage the quota pool schemes properly, industrialists may produce more because of over allocation, and will be worse off if the category exceeds the available quota to over needs. Close coordination between issuing and servicing agencies is required and must be monitored on a regular basis, particularly, when SDQs

are allocated and reallocated. If the servicing authority does not report utilization in time, un-utilised quota may not be reallocated.

Other causes for over-utilization may be (b) mistakes made by the Customs authority in the importing country which records imports under the wrong category and (c) shipments based on forged export documents. When the demand for a certain quota category is high, some exporters produce forged documents to export more garments which have high demand, exceeding their quota limits. They obtain visa for one category, which can be exported under quota but export a different category, which is in high demand. For example, in 1998, the USA Customs import data revealed that about 90 per cent of the category 334/634 quota had been utilized by end September. Subsequent investigations showed that because of the high demand for the category, some exports had been made using fraudulent documents.

The immediate impact of over-utilization will be deferment or cancellation of export orders. The exporters have to bear the total cost of cancelled orders, face problems of storage and related costs and overcome difficulties in servicing bank loans. Loss of credibility in exporters due to postponements and cancellations of shipments *etc.* will divert buyers away from that country. Imposition of an embargo will hinder possibilities of future enhancement of base limits of the TQs under the flexibility facility until such time as both parties come to an agreement. The industry is in a transition period with the gradual phasing out of quotas. It is becoming very competitive due to new procedures and regional groupings in the West. Maintenance of the country's image among buyers is imperative to survive in the future in a highly competitive environment under the quota free system.

Meanwhile the industry should use the opportunity of entering large markets through the quota system not only to sell their production today but also to build up relationships with buyers and to look for new markets for the future. Sri Lanka is in the process of moving into more non-quota exports and high value added products. However, progress has been slow in finding new markets in non quota countries. The share of garments exported to non-quota countries (excluding EU) is still around 4 per cent of total garment exports from Sri Lanka. Sri Lanka should move fast in this direction, and be well equipped to deal with market conditions when quotas will be dismantled by 2005.

III. Nature of Sri Lanka's Textile and Garment Industry and its Challenges

Sri Lanka as a garment exporter has shown improvement in many respects. However, even at present, under the quota system more than 52 per

cent of Sri Lanka's garments exports to the world. Besides, heavy dependence on the quota system, inflexible labour markets and competition from emerging garment procedures are the major issues that need urgent attention for survival in quota free markets.

A. Overdependence on a Single Product

Following liberalisation in 1977, the export structure of the economy changed drastically from the agricultural base to an industrial base until 1995; no significant changes has been seen thereafter. Textiles and garments, which became Sri Lanka's largest single item of exports in 1986 continued to maintain that position, increasing its share from 28 per cent in 1986 to 52 per cent in 2002.

Although gross earnings from the textiles and garment sector are high, tea remains the country's largest net foreign exchange earner until 1991. Textiles and garment sector became Sri Lanka's largest net foreign exchange earner in 1992 (Chart 2 and 3) partly as the industry shifted from low value added garments to high value added garments and as the sector as a whole expanded rapidly. Some industries such as rubber based products, machinery and equipment, diamond and jewellery, travel goods and footwear, ceramic products, fish products emerged. However, the prominence of textiles and garments exports has remained unchanged and this product accounted for 70 per cent of industrial exports.

This sector used 40 per cent of all intermediate good imports of the country in 2001. Therefore, vulnerability to the external sector continued, perhaps, somewhat reduced as Sri Lanka depends heavily on one single industrial commodity *i.e.* garments for exports earnings. That commodity itself depends heavily on imported raw material.

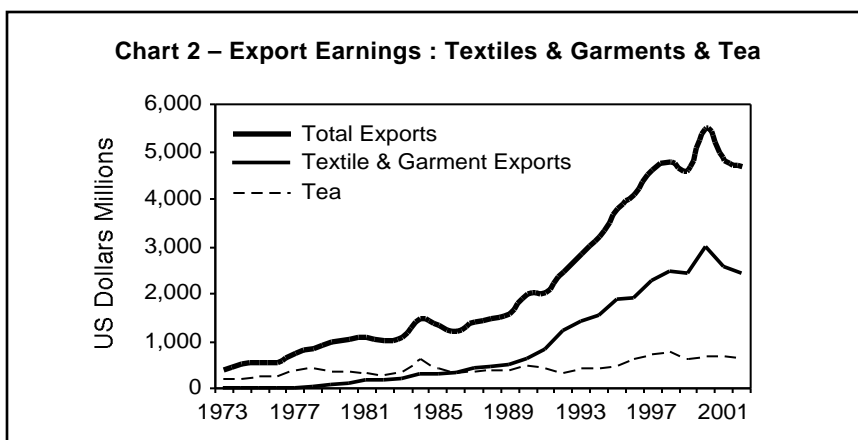
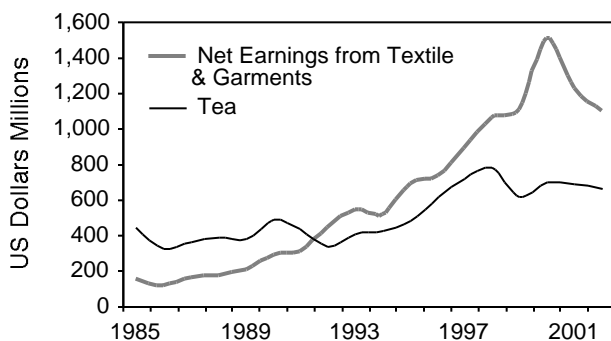


Chart 3 – Net Earnings from Textile & Garment vs. Tea**Table 2 – Structure of Export (Percentage Share)**

Product	1977	1985	1990	1995	2002
Agricultural	79.3	52.5	36.4	21.6	20.0
Industrial	14.2	39.5	52.2	75.5	77.3
O/w: Textiles & Garments	2.1	21.9	31.6	48.4	51.6
Mineral	4.8	2.4	4.4	2.3	1.9
Other	1.7	5.6	7.0	0.6	0.8

Source : Central Bank of Sri Lanka

B. Heavy Dependence on a Few Export Markets

Sri Lanka's textiles and garment exports are concentrated in a few export markets. USA accounted for 64 per cent of the total garment exports and the share of EU was 30 per cent in 2001. Canada, accounted for 2 per cent of total garment exports. More than ninety countries, including Australia, Japan, Switzerland and Israel accounted for balance 4 per cent. Even though USA and EU accounted for more than 94 per cent of Sri Lanka's garment exports Sri Lanka supplies only 2.3 per cent and 0.9 per cent of USA and EU garment markets, respectively.

Heavy dependence on quota markets is a major concern in the textiles and garments industry. Even though phasing out of quota restrictions under the Agreement of Textiles and Clothing (ATC) had been started since January 1995, Sri Lanka had not felt much of these changes until December 2000 as in the first two stages, USA and EU chose items with less restrictions or which

Table 3 – Country-wise Classification of Garment Exports

Country	Percentage Share			Average growth
	1990	1995	2002	1997-2002
USA	66.3	60.7	63.3	6.0
EU	27.0	34.2	31.0	3.8
O/w: UK	6.2	13.7	19.9	12.2
Germany	9.6	9.0	3.4	-8.7
Netherlands	3.4	3.8	1.5	-7.9
Canada	2.2	1.7	1.8	13.4
Other Countries	4.5	3.4	3.9	6.7
O/w: Australia	0.2	0.3	0.4	13.4
Japan	1.0	0.7	0.6	4.6

Source : Central Bank of Sri Lanka

were less competitive in US and EU markets. This was very clear in the US market, where Sri Lanka's share of garments exports under quota restriction declined from 97.9 per cent in 1990 to 84.1 per cent in 2001 whereas share of quota garments to the EU increased from 24.1 per cent in 1990 to 26.8 per cent in 2001. However, Sri Lanka's dependence on quota market was much lower than that of her South Asian competitors. (Table 4)

During the period 1996-2000, quota allocation by the USA increased by an annual average rate of 7.5 per cent (in volume terms) while EU quota allocation increased by an annual average rate of 12.5 per cent. As a result more than 60 per cent of Sri Lanka's garment exports are covered by the MFA in 2000. The removal of quota restriction on Sri Lanka's exports to the EU countries by 1 January 2001 will clear about 10 per cent of existing quota restrictions on Sri Lanka's garment exports. Even though adverse developments in the western world reduced the demand for garments in 2001, quota allocated by USA and Canada increased by 6.7 per cent and 9.5 per cent, respectively in 2001.

Table 4 – Exports of Garments Under Quota System –South Asia

Country	Quota Based Exports (%)
Bangladesh	95
India	73
Nepal	80
Pakistan	90
Sri Lanka	53(a)

(a) 2002 estimate

Source: Garment Industry in South Asia Rags or riches ILO-2002

Table 5 – Quota vs. Non-Quota Garments

Country	Value of Exports		Exports under Quota (%)	
	1990 (Sq. Mtrs.)	2002 (US \$ Million)	1990	2001
USA	412.5	1,421.1	97.9	81.0
EU	168.5	696.6	24.1	–
Canada	13.8	40.5	n.a.	80.0
Other	27.6	88.3	–	–
Total	622.4	2,246.4	67.0	52.7

Source: Textile Quota Board,
Sri Lanka Customs

Notes : 1990 – Calculations are based on Squire Meters
2001 – Estimates are based on Value

C. Insufficient Product Diversification

Insufficient product diversification is another problem in the industry. The composition of the textiles and garments exports showed a marginal change over the past 2 decades. Garments exports accounted for more than 96 per cent of total textiles and garments exports in 1980. Textiles, other than made up articles and yarn emerged as export items in early 1990's and increased their shares to 3 per cent each while garments exports accounted for more than 90 per cent of total textiles and garments exports in 2001. Sri Lanka expanded its product coverage from four items (shirts, blouses, trousers and jackets) in 1977 to a broader base of more than 50 items in 2000, but is still highly concentrated on a few product categories, particularly casual ware for men and women. The quota restrictions imposed by major importing countries limit the export of most of these popular items.

**Table 6 – Structure of Textile and Garment Exports
(Percentage Share)**

Product	1990	1995	2002
Textiles	0.4	2.8	2.8
Garments	96.5	89.3	92.6
Yarn	...	2.4	1.1
Made up articles	2.1	3.5	19.0
Other	1.0	2.0	1.6
Total	100.0	100.0	100.0

Source: Central Bank of Sri Lanka

D. Heavy Dependence on a Few Large Scale Industries

Heavy dependence on a few large scale producers is another important feature of the industry today. Out of 1,061 large and medium scale garment factories operated in Sri Lanka, about 26 per cent are small scale with less than 100 employees. Another 51 per cent are of medium scale. Only 23 per cent belongs to the large and very large category with 500 or more employment. However, these large (244) manufacturers accounted for 62 per cent of total employment in the industry. Local entrepreneurs currently own about 80 per cent of total garment factories while balance are owned by foreign companies or partnerships of well known companies.

Table 7 – Distribution of Factories - By Size

Category	No. of Employees	No. of Factories		Percentage (%)	
		1998	2001	1998	2002
Small	0-100	286	271	32.8	25.5
Medium	101-500	430	546	49.3	51.5
Large	501-1,000	139	183	15.9	17.2
Extra	Over 1,000	17	61	1.9	5.7
Total		872	1,061	100.0	100.0

Source : Survey conducted by the Textile Training and Services Centre

According to Customs' records 1,045 manufacturers exported garment products. However, 55 companies exported garments worth less than US dollar 100 each in 2002. These 55 companies accounted for a negligible amount of total export earnings in 2002. Out of the balance 990 exporters more than 50 per cent accounted for less than 1 per cent of total garments exports. The top ten per cent of exporters accounted for more than 70 per cent of total garments exports (Table 8). Out of this ten per cent 39 exporters (top 3.9 per cent)

Table 8 – Distribution of export earnings by Companies

Exporters as a percentage of total exporters	Export earning as a percentage of total earnings (%)	
	1999	2002
Top 10 per cent	72.0	72.3
2nd top 10 per cent	16.2	17.4
3rd top 10 per cent	6.9	6.6
4th top 10 per cent	3.0	2.4
5th top 10 per cent	1.3	0.9
Lowest 50 per cent	0.6	0.4

Source: Sri Lanka Customs

supplied 50 per cent of the total garments exports. These two indicators demonstrate the top heavy structure of the garments industry.

The distribution of export earnings and employment according to size of the factory, showed that a large share of employment and export earnings in the garment industry was concentrated on a few large companies. Large companies with more than 500 employees each which contribute 23 per cent of all garment factories accounted for 90.7 per cent of total garment exports and provide employment of 61.9 per cent of total employment (Table 9).

Table 9 – Distribution of Factories, Employment - by Size

Category		Factories (%)	Employment (%)	Export Earnings (%)
Small	0-100	25.5	3.1	0.3
Medium	101-500	51.5	35.0	9.0
Large	501 or more	23.0	61.9	90.7
Total		100.0	100.0	100.0

Source: Survey conducted by the Textile Training and Services Centre

The geographical location of garment factories show that the industry is not well scattered in the country. Labour migrated from rural areas to towns and create social and economic problems as residential facilities are expensive in these area. Owing to the high cost of living in relation to their income, female employees leave employment to stay with their families after marriage. Most of the garment industries are located in Colombo and Gampaha districts because of better infrastructure facilities and close proximity to Colombo harbour. Accordingly, more than 65 per cent of garment factories are located in these two districts. Under the 200 Garment Factories programme which aimed at encouraging the establishment of other factories in rural and difficult areas, 189 industries were located in 21 districts. Of these 153 were located outside Colombo and Gampaha Districts. Under the New Garment Factory Programme introduced in the 1998 Budget, 60 factories were in commercial operation in 19 Districts outside Colombo District in 2002.

E. Lack of Solid Raw Material Base

Lack of a solid raw material base is considered as one of the major factors weakening Sri Lanka's competitive strength among its major competitors in Asia. Textiles and garments industry in Sri Lanka depends heavily on imported raw material and accessories. More than 70 per cent of the raw material and

70-90 per cent of the accessories used in this industry are imported. Since fabrics and accessories account for more than 70 per cent of the cost of production, lack of backward linkages is a major constraint to the development of this industry. Availability of raw material in the close proximity, most importantly within the country, is an essential factor in today's context where lead time (the time between ordering the goods and having it arrived in the stores) play a major role in international competitiveness. Backward linkages will not only provide employment and save foreign exchange, but will managed the time of transporting inputs efficiently thus reducing lead-time.

Wastage takes place because of several reasons. There are rejects and over production. Wastage takes place in transport within the factory premises and between the factory and warehouses. Idling machines add to wastage. Waste also access in stocking and in handing. More efficient supporting services can reduce wastage. Attention to reduce waste will increase the competitive edge in most Sri Lankan factories.⁴

F. Wage Differentials

Wage differences between industrialised western countries and developing countries was the main reason for shift of textiles and garments industry from the western world to Asian countries. All over the world average labour cost has increased. However, average hourly wage rates given in Table 10 suggest that Sri Lanka no longer has the advantage of lower labour cost in relation to her Asian competitors although, she has an advantage over developed countries.

Table 10 – Average Hourly Labour Cost (Wages and social charges - in US \$)

Country	1992	1998	2000	Country	1992	1998	2000
USA	10.00	12.97	14.24	Sri Lanka		0.49	0.46
Canada	10.50	13.93	14.29	Pakistan		0.40	0.37
Mexico	1.70	2.23	2.20	Philippines		1.12	
Germany	18.40	21.48	18.10	Indonesia		0.24	0.32
France	13.40	14.16	13.85	Turkey		2.48	2.69
UK		13.58	12.72	Hong Kong	3.70	5.65	6.10
Switzerland		24.08	13.85	Korea	3.80	3.63	5.32
Thailand		1.09	1.18	China	0.42	0.62	0.69
Bangladesh		0.43		Taiwan		5.85	7.23
India		0.60	0.58	Japan	10.30	20.70	26.10
Italy	15.70			South Korea		2.05	1.82

Sources : World of Work – 1996 & 1999
Werner International – 2000

4/ Juji Hasumi (1999)

In Sri Lanka the cost of labour was about 15 –16 per cent of the total cost of production. This was relatively a low percentage in comparison to that in industrialised countries. However, Vietnam, Cambodia, Caribbean nations and sub-Saharan countries are emerging as lower cost producers. They also have a preferential access to US and EU markets.

G. Lack of Skilled Labour

As the industry expanded rapidly job opportunities increased significantly. There is now apprehension that job opportunities will be lost rapidly, if the industry cannot successfully face competition after removal of quota in 2005.

Over the last three years employment in the textiles and garments sector increased by 21 per cent. The industry faces many problems in developing and maintaining the required manpower. Estimated cadre requirement given in Table 11 shows that the industry find it difficult to recruit sufficient employees in all categories, particularly, in operational grades. Even in the managerial grades, about 8 per cent of the vacancies are unfilled due to lack of suitable persons. The operational category comprised 94 per cent of the total workforce of which 90 per cent are female. Management category

Table 11 – Composition of Employment

Category	Employment			Vacancies 2002(a)	(%)		Age Structure (%)			
	1998	2001	2002		Male	Female	18-24	25-29	30-39	>40
Management Grade	12,354	19,794	21,499	1,705	42	58	25	54	18	2
Senior Managers	2,122	1,586	1,639	53	84	16	9	17	48	26
Middle Level										
Managers	3,240	2,664	2,781	117	64	36	20	48	29	3
Front Line Managers	6,992	15,544	17,079	1,535	34	66	28	59	13	0
Operative Grade	245,994	290,736	316,803	26,067	10	90	64	30	5	1
Mechanics	3,162	4,054	4,305	251	99	1	38	48	13	1
Operators	129,349	176,663	198,376	21,713	6	94	64	30	5	1
Helpers	70,344	65,345	68,281	2,936	10	90	66	30	4	0
Checkers	22,158	23,188	23,242	54	12	88	66	31	3	0
Line Leaders	3,225	1,289	1,305	16	5	95	22	62	15	1
Cutters	2,289	2,515	2,592	77	87	13	20	30	48	2
Others	15,467	17,682	18,702	1,020	12	88	69	20	10	1
Total	258,348	310,530	338,302	27,772	12	88	62	31	6	1

(a) Vacancies at the beginning of 2002

Source : Survey conducted by the Textile Training and Services Centre

accounted for the balance 6 per cent. Most of the female workers leave the industry after marriage while a considerable number of trained workers leave the industry for foreign employment. The average labour turnover worked out per factory is about 60 per cent per annum. Taking the labour migration within the industry into account, the net number of persons leaving the industry each year is estimated as 25 per cent.

There is the problem of maintaining a stable work force and much effort required to maintain quality and productivity in the labour force. More than 64 per cent of the labour force in the operational grades are in age group 18-24 years. Even in managerial grades, nearly 79 per cent are below 29 years of age and another 18 per cent are between 30-39 years. Exceptionally 74 per cent of senior managers are older than 30 years.

Table 12 – Educational / Vocational Training

Category	Educational (%)					Vocational (%)			Industry Preference
	Deg- ree	G.C.E. (A/L)	G.C.E. (O/L)	Below G.C.E. (O/L)	Total	Certifi- cates	Trai- ned	Experi- -ence	
Management Grade	9	64	27		100				GCE (A/L)
Senior Managers	30	62	8		100				GCE (A/L)
Middle Level Managers	8	80	12		100				GCE (A/L)
Front Line Managers	7	62	31		100				GCE (A/L)
Operative Grade		9	69	22	100	..	14	86	Experience
Mechanics		10	86	4	100	5	12	83	Experience
Operators		6	72	22	100		20	80	Experience
Helpers		3	65	32	100		5	95	Experience
Checkers		41	54	5	100		4	96	Experience
Line Leaders		19	75	6	100		1	99	Experience
Cutters		20	80	0	100		2	98	Experience
Ironers		10	62	28	100		2	98	Experience
Others		16	71	14	100		7	93	Experience
Total	1	12	66	21	100		14	86	Experience

Source: Survey conducted by the Textile Training and Services Centre, 2001

Only 4 per cent of the workforce currently engaged in the operational grades has acquired vocational training; the balance acquired skills through work experience. Even in the managerial and technical grades professionally qualified managers and supervisors are in short supply. In many instances, these positions are held by persons promoted from operator level without any

additional training. Among senior managers, almost 70 per cent have had no more education than GCE Advanced Level or GCE Ordinary Level.⁵

H. Productivity of Labour

Productivity of labour is considered very low in comparison with competitors. However, labour productivity in the garment sector improved slowly and gradually over last several years. Better working conditions, on the job training and better management techniques contributed these improvements. Some of the factors responsible for low productivity are lack of properly trained labour, rigidities in labour legislation, poor working conditions, high labour turnover, difficulties in obtaining seasonal labour and outsourcing labour. An other major concern is the large number of holidays each year due to statutory, religious, and social obligations. They contribute low productivity in labour while reducing the number of effective manhours per year. The large number of strikes and loss of man days also adversely affects the productivity of labour.

I. Rigidity in the Labour Laws

Rigidity in the labour laws is one of the areas that government should pay attention to. In a competitive environment, industrialists are under pressure to deliver orders on time and reduce lead time. Some international buyers require compliance with local labour regulations. Our regulations are sometime not in compliance with international standards. International buyers stipulate that workers should not work in excess of 60 hours per week unless local legislation permit other wise. Until recently, Sri Lanka labour laws restricted overtime for female workers to 100 hours per year or 6 hours per week. That restriction make Sri Lankan industrialist lose competitiveness to those in other countries which practise more flexible labour legislation. This legislation was amended to increase the number of overtime hours to 60 hours per month or 720 hours per annum effective from 6 August 2002. Furthermore, wage policies should contain provisions to link wages with productivity. Our laws have many loopholes in that respect. Labour laws need to be revised to suite the requirements of the modern economies. Draft legislation has already been prepared to amend laws relating to termination of employment, dispute settlement and other matters and are expected to be presented to Parliament soon.

5/ Employment data are based on a survey conducted by the Textile Training and Services Centre. Author wishes to place a note of appreciation to Mr. A.H.H. Saheed of the TTSC for providing most recent information.

J. Lead Time

Lead time has become one of the principal factors considered by western importers. In order to respond to fashion trends and meet competition, importers are now looking for delivery services of 8-12 weeks after placing an order. Lead time heavily depends upon overseas locations. Shorter delivery time makes production and marketing process more efficient providing opportunities for quicker responses to changing demand. Specially US and EU buyers are demanding fast response. Shorter lead time is partly responsible for the increase in market share by Mexico and Caribbean countries in the US market from 6 per cent in 1984 to 41 per cent in 1999. As there are several countries with competitive labour costs and shorter lead time in Latin America, South Asian and Far Eastern countries are now face a growing competition from those countries. According to a recent study⁶ Canadian buyers have indicated concerns on perceived long delivery time, high prices and unreliable supply in Sri Lanka garments sector as well as political instability in the country.

K. Product Quality

Product quality is one of the crucial factors in determining the sources of the US and EU garments imports. A survey⁷ conducted with 23 of 35 top retailers in the USA confirmed that over 70 per cent of buyers indicated relative product quality as the most important factor in selecting a garment producer. Where quality is concerned, buyers go for particular producers not for the country because quality varies among factories within countries. Lead time and cost were ranked numbers two and three. However, the mass merchants and department stores ranked lead time slightly above quality. A more recent study found that almost 40 per cent of the respondents indicated price as the most important factor in selecting an apparel producer. The same source concluded that ‘the most successful manufacturers will be those who create and market their own brand names to the consumer’. Brand recognition, brand identity and consumer acceptance of these brands will enable manufacturers to create better margin opportunities. Quality improvement is the area where Sri Lanka can maximise her potential for winning buyer’s confidence which is essential for retaining customers. Most recent studies on the North American market for Sri Lanka apparel found that both US and Canadian buyers believed in the high quality of Sri Lankan garments.

6/ Goss Gilroy Inc. (2001)

7/ Hathcote and Nam (1999)

L. Investment in Technologies

The garments industry has become a hi-tech industry worldwide. For Sri Lanka to develop competitive edge in international markets and survive, it has to concentrate on move higher value added products. If Sri Lanka remains as a producer of standard low value added, low price garments, buyers will find other cheaper sources in Asia, Africa and Eastern Europe. To be competitive Sri Lanka must produce specialized, high quality up-market garments which are not highly price sensitive. To achieve the quality required to meet up-market products it is necessary to invest in advanced technology. During the past several years investment in machinery and equipment increased at a moderate level but most of them were concentrated in a few large factories. Most small scale factories are unable to invest in hi-tech machinery due to massive capital costs. Sometimes, unwillingness to bear the large costs in long term investment has worsened the situation.

IV. International Markets and Challenges

Sri Lanka's textiles and garments industry is adversely affected by many of the emerging regional blocks which erode Sri Lanka's market share in the world market. This situation will be further aggravated as these agreements are fully established in the next few years. A recent study⁸ found that sourcing strategies in the USA were increasingly driven by government policy towards specific regions. USA has already entered into a number of preferential trading agreements and these agreements influence sourcing decisions world wide. Beyond 2005, sourcing will tend to value those with favoured trade relations with the USA.

A. Trade Agreements

North American Free Trade Agreement (NAFTA)

North American Free Trade Agreement (NAFTA) made Mexico a privileged supplier of clothing to Canada and USA and diminished Sri Lanka's access to the USA and Canada markets. Although, the cost of labour in Sri Lanka is very much lower than in Mexico, Mexico is in close proximity to USA and receives tariff and non-tariff concessions under NAFTA. Mexico overtook China as the largest exporter to USA and now contributes 4.2 per cent to world garment exports. Its share in the world market was less than

^{8/} Overview of the North American Market for Sri Lankan Apparel – GOSS GILROY INC, Management Consultant.

0.1 per cent in 1980. During the last seven years, garment exports from Mexico to US increased by an average rate of 15.4 per cent per annum. Mexico captured 14.8 per cent of the market in 1999 but the share declined to 13 per cent in 2002. Sri Lanka's exports to US increased by an average rate of 6 per cent per annum, during the same period. Although Sri Lanka slipped in rank from 12th in 1995 to 16th in 2002, her market share has been stable around 2.5 per cent during last 7 years.

The 'African Growth and Opportunity Act' (AGOA)

The Trade and Development Act of 2000 enacted in USA, which provides tariff and quota preferences for garments produced in Sub-Saharan African countries (SSA) and Caribbean Basin (CB) countries would place these countries in an advantages position over other garment producing countries. Under this agreement 24 Caribbean and Central American countries and 48 SSA would be eligible for duty and quota free access to the USA market for garments made with USA fabric and yarn. The 'African Growth and Opportunity Act' (AGOA) which aims at establishing a comprehensive trade and development policy for SSA signed by the US president in May 2000, would provide similar but limited market access to garments made out of African fabrics as well. Those countries in SSA with a per capita income below US dollars 1500 gives duty and quota free access to garments made from third country fabric for a period of 4 years. Mauritius, Lesotho, South Africa, Kenya, and Madagascar who has a production base would be the first to benefit out of this legislation. Nine others were identified as having potential. USA who imports from AGOA eligible countries will be exempt from paying import duties of 17-33 per cent. As dramatic growth cannot be expected in US demand for textiles and garments in the near future, the wide opportunities provided by the AGOA will help SSA countries to increase their exports to US at the cost of Asian countries. The AGOA and other TDA eligible countries are expected to reach their annual export cap to USA of US dollars 8.75 billion by 2008. More important US mass market retailers, who will save their duty payments will encourage their suppliers to relocate in TDA eligible countries. This would direct large inflows of foreign capital investments to those countries.

The second section of TDA 2000, is entitled the United States - Caribbean Basin Trade Partnership Act (Caribbean Basin Initiative - CBI). This provides duty and quota free treatment to garments cut in US and assembled in the Caribbean using US fabric and yarn, garments cut and assembles in Caribbean using US fabric, yarn and thread and limited quantities of certain other items. In addition to concessions under TDA 2000, cheaper labour in the Caribbean and Mexico, close proximity, lower shipping cost and less lead time give them

an advantage over Asian countries. CBI promotes US investments in the Caribbean Basin and helps strengthen the international competitive position of the US textile industry.

Even before TDA 2000, Caribbean exported wide range of cotton garments to US. These exports grew by an annual rate of about 15.1 per cent 1996-1999. Garment exports from Mexico to US increased by an annual rate of 16.8 per cent during 1990-1993 prior to the implementation of NAFTA. From 1994 until 2000, the Mexican garments exports increased by an annual rate about 30 per cent.⁹ Some project similar growth in Caribbean garment exports to US in the initial stage. However, they might lose a part of their market share again to Asia, once quota restrictions are removed for all WTO countries in 2005. However, one should not under estimate that the Caribbean countries will continue to enjoy advantages over Asia on several fronts.

An Agreement between the EU and Sri Lanka

In 2000, Sri Lanka signed a Memorandum of Understanding with EU. EU removed quota restrictions on textiles and garments exports to EU countries in January 2001. In reciprocity, Sri Lanka agreed to bind tariff rates at 0 per cent for raw materials, 5 per cent for yarn and fabric, 10 per cent for fabrics and 17.5 per cent for clothing products (current rates are 0, 0, 25 and 10 per cent, respectively). As some of the binding rates are lower than currently effective rates, some local industries were protected by the extension of exemptions on selected products, such as coir twine, rope *etc.* used in producing fishing nets, coconut coir, sanitary articles *etc.* In line with the bound tariff rate, import duty on carpets and other textile floor coverings were reduced from 25 per cent to 10 per cent with effect from 11 January 2001. Sri Lanka will also refrain from introducing any non-tariff barriers on imports of textiles and clothing.

Sri Lanka is the 20th supplier of textile and garments to EU while EU is the second largest importer of Sri Lanka's textiles and garments exports. Therefore, it is expected that the phasing out of the textiles and garments quota on exports to the EU market would have a positive impact on the Sri Lanka's textiles and garments industry. This will result in higher production and exports while allowing exporters to utilize their unused capacity. This will also build up confidence in exporters to plan for the future while easing fears of facing a quota free market environment.

Advantages that Turkey and Central and Eastern European economies had in the EU market due to preferential agreements with those countries were

^{9/} Garment exports by Mexico to USA declined by 7 per cent and 5 per cent respectively in 2001 and 2002.

diminished to a certain extent, when quota restrictions on Sri Lanka garments exports to EU were removed. At present, Sri Lanka has an advantage over India and Pakistan to EU. However, India is negotiating with the EU to make bilateral arrangements. Bangladesh and Cambodia have separate bilateral agreements with EU. However, in October 2000, EU approved duty and quota free access to 48 least developed countries including Bangladesh which is one of the competitors with Sri Lanka in the Asian region. These 48 countries are eligible for exporting any product, excluding arms, to EU without any duty or quota restrictions.

Scheme of Generalised Preferences

The Scheme of Generalised Preferences of EU, gives some advantages to Sri Lanka over India and Pakistan. Sri Lanka is eligible to obtain the tariff cut of 15 per cent of the common EU duty rates for textiles and garments. If the country fulfils the requirements of (a) maintaining sufficient labour standards and (b) protection of environment, additional tariff cut of 15 per cent of common EU duty rates will be granted. However, the utilization rate of this facility so far is not very attractive. The most important bottleneck was the lack of local fabric base on the island which prevent for obtaining rule of origin status.

The European Union has recognised South Asian Association for Regional Co-operation (SAARC) as a regional grouping for the purpose of extending “Cumulative Rules of Origin” to the member countries of the South Asian Preferential Trade Agreement (SAPTA). This decision was effective for the fulfilment of Rules of Origin Criteria Under the Generalised System of Tariff (GSP) from 1 October 2000. This was a result of negotiations member countries of SAARC and the SAARC Secretariat had with the EU to obtain special concessions for its members on the local content requirement under the ‘Cumulative Rules of Origin’ criteria for the grouping. Under this criteria, material imported from SAARC member countries and used in production in any member country could be considered ‘local material’ in deciding the local content requirement. However, this is also ineffective since for technical reasons Sri Lanka’s garment producers need to source from other Asian Countries outside SAARC. Import content of fabric from non-SAARC countries is mostly too high to satisfy the value requirement under the rules of origin though Sri Lanka continued to receive tariff concessions from the participating developed countries of the GSP, without any reciprocity.

Other Competitors

Central and Eastern Europe, especially, Bulgaria, Hungary, Poland, Romania, and the Czech Republic are gradually becoming important suppliers to the European market. Since 1992 investors and entrepreneurs have shifted their activities from former Yugoslavia to other countries such as Croatia, the Russian Federation, Slovenia and Ukraine and relocated garment factories in these countries. Some factories in these countries with ultra-modern technology enable them to produce articles complying with European quality standards. They are capable of competing with Western counterparts. Morocco, Mauritius, Tunisia and, more recently, Madagascar have become important garments producers. These countries export their products to industrialised countries. Vietnam has become a major competitor with Sri Lanka in the US market in 2002. Vietnam textiles and garments exports to USA picked up remarkably in 2002 and overtook Sri Lanka in the US textiles and garments market during the first quarter of 2003 recording 1,563 per cent growth in textiles and garment exports to USA. This phenomenal growth was a result of the US-Vietnam Trade Agreement (BTA) signed on 13 July 2002. Vietnam overtook 13 other exporters and rose to the 5th position during the first quarter of 2003.

B. Impact of China's entry in to WTO

With China's entry into WTO, China will have the same market access to the USA and other markets as Sri Lanka by 2005. Lower wage rates, large labour force, expertise, raw materials base, flexibility and efficiency give China an advantageous position in many areas of textiles and garments industry over Sri Lanka. However, most of these advantages are not new to Sri Lanka or other Asian countries, as China has been a competitor over the last several years.

China's entry into the WTO is not a new challenge to world trade because China has been in world trade for the last 50 years and its trade relation have expanded to almost every country. The importance of the accession of China to the WTO is that China will now be governed by the same rules and regulations of WTO as other countries and as a result provide trading partners access to its huge market. China has a large market with over one billion population. China is the sixth largest economy in the world and Chinese trade accounts for about 4.4 per cent of World trade. Similarly, China will have access to member state's markets on equal terms. This event provides both challenges and opportunities for all members of WTO, including Sri Lanka.

A number of developments in the international arena will minimise threats from the China's entry into WTO. The favourable development will be

that, China itself committed to reduce its import tariffs on textiles and clothing from 20.1 % to 11.5 % by January 1, 2005. It has also bound its import duties at 5-6 % for yarn, 10-18 % for fabric and made ups and 14-20% for garments. Moreover, all quantitative restrictions on imports, including the one on US exports, would be abolished as required to the agreement on Textile and Clothing of WTO. With downward adjustments to the tax system recently, China's general tariff level has dropped from 15.3 per cent to 12 per cent on 1 January 2002 and those reductions affected more than 5,300 taxable items. China has also reduced the scope of commodities under quota and license controls.

China has nearly completed the work of sorting out and revising laws and statutes relevant to the fulfilment of commitments to WTO. Therefore, other WTO member countries can challenge China in the event of (export) subsidies and dumping. By end June 2002, anti-dumping cases against Chinese products by the EU totalled 91, including restrictions on Chinese textiles, canned mushrooms and garlic.

Within the multilateral negotiation system, the bargaining position of developing countries have been strengthened. Furthermore the agreement between China and USA signed in 1999 offers some restrictions to the expected surge in the Chinese garment industry. Without needing to prove damage to the local industries, WTO members can reimpose quotas on Chinese garments till 2008. Some specific categories of imports can be restricted till 2013. Meantime the growing trade union movement in China which decries the abuse of workers' rights in China, will provide cause for developed nations to impose restrictions on China without violating WTO commitments.

C. Restrictions Other than Quota

So far, the implementation of Uruguay Round has not significantly increased market access for developing countries. Although the legal commitments under ATC have been met by most members, there has been criticism of the way the agreement has been implemented. The selection of quota free items is at the discretion of importing countries and the integration list must encompass products from each of four group *i.e.* (a) tops and yarn, (b) fabric, (c) made up textile products and (d) clothing. However, after 2 stages of implementing ATC, the selection of higher value – added items, particularly clothing has been rather limited. In the case of USA the percentage (basis is volume of 1990 imports) of clothing imports integrate during the two stages amounted to only 3.9 per cent.¹⁰ With the implementation of the third stage of integration under the MFA phasing out programme on 1 January 2002,

10/ AITIC (1999)

USA removed 36 quota categories while 4 categories were partially integrated. However, none of the Sri Lanka's quota categories were included in the list of fully integrated quota categories. Only four categories are in the list of partially integrated quota categories. With this integration, allocation of garment quota to Sri Lanka declined by 10 percent in 2002 as against that of 2001. This will reduce dependence on quota to 50-52 per cent. It has been estimated that by 2004 the 11 principle developing country exporters will face quota restrictions on 80 per cent of their textiles and garments exports. Although ATC cannot be extended, some other form of protection could substitute for quota. Tariffs and quantitative restrictions other than quota imposed by developed countries on developing countries may continue even after the removal of MFA. Many developing countries who export textiles and garments also use extensive and very high degrees of protection through high tariff and quantitative restrictions to limit foreign competition. Although the results of an Uruguay Round was expected to reduce tariff rates and simplify tariff structures, both the level and frequency of tariffs remain matters of concern in a number of key sectors of direct interest to developed countries. Although non-tariff restrictions and subsidies were not allowed, industrialized countries use measures consistent with WTO agreements. In addition to tariffs, contingent measures such as anti-dumping or technical barriers could become more common means of protecting against imports from developing countries.¹¹

Bound Tariff

Uruguay Round Agreement on Agriculture (URAA) required members of WTO to replace non-tariff measures (NTM) with tariffs and to bind them against future increases. It also required them to reduce these bound tariffs by 36 per cent on average by industrial countries during 1995-2000 and 24 per cent on average by developing countries during 1995-2004. With the full implementation of UR, average duty rate of 7 per cent is expected for all merchandised trade. Eighty per cent of textile and garments is covered by bound tariffs and bound rate is 12 per cent.

Even though a bound simple average rate of 12 per cent was expected this figure covers significant differences between industrial and developing countries and across the products (Table 13). Furthermore, average applied tariff rates are lower than bound rates. Thus, there is considerable scope for textile and garment exporters to raise the apply tariff protection to be consistent with UR commitments.

In practice, some countries express their tariffs in absolute or specific terms which make them far less transparent and difficult to quantify. In USA

11/ Spinanger, 1999

Table 13 – Post-UR Average Tariff Rates - Textiles and Garments

	Bound Rate	Applied Rate
Industrial countries	11	8
Developing countries	24	21
World	12	10

Source: Market Access for Developing Countries' Exports, IMF and World Bank - 2001

and UK, about 44 per cent of agricultural tariff lines have specific tariffs. These conditions provide opportunities for developed economies to continue with hidden non-tariff barriers to protect their markets at the cost of exports in the developing countries.

Incidence of Tariff Measures

The incidence of applied tariff across deferent countries is compared using trade weighted tariffs. There is greater differentiation in the incidence of tariffs in industrial markets than in developing markets. Developing countries face much higher tariff for their agricultural goods than manufactured goods.

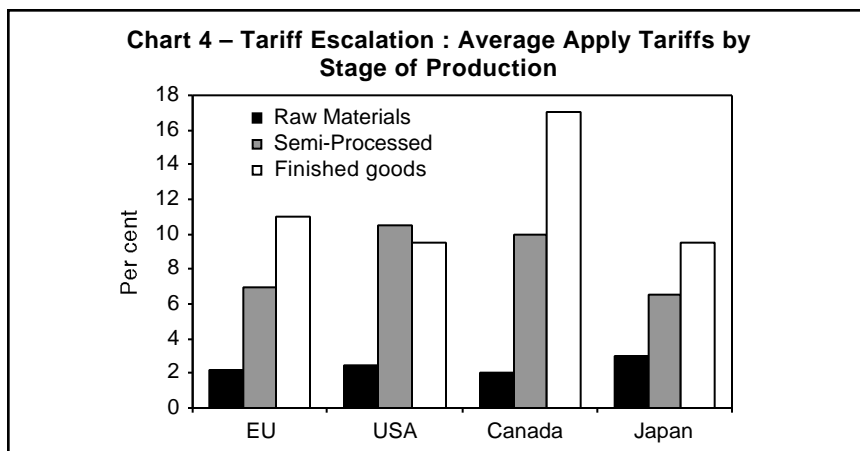
Tariff Peak and Escalation

Both industrial and developing countries use tariff peaks and tariff escalations. In USA and Canada, the largest import category subject to tariff peak is textiles and clothing, where more than 90 per cent of LDC exports to these countries is concentrated. Similarly the tariff structures of developing countries contain a significant number of tariff peaks. This indicates the importance of barriers facing developing countries exporting to other developing countries.

Tariff escalations are common in both developed and developing countries. Tariff escalations reduce the demand for processed goods from developing countries and hamper the expansion of their processing industries. Among 18 a major processing chains of developing country exports to industrial countries majority suffers from tariff escalation (Chart 4).

Other non-Tariff Measures

Trade remedies permitted under the WTO agreements include antidumping measures, countervailing duties against 'actionable' subsidies



and safeguard measures to protect against serious injury from import surges. During the last decade, antidumping has become the popular safeguard instrument among high income developed countries and has gained increased popularity among developing countries.

In 1997, out of 239 cases initiated in WTO, 143 concerned developing countries and countries in transition. Between late 1980 and 1994, the EU alone brought at least 179 anti-dumping measures or proceedings against China. During 1995-1999, over 1,200 antidumping investigations were initiated. As shown in Table 14, developing countries appeared to be the major object of antidumping cases from both industrial and other developing countries. According to antidumping investigations, initiated during 1995-1999, more than 58 per cent were initiated by developing countries of which 36 per cent were against developing countries. More than 41 per cent were initiated by developed countries. Less than 1 per cent originated from transition countries.

Table 14 – Initiations of Antidumping Investigations

Initiating Country	Affected Countries			
	Industrial Countries	Developing Countries	Transition Countries	Total
Industrial Countries	126	244	129	499
Developing Countries	252	258	201	711
Transition Countries	4	0	4	8
Total	382	502	334	1,218

Source : WTO –2001, Table II.8

Technical, health and safety standards and regulations

The Agreement on Technical Barriers to Trade (TBT) and Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) attempt to strengthen international rules governing product standards in order to minimise their use for protectionist purposes. Developing countries have to incur additional expenses to upgrade their infrastructure for maintaining quality controls, testing, certifications *etc.* and upgrading production methods to meet quality standards. The associated cost will be higher for exporters if they have to meet the standards different from those in their home markets.

One indicator of the relevance of standards in restricting trade is the increasing number of trade disputes over standards and technical barriers that have been initiated during the last 6 years. Most of the cases have been brought by industrial countries against other industrial countries. Except India, no other low income country has brought cases to WTO under TBT or SPS. The need to conform to technical, sanitary, and phytosanitary standards imposes costs on exporters. An increasing number of disputes over standards and technical barriers also constrains trade in developing countries. This makes it difficult for poorer countries to shift exports towards higher value added manufactures. Complex and inefficient Customs procedures can also deter trade. Excessive control, inefficiency in customs procedures and documentary red tape in customs procedures has been estimated to increase the cost of imports, substantially by around 7-10 per cent of world trade.

Tariff Preferential Schemes

The restrictive effect of tariff and non-tariff barriers are lessened by preferential Access Schemes for poorer countries. However, these are often applying to products that already enjoying low tariffs. In many cases, these preferential schemes are subject to various eligibility criteria and conditions. Therefore, these schemes are not an effective as they appear.

V. Welfare Gains and Loses from Liberalization in Textiles and Garments

A. Gains from Liberalization

Recent estimates¹² of potential gains from the further liberalization of merchandized trade¹³ shows that full implementation of UR in 2005 will

12/ Anderson and Others (2000)

13/ Computable General Equilibrium (CGE) models are commonly used for estimating potential gains from further liberalisation of merchandised trade *i.e.* Anderson and others (2000 and 1999) Hertel (2000), Dee and Hanslow (2000) *etc.*

improve welfare in both developed and developing countries. Developing countries gain most from industrial country liberalization on textiles and garments, industrial countries gain more from liberalization in developing countries. MFA quotas in industrial countries on textiles and garments imports from developing countries impose substantial costs for both developing and industrial countries. Therefore the removal of those barriers will increase welfare gains substantially. Removal of MFA quotas is estimated to improve developing country welfare by US dollars 13-22 billion.¹⁴ Global trade in textiles and garments is expected to increase by about 34-60 per cent once MFA quotas are completely eliminated.¹⁵

Table 15 – Welfare Gains from Post UR Liberalisation of Textiles and Garments

Liberlising Region	Benefiting Region (in billions of 1995 US \$)		
	Industrial Countries	Developing Countries	All Countries
Industrial Countries	-5.7	9.0	3.3
Developing Countries	10.5	3.6	14.1
All countries	4.8	12.6	17.4

Source : Anderson and others (2000)

B. Impact on Employment and Exports

Even though, there are different opinions among industrialists and other parties concerned, there is a common fear that the garment industry will suffer significantly after the phasing out of quota in 2005. Some surveys¹⁶ revealed that 50 per cent of the industry would be forced to close down. Most of the medium and small scale factories are not considered up to the level of export markets. Distribution of export earnings and employment according to size of the factory, showed that a large share of employment and export earnings in the garment industry was concentrated in a few large scale companies. Large scale companies with more than 500 employees which cover 23 per cent of total garment industries accounted for 90.7 per cent of total garment exports and provided employment to 61.9 per cent of total employment. Customs Statistics showed, out of 1,061 garment companies¹⁷ 50 per cent together

14/ Anderson and others (2000) and Australian department of Foreign affairs and Trade (1999)

15/ Deardorff (1994)

16/ Gopal Joshi, Garment industry in South Asia.

17/ Ministry of Industries records for 2001.

exported less than US dollars 10 million of garments in 2002. These factories will face severe competition from large scale industries as from the outside world and may be wiped out. Closing down these industries will cause a loss of less than 1 per cent of export earnings. However, they may have a greater impact on employment as these establishments provide approximately 20 per cent of total employment. However, some of the small companies are not in the list of exporters. Although, there is a scheme to transfer unutilised quota through TQB, some small companies get their quota and sell them to large firms and exports are recorded under the latter's names. According to survey conducted by TTSC, out of 175 firms drawn from 1,061 companies in the list in the Ministry of Industries 47 were not in operation. Therefore, the loss of employment may be less than estimated. Although, some employment will be lost in the short run, labour is likely to be absorbed into recovering stronger firms. Even at present, the industry is facing difficulties in recruiting skilled and trained labour. As most of the existing firms have to be expanded and become stronger to survive in the emerging competitive environment more demand for labour can be expected from these firms. Some of the small scale firms may sub-contract, utilizing their capital and labour while some others may be acquired by large companies. Therefore, in the long run, employment loss will be looked after within the industry itself.

VI. Prospects and Strategies for Future Development

Global trade in textile and garment is expected to gain from liberalization. It is expected that the liberalization of textiles and garments industry in both developed and developing countries will have a positive impact on the industry. It is observed that, phasing out of quotas will close down nearly fifty per cent of garment factories. However, as production in the Sri Lanka's garment industry, is concentrated on a few large factories, a large part of export earnings and job opportunities will be saved. However, in the short run there will be a negative impact on employment, which may not be very serious. Large scale firms and at least a some of the medium scale firms will have to be strong enough to face the competitive environment emerging after the phasing out of quota in 2005. Therefore, the future of Sri Lanka's garments industry depends, to a large extent, on maintaining the momentum built up over the last 20 years while increasing the competitive edge that Sri Lanka has in the international environment. A firm foundation has been laid, on which the future of this sector could be strengthened and safeguarded. Yet there is much to be done to meet the challenges of intense competition in the future.

In the past, Sri Lanka's garments industry competed with other countries protected by quotas, government incentives, competitive labour costs and Free Trade Zones. However, nowadays competitiveness is not defined as something

emanating from abundant natural resources, cheap labour, continuous currency depreciation or government incentives. It has to be achieved by increasing value addition (and profits) through efficient and effective management. These include (a) identifying and serving specialized markets, (b) adding unique features to products, (c) adding value and service dimensions to export products and (d) developing complex products which cannot be easily replicated. Industries can build competitive advantage through superior economic and business strategies. They should emulate the strategies which are being adopted by other competitors. Venturing into new markets outside the traditional markets should be coupled with measures to reduce costs of production, increase productivity, specialize and be product focused, to train and develop manpower skills, enhance investments and adopt new and efficient technology. The Government must improve infrastructure facilities, ensure minimum disruptions in the working environment to support the industry.

Strategies based on labour cost advantages are not a sustainable source of comparative advantage due to existing labour market rigidities and lower labour costs in other markets. In regard to labour costs, other emerging markets such as India, Bangladesh, Indonesia, Vietnam and China will continue to be major competitors. As reducing of labour costs per hour is not feasible, the way out should be reduce labour costs per product. Sri Lanka's garment industry is considered as operating at an average of 40 per cent efficiency.¹⁸ Hence, there is much room for improving efficiency. High literacy rates and in easily trainable workforce are the advantages possessed by the country. A long term plan to build up professionalism and a stable work force is necessary for further growth in the industry. Development of infrastructure to provide training facilities as well as a change in attitudes to match the new challenges in the industry are essential to provide sufficient manpower as well as to improve quality and productivity. As a long term strategy, human resources development should be go hand in hand with educational reforms. Universities, technical colleges and other government and non government organizations such as Industrial Services Centre and Textiles Training and Services Centre are now offering training facilities to develop various skills relating to the textiles and garments industry. More investments should be diverted to develop designer capabilities and the marketing and management skills of entrepreneurs.

Increasing productivity and efficiency of labour is associated with technology enhancements as well. This should be associated with work plans and targets set according to international standards. Proper time management, maintaining accurate work measurements, proper tools to collect information pertaining to production and close monitoring with efficient methods to detect

18/ Mr. R.U. Kuruppu, Seminar on Cost Reduction through Efficiency Improvement, Phoenix College of Clothing, Ratmalana.

errors and inefficiencies associated with production are essential to minimize losses. Quick responses to correct errors and to avoid inefficiencies and use the most appropriate method to correct them are key elements in efficiency improvement.

Working condition and effects on the environment have been brought in to the limelight. This is one area when Sri Lanka can capitalise as it has a better record than many of her neighbouring competitors. Some large companies have already taken steps to obtain certificates of conformity is accepted standards in labour, health and safety and the environment. Eco-labelling, ISO 9000, ISO 14,000 *etc.* should be taken as advantages for building up marketing strategies in future competitive markets.

Quality improvement is a priority area, with which Sri Lanka can maximise opportunities in the developed markets. Sri Lanka can focus on developing brand names to build an image as the best garment manufacturer in Asia. Our exporters have already selected this as their vision for the future. Sri Lanka's product base is highly concentrated on casual ware. Future trends in European and American markets are for casual ware rather than designer attire. The garment industry is expected to have a grater shift towards casual and comfortable clothes. The newest generation of children, 'eco boomers' are the force behind the success of the children's ware industry. Sri Lanka can specialize in these products with her existing experience and skills to meet the future demand in those countries.

The geographical location of Sri Lanka places it far from the main markets. This is a disadvantage to some extent, because quick responses are crucial to keeping up with fast changing fashions. Sri Lanka and India have the higher lead time (19-45 days) compared to competing countries such as Mexico (6-8 days). The industry has to focus on exploring new markets and making efforts to strengthen the raw material base for the industry and to reduce lead time. If delays involved in obtaining raw material could be eliminated by attracting world class fabric producers, accessory manufacturers *etc.*, the present long lead times could be reduced. Therefore, there is an opportunity to develop the textiles industry to provide raw materials and accessories for the garment industry in the region. Indo Sri Lanka Free Trade Agreement opened a window of opportunity to break through to the huge Indian market and source fabric from internationally reputable textiles manufacturers. The industry must focus upon taking advantage of the Free Trade Agreement with India. Although quotas available for Sri Lanka are limited to 8 million pieces, the development of India as a supply source of textiles to Sri Lanka will solve the problem of lead time to a large extent. The industry should explore market access in India. This opportunity can be used to explore the possibility of inviting fabric manufacturers to establish joint ventures/ strategic alliances.

The emerging regional trade blocks have adversely affected Sri Lanka's textiles and garments industry eroding Sri Lanka's market share in the world market. This situation will be further aggravated when these agreements are fully established in the next few years. However, Sri Lanka has also achieved considerable development towards regional and international co-operation. An agreement with the EU and Sri Lanka to remove all quota restrictions on textiles and garments exports to the EU enabled it to reduce advantages that Turkey and Central and Eastern European economies had in the EU market. At present, Sri Lanka has an advantage over India and Pakistan. India is negotiating with the EU for bilateral arrangements. Bangladesh and Cambodia also have separate bilateral agreements with the EU.

The Scheme of Generalised Preferences of EU gives the advantages to Sri Lanka over India and Pakistan. Sri Lanka is eligible for the preferential rate of 15 per cent of the common tariff rate for textiles and garments. Under special arrangements, another 15 per cent of the common tariff rate is granted to countries that country fulfil the requirements of (a) maintaining sufficient labour standards and (b) protecting the environment. Recognition of SAARC as a regional grouping for the purpose of extending 'Cumulative Rules of Origin', by EU will help SAARC members to use the facilities available under GSP more effectively.

Government provides a generous incentive package (liberalisation of imports of raw material and machinery, establishment of free trade zones *etc.*) for sustained development of the textiles and garments industry. However, such incentives are no longer a sustainable source of competitiveness. Given the budgetary constraints, Sri Lanka cannot spend continuously to provide these incentives. Any available resources must be diverted to improve infrastructure facilities such as transportation, power and energy, telecommunications and waste disposal system *etc.* Sri Lanka would have to attract fabric mills, accessory manufacturers, marketing and training institutions, designing centres *etc.* Incentives and encouragement should be diverted to foster areas such as fabric design capabilities and information technology to build up a full service industry. The government has taken steps to improve efficiency in customs procedures (introduction of ASYCUDA++) and successfully implemented the Electronic Visa Transformation System to reduce the malpractices and inefficiencies in quota utilisation. The industry initiated the use of electronic media in the textiles and garments industry. Internet has proven to be a viable alternative to traditional distribution channels in developed countries. Accordingly firms can explore the opportunities that internet offers to build up relationships with customers and suppliers through these channels. Government can take initiatives to canvass in major exporting centres to obtain concessions some of which are already enjoyed by our competitors. Such canvassing must be supported with world class negotiators on behalf of the country.

Furthermore, cultivation of more innovative ideologies among public institutions, minimisation of political intervention in labour issues, transparency in economic policies, maintenance of consistency in macro economic framework, better co-ordination among public sector institutions and development of a continuous dialogue between the government and the private sector would be the responsibilities of the government to ensure an environment conducive to the growth of the industry to grow in a more competitive market in the future.

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The Measurement of Tax Elasticity in Sri Lanka : A Time Series Approach¹

Yuthika Indraratna

Since the primary function of a tax system is to generate revenue, the first goal of tax reform must be to ensure that this function is discharged adequately.

World Bank (1991)

Abstract

Revenue mobilisation is an important goal of tax reform. In this regard, tax elasticity - the built-in responsiveness of revenues to changes in income - constitutes an essential ingredient for tax policy formulation. This paper utilises a time series approach to empirically estimate tax elasticities for Sri Lanka for the period 1960-1994. Tax elasticities are computed for income, turnover, excise, import and total taxes on a short run and long run basis for the pre-reform as well as the post-reform periods. All elasticity coefficients reveal a low responsiveness of taxes to income growth with estimates registering less than unity in most cases. The tax buoyancies computed for the same taxes show that tax revenues have been maintained through discretionary measures. (JEL H21, H22)

1. Introduction

A primary motivation for tax reforms in developing countries has been the need for increased revenues. The need to raise more revenue against the backdrop of high expenditures has taken added importance when compared to other sources of resource mobilisation such as deficit financing and money creation. Tax systems have been revamped and restructured with the objective of maximising tax revenues from the reform process. In this regard, tax elasticity - the responsiveness of tax revenues to income at a given rate structure

1/ This paper forms part of a thesis submitted by Y. Indraratna for the Ph.D. degree at the University of London. I would like to take this opportunity to thank Prof. Richard Disney for his guidance and supervision of this paper and Dr. N. Weerasinghe for valuable suggestions.

- constitutes an important ingredient of a tax system. An elastic tax system is one in which tax revenues rise proportionately faster than income as income increases. Such a tax system becomes desirable for developing countries in order to provide resources for government expenditures, both for consumption purposes and for financing capital formation. Apart from the need to mobilise resources for revenue purposes, a study of tax elasticity is also important for revenue forecasting purposes, analysing the automatic stabilising properties of a tax system and for examining the progressivity of a tax system. Therefore, an examination of tax elasticity is crucial for tax policy formulation.

This paper measures the elasticity of Sri Lanka's tax system for the period 1960 - 1994 in an attempt to provide some insight as to the revenue responsiveness of Sri Lanka's tax structure. Although a number of methodologies may be employed to determine the elasticity of a tax structure, the data requirements of these techniques necessarily limit their usage in most instances.² This paper attempts to empirically examine tax elasticity in Sri Lanka by resorting to the traditional time series regression approach albeit with improved methodology. The rest of the paper is organised as follows. Section 2 introduces the concept of tax elasticity and provides a definition of tax responsiveness. Section 3 discusses in brief the theoretical framework for the empirical measurement of revenue responsiveness. Section 4 outlines the methodology involved in the empirical estimation of elasticities while providing details of the estimation procedure itself. This section also provides a data description for the time series analysis. Section 5 gives the results of the elasticity estimation. A conclusion follows.

2. Tax Elasticity

In the public finance literature, tax elasticity is defined in a number of ways. Elasticity can be generally defined as the change in tax revenue directly arising from a unit change in income. More specifically, elasticity is defined as the ratio of the proportionate change in tax to the proportionate change in income as follows:

$$\begin{aligned} E &= T/T / Y/Y \\ &= T / Y / T/Y \end{aligned} \quad (1)$$

where E = elasticity
 T = tax payments
 Y = income

2/ Johnson and Lambert (1989) point to four methods of measuring empirically income tax revenue responsiveness to growth in incomes; the regression approach, the exact calculation method, the linear pareto model and the simulation method.

In a simple tax function where $T = T(Y)$, equation (1) can also give rise to a definition of elasticity as the ratio of the Marginal Tax Rate (MTR) to the Average Tax Rate (ATR).

$$E = MTR / ATR \tag{2}$$

where

$$\begin{aligned} MTR &= T / Y \\ &= dt / dy \\ &= T'(Y) \end{aligned} \tag{3}$$

and

$$ATR = T / Y \tag{4}$$

ATR as defined above is total tax payments as a proportion of income. MTR can be said to represent the “tax take from a given unit (£1) increase in income” (Johnson and Lambert, 1989).³ In other words, it is the rate of tax applied on an incremental unit of income.

2.1 Aggregating Tax Elasticities

A widely used measure of tax elasticity is the definition of tax elasticity as the weighted average of the sum of the elasticities of separate taxes that often have widely divergent responses to changes in income (Mansfield, 1972). Overall tax elasticity therefore is determined through a weighted sum of elasticities of individual taxes as follows:

$$E_{TY} = \frac{T_1}{T_t} \frac{T_1 Y}{Y T_1} + \dots \frac{T_k}{T_t} \frac{T_k Y}{Y T_k} + \dots \frac{T_n}{T_t} \frac{T_n Y}{Y T_n} \tag{5}$$

where

E_{TY} = elasticity of total tax revenue to income

T_t = total tax revenue

T_k, T_n = tax revenue from k^{th} and n^{th} taxes in a system of n taxes

Y = income

³/ MTR in this paper corresponds to the Effective Marginal Rate (EMR) measure used by Johnson and Lambert (1989) and Lambert (1993).

The above definition of tax elasticity is based on the definition of the elasticity of individual taxes which can be separated into two components - tax to base elasticity and base to income elasticity as follows:

$$E_{tky} = \frac{T_k}{B_k} \frac{B_k}{T_k} \frac{B_k}{Y} \frac{Y}{B_k} \quad (6)$$

where

B_k = tax base of the k^{th} tax

and the bracketed expression on the left hand side of equation (6) constitutes the tax to base elasticity of the k^{th} tax and the bracketed expression on the right hand side represents the base to income elasticity of the k^{th} tax. From equation (6) the elasticity of total revenue to income can be shown to depend on the product of the tax to base and base to income elasticities of individual taxes weighted by the importance of the individual taxes in the tax structure as follows:

$$E_{Ty} = \frac{T_1}{T} \frac{T_1}{B_1} \frac{B_1}{T_1} \frac{B_1}{Y_1} \frac{Y_1}{B_1} + \dots \frac{T_n}{T} \frac{T_n}{B_n} \frac{B_n}{T_n} \frac{B_n}{Y} \frac{Y}{B_n} \quad (7)$$

An advantage of using such a definition is the ability to identify factors responsible for rapid or lagged revenue growth. Factors that affect tax to base elasticity such as tax rates, exemptions and improvements in tax administration are within the control of the fiscal authorities thereby making this measure important for policy purposes. Base to income elasticity on the other hand is determined largely by the way in which the economic structure responds to growth.

It may be appropriate at this juncture to highlight the distinction between two measures of revenue responsiveness, the concepts of elasticity and buoyancy. Tax elasticity measures the built-in response of revenues to changes in income, while tax buoyancy quantifies the total change in revenue due to changes in income. Tax elasticity in other words, measures the responsiveness of tax revenue excluding the effect of discretionary changes taken by authorities to maintain short term revenue objectives. Elasticity compares the growth in tax revenue with that of GDP on the assumption that a particular tax structure prevails throughout the period under study. In other words, tax elasticity captures the responsiveness of tax revenue to changes in income assuming an

unchanged tax structure while buoyancy measures the responsiveness of revenue to a changed tax system. An elasticity coefficient of one would indicate a similar growth for both revenue and GDP while a coefficient less than one would show lagged revenue growth compared to GDP growth. An elasticity of more than one would indicate revenue growth exceeding GDP growth. Likewise, a buoyancy of one would indicate a revenue growth in line with GDP growth. A buoyancy of less than one would be indicative of a growth in revenue which is less than proportionate to GDP growth while a buoyancy of more than one would show a more than proportionate growth in revenue.

Tax elasticity and buoyancy constitute only two measures encountered in the public finance literature to quantify tax revenue responsiveness to growth in incomes. The other widely used measures are the Average Rate Responsiveness (ARR) measure, the Gross Earnings Deflator (GED) and the Marginal Rate Responsiveness (MRR) measure [(Johnson and Lambert, 1989) (Lambert, 1993)].

3. Measuring Revenue Responsiveness Empirically

Johnson and Lambert (1989) point to four methods of measuring empirically income tax revenue responsiveness to growth in income. These comprise the Regression approach [(Prest 1962), (Tanzi 1969,1976), (Jayasundara 1989), (Ram 1991)], the Exact Calculation method [(Hutton and Lambert 1980), (Fries, Hutton and Lambert 1982)], the Linear Pareto model (Hutton and Lambert 1982a), and the Simulation method [(Dorrington 1974), (Hutton and Lambert 1982b), (Caminada and Goudswaard 1996)]. However, other methodologies have also been utilised to measure elasticity. Among contributors to other approaches have been Choudhry (1979) where a divisia index approach based on a productivity concept has been used, and Creedy and Gemmel (1982) who have utilised a tax model to examine the elasticity of the UK income tax. Empirically, the regression approach has been the most extensively adopted methodology to examine tax elasticities. As this paper also utilises a time series regression analysis to estimate elasticities, discussion will now focus upon the regression methodology.

3.1 Regression Methodology

A typical log linear specification of an equation of this form is:

$$\ln T_i = a + b \ln X_i + e_i \quad (8)$$

where T_i = tax revenue from i^{th} observation
 X_i = tax base of i^{th} observation

Elasticity in this case is measured by the coefficient b . The regression method is based on the functional form

$$T = Ax^b \tag{9}$$

where it is assumed that when incomes change by a certain factor k , tax liabilities also change by k^b which leads to an increase in tax revenues. The assumption of constant proportionality between t and x^b in this method does not take into account a change in the distribution of income in time series analyses, although additional regressors might be added to capture these and other effects.

A tax system may change due to discretionary measures such as rate revisions, expansion in the coverage of various taxes or the imposition of new taxes. Therefore, the estimation of tax elasticity requires an adjustment to the actual revenue series so as to separate the growth in revenue arising from discretionary changes from that due to automatic changes. This adjustment to tax revenue is made in order to distinguish tax elasticity from tax buoyancy.

There are three major ways of adjusting a revenue series; the constant rate method, the proportional adjustment method and the dummy variable method. The choice of adjustment method employed depends on factors such as the availability of data on tax changes and the type and frequency of such changes. The proportional adjustment method requires calculation of the revenue implications of discretionary measures. Similarly, the constant rate structure method requires disaggregated data on tax rates and tax bases. The dummy variable method on the other hand can not be used when there are frequent discretionary changes. Attention will now focus on a brief discussion of the proportional adjustment method as this methodology is used to adjust revenues in this paper.

3.2 Proportional Adjustment Method

The proportional adjustment method adjusts a historical revenue series according to a particular years tax structure on the assumption that this particular tax structure is maintained throughout the period under consideration. Thus, this method basically involves two steps. Firstly, observed revenue data for each year are adjusted for discretionary changes by removing from such data the estimated revenue impact of discretionary changes. This gives an estimate of the automatic growth in revenue between two successive years. Secondly, the series are converted to the first year's basis by adjusting the year to year changes by the ratio of the tax yield on the basis of the first year rates to the actual tax yield (Chelliah and Chand, 1974). Thus, the proportional adjustment method can be used to construct a hypothetical revenue

series in two ways - a series of accumulated ratios going forward from a reference year or a series of decumulated ratios going backward from a base year. Numerically, the accumulated series can be derived as follows:

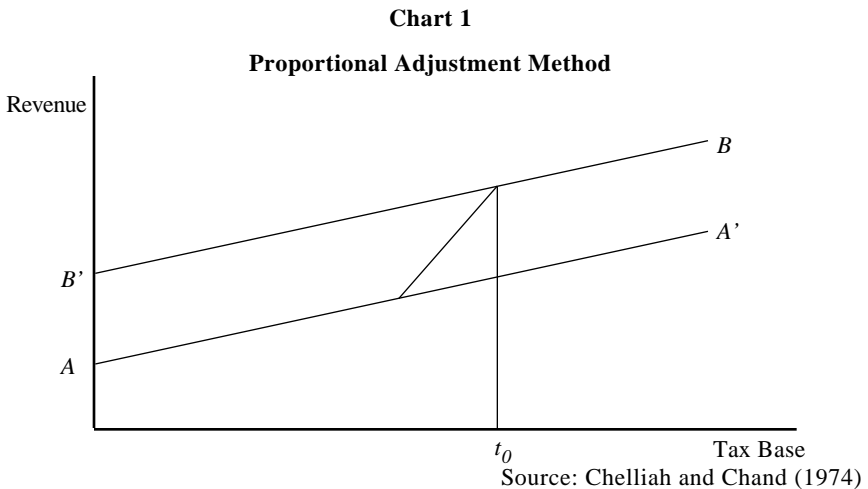
$$T_{1,j} = T_{1,j-1} + \frac{(T_j - D_j - T_{j-1})}{T_{j-1}} \cdot T_{1,j-1} \quad (10)$$

where T_j = actual revenue in j^{th} year
 D_j = revenue impact of discretionary changes
 $T_{1,j}$ = revenue in j^{th} year adjusted to structure of i^{th} year which is base year

In the above case, the reference year for the series constitutes the first year of the series. Similarly, a decumulated adjusted revenue series can also be computed with the last year of the data series constituting the reference year. The general formula used in the construction of such a revenue series can be shown as follows:

$$T_{n,j} = T_j \frac{T_{j+1}}{T_{j,j+1}} \frac{T_{j+2}}{T_{j+1,j+2}} \dots \frac{T_n}{T_{n-1,n}} \quad (11)$$

Graphically, the two series can be illustrated as in chart 1. The line AB represents the actual unadjusted revenue series with a revenue raising



discretionary action taking place at $t = t_0$. An adjusted revenue series using the first year tax structure as the base year is shown by line AA' . Line AA' adjusts the observed revenue series by subtracting from all observations the revenue impact of the discretionary change subsequent to the discretionary action at time period t_0 . Similarly, line BB' shows an adjusted revenue series with the last year taken as the base year where the revenue impact of the discretionary change has been added to revenue observations occurring prior to the changed tax structure.

An important assumption of the proportional adjustment method is that the revenue impact of the discretionary measure grows in proportion to total revenue. This implies that the proportional adjustment method does not alter the elasticity of the tax system although the tax yield may change due to such actions. In effect, what is derived from the elasticity estimate is an average elasticity of all the tax structures under consideration.

4. Empirical Analysis

4.1 Data

The paper adopts the Government Finance Statistics (GFS) classification used by the IMF to categorise tax revenue. In line with this classification, tax revenues are classified in accordance with the bases upon which they are levied or the activities due to which the tax liability arises.⁴ Taxes for which several tax bases apply are categorised into the most prominent tax base while fines and interest charges paid for late payment of various taxes are covered under the specific taxes concerned. Since the tax base or the activity concept is defined by law, this classification facilitates economic analysis as taxes constitute an additional cost in supply and demand relationships (GFS, 1986).

The adoption of a tax base categorisation for government revenue necessitated the compilation of a new tax revenue table for Sri Lanka for the period 1950-1996.⁵ Taxes were categorised into the following bases; income and profit, domestic goods and services, international trade, property and a

4/ For example, income taxes are categorised as taxes on income, profit and capital gains as the tax base of income taxes constitute income, profit and capital gains. Import and export taxes are classified as taxes on international trade and transactions as these taxes arise from the importation and exportation of goods.

5/ Prior to 1965 the economic classification of Sri Lanka's revenue was based on the SNA system of the United Nations which categorised tax revenue into current and capital receipts. Before 1955 tax revenue was compartmentalised into direct and indirect taxes wherein the distinction between these two sources was based on the relationship between the government and the taxpayer and not on the shiftability of the tax.

miscellaneous tax base. Taxes on income and profit constitute those levied on the actual or presumptive income of individuals and profits of businesses.⁶ Taxes on domestic goods and services include all taxes levied on the production, sale and transfer of goods while incorporating taxes on specific services as well as those imposed on the usage of goods. Thus, turnover and excise taxes constitute major categories under this heading while other important such taxes include license taxes and revenue obtained from government monopolies.⁷ Import and export duties comprise the major taxes levied on international trade and transactions.⁸ FEECs revenue is also classified under this category as they represent a transfer to the government of exchange profits resulting from the maintenance of a dual exchange rate. Foreign exchange taxes which were imposed during the pre-1977 period on foreign exchange obtained for travel purposes are also included in this category as they constitute a levy on the payment of invisible imports and exports. Property taxation is defined in accordance to the use, ownership, and the transfer of wealth of movable and immovable property. The main components under property taxation comprise estate duties, wealth taxes, gift taxes and taxes on financial and capital transactions. The tax revenue database compiled in line with the GFS classification for the period 1950-1996 for Sri Lanka is given in Appendix 1.

As legal bases were not available for all tax categories, proxy bases were used for estimating tax revenue elasticities. The proxy bases used for the empirical estimation constituted variables from the national accounts and the balance of payments as the tax categories chosen for the estimation can be associated with bases that cover large parts of economic activity in the country.

Proxy Tax Bases	
<u>Tax Revenue</u>	<u>Proxy Base</u>
Income Tax	GDP at factor cost current prices
Turnover Tax	Private consumption at market prices
Excise Tax	Private consumption
Import Duties	Imports of goods and services
Total Taxes	GDP at current market prices

6/ Revenue from taxes on capital gains are also enlisted under this tax base.

7/ The profits of fiscal monopolies constituted an important revenue source during the pre-1977 period as they represented the exercise of monopoly powers of the government for tax purposes.

8/ Taxes on international trade cover levies on goods shipped in or out of the country.

GDP at factor cost constituted the proxy base for income taxes as the growth of personal and corporate income is reflected in the Gross Domestic Product. Private consumption expenditure is used as a proxy base for turnover taxes as consumption expenditure reflects such taxes which are borne by consumers.⁹ Private consumption is also used for the estimation of excise tax elasticities as excise taxation constitutes a consumption based tax. Import duty elasticities are estimated on a proxy base consisting of imports of goods and services in value terms as import duties are levied on this tax base. Gross Domestic Product at current market prices constitutes the proxy base for total tax revenue.

As the computation of tax elasticities necessitates an adjustment to the observed revenue series, the proportional adjustment method was employed in this paper to adjust the actual revenue series. As mentioned before, the proportional adjustment method adjusts the tax yields in years prior to the reference year to give an indication of the revenue collections that would have been had the reference years tax system been in force throughout the period under study. This method was adopted as the data requirements for this methodology are minimal in that apart from actual revenue collections, what is required is a quantitative impact of discretionary measures. Data on discretionary changes were obtained from budget speeches while actual and estimated revenue data were obtained from the Government Estimates of Revenue and Expenditure and the Central Bank Annual Reports.¹⁰ Appendix table 2 gives the revenue impact of the discretionary tax changes.¹¹

The methodology of constructing an adjusted revenue series can be demonstrated as follows: For a series of actual revenue collections,

$$T_1, T_2, \dots, T_n$$

and a series of discretionary measures

$$D_1, D_2, \dots, D_n$$

the adjusted revenue for a particular year can be obtained from the equation:

9/ The forward shifting of taxes by firms to consumers is assumed here.

10/ Although budget presentations are not the only occasion when changes to the revenue structure are made, nevertheless they give a fair indication of important changes made to the tax system.

11/ When a tax measure is announced, it is usually quantified in order to examine the impact on revenue. Appendix table 2 gives ex-ante estimates of tax measures. The paper corrects ex-ante budget estimates by applying ratios of actual to estimated overall yield for each tax.

$$AT_{n-1} = T_{n-1} (T_n / T_n - D_n)$$

where AT = adjusted tax revenue
 T = actual tax revenue
 D = revenue effect of discretionary measure

However, for the reference year,

$$AT_n = T_n$$

For each year where a discretionary action takes place, a “discretionary factor”, $(T_n / T_n - D_n)$, is calculated excluding the revenue amount resulting from the legal action for that particular year. Discretionary factors are calculated for all years in which such changes occur. The adjusted revenue series is obtained by multiplying the previous year’s revenues by these discretionary factors. The adjusted revenue series gives an approximation of the revenue which could have been obtained had these measures been in force during the previous years. The adjusted tax revenue series is shown in Appendix 3.

A problem encountered with the use of budgetary estimates of discretionary measures is that the actual revenue effect of the discretionary change may differ from the ex-ante budget estimate. One possible method of overcoming this problem is to correct ex-ante budget estimates by applying ratios of actual to estimated overall yield of each tax (IMF, 1993). An assumption underlying this approach is that the percentage error in estimating the revenue effect of a discretionary change would be about the same as that arising from forecasting the overall yield of the same tax (IMF, 1993). Therefore, in order to adjust for the error in forecasting discretionary changes in Sri Lanka, revenue from this measure was adjusted by the ratio of actual to estimated revenue. Appendix table 4 gives the ratios of actual to estimated revenues.

4.2 Methodology

The paper utilises a time series regression approach to estimate elasticities for income, turnover, excise and import taxes and total tax revenue. In order to compare the impact of discretionary changes, tax buoyancies are also estimated for the same taxes.

The estimation of tax elasticity through regression analysis is based on the partitioning approach whereby tax elasticity is subdivided into tax to base and base to income elasticity. The functional form of the equation for computing tax to base elasticity is in log linear specification as follows:¹²

^{12/} The logarithm form is chosen as this gives directly an estimate of elasticity.

$$\ln T = a + b \ln X$$

where T = adjusted tax revenue
 X = tax base

Similarly, the regression used to estimate base to income elasticity is as follows:

$$\ln B = a + c \ln Y$$

where B = tax base
 Y = GDP at market prices

The coefficients b and c in the above two equations give an estimate of the respective elasticities. The product of tax to base and base to income elasticities ($b * c$) gives an estimate of overall elasticity in this instance. A list of variables used in the elasticity estimation is given below.

Variable List

LAIT	= Log adjusted income taxes
LATT	= Log adjusted turnover taxes
LAEXCT	= Log adjusted excise taxes
LAEXPT	= Log adjusted export taxes
LAIMPT	= Log adjusted import taxes
LATTR	= Log adjusted total tax revenue
LPC	= Log private consumption
LIMP	= Log imports (value)
LGDPF	= Log gross domestic product at factor prices
LGDPM	= Log gross domestic product at market prices
DP	= Dummy variable for import duty estimation
IMPD4	= Dummy variable for total tax revenue estimation
LITD	= Dummy variable for income tax estimation
LAITD	= Dummy variable for income tax estimation
LATTD1	= Dummy variable for turnover tax estimation
LATTD2	= Dummy variable for turnover tax estimation
LATTD	= Dummy variable for turnover tax estimation
LAEXCTD1	= Dummy variable for excise tax estimation
SLGDPD	= Dummy variable for total tax revenue
Y	= Fitted values of LGDPM

The first step in seeking a methodology for modelling any economic relationship is to ascertain the stationarity of the variables under scrutiny.¹³

13/ Stationarity is an important concept in econometrics since the standard regression model makes assumptions regarding the stationarity of the error term and the variables. A stationary (weakly) time series has a constant mean and variance for all t .

Therefore, a crucial preliminary task in the estimation procedure is to check for the stationarity of variables by testing for their order of integration.¹⁴ The data were tested for the order of integration through an Augmented Dickey Fuller (ADF) test and checked for the presence of unit roots.¹⁵

The results of the ADF test are shown in Table 1. The ADF test shows the variables as being $I(1)$ with one unit root although a significant ADF- t statistic is obtained for the first difference of LGDPF only at the 5 per cent level.

Table 1
ADF Test Results

Variable	$I(0)$	$I(1)$
LAIT	-2.08	-7.22
LATT	-39.82	-
LAEXCT	-19.97	-
LAIMPT	-0.80	-6.22
LATTR	-1.04	-6.09
LPC	-2.29	-3.94
LIMP	-2.01	-4.70
LGDPF	-2.56	-4.15
LGDPM	-2.77	-4.47
LGDE	-2.38	-4.04
LIT	-1.93	-7.27
LTT	-9.22	-
LEXCT	-2.71	-5.91
LIMPT	-1.64	-4.62
LTTR	-1.70	-6.02

Source: Author's Estimates.

Note: $I(0)$ and $I(1)$ refer to the level and the first difference of the variable respectively. The figures shown are t ratios for which a suggested significance value in the ADF test is usually -3.0 or below (Dickey and Fuller, 1979, 1981). A constant and time trend were used in all the unit root estimations.

14/ A variable x_t is said to be integrated to the order d , $x_t \sim I(d)$, if it must be differenced at least d times to reach stationarity.

15/ The presence of unit roots has far reaching implications for economic analysis. Under the unit root hypothesis, random shocks have a permanent effect making the system nonstationary. The ADF test can be used to test for unit roots through the following equation:

$$y_t = \alpha y_{t-1} + \epsilon_t \text{ where } \alpha = \rho - 1$$

Testing for unit roots entails testing whether $\alpha = 1$ or $\alpha < 1$. If these conditions are fulfilled, the y_t series is said to have unit roots. However, the usual caveat regarding the low power of ADF tests in distinguishing between unit roots and near unit roots in small samples applies here. See Dickey and Fuller (1981).

In performing unit root tests, however, care must be taken if structural breaks are suspected in the data series. The Augmented Dickey Fuller test is biased towards *non-rejection* of unit roots when structural breaks are incorporated in the data. In such cases, a Perron test can be performed to check for unit roots in the presence of a structural change.¹⁶

As the ADF test for Sri Lankan data displayed unit roots and the existence of structural breaks in a data series biases the ADF statistic towards *non-rejection* of unit roots, a Perron test was also carried out for the data series displaying unit roots.¹⁷ As the Perron test plays a pivotal role in this econometric analysis, it may be useful at this juncture, to engage in a short discussion of this methodology.

The Perron test constitutes a unit root test for a time series affected by a structural change in its mean. The basic premise underlying this methodology is that shocks that affect an economy may be considered as “outlier events” imposing only a transitory as opposed to a permanent effect on the system.¹⁸ The change is considered as an outlier as it appears very big in relation to other changes observed in the time series. Perron removes the sudden change from the noise function and introduces it in the deterministic part of the series. The noise function is then analysed without the particular “extraordinary event”. An assumption underlying this methodology is that shocks are exogenous and are not the result of the data generating process. The statistical methodology applied in this test is an extension of the Dickey Fuller test.

In statistical terms, the Perron methodology can be described as follows. For a time series characterised with a one time change in the structure occurring at time period T_B ($I < T_B < T$), the null hypothesis can be given as:

$$y_t = \mu_t + y_{t-1} + dD(TB)_t + (\mu_2 - \mu_1) DU_t + e_t$$

16/ Another econometric procedure which can be performed when testing for unit roots in the presence of structural breaks involves splitting the sample and carrying out a Dickey Fuller test on each *sub-sample* (Enders, 1995). However, in this case, the degrees of freedom for each regression become less. The Perron methodology constitutes a better test as it utilises the full sample.

17/ Perron (1989) challenges Nelson Plosser by showing that most variables do not have unit root processes but are trend stationary processes having structural breaks. Therefore, Perron’s test involves testing for unit roots in the presence of structural change either at a known or unknown breakpoint in time. From a series of Monte Carlo experiments, Perron finds that the *non-rejection* of the unit root hypothesis becomes more probable as the magnitude of the change in the mean increases. See also Perron, 1990, 1992.

18/ Nelson and Plosser (1982) argue that most macroeconomic time series are characterised by stochastic shocks which are nonstationary. The total variability of a time series over time is therefore explained in terms of greater variability on the part of permanent shocks than transitory shocks.

where $D(TB) = 1$ if $t = T_B + 1$ and 0 otherwise

$$DU_t = 1 \text{ if } t > T_B \text{ and } 0 \text{ otherwise}$$

The above model allows for a change in the intercept of the trend function as well as a change in the slope of the trend function. The alternative hypothesis in this case can be shown as follows:

$$y_t = \mu_1 + \beta_1 t + (\mu_2 - \mu_1) DU_t + (\beta_2 - \beta_1) DT_t + e_t$$

where $DT_t = t$ if $t > T_B$ and 0 otherwise

The Dickey Fuller (*DF*) procedure is used to test for unit roots in the presence of structural break. When errors are uncorrelated, the *DF* test used is

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

When the innovation sequence is correlated, the above approach is modified by the addition of extra lags of the first differences of the data as regressors as follows:¹⁹

$$y_t = y_{t-1} + c y_{t-j} + e_t$$

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

In the above equation, $\sum c_i$, the sum of the autoregressive coefficients, is the OLS estimator and the test for the existence of unit roots comprises $\sum c_i = 1$. The above approach implies an instantaneous change in the trend function. However, there may be times when the economy reacts gradually to a change in the trend function. One way of incorporating such a change is to suppose that the economy responds to a shock to the trend function in the same way as it reacts to any other shock.²⁰ Perron then extends the *DF* framework by adding dummy variables and constructing a model by nesting null and alternative hypotheses as follows:

$$y_t = \mu + DU_t + t + DT_t + dD(TB)_t + y_{t-1} + \sum_{i=1}^k c_i y_{t-i} + e_t$$

A visual inspection of the data for Sri Lanka for the period 1950-1994 reveals a sudden shift in the mean of the series around 1977. Appendix 5

19/ This approach follows that of Dickey and Fuller (1979) and Said and Dickey (1984).

20/ This methodology is consistent with the “innovational outlier” specification in literature on outlier models.

gives a time plot of the variables used for the elasticity estimation. Borrowing upon terminology from Perron, this sudden change can be viewed as “extraordinary” against the background of the general historical pattern observed in the series. The reforms initiated with the economic liberalisation in 1977 can be held responsible for this sudden change. Therefore the year 1977 was chosen to represent the break point for the structural break since far reaching economic reforms were undertaken during this year. The Perron test was performed for each variable with unit roots by estimating the following equation:

$$y_t = a_0 + \mu_1 D_L + \mu_2 D_P + \beta_2 t + \beta_1 y_{t-1} + \sum_{i=1}^k y_{t-i}$$

where, D_L = level dummy and $D_L = 1$ if $t >$ and $D_L = 0$ otherwise
 D_P = pulse dummy and $D_P = 1$ if $t = +1$ and zero otherwise
 $\beta_1 = /T$ (proportion of observations prior to break)
 β_2 = breakpoint = 1977
 t = trend

The null hypothesis is that of a unit root process with a one time change in the mean of a unit root process with $\beta_1 = 1$, $\beta_2 = 0$ and $\mu_2 = 0$. The alternative hypothesis predicts a trend stationary model with a permanent one time break with $\beta_1 < 1$ and $\mu_1 = 0$. The results of the Perron test are given in Table 2.

Results from the Perron test do not indicate support for the unit root hypothesis. The estimated values of β_1 for all variables are significantly different from unity at the 5 percent level as shown by the computed t values which are greater than the critical values calculated by Perron. In fact, most variables seem to have a deterministic trend with β_2 coefficients displaying significant t ratios. The level dummy as measured by μ_1 seems to be insignificant for all variables. The pulse dummy as measured by μ_2 on the other hand seems to be significant for the variables LAIMPT, LGDPF, LGDE, LIMP, LEXCT, LTTR and LIMPT. Thus, the Perron test seems to reject the null hypothesis of unit roots. The tax variables are stationary and justify the use of level variables in regression analysis.

In the light of the above results, a general to specific modelling strategy in log levels was adopted which seemed to give satisfactory results.²¹ In order

21/ The general model consisted of an Autoregressive Distributed Lag (ADL) model where the dependent variable is expressed as a function of its own values and current and lagged values of explanatory variables. Considering the small sample nature of the data series, lag lengths of up to three were generally incorporated. The specific model formulation was arrived at by gradually reducing the general model by testing for linear restrictions through Wald tests. See Gilbert (1986), Charemza (1992) and Hendry (1995) for more information on general to specific modelling.

Table 2
Perron Test Results

Variable	T	K		μ_1	μ_2	1	2
LAIT	42	2	0.6	0.11 (0.65)	-0.14 (-0.62)	0.84 (8.6)	0.01 (1.78)
LAIMPT	42	2	0.6	0.18 (1.59)	-1.02 (-5.6)	0.09 (16.14)	-0.001 (-0.18)
LATTR	34	10	0.5	-0.01 (-0.22)	0.02 (0.27)	0.76 (10.35)	0.02 (4.03)
LGDPF	40	5	0.6	-0.002 (-0.33)	0.15 (2.84)	0.87 (12.17)	0.02 (3.11)
LGDPM	40	5	0.6	-0.01 (-1.03)	0.06 (1.26)	0.93 (13.96)	0.01 (2.35)
LGDE	40	5	0.6	0.01 (0.75)	0.14 (2.89)	0.82 (12.11)	0.02 (3.31)
LIMP	43	4	0.6	0.01 (0.49)	0.22 (2.13)	0.82 (9.97)	0.02 (2.85)
LEXCT	38	2	0.7	0.08 (1.22)	0.22 (2.02)	0.58 (5.84)	0.07 (3.75)
LTTR	41	3	0.6	0.06 (0.81)	0.45 (4.71)	0.94 (19.44)	0.01 (1.92)
LIT	41	3	0.6	0.14 (1.02)	-0.1 (-0.15)	0.84 (9.29)	0.02 (2.21)
LIMPT	43	1	0.6	0.16 (1.2)	0.78 (4.09)	0.96 (23.04)	0.002 (0.56)

Source: Author's Estimates.

T = number of observations

k = lag length

* The figures in parentheses represent t ratios.

** Critical values for the Perron test consisting of a sample of 50 observations are as follows:

	<u>1 %</u>	<u>5%</u>
= 0.5	-4.09	-3.45
= 0.6	-4.11	-3.43

to compare the responsiveness of tax revenue during the *pre-reform* period and the *post-reform* period, elasticities were computed for three sample periods comprising the years 1960-1994, 1960-1977 and 1978-1994. The three sample periods of 1960-1977, 1978-1994 and 1960-1994 were chosen specifically to see the behaviour of the estimated coefficients during vastly different time periods in Sri Lanka's history. While the period 1960-1977 constituted an inward looking state controlled economic regime, the time period 1978-1994 represents an outward oriented market based economic regime. The sample period 1960-1994 incorporates both these economic regimes. The elasticity estimates presented in tables 8 and 9 were obtained from the product of tax to base and base to income elasticities.

4.2.1 Tax to Base Elasticities

The tax to base regressions for income taxes shown in Table 3 reflect the significance of GDP as well as income taxes lagged one period in the determination of income tax revenue. The explanatory power of the latter variable seems to be greater partly due to the fact that income taxes are very often subject to lags in collection. Moreover, as tax incentives in the form of tax holidays are a major component of the income tax system, the utilisation of these incentives would erode the tax base thereby lessening the tax to base

Table 3
Tax to Base Income Tax Regression Results*

LAIT	1960-1994	1960-1977	1978-1994
LAIT _{t-1}	0.72 (9.22)	0.54 (3.51)	0.71 (5.37)
LGDPF	0.22 (3.70)	0.35 (2.95)	0.22 (2.26)
LITD (1973=1)	–	0.33 (2.65)	–
LAITD (1989=1)	-0.61 (-3.99)	–	-0.59 (-3.50)
Test Statistics			
R ²	0.99	0.99	0.99
Durbin - h Statistic	-1.28	-1.30	-0.34
SEE	0.1513	0.1172	0.1635
RSS	0.7328	0.2060	0.3744

Source : Author's Estimates

* Figures below coefficients in parenthesis represent *t* ratios.

relationship between income taxes and GDP. The negative LAITD variable used in the income tax elasticity estimations reflects the sharp decline in income tax revenue collections on account of civil disturbances and slow economic growth in 1989. All test statistics for the three sub-periods seem to be significant. The Durbin-h statistic which tests for autocorrelation when lagged variables are present does not reject the null hypothesis of no autocorrelation for these regressions.

The tax to base regressions estimated for turnover taxes (Table 4) show the significance of the tax base private consumption in explaining turnover tax revenue. LPC is highly significant during all three sub-periods with the period 1978-1994 bearing a coefficient of 0.84 having the highest explanatory power in explaining turnover tax revenue. The LATTD1 dummy used in the turnover tax elasticity estimations for the period 1960-1977 reflects the introduction of the FEEC scheme in the form of a dual exchange rate system in May, 1968. As imports constitute a major component of private consumption,

Table 4
Tax to Base Turnover Tax Regression Results*

LATT	1960-1994	1960-1977	1978-1994
Constant	0.10 (0.62)	1.47 (4.99)	0.46 (-2.09)
LATT _{t-1}	0.10 (6.4)	0.12 (13.14)	–
LPC	0.71 (33.2)	0.55 (15.85)	0.84 (45.28)
LATTD1 (1969=1)	–	0.16 (2.68)	–
LATTD2 (1970=1)	–	-0.30 (-5.08)	–
LATTD (1981=1)	–	–	0.23 (3.83)
Test Statistics			
R ²	0.99	0.99	0.99
Durbin - d Statistic	–	–	1.98
Durbin - h Statistic	0.14	-0.84	–
SEE	0.09911	0.0554	0.0560
RSS	0.2652	0.0276	0.0439

Source : Author's Estimates

* Figures below coefficients in parenthesis represent *t* ratios.

the introduction of this scheme would have had a major impact on private consumption and therefore on turnover tax revenue collections. The positive LATTD dummy variable in the turnover tax estimations for the 1978-1994 period reflects the imposition of turnover taxes on imports in 1981 which shows a revenue augmentation impact for turnover taxes as a result of a base broadening effect. Test statistics for the turnover tax regression are also significant.

The short run elasticities for excise taxes generally point to low estimates (Table 5).

Table 5
Tax to Base Excise Tax Regression Results*

LAEXCT	1960-1994	1960-1977	1978-1994
Constant	1.07 (3.58)	-0.69 (-1.24)	6.70 (12.99)
LAEXCT _{t-1}	0.70 (7.11)	—	—
LPC	1.34 (3.18)	0.90 (14.77)	1.48 (2.59)
LPC _{t-1}	-1.22 (-3.03)	-	-1.29 (-2.33)
LAEXCTD1 (1988=1)	—	—	-0.30 (-2.75)
Test Statistics			
R ²	0.98	0.93	0.71
Durbin - d Statistic	—	1.43	1.60
Durbin - h Statistic	-0.40	—	—
SEE	0.1450	0.1506	0.1060
RSS	0.6309	0.3854	0.1461

Source : Author's Estimates

* Figures below coefficients in parenthesis represent *t* ratios.

During the period 1960-1994 the short run elasticity estimates amount to 0.12 while during the *post-liberalisation* period this estimate improves to 0.19. The specific nature of the excise taxation can largely explain the low elasticities found in this revenue source. The short run elasticity estimate for excise tax revenue during the 1960-1977 period is relatively high at 0.90 due to the improved effort put into tax administration during this period. All test statistics are significant for all estimations.

Import tax revenue (Table 6) reflect very low tax to base elasticities during the 1960-1994 period and 1960-1977 sub-period. An important factor that seems to be affecting the results of the estimation for import taxes seems to be the imposition of import restrictions in the form of quotas during the 1970-1977 period. As the period 1970-1977 was characterised by quantitative restrictions, this would have exerted a downward bias on the estimates. The insignificant t statistic observed for the tax base variable LIMP for the elasticity estimation of 1960-1977 provides further evidence of the importance of import substitution policies during this period. On the other hand, import duties, lagged one period, turns out to be an insignificant explanatory variable for the elasticity estimation during the *post-liberalisation* period. This can be due to the fact that import duties are usually collected promptly, without a lag, as goods can not be released before payment of duty.

Table 6
Tax to Base Import Tax Regression Results*

LAIMPT	1960-1994	1960-1977	1978-1994
LAIMPT _{t-1}	0.94 (45.31)	0.93 (21.79)	0.23 (1.42)
LIMP	0.06 (3.29)	0.07 (1.45)	0.63 (4.70)
DP (1978=1)	-0.88 (5.08)	—	—
Test Statistics			
R ²	0.99	0.99	0.99
Durbin - h Statistic	1.17	1.54	1.83
SEE	0.1709	0.1931	0.1796
RSS	0.9347	0.5966	0.4839

Source : Author's Estimates

* Figures below coefficients in parenthesis represent t ratios.

However, the generally low import elasticity estimates obtained during the *post-liberalisation* period can be attributed to the plethora of duty waivers and exemptions available during this period. The DP dummy used in the import duty elasticity calculations in 1978 reflects the adoption of liberalised policies in November, 1977.

Tax to base elasticities for total taxes (Table 7) also reflect very low elasticity estimates. An important factor that seems to be affecting the results of the estimation for total tax revenue seems to be the imposition of import

restrictions in the form of quotas during the 1970-1977 period. Moreover, the low elasticities observed in excise taxes would also have contributed to the low estimate for total taxes. A noteworthy feature is the high R^2 observed for all the regressions. This is as expected as many aggregate economic models assume that tax revenues are functionally related to GDP (Mansfield, 1972). This bears out such an assumption on purely statistical grounds as opposed to causative grounds.

Table 7
Tax to Base Total Tax Regression Results*

LATTR	1960-1994	1960-1977	1978-1994
Constant	0.95 (2.69)	—	—
LATTR _{t-1}	0.76 (10.81)	0.85 (22.45)	0.90 (17.42)
LGDPM	0.14 (4.07)	0.15 (3.89)	0.77 (3.09)
LGDPM _{t-1}	—	—	-0.69 (-2.96)
SLGDPD	0.02 (3.40)	—	0.23 (4.0)
Test Statistics			
R ²	0.99	0.99	0.99
Durbin-h Statistic	0.52	-0.98	-0.54
SEE	0.0682	0.0722	0.0515
RSS	0.1441	0.0834-	0.0345

Source : Author's Estimates

* Figures below coefficients in parenthesis represent t ratios.

4.2.2 Base to Income Elasticities

In estimating base to income elasticities, a problem encountered in the estimation procedure was the existence of simultaneity bias in the equations.²² The variables LPC, LGDPF, LIMP and LGDPM were thought to be endogenous

22/ The bias in the base to income elasticities arises from the simultaneous determination of the dependent and the exogenous variables. For example, in a simple consumption function of the form $C_t = \alpha + Y_t + \mu_t$, the variables Y_t and C_t are simultaneously dependent on each other as $Y_t = C_t + I_t + G_t + (X - M)$. OLS is not consistent in this case as the endogenous variables in the r.h.s. are correlated with the error term.

and hence a Two Stage Least Squares (2SLS) approach was adopted in estimating these equations. The structural form of the base to income elasticity equations for private consumption, to cite one example, was as follows:

$$LPC = \alpha_1 + \alpha_2 LGDPM + u$$

As LGDPM constituted the endogenous variable in all the base to income equations to be purged of its stochastic content, the first stage of the 2SLS procedure involved the estimation of the following regression to obtain fitted values of LGDPM:

$$LGDPM = 0.23 + 0.19LG + 0.82 LGDPM_{t-1}$$

(1.6) (3.1) (12.1)

R²=0.99, Durbin h statistic = 0.53 RSS= 0.14 SEE=0.05

Government expenditure (LG) and lagged LGDPM were two exogenous variables that were used to estimate the fitted values in the first stage of the 2SLS procedure. In the second stage, the fitted values, (Y), were used in the structural equations to estimate base to income elasticities. The fitted values satisfy two necessary conditions for a valid instrument; firstly, it has no correlation with the error term in the structural equation and secondly, it is highly correlated with the endogenous variable.

The base to income elasticities were estimated as follows:

$$LGDPM = -0.10 + 1.006Y - 0.12D$$

(-2.09) (195) (-3.15)

R² = 0.99 DW = 1.75 RSS = 0.09 SEE = 0.05

$$LPC = -0.38 + 1.38Y - 0.38Y_{t-1} - 0.19D$$

(-5.2) (9.2) (-2.4) (3.4)

R² = 0.99 Durbin - h = 0.90 RSS = 0.09 SEE = 0.05

$$LIMP = -0.72 + 0.71LIMP_{t-1} - 1.04Y_{t-1} + 1.36Y + 0.31D$$

(-2.5) (5.9) (-3.7) (4.2) (2.9)

R² = 0.99 Durbin - h = 0.92 RSS = 0.31 SEE = 0.10

Base to income elasticities were estimated for the periods 1960-1994, 1959-1977 and 1978-1994. The elasticity estimates in all cases, except import duties, turned out to be equal to one.²³ In the case of base to income elasticities of import duties, the estimated coefficient turned out to be 1.1081.

^{23/} As the elasticity estimates all turned out to be equal to unity, the regressions for the period 1960-1994 only are reported above.

5. Results

Long run and short run elasticities for the above mentioned taxes were computed from the regressions, the results of which are given in Tables 8 and 9.²⁴ As mentioned before, the overall elasticity of individual taxes was estimated by the product of the tax to base and base to income elasticities.

Table 8
Long Run Tax Elasticities*

Tax	1960-1994	1960-1977	1978-1994
Income taxes	0.78 (0.012)	0.76 (0.007)	0.76 (0.023)
Turnover taxes	0.80 (0.016)	0.63 (0.037)	0.84 (0.019)
Excise taxes	0.43 (0.073)	0.90 (0.062)	0.20 (0.040)
Import taxes	1.12 (0.067)	1.13 (0.099)	0.91 (0.006)
Total taxes	0.58 (0.045)	1.01 (0.014)	0.85 (0.032)

Source: Author's Estimates

* Standard errors are reported in parenthesis

Table 9
Short Run Tax Elasticities*

Tax	1960-1994	1960-1977	1978-1994
Income taxes	0.22 (0.15)	0.15 (0.12)	0.22 (0.16)
Turnover taxes	0.71 (0.10)	0.55 (0.05)	0.84 (0.06)
Excise taxes	0.12 (0.14)	0.90 (0.38)	0.19 (0.11)
Import taxes	0.06 (0.17)	0.07 (0.19)	0.63 (0.18)
Total taxes	0.14 (0.07)	0.15 (0.07)	0.08 (0.05)

Source: Author's Estimates

* Standard errors are reported in parenthesis

In order to see the effect of discretionary changes on tax revenues, buoyancies were also estimated for the above mentioned taxes.²⁵ The buoyancy estimates along with standard errors are given in Table 10.

Table 10
Tax Buoyancies*

Tax	1960-1994	1960-1977	1978-1994
Income taxes	0.94 (0.02)	0.92 (0.07)	0.97 (0.05)
Turnover taxes	1.35 (0.06)	1.62 (0.37)	1.18 (0.18)
Excise taxes	0.79 (0.13)	0.63 (0.56)	0.76 (0.66)
Import taxes	1.42 (0.21)	0.88 (0.06)	0.92 (0.02)
Total taxes	1.00 (0.15)	0.98 (0.23)	0.95 (0.11)

Source: Author's Estimates

* Standard errors are reported in parenthesis

The results from the elasticity estimation point to several noteworthy features of the Sri Lankan tax system. Firstly, low elasticities can be observed for all taxes during the period under study. The growth in tax revenues has not kept pace with that of tax bases. Income taxes show an elasticity estimate of 0.78 for the whole period under study. The elasticity estimates for the *pre-reform* and the *post-reform* periods at 0.76 show that income tax revenues have not increased in line with GDP growth. Excise taxes exhibit a very low elasticity of 0.20 during the *post-1977* period reflecting the combined effect of the specific nature of excise taxation and the high growth in private consumption during this period. In addition, factors such as the illicit production of liquor impose a negative effect on excise tax elasticity as this is not captured in the national accounts data. In contrast, the relatively high

24/ The long run elasticity of y with respect to x of an ADL equation $y_t = a_1x_t + b_2x_{t-1} + c_1y_{t-1}$ specified in logs can be derived as
$$= \frac{a_1 + b_2}{1 - c_1}$$

25/ A similar procedure to the elasticity estimation was adopted for the buoyancy estimation except that the dependent variable in the latter case constituted actual revenue as opposed to adjusted revenue.

elasticity of 0.90 observed for excise taxes during the 1970-1977 period points to strengthened tax administration during this period. Turnover taxes, in comparison to other tax sources, have been more responsive to increases in its tax base displaying long run coefficients of around 0.80 during the period under study. There seems to be no significant difference between the turnover tax elasticity estimates for the *pre-liberalisation* and the *post-liberalisation* periods. Import taxes as noted before record an elasticity estimate of unity prior to 1977 while the *post-1977* period witnesses an elasticity estimate of 0.80. The lower import tax elasticities obtained for the *post-liberalisation* period reflect the provision of duty waivers and exemptions prevalent during this period resulting in a lowering of the elasticity estimate. The elasticity for total tax revenue is 0.80 from 1978 onwards reflecting an inelastic tax structure even with the implementation of tax reforms.

Another distinct feature that can be observed from the above estimation is the generally lower elasticity estimates obtained for the short run. This is in line with a priori expectations when factors such as lags in collection would always make for delays in payment. Income taxes display very low short run elasticities which may be due to collection lags arising from low tax compliance and weak tax administration. Turnover taxes record relatively higher short run tax elasticities for all periods under study as these tax payments are made quarterly. In the case of excise taxes, the short run and the long run elasticities at 0.90 during the 1960-1977 period are quite high mainly due to strengthened tax administration during this period. The lowest short run elasticities are found in total tax revenue which is not a surprising result as collection lags in all sources of tax revenue will be incorporated in this variable.

As regards the finally preferred estimates, from an econometric point of view, estimates obtained from the longest sample period may be thought of as the preferred estimates as this sample period incorporates the largest number of observations. In such circumstances, the sample period 1960-1994 can be cited as the period bearing the desired estimates. However, in the case of Sri Lanka, this sample period incorporates the inward oriented, state interventionist and import and exchange controlled time period which would have had some impact on the elasticity estimates derived for this period. Moreover, the choice of preferred estimate must also be based on the purpose for which the elasticity estimates are being used. As revenue forecasting would be a priority area for which these elasticity coefficients can be used, utilising estimates from a sample period similar to the forecasting period would be desirable. As such, the elasticity coefficients arising from the sample period 1978-1994 can be chosen as the finally preferred estimates.

6. Conclusion

The time series analysis of tax elasticity reveals a very inelastic tax structure for the period 1960 - 1994. Taxes are not greatly responsive to changes in income with most elasticity coefficients registering below unity. The low elasticity observed in the Sri Lankan tax system is explained through factors such as exemptions, tax incentives, duty waivers, low compliance and vibrant sectors of the economy which are not subject to taxation. Thus, the automatic responsiveness of taxes to income is seen to be low. The *pre-reform* and the *post-reform* periods did not reveal a significant difference in elasticities for most taxes. In fact, the higher coefficients obtained through the buoyancy analysis point to the role of discretionary measures in maintaining a steady source of tax revenue throughout the period under study. Therefore, the tax reforms implemented during the *post-1977* period seem not to have brought about an increase in the elasticity of the tax system.

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Tax Revenue

Appendix 1

(Rs. Million)

Tax Category	49/50	50/51	51/52	52/53	53/54	54/55	55/56	56/57	57/58	58/59	59/60	60/61	61/62	62/63	63/64	64/65
Tax on Income, Profit & Cap. Gains	117	134	205	232	217	206	300	271	264	201	194	271	276	277	289	297
Personal																
Corporate																
Domestic Taxes on Goods & Services	48	55	56	72	76	72	86	97	118	127	181	168	199	241	271	338
General Sales & TT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	35
Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	35
Non-Manufacturing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Imports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selective Sales (Excise)	3	3	3	6	9	10	12	19	28	39	43	54	78	95	108	126
Liquor																
Tobacco																
Other																
Defence Levy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Licence Tax	13	15	16	21	22	18	19	20	32	26	58	44	38	35	41	39
Heavy Oil Motor Vehicle Tax	0	1	1	2	2	3	3	4	3	3	1	2	9	11	14	42
Surplus of Govt. Monopolies	29	33	33	39	39	34	46	50	52	55	76	65	72	98	88	90
Taxes on Specific Services	3	4	4	5	5	8	6	4	3	3	3	3	2	2	5	6
Betting/Lottery Tax	3	4	4	5	5	8	6	4	3	3	3	3	2	2	5	6
Taxes on International Trade	357	529	489	446	505	630	610	629	618	698	708	733	758	677	765	756
Import Duties	188	245	260	251	244	258	286	303	292	367	406	435	465	397	481	436
Export Duties	169	284	229	195	261	372	324	326	326	331	302	298	293	280	280	315
Foreign Exchange Taxes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	5
FEECs Revenue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Taxes on Property	6	4	6	5	7	7	6	3	16	16	19	31	30	32	32	37
Estate Duties	6	4	6	5	7	7	6	3	5	7	8	10	9	8	8	7
Wealth Tax / Gift Tax	0	0	0	0	0	0	0	0	0	0	1	12	12	12	13	19
Taxes on Financial & Cap. Trans.	0	0	0	0	0	0	0	0	11	9	10	9	9	12	11	11
Treasury Bill Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Property Transfer Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bank Debits Tax	0	0	0	0	0	0	0	0	11	9	10	9	9	12	11	11
Other Taxes	9	13	12	13	13	11	12	13	8	12	13	12	13	14	14	15
o/w Stamp Taxes	9	13	12	13	13	11	12	13	8	12	13	12	13	14	14	15
Tax Revenue	537	736	769	769	819	926	1,013	1,013	1,025	1,054	1,115	1,215	1,277	1,241	1,371	1,443

(Contd.)

Tax Revenue

Appendix 1 (Contd.)

(Rs. Million)

Tax Category	65/66	66/67	67/68	68/69	69/70	70/71	71/72	73	74	75	76	77	78	79	80	81
Tax on Income, Profit & Cap. Gains	281	312	321	349	445	447	453	704	606	770	935	937	1,102	1,357	2,086	2,029
Personal								246	190	258	253	287	384	386	378	570
Corporate								458	416	512	682	650	718	971	1,708	1,459
Domestic Taxes on Goods & Services	354	384	421	494	645	786	1,071	1,191	1,252	1,375	1,417	1,548	2,557	2,966	3,497	4,864
General Sales & TT	39	72	79	111	247	326	394	536	604	646	711	662	1,078	1,195	1,639	2,828
Manufacturing	39	72	79	111	247	326	394	457	495	531	569	451	834	665	1,051	1,727
Non-Manufacturing								79	109	115	142	211	244	530	588	1,101
Imports								-	-	-	-	-	-	-	-	-
Selective Sales (Excise)	137	154	185	237	226	265	336	368	589	665	642	832	1,374	1,684	1,776	1,941
Liquor								23	216	206	190		555	498	683	749
Tobacco								313	341	373	459	452		759	801	1,000
Other								0	0	-	-	-	60	385	93	69
Defence Levy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Licence Tax	40	38	31	18	47	45	53	50	59	64	64	54	74	87	81	95
Heavy Oil Motor Vehicle Tax	10	0	1	0	1	1	0	7	0	0	0	0	0	-	1	-
Surplus of Govt. Monopolies	118	107	110	110	124	149	287	230	0	-	-	-	31	-	-	-
Taxes on Specific Services	10	12	15	18	0	0	0	0	0	0	0	0	0	-	0	0
Betting/Lottery Tax	10	12	15	18	0	0	0	0	0	0	0	0	0	-	0	0
Taxes on International Trade	736	777	912	1,091	1,121	981	1,071	1,321	2,062	1,987	2,321	2,870	6,484	6,529	6,317	6,518
Import Duties	477	544	514	460	306	282	258	222	277	336	476	518	1,409	2,131	2,576	2,725
Export Duties	259	233	321	346	369	303	277	425	821	596	771	1,195	4,746	4,391	3,740	3,771
Foreign Exchange Taxes	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEECs Revenue	-	-	77	285	446	396	536	674	964	1,055	1,074	1,157	329	7	1	22
Taxes on Property	24	22	23	28	30	55	62	86	81	102	100	118	142	62	56	71
Estate Duties	10	9	9	14	12	14	16	14	11	11	14	18	18	15	16	24
Wealth Tax / Gift Tax	12	13	13	13	17	25	27	41	37	54	45	50	45	37	28	37
Taxes on Financial & Cap. Trans.	2	0	1	1	1	16	19	31	33	37	41	50	79	10	12	10
Treasury Bill Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Property Transfer Tax	0	0	1	1	1	1	3	2	2	3	3	1	10	10	12	10
Bank Debits Tax	2	-	-	-	-	15	16	29	31	34	38	49	69	-	0	-
Other Taxes	16	19	20	21	21	21	25	20	19	25	26	36	68	101	201	211
o/w Stamp Taxes	16	19	20	21	21	21	25	20	19	25	26	36	68	101	201	211
Tax Revenue	1,412	1,515	1,697	1,983	2,262	2,290	2,682	3,323	4,020	4,259	4,799	5,509	10,354	11,015	12,158	13,694

(Contd.)

Appendix 1 (Contd.)

Tax Revenue															
(Rs. Million)															
Tax Category	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
Tax on Income, Profit & Cap. Gains	2,923	3,366	5,480	5,586	4,787	4,909	4,647	5,148	7,337	9,722	10,967	12,543	15,277	17,161	20,751
Personal	808	891	1,760	1,424	1,513	1,580	1,464	2,207	2,957	3,539	4,067	5,235	5,621	7,358	7,315
Corporate	2,115	2,475	3,720	4,162	3,274	3,329	3,183	2,941	4,380	6,183	6,900	7,308	9,656	9,803	13,436
Domestic Taxes on Goods & Services	6,320	8,710	10,888	13,360	14,788	15,668	17,021	20,829	28,771	32,110	38,160	47,963	56,685	70,797	77,105
General Sales & TT	4,052	6,224	8,143	10,189	10,088	10,611	12,321	14,658	20,291	21,430	24,095	29,663	32,300	36,429	37,631
Manufacturing	1,806	2,718	3,045	3,619	3,270	3,675	3,610	4,496	6,798	7,945	8,262	9,231	9,171	9,906	8,874
Non-Manufacturing	1,524	1,891	1,928	2,739	2,415	2,426	3,386	3,004	3,726	2,974	3,546	4,825	6,445	7,074	9,711
Imports	722	1,615	3,170	3,831	4,403	4,510	5,325	7,158	9,767	10,511	12,287	15,607	16,684	19,449	19,046
Selective Sales (Excise)	2,123	2,298	2,549	2,982	4,414	4,716	4,420	5,812	8,170	10,597	10,232	11,655	14,632	19,436	22,067
Liquor	808	867	1,013	1,104	1,485	1,644	1,754	1,955	2,657	3,126	3,434	4,686	6,298	5,839	
Tobacco	1,315	1,431	1,536	1,877	2,927	3,071	2,665	3,855	5,461	6,884	3,339	6,866	7,888	8,788	12,833
Other	-	-	-	1	2	1	1	2	52	587	3,459	726	2,058	4,350	3,395
Defence Levy	-	-	-	-	-	-	-	-	-	-	3,763	6,589	9,693	14,408	16,441
Licence Tax	145	188	194	188	285	340	279	358	309	80	66	56	60	524	966
Heavy Oil Motor Vehicle Tax	0	0	0	0	0	0	-	-	0	-	-	-	-	-	-
Surplus of Govt. Monopolies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxes on Specific Services	0	0	2	1	1	1	1	1	1	3	4	-	-	-	-
Betting/Lottery Tax	0	0	2	1	1	1	1	1	1	3	4	-	-	-	-
Taxes on International Trade	5,172	7,439	13,081	10,998	11,050	12,975	12,501	16,495	19,341	19,752	21,641	20,819	22,598	24,373	25,464
Import Duties	2,538	4,047	6,670	8,093	9,414	11,051	10,671	14,923	16,792	18,617	20,819	20,762	22,598	24,365	25,459
Export Duties	2,634	3,392	6,411	2,905	1,636	1,924	1,830	1,572	2,549	1,135	822	57	-	8	5
Foreign Exchange Taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEECs Revenue	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-
Taxes on Property	74	69	92	123	154	112	114	2,470	2,815	3,222	2,185	1,095	504	1,050	1,604
Estate Duties	22	17	23	41	34	25	19	10	17	13	15	-	-	-	-
Wealth Tax / Gift Tax	42	43	59	69	108	75	80	100	163	161	161	-	-	-	-
Taxes on Financial & Cap. Trans.	10	9	10	13	12	12	15	2,360	2,635	3,048	2,009	1,095	504	1,050	1,604
Treasury Bill Tax	-	-	-	-	-	-	-	2,345	2,618	3,033	1,991	1,073	471	1,050	1,604
Property Transfer Tax	10	9	10	13	12	12	15	15	17	15	18	22	33	-	-
Bank Debits Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Taxes	247	326	397	375	492	1,454	1,663	2,571	2,942	3,351	3,400	3,452	4,363	5,150	5,279
o/w Stamp Taxes	247	326	397	375	492	1,454	1,663	2,351	2,942	3,271	3,400	3,452	4,363	5,150	5,279
Tax Revenue	14,736	19,911	29,938	30,442	31,271	35,118	35,946	47,513	61,206	68,157	76,353	85,872	99,427	118,531	130,203

Source: Central Bank of Sri Lanka Annual Reports and Ministry of Finance Estimates of Revenue and Expenditure

Appendix 2

Tax Discretionary Changes

(Rs. Million)

Tax Category	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Income Tax	-2.5	5	16.5	0	23	0	0	20	8	0	0	45	81	10	0
Turnover Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	30	40
Excise Tax	0	0	0	0	9	0	0.2	0	0	0	17	0	10	6	6
Import Duty	0.5	-4	-5.5	0	17	-2	0	5.7	22	20	7.5	0	32	27	31
Total Tax Changes	-2	1	11	0	49	-2	0.2	25.7	30	20	24.5	45	123	73	77

Tax Category	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
Income Tax	-3.5	6	0	15	0	0	0	0	15	0	23	0	100	0	85
Turnover Tax	0	0	0	12	166	29	15	44	-25	0	0	0	0	0	0
Excise Tax	2	0	0	15	20	0	35	10	45	0	0	95	0	0	0
Import Duty	15	29	0	80	-15	0	60	0	0	0	0	-15	10	0	0
Total Tax Changes	13.5	35	0	110	17	166	124	25	104	-25	23	80	110	0	85

Tax Category	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
Income Tax															
Turnover Tax															
Excise Tax															
Import Duty															
Total Tax Changes															

Source : Ministry of Finance Budget Speeches

Adjusted Tax Revenue

(Rs. Million)

Year	Income Tax	Turnover Tax	Excise Tax	Import Tax	Total Tax Revenue
1950	999	—	—	5,350	9,517
1951	1,104	—	—	7,087	11,697
1952	1,552	—	—	7,681	12,044
1953	1,757	—	—	7,415	12,047
1954	1,460	—	248	6,696	12,022
1955	1,382	—	277	7,136	12,793
1956	2,046	—	330	7,911	13,716
1957	1,718	—	544	8,211	13,351
1958	1,628	—	801	7,336	12,908
1959	1,240	—	1,115	8,658	13,022
1960	1,133	—	744	9,394	13,075
1961	1,313	—	934	10,065	12,718
1962	984	—	1,030	9,951	11,553
1963	952	—	1,160	7,977	10,594
1964	994	517	1,244	9,019	10,881
1965	1,007	1,132	1,428	7,936	9,295
1966	932	1,261	1,554	8,205	8,953
1967	1,034	1,330	1,747	8,508	9,092
1968	1,005	1,459	1,926	6,802	9,464
1969	1,093	1,831	2,239	6,278	10,963
1970	1,436	1,280	1,948	4,176	11,439
1971	1,442	1,538	1,983	3,012	10,277
1972	1,462	1,794	2,458	2,756	11,941
1973	2,220	2,232	2,465	2,371	12,662
1974	1,911	2,626	3,943	2,959	15,425
1975	2,337	2,809	4,452	3,589	16,251
1976	2,838	3,091	3,722	5,237	18,091
1977	2,525	2,878	4,824	5,592	20,323
1978	2,610	4,062	7,794	2,489	23,271
1979	2,978	4,503	9,553	3,765	24,709
1980	4,578	5,786	9,649	4,551	27,555
1981	4,150	9,184	10,091	4,814	30,040
1982	5,576	8,672	8,410	4,764	29,156
1983	6,421	8,776	9,103	4,845	31,532
1984	10,404	10,665	9,362	7,943	46,021
1985	10,998	13,385	7,964	9,036	45,372
1986	8,639	12,914	10,468	10,216	45,056
1987	9,224	13,554	9,695	11,691	48,049
1988	9,109	15,776	7,392	10,865	48,022
1989	5,645	17,759	8,404	14,667	54,531
1990	7,187	23,292	10,523	16,370	66,917
1991	8,350	24,721	11,896	18,149	71,608
1992	10,147	28,080	11,058	20,528	78,856
1993	12,044	29,621	12,157	20,312	86,340
1994	15,277	32,300	14,632	22,598	99,427

Source: Author's Estimates.

Ratios of Actual to Estimated Tax															
Tax Category	49/50	50/51	51/52	52/53	53/54	54/55	55/56	56/57	57/58	58/59	59/60	60/61	61/62	62/63	63/64
Tax on Income, Profit	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	0.9	0.9	1.0	1.2	0.9	0.9	1.1
Domestic Taxes on Goods & Services	1.0	0.8	1.0	1.1	0.9	1.0	1.0	1.1	1.2	1.1	1.1	1.0	1.0	1.1	1.0
General Sales & TT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Selective Sales (Excise)	1.1	1.2	1.0	1.2	1.1	1.1	1.0	1.5	1.4	1.2	1.0	1.1	1.0	1.2	1.0
Defence Levy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Licence Tax	1.0	1.0	1.0	1.1	0.7	1.1	1.0	1.0	1.7	1.2	1.4	0.8	0.9	0.9	1.1
Motor Vehicle Taxes	1.0	1.7	1.8	2.2	1.0	1.0	1.0	1.3	0.8	0.8	0.4	1.0	1.1	1.1	0.8
Surplus of Govt. Monopolies	0.9	0.7	1.0	1.1	1.0	0.9	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.1
Taxes on Specific Services	1.0	1.3	1.3	0.8	1.7	1.0	0.9	0.8	0.6	0.7	0.8	0.9	0.7	1.2	1.0
Lottery Tax	1.0	1.3	1.3	0.8	1.7	1.0	0.9	0.8	0.6	0.7	0.8	0.9	0.7	1.2	1.0
Taxes on International Trade	1.1	1.0	1.0	1.1	1.1	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.1	0.9	1.0
Import Duties	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.1	1.0	1.0	1.1	0.9	1.0
Export Duties	1.1	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	0.9	0.9
FEECs Revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Taxes on Property	1.0	1.0	2.0	1.3	1.2	1.4	0.9	0.4	0.8	0.8	1.1	0.8	0.9	1.1	0.9
Estate Duties	1.0	1.0	2.0	1.3	1.2	1.4	0.9	0.4	0.7	1.0	1.1	1.0	1.3	1.1	1.1
Wealth Tax / Gift Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.9	1.0	0.7
Taxes on Financial & Cap. Trans.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.8	1.0	0.6	0.8	1.1	1.1
Treasury Bill Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Property Transfer Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Taxes	1.1	1.4	1.1	1.2	1.0	1.0	1.1	1.1	0.5	0.8	1.1	1.0	1.1	1.2	1.2
Stamp Taxes	1.1	1.4	1.1	1.2	1.0	1.0	1.1	1.1	0.5	0.8	1.1	1.0	1.1	1.2	1.2
Total Taxes	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0

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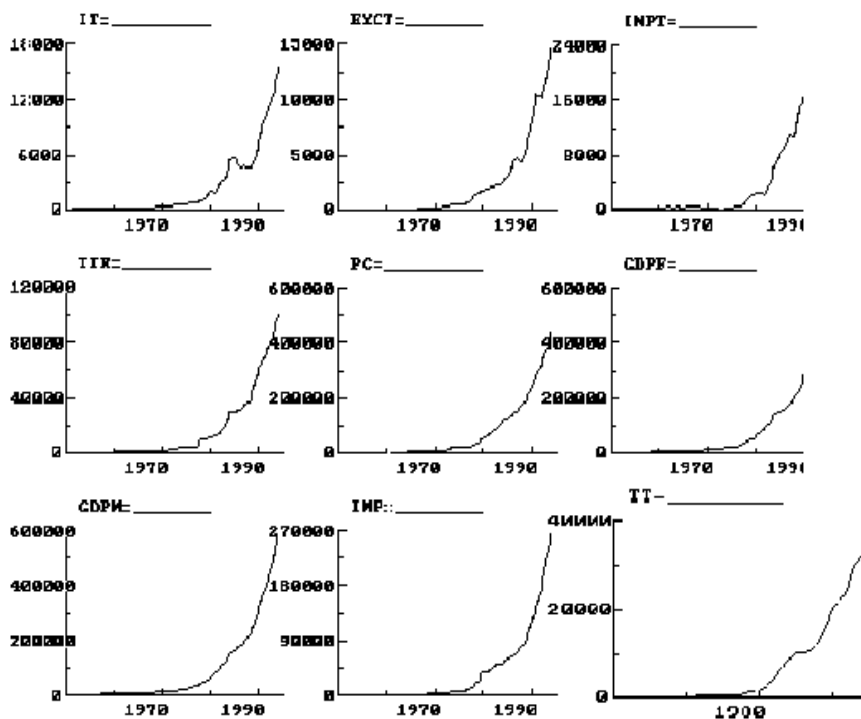
Ratios of Actual to Estimated Tax															
Tax Category	64/65	65/66	66/67	67/68	68/69	69/70	70/71	71/72	73	74	75	76	77	78	79
Tax on Income, Profit	1.1	1.1	1.2	1.2	1.0	1.0	1.0	0.7	1.1	1.1	1.3	1.1	1.1	1.0	1.2
Domestic Taxes on Goods & Services	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	0.9	1.0	1.0	1.0
General Sales & TT	1.0	1.1	1.0	1.1	1.0	1.0	1.0	0.9	1.0	1.1	1.0	1.0	1.0	1.0	0.9
Selective Sales (Excise)	1.0	1.0	1.0	1.0	1.1	1.0	1.0	0.8	1.1	1.0	1.0	0.9	1.0	1.0	1.1
Defence Levy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Licence Tax	1.0	1.0	1.1	0.9	0.4	1.2	1.0	0.9	0.8	1.0	1.0	1.1	0.9	1.3	0.9
Motor Vehicle Taxes	0.9	2.0	1.5	1.7	0.1	2.5	4.5	0.0	1.0	0.0	2.7	2.7	0.2	1.0	0.0
Surplus of Govt. Monopolies	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Taxes on Specific Services	29.5	0.9	24.8	1.1	1.0	0.0	5.0	3.8	1.0	0.7	1.4	1.6	1.1	0.9	0.0
Lottery Tax	29.5	0.9	24.8	1.1	1.0	0.0	5.0	3.8	1.0	0.7	1.4	1.6	1.1	0.9	0.0
Taxes on International Trade	0.9	0.9	1.1	1.1	1.0	1.0	1.0	0.8	0.9	1.1	1.0	1.1	1.1	1.0	1.0
Import Duties	0.8	0.9	1.1	1.0	1.0	1.0	1.0	0.8	0.9	1.3	1.1	1.0	1.0	1.0	1.1
Export Duties	1.1	0.9	1.0	1.0	1.1	1.0	1.0	0.8	1.1	1.0	1.1	1.3	1.7	1.0	1.0
FEECs Revenue	0.0	0.0	0.0	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0
Taxes on Property	1.0	0.9	0.9	1.0	1.2	1.1	1.0	0.9	1.3	1.3	1.3	1.1	0.8	1.2	0.9
Estate Duties	0.8	1.1	1.0	1.0	1.6	0.8	1.1	1.1	1.2	0.9	0.9	1.2	1.1	0.9	0.8
Wealth Tax / Gift Tax	1.1	0.6	0.8	1.0	1.0	1.4	1.0	1.0	1.5	2.0	1.6	1.1	0.5	1.1	1.1
Taxes on Financial & Cap. Trans.	1.0	29.6	1.4	1.2	1.0	0.9	0.9	0.7	1.1	1.1	1.1	1.1	1.4	1.4	0.5
Treasury Bill Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Property Transfer Tax	0.7	3.9	1.4	1.2	1.0	0.9	1.4	1.5	0.9	1.0	1.5	1.5	0.3	1.7	0.5
Other Taxes	0.9	0.9	1.1	1.3	1.1	1.1	0.9	1.0	0.8	0.8	1.0	1.0	1.4	1.9	1.3
Stamp Taxes	0.9	0.9	1.1	1.3	1.1	1.1	0.9	1.0	0.8	0.8	1.0	1.0	1.4	1.9	1.3
Total Taxes	1.0	1.0	1.1	1.1	1.0	1.0	1.0	0.8	1.0	1.1	1.0	1.0	1.1	1.0	1.0

(Contd.)

Tax Category	Ratios of Actual to Estimated Tax														
	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
Tax on Income, Profit	1.8	0.9	1.0	1.0	1.2	1.0	1.0	1.0	1.0	0.9	1.1	1.2	1.1	0.9	1.0
Domestic Taxes on Goods & Services	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0
General Sales & TT	1.2	1.0	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9
Selective Sales (Excise)	1.0	1.0	1.0	1.0	1.0	0.9	1.1	1.0	1.0	1.0	1.0	1.0	0.8	0.9	1.1
Defence Levy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	1.0	1.1
Licence Tax	0.9	0.8	0.6	1.0	1.0	1.0	1.2	1.2	0.9	1.0	0.8	2.5	2.0	1.5	1.2
Motor Vehicle Taxes	80.0	0.0	1.0	1.3	1.0	1.7	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Surplus of Govt. Monopolies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Taxes on Specific Services	3.0	1.1	1.3	3.1	10.1	1.0	1.0	1.0	0.5	1.0	1.4	0.0	0.0	0.0	0.0
Lottery Tax	3.0	1.1	1.3	3.1	10.1	1.0	1.0	1.0	0.5	1.0	1.4	0.0	0.0	0.0	0.0
Taxes on International Trade	1.0	1.0	0.9	1.0	1.1	1.1	1.0	1.0	0.9	1.0	1.1	1.0	1.0	0.8	0.8
Import Duties	1.2	0.9	0.8	0.9	1.2	1.1	0.9	1.0	0.9	1.0	1.0	1.0	1.0	0.8	0.8
Export Duties	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	0.9	1.1	0.8	1.0	1.8	0.0
FEECs Revenue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Taxes on Property	0.8	1.2	1.3	0.8	1.2	1.9	2.2	1.3	1.3	1.0	0.9	1.0	1.2	0.8	0.9
Estate Duties	0.8	1.6	1.4	0.8	1.2	2.4	1.5	1.7	1.0	1.0	1.1	1.3	1.5	0.0	0.0
Wealth Tax / Gift Tax	0.9	1.1	1.3	0.8	1.3	1.8	3.0	1.3	1.5	1.6	1.6	1.5	10.7	0.0	0.0
Taxes on Financial & Cap. Trans.	0.8	0.9	0.9	1.0	1.0	1.3	1.0	1.0	1.1	1.0	0.9	1.0	1.1	0.8	0.9
Treasury Bill Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.9	1.0	1.1	0.7	0.9
Property Transfer Tax	0.8	0.9	0.9	1.0	1.0	1.3	1.0	1.0	1.1	1.1	1.1	0.9	0.0	0.0	0.0
Other Taxes	2.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.2	1.2	1.2	1.1	1.0	1.0
Stamp Taxes	2.2	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.1	1.2	1.1	1.1	1.0	1.0
Total Taxes	1.1	1.0	0.9	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9

Source : Central Bank of Sri Lanka Annual Reports and Ministry of Finance Estimates of Revenue and Expenditure

Time Plots for Variables in Elasticity Estimation



Source: Author's Estimates.