මාණ්ඩලික පත්‍රිකා
STAFF STUDIES

14 වැනි කලාපය අංක 1 සහ 2
Vol. 14 No. 1 & 2

1984 අප්‍රේල්/සැප්තැම්බර්
April/September, 1984.

ARTICLES

Books Reviewed

ශ්‍රී ලංකා මහ බැංකුව
CENTRAL BANK OF SRI LANKA

මාණ්ඩලික පත්‍රිකා

STAFF STUDIES

S. T. Mookandi.
March. 1985.
Colombo

ශ්‍රී ලංකා මහ බැංකුව

CENTRAL BANK OF SRI LANKA

14 වැනි කලාපය අංක 1 සහ 2
Vol. 14 No. 1 & 2

1984 අප්‍රේල්/සැප්තැම්බර්
April/September, 1984.

The views presented in these papers are those of the authors and should not be interpreted as necessarily indicating the views of the Central Bank of Sri Lanka.

QUARTERLY ESTIMATES OF GROSS NATIONAL PRODUCT FOR SRI LANKA[1]

By

TERRENCE SAVUNDRANAYAGAM

ABSTRACT

Usually quarterly estimates of GNP are obtained from indicator variables, and regression and recursive methods. In this study ,quarterly estimates have been obtained by estimating value added for sub items in each of the major sectors in GDP. This has been done by disaggregating production and inputs (costs of production) into quarters and thereby ariving at quarterly estimates of value added. Since with the exception of tea and rubber, production data are not available by quarter, these estimates have been obtained by disaggregating annual estimates on the basis of indicators.

1. Introduction

This paper presents a quarterly series of Gross National Product for the years 1972 to 1981. For Sri Lanka quarterly estimates of production and prices are available only for a very few commodities. The estimation of a quarterly series, therefore required the use of indirect methods, in order to allocate annual estimates of output to each quarter.

Usually quarterly estimates are made on the basis of indicator variables. Regression methods are then used to obtain the best linear unbiassed estimates of the quarterly national accounts. Sometimes, where limited base data are available recursive methods are used to estimate quarterly national accounts.

In the series presented here however quarterly production data where available have been used to estimate value added in each quarter or the annual estimates of production have been disaggregated into quarters on the basis of indicators. The reliability of these estimates depends very largely on whether annual data can be disaggregated in this way. It is our view that a large part of data used in estimating Gross National Product can be fairly accurately broken into quarters. The methods used in estimating quarterly GNP at current and constant prices are given in Sections 3 and 4.

---

1. I am grateful to Mr. Werner Danneman, Director, Bureau of Statistics, International Monetary Fund, Washington for very useful comments on an earlier draft of this article.

Table 1 shows quarterly estimates of GNP at current prices while Table 2 shows estimates at constant (1980) prices. Table 3 shows quarterly changes in the GNP deflator. In line with the recommendations in the United Nations System of National Accounts (SNA) 1968, all export taxes have been treated as indirect taxes. The SNA treats all taxes on production and expenditure as indirect taxes. Official estimates of Sri Lanka's National Income Accounts treat export taxes as direct taxes and therefore as part of factor costs.[2]

2. Reasons for Estimating a Quarterly Series

There are many advantages in estimating national income on a quarterly basis. A quarterly series expands annual series data and provides a better data base for analysis and forecasting. Because a quarterly model has four times the number of observations as an annual one, this improves the degrees of freedom problem a great deal. However the degrees of freedom are not improved by a multiple of four because additional parameters for seasonality and autocorrelation have to be estimated. The use of annual data tends to gloss over estimated lagged relationships. It is also possible to estimate dynamic relationships better with quarterly data.

Quarterly estimates of National Income are also useful in short-term econometric models. It is likely that annual data do not capture short-term effects. In particular monetary oriented models are usually more meaningful when estimated quarterly since disequilibrium in the monetary sector tends to work itself out in a shorter time period than a year. All the relevant monetary variables are available at least quarterly. There is therefore a great loss of information in the monetary sector if annual estimates are used. Improved estimates can be obtained using quarterly data.

---

2. The rationale for the treatment of export taxes as direct taxes and therefore as part of factor costs is found in the usual elasticity argument-*i.e.* the producer has to take the price on the international market as given and cannot shift the burden of the tax. In this instance however, the issue of tax incidence is likely to be a controversial one. The most recent estimate of National Income by the Department of Census and Statistics, values GDP in each sector at market prices and thus obviates this problem.

3. Methods used in Estimating Quarterly GNP at Current Prices

The methods used in estimating GNP by sector are described below :—

1. Agriculture, Forestry and Fishing :

(*i*) *Tea and Rubber*

Quarterly data on production and prices are available.

Value added has been estimated as follows :

Tea : Value of green leaf less inputs
Rubber : Value of latex less inputs.

The prices of green leaf used has been the same as the annual price. However, where the price of green leaf has been changed during any year, the average price of green leaf has been revised for the relevant quarters of the year.

The average price of latex, was estimated on the basis of the Colombo Market Price of different grades of rubber. The same method has been applied to the quarterly prices of rubber to obtain quarterly latex prices.

(*ii*) *Coconut*

Coconut production has been estimated as equal to the nut equivalent of domestic consumption and exports in each quarter. The value of inputs in coconut growing has been estimated as equal to one fourth the annual inputs.

Estimates of value added in husks and cadjans have been made to follow the quarterly estimate of coconut production.

(*iii*) *Paddy*

Production data are available in March/April and September/October for the Maha and Yala harvests. On this basis paddy production could be allocated to the 1st and 4th quarters of each year respectively. However, paddy production data are aggregated at two points of time for statistical purposes only. The actual production cycle for paddy spreads throughout almost the entire year depending on availability of water and

other factors. In order to allocate production to each quarter, paddy purchases under the GPS was thought to be a good proxy, for quarterly estimates of production. However, since sales of paddy under the GPS would depend on other factors such as the prevailing market price, the availability of transport etc. it was decided to use GPS purchases in 1972 and 1973, when there were stringent restrictions on sales of paddy, outside paddy growing areas as an indicator of production in each quarter. In these years sale of paddy under the GPS would have moved closely with production. Since we are trying to find out what proportion of total paddy production is produced in each quarter, it is assumed that for subsequent years too this would be a fairly accurate indicator of paddy production in each quarter. Thus paddy production has been allocated in the average ratio of monthly GPS sales to total GPS sales in 1972 and 1973, as follows : 4 : 3 : 1.5 : 1.5 for each of the years from 1972 to 1981.

Value added in paddy was estimated separately for the Maha and Yala seasons. Thus the average producer price of paddy and the cost of inputs in each of these seasons, has been used. Quarterly estimates of value added in paddy have been obtained by allocating total value added in Maha and Yala in the ratios mentioned above.

(*iv*) *Subsidiary Food Crops*

Here too, data are available for the Maha and Yala seasons separately and the quarterly trend in production has to be determined. In order to arrive at the quarterly production figures, purchase of vegetables and fruits by the marketing department was used as a proxy. In most years the quarterly ratio of purchases to total (annual) purchases was approximately 3.5 : 2 : 2. 5 : 2. *i.e.* taking total purchases as equal to 100 per cent, quarterly purchases are 35 per cent, 20 per cent, 25 per per cent and 20 per cent of total purchases respectively. Value added was estimated separately for Maha and Yala seasons thus reflecting half yearly changes in production and prices. The sum of value added in Maha and Yala was allocated to each quarter in the above ratio.

(*v*) *Fruits and Vegetables*

Annual estimates of the value of production were allocated in the same ratio as subsidiary food crops. The coefficient used in the annual estimates, was used to estimate value added in each quarter.

Value added in spices and medicinal herbs was also allocated in the same ratio.

(*vi*) *Fishing*

Annual estimates of the value of production were allocated on the basis of monthly data on quantities of fish obtained from the Department of Fisheries. It was found that for most years the annual production could be allocated to each quarter in the ratio 3 : 2 : 3 : 2, respectively. The annual estimates of the value of production of fish was therefore allocated on this basis. The same input coefficient as in the annual estimates was applied, to estimate value added in each quarter.

(*vii*) *Forestry*

This is estimated as the sum of value added in timber and firewood. Timber used in building construction has been estimated as a ratio of the total value of buildings. Quarterly estimates in respect of the sub items under timber *i.e.* timber used in furniture, plywood, matches, electric posts etc. have been made by allocating annual estimates equally to each quarter.

Quarterly estimates of value added in firewood have also been obtained by dividing the annual estimate by four.

(*viii*) *Minor Export Crops*

Value added in minor export crops has been estimated from the f.o.b. value of minor export crops in each quarter.

(*ix*) *Other Food Crops*

This consists of tobacco, betel and arecanut, spices and medicinal herbs.

Quarterly estimates were obtained by allocating annual estimates of value added, equally to each quarter.

2. Mining and Quarrying :

This is estimated as the sum of value added in gems, graphite, salt, building materials (bricks, sand, lime, cabook and tiles) and other minerals products (dolomite, ilmenite etc.)

(*i*) *Gems*

Value added is estimated from the quarterly (f.o.b.) value of gems exported.

(*ii*) *Salt and Graphite*

This is estimated from quarterly production data. The same value added coefficient as in the Central Bank's estimates is used.

(*iii*) *Other Building Materials*

This is estimated as a coefficient of the (quarterly) value of buildings.

(*iv*) *Mineral Products*

The annual estimate of value added is allocated equally to each quarter.

3. Manufacturing :

This consists of value added in agro processing, factory industry, small industry and other industry.

(*i*) **Agro processing :** Value added has been estimated as follows.

(*a*) *Tea*—Production valued at Colombo Market Price, less value of green leaf and value of inputs in processing.

(*b*) *Rubber*—Production valued at Colombo Market Price, less value of latex and value of inputs in processing.

(*c*) *Coconut*—Colombo Market Price value of Copra, desiccated coconut and coconut oil less inputs in processing.

(*ii*) **Factory Industry :**

Quarterly estimates of value added in factory industry have been derived from the annual estimates of value added on the basis of imports of raw materials, lagged one month.

Value added in cottage industry has been allocated in the following ratio 2 : 2 : 3 ; 3. This is because the demand for agricultural labour is higher in the first two quarters and this will probably affect output of cottage industry.

Value added in other industry has been allocated equally to each quarter.

4. Construction :

The annual estimates of construction are obtained by multiplying the value of selected building materials (cement, iron, steel, asbestos etc.) by 4.47. In effect therefore the value of cement bears a certain relationship to the value and the mix of other building materials. In estimating construction for the quarterly series, the value of cement sales (lagged one month) was taken as a basic indicator of construction activity. The quarterly value of other building materials in the mix, was estimated from the annual figures on the basis of the ratio of cement to other building materials in each year. Adjustments were made to take account of changes which occured in the prices of cement and of other building materials in any quarter. The annual value of civil engineering construction was also allocated on the basis of sales of cement.

5. Electricity, Gas, Water and Sanitary Services :

The value of Electricity Sales was disaggregated into quarters on the basis of units of electricity consumed. The value of inputs were estimated from the Central Bank's series.

Value added in gas, water and sanitary services was allocated equally to each quarter.

6. Transport, Storage and Communication

This consists of passenger transport (railways, motor buses, passenger coaches, private hiring cars, air transport (Air Lanka) Shipping, transport of domestically produced goods, transport of exported and imported goods.

(*i*) **Passenger Transport and Freight**

Data on passenger and freight mileage with the Sri Lanka Central Transport Board and the Ceylon Government Railway were used to allocate the gross value of passenger transport including

private passenger transport. Value added in all other such items, *i.e.* communication, hiring cars, air travel shipping etc. were allocated equally to each quarter.

Value added in transport of domestically produced goods was estimated from the quarterly data on agriculture, mining and manufacture. Value added in transport was estimated as equal to 30 per cent of the difference between retail and producer value of domestically produced goods.

In these estimates, the difference between the retail value and the producer value is allocated between transport and trade in the ratio of 3 : 7. In estimating value added in transport (and trade) available quarterly price data were used.

(*ii*) **Exports**

In the case of tea, rubber and coconut value added is estimated as 30 per cent of the difference between the FOB value and Colombo Market Price (CMP) value, less other inputs and less export duties. In the case of other exports value added is estimated by applying a coefficient to the f.o.b. value.

(*iii*) **Imports**

Value added is estimated as 30 per cent of the margin on imports.

7. Wholesale and Retail Trade

Value added is estimated separately for domestically produced goods, exports and imports. Seventy per cent of the margin (*i.e.* Retail value less Producer value) on domestically produced goods, exports and imports is allocated to Wholesale and Retail Trade. A further deduction from Wholesale and Retail trade, is the amount paid as Business Turnover Tax, (non manufacturing). Value added in both trade and transport are estimated after deduction of export taxes from the f.o.b. value.

8. Banking, Insurance and Real Estate

Annual estimates of value added in this sector have been allocated to each quarter according to the ratio of the quarterly estimate of Domestic Credit Expansion (DCE) of the commercial banks to the annual estimate of DCE.

9. Ownership of Dwellings

The annual estimates of value added have been allocated equally to each quarter.

10. Public Administration and Defence

The same procedure as in the section above has been followed.

11. Services (n.i.e.)

This consists of education and health services, broadcasting and meteorology, recreation and entertainment, domestic and utility services, hotel and restaurant services, professional and institutional services, personal services and financial services to individuals.

Quarterly adjustments were made in respect of estimates of hotel and restaurant services which were adjusted to reflect quarterly changes in earnings from tourism. In the case of all other activities, annual estimates of value added were allocated equally to each quarter.

Indirect Taxes

A breakdown of indirect taxes on a quarterly basis is available from 1974 onwards. For 1971 to 1973, the quarterly estimates were made as follows : Export and import taxes were allocated to each quarter, in the ratio of quarterly export and import values to the annual export and import values respectively. Other indirect taxes were allocated according to the quarterly ratio of real value added in wholesale and retail trade to the annual total.

Subsidies—Quarterly estimates of the value of subsidies are not available. Therefore, the annual estimate was allocated to each quarter in the ratio of the quantity of rice issued on subsidy in each quarter to the annual quantity of rice issued.

4. Methods used in estimating quarterly GNP at constant (1980) prices.

In estimating the quarterly series at constant prices, annual (1980) quantities and prices were used as the base. The methods used in estimating quarterly GNP by sector are given below.

1. Agriculture, Forestry and Fishing :

(*i*) *Tea and Rubber*—Quarterly data on production and prices are available for these commodities. Constant price estimates were obtained by using an output index based on production (quantity) in 1980.

(*ii*) *Coconut*—Quarterly production of coconut was estimated as equal to the nut equivalent of quarterly exports and domestic consumption. Constant price estimates were made from an output index based on production in 1980.

(*iii*) *Subsidiary Food Crops*—Estimates of production in the Maha and Yala season for each of the years 1972 to 1981 were valued at 1980 prices ; value added was obtained by using the 1980 input coefficient. This was allocated to each quarter in the same ratio as in the current price estimates.

(*iv*) *Paddy*—A similar procedure as in (*iii*) above was followed in the case of paddy.

(*v*) *Minor Export Crops*—Constant price estimates were made from an output index constructed from data on quantities exported quarterly, of a selected number of minor exports.

(*vi*) *Fruits and Vegetables*—Value added was first estimated at 1980 prices using annual data. This was allocated to each quarter in the same ratio as in subsidiary food crops.

(*vii*) *Fishing*—Annual estimates of value added at 1980 prices were allocated to each quarter in the same ratio as the current price estimates.

(*viii*) *Livestock*—Annual estimates of value added at 1980 prices were allocated equally to each quarter.

(*ix*) *Other Food Crops*—Tobacco, betel and arecanut, spices and medicinal herbs : Here too the annual estimates at (1980) prices, were allocated equally to each quarter.

(*x*) *Forestry*—A separate quarterly estimate of timber used in construction was made. Here the annual estimate of timber used in construction, at (1980) prices, was allocated to each quarter in the ratio of the real value of building construction in each quarter to the total (real) value of buildings constructed in the relevant year (as obtained from estimates of construction described at 4). In the case of all other sub-items—*i.e.* timber used in furniture, plywood, matches electric posts and firewood value added at 1980 prices was allocated equally to each quarter.

2. Mining and Quarrying :

Quarterly data on quantities are available for gems, salt and graphite. Quarterly estimates of value added were made by using an output index. Quarterly estimates of value added in building materials (bricks, sand, tiles, etc.) were derived from the annual estimates which were split up in the ratio of the real value of buildings in each quarter, to the total value of buildings in the relevant year.

The annual estimate of value added in mineral products was allocated equally to each quarter.

3. Manufacturing :

(*i*) *Factory Industry*—Quarterly estimates of value added were obtained by allocating the annual estimate in the ratio of raw materials imports in each quarter (estimated with a one month lag to the total value of raw materials imported.

(*ii*) *Processing of Tea, Rubber and Coconut*—Quarterly estimates were obtained by using output indices.

(*iii*) *Cottage Industry and other Industry*—Annual estimates were allocated to each quarter in the same ratio as in the current price series.

4. Construction :

Quarterly estimates at constant prices were obtained by allocating the annual estimates in the ratio of the lagged sales (quantity) of cement in each quarter to total sales of cement.

5. Electricity, Water, Gas and Sanitary Services :

Annual estimates of value added in electricity were allocated in the ratio of the number of units of electricity consumed in each quarter, to the total number of units of electricity consumed.

Value added in gas, water and sanitary services was obtained by allocating the annual estimate equally to each quarter.

6. Transport, Storage and Communication :

(*i*) *Passenger Transport*—Value added in the Sri Lanka Central Transport Board (SLCTB) and the Ceylon Government Railway (CGR) was allocated to each quarter using passenger and freight mileage as an indication. Value added in private passenger transport was allocated to each quarter in the same ratio as passenger transport in the SLCTB.

(*ii*) *Road Haulage*—Transport of domestically produced goods and services was estimated for each quarter by using an index of the volume of goods and services transported. Quarterly estimates of value added at constant prices in Agriculture, Mining Manufacturing and Construction were used to construct this index.

(*iii*) *Imports*—Value added was estimated by using an index of the volume of imported goods transported in each quarter. Since quarterly indices of import prices are not available the CIF value of imports in each quarter was deflated by the annual import price index in each year.

(*iv*) *Exports*—The f.o.b. value of exports in each quarter was used to construct an index of the volume of exported goods. In order that this estimate would better reflect the change in export volumes in each quarter a separate index was constructed by valuing the volume of tea, rubber and coconut exported in each quarter at 1980 prices. Exports other than tea, rubber and coconut were deflated, by the average export price index for other exports. Thus quarterly estimates of value added were made separately for tea, rubber, and coconut and for ' other ' exports.

All other items coming under the transport sector (value added in hiring cars, air travel, shipping, communication etc.) were allocated equally to each quarter.

7. Wholesale and Retail Trade

Estimates of value added were made separately for locally produced goods, imports and exports, by using indices of the volume of goods. The methods used in constructing these indices were described in (*ii*), (*iii*) and (*iv*) of item 6 above.

8. Banking, Insurance and Real Estate :

Estimates of value added at current prices were deflated by an implicit price index as obtained from the annual estimates.

9. Ownership of Dwellings :

Annual estimates of value added at constant prices were allocated equally to each quarter.

10. Public Administration and Defence :

Annual estimates of value added at constant prices were allocated equally to each quarter.

11. Other Services :

Value added in Hotel and Restaurant Services was made to reflect quarterly changes in the number of tourist arrivals. Value added at 1980 prices in all other services (Health, Education, Professional, Recreation and Personal Services etc.) were allocated equally to each quarter.

12. Net Factor Income from Abroad :

Current price estimates have been deflated by an index constructed from the Sri Lanka Rupee/SDR rate.

13. Indirect Taxes :

Current price estimates were deflated by the Cost of Living Index.

14. Subsidies :

Current price estimates were deflated by the Cost of Living Index—Food Group.

TABLE 1

Quarterly Estimates of Gross Domestic Product at Current Prices 1972 - 1981

Rs. Million

Sector	1972				1973			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry and Fishing ..	1,084	940	842	827	1,331	1,167	1,144	1,121
2. Mining and Quarrying ..	30	28	35	36	111	127	142	109
3. Manufacturing ..	485	517	426	442	507	414	474	852
4. Construction ..	169	158	193	191	217	179	193	214
5. Electricity, Gas, Water & Sanitary Services ..	32	31	32	35	33	31	31	32
6. Transport, Storage & Communications ..	406	434	384	393	496	469	516	556
7. Wholesale & Retail Trade ..	1,040	986	935	964	1,150	1,064	1,101	1,041
8. Banking, Insurance & Real Estate ..	46	47	48	50	54	55	54	57
9. Ownership of Dwellings ..	104	104	104	104	105	105	105	105
10. Public Administration & Defence ..	144	144	144	144	164	164	164	164
11. Services, n.e.s. ..	439	412	419	476	499	446	454	528
12. Gross Domestic Product at Current Factor Cost Prices ..	3,979	3,801	3,562	3,662	4,667	4,221	4,378	4,779
13. Net Factor Income from Abroad ..	-44	-64	-47	-57	-37	-40	-53	-53
14. Gross National Product at Current Factor Cost Prices ..	3,935	3,737	3,515	3,605	4,630	4,181	4,325	4,726
15. Indirect Taxes Net of Subsidies ..	170	218	266	861	64	113	170	834
16. Gross National Product at Current Market Prices	4,105	3,955	3,781	4,466	4,694	4,294	4,495	5,560

TABLE 1 — (*Continued*)

Quarterly Estimates of Gross Domestic Product at Current Prices 1972 - 1981

Rs. Million

Sector	1974				1975			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry and Fishing ..	2,319	1,873	1,736	1,583	2,167	1,729	1,779	1,832
2. Mining and Quarrying ..	84	95	92	63	106	115	115	114
3. Manufacturing ..	506	753	781	892	847	1,114	1,003	942
4. Construction ..	236	215	281	279	248	247	280	243
5. Electricity, Gas, Water & Sanitary Services ..	37	35	31	51	42	41	43	38
6. Transport, Storage & Communications ..	602	588	606	583	688	701	657	663
7. Wholesale & Retail Trade ..	1,180	1,323	1,399	1,135	1,383	1,452	1,325	1,224
8. Banking, Insurance & Real Estate ..	71	76	76	79	82	82	85	87
9. Ownership of Dwellings ..	114	114	114	114	160	160	160	160
10. Public Administration & Defence ..	176	176	176	176	200	200	200	200
11. Services n.e.s. ..	537	471	521	553	614	561	581	654
12. Gross Domestic Product at Current Factor Cost Prices ..	5,862	5,719	5,813	5,508	6,537	6,402	6,228	6,157
13. Net Factor Income from Abroad ..	-29	-43	-42	-69	-25	-41	-56	-91
14. Gross National Product at Current Factor Cost Prices ..	5,833	5,676	5,771	5,439	6,512	6,361	6,172	6,066
15. Indirect Taxes Net of Subsidies ..	172	113	242	921	-32	143	103	924
16. Gross National Product at Current Market Prices	6,005	5,789	6,013	6,360	6,480	6,504	6,275	6,990

TABLE 1 — (*Continued*)

Quarterly Estimates of Gross Domestic Product at Current Prices 1972 - 1981

Rs. Million

Sector	1976				1977			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	2,402	1,948	1,796	1,746	3,105	2,614	2,420	2,299
2. Mining and Quarrying ..	163	158	147	171	158	133	137	167
3. Manufacturing ..	841	895	964	1,181	1,358	1,658	1,244	1,366
4. Construction ..	275	283	297	309	318	184	289	342
5. Electricity, Gas, Water & Sanitary Services ..	43	41	42	45	48	47	48	51
6. Transport, Storage & Communications ..	759	744	747	817	861	848	977	1,034
7. Wholesale & Retail Trade ..	1,577	1,524	1,580	1,528	1,870	1,866	2,035	2,135
8. Banking, Insurance and Real Estate ..	98	104	107	110	130	136	133	143
9. Ownership of Dwellings ..	182	182	182	182	208	208	208	208
10. Public Administration and Defence ..	237	237	237	237	294	294	294	294
11. Services n.e.s. ..	677	631	558	729	751	614	555	796
12. Gross Domestic Product at Current Factor Cost Prices ..	7,254	6,747	6,657	7,055	9,101	8,602	8,340	8,835
13. Net Factor Income from Abroad ..	-41	-57	-75	-109	-07	-74	-54	-114
14. Gross National Product at Current Factor Cost Prices ..	7,213	6,690	6,582	6,946	9,094	8,528	8,286	8,721
15. Indirect Taxes Net of Subsidies ..	129	279	535	775	529	270	255	867
16. Gross National Product at Current Market Prices	7,342	6,969	7,117	7,721	9,623	8,798	8,541	9,588

TABLE 1 — (*Continued*)

Quarterly Estimates of Gross Domestic Product at Current Prices 1972 - 1981

Rs. Million

Sector	1978				1979			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	3,729	2,998	2,883	2,959	3,999	3,389	3,291	3,003
2. Mining & Quarrying ..	151	134	206	248	241	202	225	279
3. Manufacturing ..	1,383	1,284	1,435	1,643	1,431	1,657	1,982	1,780
4. Construction ..	482	456	518	499	519	858	898	943
5. Electricity, Gas, Water & Sanitary Services ..	61	59	63	56	95	98	103	102
6. Transport, Storage & Communications ..	1,071	1,088	1,029	1,153	1,276	1,210	1,262	1,271
7. Wholesale & Retail Trade ..	2,302	2,143	1,903	1,934	2,273	2,246	2,126	1,914
8. Banking, Insurance & Real Estate ..	197	214	214	220	292	301	313	336
9. Ownership of Dwellings ..	242	242	242	242	323	323	323	323
10. Public Administration and Defence ..	379	379	379	379	416	416	416	416
11. Services n.e.s. ..	859	816	780	954	1,074	994	942	1,206
12. Gross Domestic Product at current factor cost prices ..	10,856	9,813	9,652	10,287	11,939	11,694	11,881	11,573
13. Net factor income from abroad ..	- 75	- 104	21	- 37	- 57	- 24	- 34	- 124
14. Gross National Product at current factor cost prices ..	10,781	9,709	9,631	10,250	11,882	11,670	11,847	11,449
15. Indirect Taxes net of subsidies ..	1,256	1,496	1,948	2,056	1,550	1,441	1,630	2,787
16. Gross National Product at current market prices ..	12,037	11,205	11,579	12,306	13,432	13,111	13,477	14,236

TABLE 1 — (*Continued*)

Quarterly Estimates of Gross Domestic Product at Current Prices 1972 - 1981

Rs. Million

Sector	1980				1981			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	5,295	4,249	3,913	3,892	6,382	5,295	4,539	4,610
2. Mining & Quarrying ..	349	268	276	356	433	363	350	366
3. Manufacturing ..	1,805	1,976	2,234	2,482	2,398	2,320	2,335	2,526
4. Construction ..	1,363	1,146	1,352	1,691	1,756	1,745	1,893	1,607
5. Electricity, Gas, Water & Sanitary Services ..	151	142	148	160	196	180	210	220
6. Transport, Storage & Communications ..	1,671	1,594	1,572	1,605	2,227	2,079	1,957	2,033
7. Wholesale & Retail Trade ..	2,832	2,868	2,186	1,941	3,399	3,583	2,553	2,619
8. Banking, Insurance & Real Estate ..	373	411	453	548	562	606	631	663
9. Ownership of Dwellings ..	364	364	364	364	442	442	442	442
10. Public Administration and Defence ..	491	491	491	491	588	588	588	588
11. Services n.e.s. ..	1,461	1,264	1,353	1,510	1,940	1,657	1,799	2,080
12. Gross Domestic Product at current factor cost prices ..	16,155	14,773	14,342	15,040	20,323	18,858	17,297	17,754
13. Net factor income from abroad ..	- 51	- 79	- 140	- 162	- 233	- 331	- 552	- 597
14. Gross National Product at current factor cost prices ..	16,104	14,694	14,202	14,878	20,090	18,527	16,745	17,157
15. Indirect Taxes net of subsidies ..	2,034	1,026	1,458	5,550	2,298	1,617	4,113	3,768
16. Gross National Product at current market prices ..	18,138	15,720	15,660	20,428	22,388	20,144	20,858	20,925

TABLE 2

Gross Domestic Product at Constant (1980) Prices 1972 – 1981

Rs. Million

Sector	1972				1973			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	3,653	3,204	3,013	2,902	3,699	3,330	3,061	2,979
2. Mining and Quarrying ..	43	38	55	54	147	241	293	181
3. Manufacturing ..	1,553	1,775	1,409	1,371	1,400	1,280	1,193	2,322
4. Construction ..	777	807	919	885	914	797	956	793
5. Electricity, Gas, Water and Sanitary Services ..	73	70	73	75	80	77	80	71
6. Transport, Storage and Communication ..	1,191	1,227	1,151	1,165	1,234	1,121	1,112	1,288
7. Wholesale & Retail Trade ..	1,910	2,040	1,717	1,737	1,998	1,705	1,678	2,112
8. Banking, Insurance & Real Estate ..	134	136	139	145	148	149	145	138
9. Ownership of Dwellings ..	275	275	275	275	278	278	278	278
10. Public Administration & Defence ..	298	298	298	298	328	328	328	328
11. Services n.e.s. ..	957	863	875	1,061	1,080	924	940	1,145
12. Gross Domestic Product at constant (1980) prices	10,864	10,733	9,924	9,968	11,306	10,230	10,064	11,635
13. Net Factor Income from Abroad ..	- 159	- 232	- 146	- 169	- 104	- 118	- 146	- 140
14. Gross National Product at constant (1980) prices	10,705	10,501	9,778	9,799	11,202	10,112	9,918	11,495
15. Indirect Taxes net of subsidies ..	342	439	528	1,763	95	196	305	1,512
16. Gross National Product at (1980) Market Prices ..	11,047	10,940	10,306	11,562	11,297	10,308	10,223	13,007

TABLE 2 — (*Continued*)

Gross Domestic Product at Constant (1980) Prices 1972 - 1981

Rs. Million

Sector	1974				1975			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	3,927	3,555	3,259	3,078	3,913	3,419	3,289	3,178
2. Mining and Quarrying ..	129	156	161	91	164	180	191	182
3. Manufacturing ..	1,553	1,608	1,522	1,770	1,393	2,077	1,738	1,631
4. Construction ..	938	727	1,057	987	835	791	970	801
5. Electricity, Gas, Water and Sanitary Services ..	73	70	73	95	86	83	88	80
6. Transport, Storage and Communication ..	1,110	1,032	1,233	1,231	1,167	1,369	1,180	1,164
7. Wholesale & Retail Trade ..	1,928	2,011	1,801	1,989	1,930	2,342	1,940	1,743
8. Banking, Insurance & Real Estate ..	171	167	166	171	169	154	159	163
9. Ownership of Dwellings ..	302	302	302	302	307	307	307	307
10. Public Administration & Defence ..	364	364	364	364	373	373	373	373
11. Services n.e.s. ..	1,103	965	1,077	1,133	1,125	1,027	1,068	1,250
12. Gross Domestic Product at constant (1980) prices	11,598	10,957	11,015	11,211	11,462	12,122	11,303	10,872
13. Net Factor Income from Abroad ..	- 79	- 118	- 113	- 175	- 67	- 104	- 137	- 217
14. Gross National Product at constant (1980) prices	11,519	10,839	10,902	11,036	11,395	12,018	11,166	10,655
15. Indirect Taxes net of subsidies ..	289	171	390	1,502	- 66	214	147	1,451
16. Gross National Product at (1980) Market Prices..	11,808	11,010	11,292	12,538	11,329	12,232	11,313	12,106

TABLE 2 — (*Continued*)

Gross Domestic Product at Constant (1980) Prices 1972 - 1981

Rs. Million

Sector	1976				1977			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	4,251	3,449	3,384	3,034	4,891	3,791	3,581	3,313
2. Mining and Quarrying ..	269	253	231	286	26	206	198	274
3. Manufacturing ..	1,577	1,780	1,677	20,037	1,808	1,724	1,723	1,896
4. Construction ..	787	895	1,033	848	942	465	774	1,045
5. Electricity, Gas, Water and Sanitary Services ..	97	91	94	100	93	93	93	99
6. Transport, Storage and Communication ..	1,216	1,227	1,269	1,279	1,359	1,232	1,201	1,270
7. Wholesale & Retail Trade ..	1,934	1,917	1,996	2,016	2,262	1,933	1,850	2,055
8. Banking, Insurance & Real Estate ..	183	194	200	205	237	238	233	233
9. Ownership of Dwellings ..	310	310	310	310	315	315	315	315
10. Public Administration and Defence ..	389	389	389	389	405	405	405	405
11. Services n.e.s. ..	1,166	1,073	1,069	1,358	1,285	1,137	1,211	1,312
12. Gross Domestic Product at Constant (1980) prices	12,179	11,578	11,652	11,862	13,859	11,539	11,584	12,217
13. Net Factor Income from Abroad ..	- 95	- 123	- 160	- 229	- 18	- 312	- 116	- 130
14. Gross National Product at constant (1980) prices	12,084	11,455	11,492	11,633	13,841	11,227	11,468	12,087
15. Indirect Taxes net of subsidies ..	186	425	825	1,199	801	388	345	1,314
16. Gross National Product at current Market Prices	12,270	11,880	12,317	12,832	14,642	11,615	11,813	13,401

TABLE 2 — (*Continued*)

Gross Domestic Product at Constant (1980) Prices 1972 - 1981

Rs. Million

	1978				1979			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	4,991	4,071	3,706	3,595	5,123	4,136	3,998	3,529
2. Mining & Quarrying ..	235	202	312	382	317	224	267	382
3. Manufacturing ..	1,649	1,912	2,014	2,203	1,818	1,985	2,299	2,013
4. Construction ..	1,053	806	1,194	1,078	1,274	1,259	1,269	1,194
5. Electricity, Gas, Water and Sanitary Services ..	115	112	121	106	128	134	140	140
6. Transport, Storage & Communication ..	1,325	1,247	1,352	1,392	1,537	1,447	1,332	1,342
7. Wholesale & Retail Trade ..	2,267	1,964	2,089	2,279	2,368	2,154	2,197	2,227
8. Banking, Insurance & Real Estate ..	279	299	297	304	409	415	359	344
9. Ownership of Dwellings ..	331	331	331	331	344	344	344	344
10. Public Administration & Defence ..	437	437	437	437	464	464	464	464
11. Services n.e.s. ..	1,308	1,250	1,198	1,474	1,369	1,319	1,262	1,538
12. Gross Domestic Product at Constant (1980) prices	13,990	12,631	13,051	13,581	15,151	13,881	13,931	13,517
13. Net Factor Income from Abroad ..	84	115	23	39	62	26	35	131
14. Gross National Product at Constant 1980 prices ..	13,906	12,516	13,028	13,542	15,089	13,855	13,896	13,386
15. Indirect Taxes net of subsidies ..	1,818	2,105	2,652	2,735	2,027	1,871	1,948	3,239
16. Gross National Product at 1980 Market Prices ..	15,724	14,621	15,680	16,277	17,116	15,726	15,844	16,625

TABLE 2 — (*Continued*)

Gross Domestic Product at Constant (1980) Prices 1972 - 1981

Rs. Million

	1980				1981			
	1	2	3	4	1	2	3	4
1. Agriculture, Forestry & Fishing ..	5,269	4,345	3,970	3,764	5,001	4,525	4,311	4,073
2. Mining & Quarrying ..	357	253	261	378	410	310	276	306
3. Manufacturing ..	1,798	2,089	2,216	2,347	2,152	2,152	2,154	2,384
4. Construction ..	1,416	1,016	1,449	1,671	948	1,217	1,459	1,756
5. Electricity, Gas, Water and Sanitary Services ..	151	142	148	160	162	151	177	183
6. Transport, Storage & Communication ..	1,538	1,362	1,496	1,641	1,774	1,526	1,527	1,614
7. Wholesale & Retail Trade ..	2,426	2,245	2,337	2,514	2,638	2,458	2,506	2,585
8. Banking, Insurance & Real Estate ..	379	417	449	537	513	548	497	492
9. Ownership of Dwellings ..	364	364	364	364	384	384	384	384
10. Public Administration & Defence ..	491	491	491	491	511	511	511	511
11. Services n.e.s. ..	1,457	1,278	1,438	1,653	1,665	1,423	1,435	1,764
12. Gross Domestic Product at Constant (1980) prices	5,646	14,002	14,619	15,520	16,158	15,205	15,237	16,052
13. Net Factor Income from Abroad ..	54	80	133	155	226	330	500	537
14. Gross National Product at Constant 1980 prices ..	15,592	13,922	14,486	15,365	15,932	14,875	14,737	15,515
15. Indirect Taxes net of subsidies ..	2,205	1,034	1,422	5,229	2,063	1,387	3,442	3,015
16. Gross National Product at 1980 Market Prices ..	17,797	14,956	15,908	20,594	17,995	16,262	18,179	18,530

TABLE 3

Changes in the GNP Deflator (1980 Average Annual = 100)

	Annual	Quarterly			
		1	2	3	4
1972 ..	—	—	- 3·2	1·0	2·3
1973 ..	15·3	12·3	- 0·4	5·4	- 5·8
1974 ..	22·6	23·2	2·4	1·1	- 6·9
1975 ..	8·2	16·1	- 7·4	4·4	3·0
1976 ..	5·9	4·8	- 2·2	- 1·9	4·3
1977 ..	21·2	10·0	15·6	- 4·9	- 0·2
1978 ..	7·0	7·5	0·1	- 4·7	2·4
1979 ..	9·4	4·0	7·0	1·2	0·3
1980 ..	21·1	20·8	5·5	8·7	- 1·3
1981 ..	17·8	27·7	1·3	8·8	2·7

Mr. Terrence Savundranayagam, Additional Director of Economic Research has responsibility for International Finance, Trade and Industry. He is an economics honours graduate of the Universities of Sri Lanka and London and holds a Masters Degree from the University of Melbourne. His major research interest is National Income Accounts.

DETERMINANTS OF SHORT - TERM FLUCTUATIONS IN PRODUCTION AND FUTURE PROSPECTS FOR THE COCONUT SECTOR IN SRI LANKA

Y. M. W. B. WEERASEKERA*

ABSTRACT

This study highlights the importance of the two most crucial factors in explaining the short term variations in coconut production : rainfall and fertilizer application, using standard multiple regression techniques. It also outlines the short-comings in the present method of estimating coconut production in Sri Lanka. The study suggests that, in order to boost production in the short run, a suitable scheme to provide irrigation facilities to growers in the drought hit areas and an attractive scheme to increase the use of fertilizer particularly by the small holders are of paramount importance.

Introduction

Coconut production in Sri Lanka in the past decade or so has been subject to heavy cyclical fluctuations. For Instance, from a peak level of production of 2,963 million nuts in 1972, it dropped to 1,821 million nuts in 1977 *i.e.* a fall of over 1,142 million nuts or 39 per cent. Again, after hovering around an average production level of 2,300 million nuts during 1977-1983, it plunged back to a very low level of 1982 million nuts in 1984. It might be interesting to know that the production in 1984 was exactly equal to that obtained 34 years ago. Past record in terms of the levels of output, yield, local consumption, exports, sector's share in the gross domestic product and extent cultivated signals that the coconut industry is in a fairly critical stage.

The coconut yields in the recent past have shown little or no improvement. The area under bearing which appears to have remained fairly constant around an average of 400 thousand hectares during the period 1960-1980 declined to 395 thousand hectares during 1981-1985. The implicit average yield—obtained by dividing total production by the extent under bearing—had been 5,944 nuts per hectare for 1981-1985 as against a high of 6,863 nuts for 1961-1965. It can be observed from Table 1 that the average yields had declined steadily during the 20 year

* Thanks are due to Dr. L. L. Gunaratne, Deputy Director of Economic Research and Dr. A. Karunasena, Senior Economist for helpful comments. I am also grateful to Mr. A. Piyanandana, Senior Programmer Analyst for computing assistance.

period 1961-1980. The slight improvement of average yield during 1981-1985 as compared with 1976-1980 is due to a high level of production assumed for 1985, a fall in the area under bearing and our assumption that this area remained constant for that period. Hence it has to be read with caution.

TABLE 1

Extent under Bearing, Yield per Hectare and Output

Item / Period	Average Extent under Bearing (hectares)	Average Yield (nuts per hectare)	Average output (million nuts)
1961—1965 ..	397,216	6,863	2,726
1966—1970 ..	405,985	6,123	2,486
1971—1975 ..	399,335	5,977	2,387
1976—1980 ..	404,973	5,321	2,155
1981—1985* ..	394,531	5,944	2,345

Sources : Coconut Development Authority, Central Bank of Sri Lanka.

* Assumes a forecast production of 2,650 million nuts for 1985 (*Source :* Ministry of Coconut Industries). Since most recent data on extent under bearing are not available, we have assumed that the 1980 extent which had been estimated at 394,531 hectares would remain constant for the period 1981-1985.

The domestic consumption of coconuts increased steadily in recent years resulting in a continuous downward trend in the volume of exports. The export surplus which stood at 52 per cent of production in 1950 fell to 25 per cent in 1984. This resulted in a decline of the relative importance of Sri Lanka's share of coconut exports, particularly coconut oil exports in the total coconut exports of the world. The share of coconut products in the total export earnings too declined from an average of 11.1 per cent during 1960-1975 to about 6.4 per cent during 1980-1984.

The share of the coconut sector in the GDP too declined in importance over the years. The sector's share which stood at 5.9 per cent in 1970 fell to 2.5 per cent in 1980-1982 and remained at the same level in 1984. Furthermore, during the period 1961-1980 the output declined by 21

per cent, and yields by 23 per cent, signalling an overall deterioration of the sector's performance. Several variables have been associated with this apparent deterioration. These factors could be briefly identified as the worsening age composition of trees, low level of fertilizer application, adverse weather conditions, and lack of land development.

In this paper, an attempt is made to identify the variables that have a bearing on short-term fluctuations in production. This would help in the formulation of policy towards arresting these fluctuations and improve the long-term viability of the industry.

The plan of the paper is as follows. The next section will discuss the variables that influence short-term variations in production. It also discusses the selection procedure that we used in the regression models that follow. After a brief interpretation of our results, we present a section on the limitations of the study titled " Quality of data and analysis of results ", followed by two further sections ; one on the importance of irrigation facilities and the other on the importance of fertilizer application. The final section attempts to summarise the paper and gives an overall conclusion.

Factors Influencing Production

The two most important inputs to agriculture are land and water. Prices of inputs and outputs too bear significance. Fertilizer and other Agro-chemicals improve productivity in the short-run. In an algebraic function to estimate the magnitude of the effects on production of each explanatory variable, above factors have to be represented by such variables as coconut acreage, extent of underplanting, replanting and new planting, rainfall, fertilizer application and incidence of pests and diseases and so on. However, the specification of the production function is dictated by the availability of data. On the basis of theoretical considerations and the availability of data the following functional relationship can be presented.

$Q_t = f(YLD_t, FZU_{t-1}, RNF_{t-1}, PDM_{t-1})$ (i), where,

Q_t = Output (in million nuts) at time t

YLD_t = yield (in nuts) at time t

FZU_t = Fertilizer application in thousand metric tons at time t

RNF_t = Average rainfall in millimetres at time t, and,

PDM_t = Domestic market price of a coconut at time t.

The coconut bearing acreage, as shown elsewhere, has been fairly constant over the past 35 years. The use of this variable in our equation did not provide plausible results as expected. However, we have used the average yield as an explanatory variable which not only take account of both changes in output and coconut bearing acreage, but also saves us from the specification error caused due to omission of acreage as an independent variable. With regard to underplanting, replanting and new planting that have taken place during the past 15 years or so, they can be safely assumed to have been hardly sufficient to meet any decline in production due to increasing senility and loss of trees due to various other reasons such as increasing demand for housing purposes etc. Similarly, the impact of pests and diseases, if at all, could also be assumed to have been negligible except in few years.

Theoretically, prices are expected to have an impact on output. In order to study this relationship, we used nut prices in the domestic market as an independent variable. Actually, producer price (farm gate price) is more relevant in explaining production than the consumer price. Since there is a close relation between the two prices and data on consumer prices are easier to obtain and more reliable, we used consumer prices as a proxi for the producer prices. However, the results were very disappointing. In fact, the relationship between prices and output turned out to be a negative one. One should note here that prices influence fertilizer use which in turn affects production. The use of both these variable in our specification could well be a reason for the unsatisfactory results with prices. Even the use of 1 to 2 year lags did not improve out results. Same procedure was followed using export prices of both desiccated coconut and coconut oil, as well as the average of the two. All these exercises showed that the prices (either f.o.b. or domestic market) explain very little of the short-term changes in production.[1]

The next important explanatory variable is the fertilizer application. It is generally known that the fertilizer applied on a holding that had not received fertilizer before will show a positive response in the subsequent year and it will build up in the second year too. However, the full impact is observed only in the 3rd and 4th years. The most

1. This does not mean that prices do not influence production. Our results show that the direct effects of prices on production would be small.

suitable form of this variable in the regression had to be selected from the estimated results with different lagged values of fertilizer use. Thus, it was found that the fertilizer application with one year time lag would explain short-term variations in production better than other forms of the variable.

The rainfall is considered as the most important independent variable that explains short-term fluctuations in production. Customarily, water is one of the two most important factors explaining production. It has been observed from past data that changes in coconut production have been largely explained by the changes in weather conditions. Since rainfall, as in the case of fertilizer, increases production through increased yields, our attempts to use yield as an explanatory variable caused the problem of multicollinearity between the two variables. On the other hand, one could easily guess the outcome as the coconut production changes are the direct results of changes in yield, since bearing area has remained almost constant i. e.

$$Q = YA \text{ or } Y = Q/A \quad \text{——————} \quad \text{(ii)}$$

where Q = output, Y = yield and A = bearing acreage

This leads us to the question as to whether it is more appropriate to take yield as the dependent variable and subsequently production estimated indirectly. Assuming yield is a function of fertilizer application and rainfall, we could write the output function as

$$Q = A\, f(FZU, RNF) \quad \text{——————} \quad \text{(iii)}$$

or

$$Q/A = Y = f(FZU, RNF) \quad \text{——————} \quad \text{(iv)}$$

We could thus estimate the following equation to obtain the yield which could then be converted into output using coconut bearing extent.

$$Y_t = a + b_1 FZU_{t-1} + b_2 RNF_{t-1} + u_t \quad \text{——————} \quad \text{(v)}$$

where u_t = random error.

Since the above formulation appears to be rational, we have decided to use 'yield' as a dependent variable. Thus, rainfall and fertilizer application with one year lag, were found to be the most important independent variables explaining short-term variations in production. We are, therefore, presenting the estimates of the equation,

$$Q = b_0 + b_1 FZU_{t-1} + b_2 RNF_{t-1} \quad \text{——————} \quad \text{(vi)}$$

which is the modified version of output function given in equation (i), together with the results of yield equation (equation v) for the purpose of comparison.

Yields

$$Y = \underset{(2.074)}{2187.101} + \underset{(2.467)}{26.953}\ FZU_{t-1} + \underset{(2.694)}{1.282}\ RNF_{t-1}$$

$R^2 = 0.40$

$\overline{R}^2 = 0.34$

D. W. Statistic = 1.90

F. Statistic = 7.21

S. E. R. = 631.22

' t ' values in parantheses.

These results show a number of interesting points. The constant term indicates that even if the fertilizer application and the effect of rainfall is zero, there would still be a yield of 2187 nuts per hectare. But in the long-run the yields could deteriorate unless water is not made available to the palms (either through rain or by irrigation). The results also show that an increase of fertilizer use in the coconut sector by 1000 metric tons would raise the average yield by approximately 27 nuts adding 11 million nuts to total production. Similarly, an improvement in weather conditions, say, for example, increased rainfall in the coconut growing areas by 25 millimeters (= 1 inch) would raise yields by 32 nuts raising production by 13 million nuts. Moreover, the two variables are highly significant (at 5 per cent level) in explaining the changes in Yields. However, the coefficient of determination indicates that only 40 per cent of the variation in yields is explained by the rainfall and fertilizer application. In order to examine what explains the balance 60 per cent of the variations, further experiments were carried out by adding more possible explanatory variables to the regression model but the results did not improve. Therefore, the low value of the coefficient of determination could possibly be due to considerable errors in estimating production to which we shall come later. Also, the issues arising from the complicated relationships between production and inputs as well as those arising from the selected form of the equation cannot be ruled out.

Production

In an attempt to study the relationship between production, rainfall and fertilizer application we estimated equation (vi) and obtained the following results.

$$Q_t = \underset{(2.196)}{896.090} + \underset{(2.531)}{10.698}FZU_{t-1} + \underset{(2.745)}{0.505}RNF_{t-1}$$

$R^2 = 0.41$

$\bar{R}^2 = 0.35$

D. W. Statistic = 1.98

F. Statistic = 7.53

S.E.R. = 244.23

' t ' values in parantheses.

The significant impact of fertilizer use and rainfall on production is further confirmed by these results. According to our estimates, the minimum production obtainable with minimum rainfall and fertilizer use is 896 million nuts. However, the potential for improving production by increased fertilizer application and providing sufficient water to the sector (either irrigation or rainfall) is substantial as shown by the highly significant (at 5 per cent level) coefficients for the two explanatory variables. The coefficient for fertilizer use indicates that an increase of fertilizer use in the sector by 1 thousand metric tons could raise overall production by about 11 million nuts. At the same time, 25 millimeters (= 1 inch) increase in the rainfall would increase production by nearly 13 million nuts. However, rainfall and fertilizer use together explain only 41 per cent of the variation in production. The interaction between the two variables as well as measurement errors in variables as discussed elsewhere may have caused the low value of the coefficient of determination.

Quality of data and analysis of results

The results obtained in this study as well as observations made by other authors and institutions on production trends are subject to one qualification, that is, the margin of error in production data is quite large. The annual coconut production in the country is estimated in

an indirect way by adding the nut equivalent of domestic consumption of fresh nuts and coconut oil to the estimated nut equivalent of copra exports, desiccated coconut and coconut oil.[2]

Despite the various limitations inherent in this method such as (*a*) the variation involved in conversion into nut equivalent, (b) inaccuracies due to ignoring of the stock variation, and (*c*) the problems involved in estimating local consumption, the institutions such as the Dept. of Census and Statistics, Central Bank of Sri Lanka, Chamber of Commerce, Coconut Development Authority, Coconut Research Board and the Coconut Marketing Board, continue to use this method in estimating production. However, their estimates differ from each other's due to difference in per capita consumption figures used.

There is no general consensus on the estimates of per capita consumption. Various institutions have, from time to time, used different estimates based on different survey results. The " Socio-Economic Survey of Ceylon 1969/70 "[3] (SES) of the Department of Census and Statistics indicates that the average per capita consumption of fresh nuts was 90 nuts and the average per capita consumption (households only) of coconut oil was 6.12 bottles (*i.e.* 34.53 nuts). This works out to an average per capita consumption of both nuts and oil (nut equivalents) of 125 nuts. This is the estimate that had been widely used in official estimates during the 70's. The Central Bank of Sri Lanka employed an estimate of 122 nuts before 1963 and 125 nuts after 1963 which closely agrees with the SES estimate.

There are, however, drawbacks in this method of estimating production. Firstly, it ignores the variation in consumption due to changes in prices (*i.e.* price elasticity). It is common knowledge that coconut consumption declines when prices rise sharply.

---

2. Conversion of metric tons into nut equivalents are done as follows :

1 *MT.*	*Nuts*
C'oil	8000
D. C.	6800
Copra	4925

3. *Socio-Economic Survey of Ceylon*, 1969/70, Department of Census and Statistics, Colombo p 170-171.

Secondly, it also responds to changes in income of the people (*i.e.* income elasticity). The SES 1969/70 states "the consumption of coconut bears a distinct relationship to the income levels of the households. The average per capita consumption varies from a minimum of 7 nuts per month at the lowest level to a maximum of 11 nuts at the highest level of income. The survey shows that rural households on the average consume more coconuts than urban or estate households."[4]

Thirdly, it varies with the availability of other items of diet. For example, an increase in the use of wheat flour, particularly in the estate sector, could lead to an increased consumption of coconuts as they are complementory. Coconut is used with wheat flour in making the popular diet " Rotti." Finally, the domestic industrial sector consumption of coconut as an input is quite significant and needs to be taken into account in estimating domestic consumption. This figure for 1969/70, according to Census and Statistics Department, stands at 90 million nuts which again is sensitive to prices since small soap manufacturers tend to stop production when prices are too high or turn to other substitutes such as imported palm oil (substitution effect).

The method presently used in estimating production is almost similar to the previous method, except that the present method excludes local oil consumption from the per capita consumption. Instead, nut equivalent of the estimated oil consumption is added to oil production which, however, has a drawback *i.e.* the reported oil production is limited to that of registered oil mills. There are a few non-registered oil mills as well as certain amount of home made oil being used in domestic consumption. To take this into account a correction factor of 10 per cent is added to the registered oil production.

In this manner, the per capita consumption is now estimated at 92.4 nuts excluding oil consumption. This estimate is based primarily on the results of the 1981/82 Consumer Finance and Socio-Economic Survey conducted by the Central Bank of Sri Lanka. The report states " No overall change in coconut consumption has occurred between 1978/79 and 1981/82 when per capita consumption has remained at 7.7 nuts (per month). In 1973, per capita monthly consumption was lower at 6.85 nuts. "[5]

---

4. Ibid p. 171.
5. *Consumer Finances and Socio Economic Survey* 1981/82, Part 1 Central Bank of Ceylon, Colombo, October 1984, p. 253.

The production data that we have used in the time series regression are subject to the above limitations. It must be borne in mind that about 75 per cent of the total annual production is consumed locally and when the estimates of domestic consumption have wide margins of error, any statistical exercise is bound to give unreliable results. The low value of the coefficient of determination in our equations may be attributed partly to the limitations of the production data. This was further confirmed by our exercise where we added other possible left-out variables such as level of public investment in the coconut sector and domestic prices as well as foreign prices, which are likely to have an impact on production, but such additions did not improve the coefficient of determination. The low R^2, however, does not mean that the results are unsatisfactory. A higher R^2 could be generally preferred if one intends to make a future production forecast since it could be more accurately predicted if R^2 is closer to 1 (meaning observed and estimated values are almost same). However, our objective is rather different *i.e.* to select the variables which influence the short-term fluctuations in production most and to study the magnitude of the impact of such variables. Therefore, the main concern of this exercise is the significance of the variables measured by the coefficients and their respective ' t ' values.

Importance of Irrigation in Coconut Lands

Much has been written on the impact of rainfall on coconut production. However, there appears to be little hope for improvement with regard to the weather patterns in the coconut growing areas. Some have expressed pessimism that the rainfall has deteriorated over the years. For example, the Low Country Products Association of Ceylon once reported ".... It must be understood that the currently reduced rainfall, particularly during South-West monsoon months, which has such adverse effect on production is not an isolated incident but the result of a trend which has become increasingly apparent over the last fifteen years. It is therefore, likely to continue and all planning should be done with this inescapable fact in mind."[6]

6. Quoted in the " Report of the committee appointed to review the policy framework applicable to the coconut industry " - B. S. Wijeweera, A. S. Jayawardena and S. Easparathasan. (Unpublished), Ocotober, 1979.

This is no exaggaration and the same point has been reiterated recently by the Ministry of coconut industries. In its report " Progress 1984 ", it is stated that ".....In the absence of irrigation, the coconut palm requires adequate rainfall spread over most part of the year for its sustenance. It is observed that during the last 15-20 years, the weather patterns in the country have changed for the worse and drought conditions prevail more frequently than before. This had a depressing effect both on the quantum as well as the size of coconuts produced during this period."[7]

Following table brings out the pattern of declining rainfall and associated fall in production in major coconut producing areas.

TABLE 2

Changes in Rainfall and Coconut Production

Rainfall Station	1963-72 (inches)	1973-82 (inches)	Change (%)
Kurunegala ..	91.9	76.3	- 16.9
Puttalam ..	47.2	45.5	- 3.6
Chilaw ..	57.1	56.5	- 1.1
Lunuwila ..	79.5	71.4	- 10.7
Average ..	68.9	62.4	- 9.4
Production—All island (million nuts) ..	2,622	2,191	- 16.4

Source : Coconut Development Strategy, Ministry of Coconut Industries, October 1984, P. 16

The importance of water in coconut growing is well established. A word about how it really affects the palm might be in order. The coconut palm lacks a tap root and stores very little moisture. Generally, that part of the root system responsible for the uptake of nutrients lies at a very shallow depth beneath the surface of the soil. Hence, an

7. *Progress* 1984—Ministry of Coconut Industries, Colombo, March 1985, P. 2.

adequate level of surface moisture, usually associated with regular rainfall, is necessary for its proper development. Unfortunately, it is also the surface layer of the earth which dries up first with the onset of a dry spell thus making the coconut palm very vulnerable to moisture stress.

The moisture stress caused by lack of rainfall in a given year takes its toll in the following year. Our results have shown that rainfall variable with one year lag gives the best positive correlation with production (*i.e.* coefficient of correlation = 0.48) and a highly significant (statistically) coefficient with the right sign. The significance of the lagget effect of rainfall has been observed by other authors as well. Abeywardena[8] states "The fact that there is a year's lag between the incidence of rainfall and its effect over the final production, is a distinct advantage in the sense that if the precise relationship can be worked out between coconut crops and rainfall, a forecast one year ahead is a possibility."

Present policy on irrigation of coconut lands

The importance of increasing coconut production in view of its contribution to both domestic consumption and foreign exchange earnings, has been constantly emphasised by the government and other concerned institutions and persons. At the same time they have also recognised that rainfall and fertilizer application are the two most important factors that influence production. Moreover, there is evidence to show that output is more responsive to rainfall than fertilizer application. In this situation, provision of irrigation facilities by way of wells should receive sufficient attention in view of the long term trend of deteriorating weather conditions.

However, the government's development strategy on the coconut sector does not seem to pay sufficient attention to this crucial factor. It aims at "expanding production through a price stabilization scheme and increase in fertilizer use." The fact that even the fertilizer application depends largely on availability of water (either through irrigation or by rainfall) appears to have been ignored in the "strategy"[9]. The "Progress 1984" however, has realized the need for irrigation. According

8. V. Abeywardena — "An interim production function to forecast coconut production in Ceylon using fertilizer consumption and rainfall data"—Coconut Institute of Ceylon Colombo 1971, P. 1.
9. See Coconut Development Strategy Ministry of Coconut Industries, Colombo, Sri Lanka, October 1984. P. 42.

to this report, the Coconut Development Authority has introduced a pilot subsidy scheme in 1981 to provide tube wells for coconut cultivation in the Puttalam district. Though this was subsequently extended to other parts of the coconut triangle the results were not encouraging. The report also says that the scheme is now being revised to make it more attractive at least to large and medium size plantations. Provision of tube wells under the East Coast Rehabilitation Project has proved more successful. However, in the absence of details of the subsidy scheme and its effectiveness, the farmers' response to it cannot be accurately assessed.

The need for irrigation facilities has been highlighted on many occasions. The East Coast Rehabilitation Project has focused on the provision of irrigation not only to mature palms, but also to the seedlings particularly in the eastern coastal area. It says " In Polonnaruwa, the drought has been responsible for the mortality of the seedlings in about 67% of the cases....".[10] In this area water has been applied with frequencies of once in two days, once in three days, and once a week. However, water application is not possible at times of severe droughts due to drying up of water resources. The project thus highlights the importance of the Tube Well Programme as against draw wells (which are currently being used). Draw wells as a source of water is not a sufficient guarantee against continued severe droughts.

It has been pointed out that the nature of the coconut palm is such that watering the roots of the palm once in 3 or 4 days would be sufficient to overcome a moisture stress, and hence, a well with a fair supply of water could provide water to about 50 acres of coconut land.[11] Therefore, a programme for supplying the farmers with tube wells or draw wells by the government where appropriate would be an effective and welcome measure which should provide a boost to production. This should be supplemented by a programme for water management and distribution which has to be drawn up before such projects are undertaken in large scale.

Fertilizer Application and Production

Fertilizer is the second most important factor, next to rainfall, which affects coconut yield and therefore the production in the short-run. Our results too bear testimony to this. Regular use of fertilizer *i.e.* at the

10. East Coast Rehabilitation project - Sample survey on progress U. V. H.Perera, L. Ranbanda, & C. Edirisuriya, Economic Research Division, CDA, Colombo March, 1985.
11. Wijeweera B.S. et al—op. cit. p. 6.

rate of 7–10 lbs. per palm per annum, given sufficient rainfall or irrigation is expected to raise production by 1,000 nuts/acre (2,471 nuts/ha.) which is almost 50 per cent of the national average yield. The Coconut Research Institute has reported the following response rates.[12]

TABLE 3

Response rates to Fertilizer Application

Rate lb./palm	Response lb. copra/acre	Standardised response
3½	517	0·77
7	635	0·95
9	670	1·00

The last column of Table 3 indicates that, if the rate of application of 9 lb./palm is the standard dosage, fertilizer applied at the rate of 7 lb. would give 95 per cent of the yield given by an acre fertilized at the rate of 9 lb./palm. Similarly, 3½ lb./palm would give 77 per cent of the yield given by an acre with the standard dosage. This implies a possibility of substitution between the amount of fertilizer applied and the extent to which it is applied. For example, according to above table, 100 acres fertilized at the rate of 3½ lb./palm would be equivalent to 77 acres fertilized at the rate of 9 lb./palm. The different yield responses, however, are subject to the law of diminishing returns.

The impact of fertilizer application on yield is usually felt with a lag of one year. In the present study too, one year lag provided the best results. Commeting on the effect of fertilizer application, Abeywardena stated thus: "It is generally known that fertilizer applied on a holding that had not received fertilizer before, will show a response in the subsequent year. This response builds up in the second year too. In fact, the full impact of fertilizer applied is observed only in the third or fourth year."[13] However, in view of the difficulties in isolating the effects each year due to a given year's fertilizer application, we shall only concern ourselves with the immediate impact *i.e.* one year's lag which has also given better results compared to longer lags.

12. Abeywardena – op. cit. P. 5.
13. Abeywardena – op. cit. p. 6.

Despite the apparent significance of this crucial factor of production, coconut remains the weakest sector in terms of fertilizer use. The fertilizer application in the past had been far below recommended levels. It has been reported that fertilizer use during 1972-77 period was only sufficient to cover 11 per cent of the total fertilizer requirement of the coconut sector. The quantity of fertilizer used in the sector had declined from 55,774 metric tons in 1980 to 37,710 metric tons in 1981, a drop of 32 per cent. With the price increases which occurred in February and September, 1981 and due to disincentives created by low returns on expenditure on fertilizer caused by a decline in coconut prices since May, 1981, the fertilizer use declined further to 30,300 metric tons in 1982 It was since 1983, the fertilizer use in the sector has begun to increase. It is evident that this increased use would clearly lead to an increased level of production in the subsequent years, particularly from 1985. The year 1984 was badly affected due to adverse weather conditions during most parts of 1983 despite an increase in fertilizer use in that year. This means that fertilizer application alone would be of no use but it is complimentary to rainfall in improving productivity.

It is believed that a mere increase in the total fertilizer applied has little impact on production unless accompanied by an even spread on the area to which fertilizer is applied even at the cost of a reduced dosage. Whether this is the right policy is debatable. One could argue that maximum productivity (and hence production) through the use of standard dosage from a given amount of land is preferable to low productivity (sub-normal application of fertilizer) from a larger extent. In other words fertilizer may be applied until the marginal product becomes equal to zero. Obviously the optimum situation is to use the standard dosage (*i.e.* 10 lbs. per/palm per annum) to the entire extent. The question, however, is whether this is possible under present condition; *i.e.* reduced fertilizer subsidy (means increased prices) and lack of irrigation facilities.

There is a host of factors which determine fertilizer use in the coconut sector. They are, among others, price of fertilizer, price of coconuts, availability of fertilizer, weather conditions and financial situation of the land owner. No statistical analysis of these factors has so far been done but a survey conducted by the Coconut Development Authority in 1981 states that " the major reason given by the land owners for the

non-application of fertilizer or its abandonment during the current year (1981), is the high fertilizer price and the corresponding low return on investment in fertilizer."[14] The low returns are due to low nut price/ fertilizer price ratio and drought conditions. Apart from above, financial difficulties of farmers too have caused reduced or complete non-application of fertilizer in the coconut sector. Similar findings have been obtained in another survey by the Agrarian Research Training Institute (ARTI). The report of the survey states "there is a clear relationship between the prices of fertilizer and their application. Many farmers have abandoned fertilizer application because of the escalation of prices since 1981."[15]

Some indication to this effect is given in Table 4 where the price changes in the main varieties of fertilizer used in coconut cultivation are given.

TABLE 4

Changes in retail prices of Fertilizer at State Wholesalers*

(Rs. per Mt.)

Year and Month of price change / Fertilizer (Variety)	Sept. 1979	Feb. 1981	Sept. 1981	May. 1983	Feb. 1985
SA ..	1,490	3,285	4,270	3,600	3,600
		(120)	(30)	(-16)	(—)
Urea ..	980	2,140	2,783	2,850	2,580
		(118)	(30)	(2)	(—)
RP ..	690	1,255	1,635	2,000	2,000
		(82)	(30)	(22)	(—)
MOP ..	1,065	2,230	2,900	2,750	2,570
		(109)	(30)	(5)	(—)
Kiezerite ..	1,230	2,645	3,440	4,800	4,800
		(53)	(30)	(40)	(—)

* Percentage changes are given in brackets underneath the prices.

Source : Review of the Fertilizer Year 1983, & data supplied for the Annual Report of the Central Bank of Ceylon, 1984. National Fertilizer Secretariat, Colombo.

14. U. V. H. Perera & L. Ranbanda–" Factors affecting the consumption of coconut fertilizer in 1981 in the coconut triangle." CDA, October, 1981. pp. 5-6.
15. G. M. Henegedara–" A process evaluation of coconut cultivation in the Kurunegala District. A sub-study of the Kurunegala Integrated Rural Development Project." Research study No. 62, Agrarian Research & Training Institute, December, 1984. p. 69.

According to these data, the prices of commonly used coconut fertilizers, MOP, SA and Urea, increased by 109 per cent, 120 per cent and 118 per cent respectively between 1979 and 1981. Between September 1981 and May 1983, the prices of MOP, Urea, RP and Kiezerite increased further by 5 per cent, 2 per cent, 22 per cent and 40 per cent, respectively. These price increases accord well with the low level of fertilizer application in the coconut sector in the recent past. The situation has been aggravated by the Government policy in those years, which has been directed, towards reducing subsidies in order to curtail the financial burden on the Government. It can be seen that in the past few years, particularly since 1979, the subsidy rates on fertilizer have been reduced. (*see* Table 5).

TABLE 5

Rates of Government Subsidy on Fertilizer

(As a percentage of CIF cost)

Fertilizer (variety) \ Period for which subsidy was applicable	Oct. 1979 to Jan. 1981	Feb. 1981 to Sept. 1981	Sept. 1981 to May. 1983	Since May 1983
SA ..	55	30	Nil	Nil
Urea ..	85	75	65	60
RP ..	75	60	30	30
MOP ..	75	60	40	40
Kiezerite ..	75	60	24	Nil

Source : Adopted from Table 3 of the RFY 83, National Fertilizer Secretariat, May, 1984.

The government's role in the subsidy policy takes two forms ; a general subsidy on fertilizer and a coconut fertilizer credit scheme. It also claims to have strengthened the coconut fertilizer distributional net work and the issue of fertilizer along with the planting material and the recovery of its value from the development subsidies. The total annual government subsidy on fertilizer for all crops is Rs. 1,000 million. Subsidies are fixed sums per ton (on the basis of CIF value) for specific chemical fertilizer ingredients and since effective price varies from one kind to another the application too is likely to vary accordingly. Also, the structure of subsidies tend to favour fertilizers used

in paddy production, mainly urea. Since urea is the most popular fertilizer in paddy as well as coconut the possibilities of fertilizer transfers between the sectors depending on the availability of water and finance, cannot be ruled out.

The liquidity problems of the farmers have also been identified as a constraint in using fertilizer in coconut lands. In order to solve this problem the government in 1979 introduced a low interest credit scheme, to be operated through the two state owned commercial banks. The scheme did not appear to be very successful until 1984 owing to high fertilizer prices, lower rate of subsidy on fertilizer and adverse weather conditions. In 1984, however, the total number of loans granted and amounts disbursed increased considerably indicating the impact of good weather on fertilizer use and hence the increased demand for fertilizer credit. High nut prices in the domestic market too played an important role in this respect.

As we have noted above, fertilizer price, subsidy rates, credit facilities and output prices are highly correlated with the amount of fertilizer applied in the coconut sector. These, however, are subject to the conditions of changing weather patterns and availability of fertilizer in the area when it is most needed.

In view of the crucial necessity to increase the application of fertilizer in coconut to boost production, the need to introduce an attractive package of incentives could be well justified. The existing systems should be first carefully studied with a view to making necessary changes to ensure that small holders can benefit from it. A mere increase in the subsidy may not be the ideal situation as it might lead to leakages to other sectors. The particular scheme should be designed in such a way that the growers have easy access to both credit and fertilizer. It should also guarantee that the fertilizer issued to the coconut sector is used properly and entirely in that sector.

Among the other areas of major concern, pricing policy is perhaps the most important. In recent years, pricing policy in the coconut sector has been dominated by the idea of insulating consumers from rising prices. Thus, the fundamental principle that producers should receive a reasonable return on their investment in order to induce

production would have been greatly undermined. Equally important are the programmes on replanting, new planting and underplanting as well as rehabilitation of coconut lands. Intercropping too should receive greater attention than what it is receiving now. All these aspects need to be carefully studied and, therefore, more research should be directed towards achieving that end.

Summary & Conclusion

In this paper, we have only dealt with the two most important factors which affect production, *i.e.* rainfall (or irrigation) and fertilizer. Even the two factors we have focussed on, needless to say, need further study before any firm conclusions are made. All we have done is to highlight the importance of the two variables in explaining short-term variations in coconut yields and production. Our results have proved that rainfall is the most important factor explaining short-term variations in the level of coconut output. However, frequent drought conditions have become a common phenomenon in Sri Lanka in recent years reflecting in lower levels of output. We would like to reiterate, therefore, that unless a suitable scheme to provide irrigation facilities to growers in drought hit areas is carried out , the coconut production not only in the short-run, but also in the long-run, is likely to be severely affected. It has also been observed that fertilizer application is the second most important factor next to rainfall which affects coconut yields and output in the short run. However, the fertilizer use in the sector in the past had been severely restricted due to high prices of fertilizer and/or low prices of fresh nuts despite a reasonable subsidy on fertilizer. In view of the sector's ability to raise yield and thus output in the short-run, the need to work out a more attractive scheme to increase the use of fertilizer, particularly by the small holders is of paramount importance.

REFERENCES

1. Abeywardena - An interim production function to forecast coconut production in Ceylon using fertilizer consumption and rainfall data, Coconut Institute of Ceylon, 1979.
2. Central Bank of Sri Lanka - Annual Reports, various issues.
3. Central Bank of Ceylon—Consumer Finance and Socio-Economic Surveys, Part I, 1978/79 and 1981/82.
4. Coconut Development Strategy—Ministry of Coconut Industries, Colombo, Sri Lanka, October, 1984.
5. Dept. of Census & Statistics—Socio Economic Survey, 1969/70.
6. Henegedara G. M.—A process valuation of coconut cultivation in the Kurunegala District. A sub-study of the Kurunegala Integrated Rural Development Project, Research Study No. 62, Agrarian Research & Training Institute, December, 1984.
7. Maddala S.—Econometrics, McGraw Hill, 1979.
8. Perera, U. V. H. & L. Ranbanda—Factors affecting the consumption of coconut fertilizer in 1981 in the coconut triangle, CDA, October, 1981.
9. Perera, U. V. H., L. Ranbanda and C. Edirisuriya—East Coast Rehabilitation Project : Sample Survey on progress, Economic Research Division, Coconut Development Authority, Colombo, March 1985.
10. Progress 1984—Ministry of Coconut Industries, March, 1985.
11. Review of the Fertilizer year 1983—National Fertilizer Secretariat, Colombo 1983.
12. Wijeweera, B. S., A. S. Jayawardena and S. Easparathasan—Report of the committee appointed to review the policy framework applicable to the coconut industry, Ministry of Coconut Industries, Colombo, October 1979. (unpublished).

Mr. Y. M. W. B. Weerasekera, Senior Economist attached to the Industry Division of the Economic Research Department is an economics honours graduate of the University of Sri Lanka, Colombo Campus. He holds a B. Phil (Economics) degree from the same university and a Masters Degree in Development Economics from William's College Massachusetts, U. S. A.

MONETARY ANALYSIS OF EXCHANGE MARKET PRESSURE IN SRI LANKA (1972 - 1985)

R. A. JAYATISSA*

ABSTRACT

The paper presents a model for Sri Lanka to analyse the pressure on net foreign assets and the exchange rate when domestic money supply exceeds the demand for money. The theoretical conclusion of the model is that a ceteris paribus increase in the ratio of domestic credit to stock of money leads to either an equiproportionate decline in net foreign assets or an equiproportionate depreciation of the exchange rate or to any combination of the two. Sri Lanka's experience indicates that changes in the ratio of domestic credit to stock of money during the 1972-75 *period has had a less than equiproportionate change in the exchange market pressure pointing to the possibility of increasing domestic credit without exerting equiproporationate pressure on foreign exchange reserves or exchange rate.*

Introduction

This paper analyses exchange market pressure in Sri Lanka using the monetary approach to the balance of payments and exchange rates. 'Exchange Market Pressure' is defined as the pressure on foreign exchange reserves and the exchange rate when there is an excess of domestic money over the demand for money. Modern monetary models analysing the behaviour of balance of payments and exchange rates originated and developed during the past two and a half decades through the work of Fleming (1962), McKinnon and Oats (1966), Mundell (1968), Johnson (1972), Dornbusch (1973), Mussa (1974), and Frankel and Johnson (1976). Different variants of these models have been applied to individual country experiences.[1] This paper presents a model to analyse exchange market pressure in Sri Lanka during 1972-1984 in the light of these studies.

---

* This paper has greatly benifited from comments and suggestions made by Mr. T. G. Savundranayagam and Dr. L. L. Gunaratne, Deputy Directors of the Economic Research Department.

1. See Argy (1969), Genberg (1976) pp. 298-326, Frankel (1976) pp. 21-45, Connolly and Taylor (1976) pp. 849-59, Girton and Roper (1977) pp. 537-48, Aghevli and Khan (1977) pp. 275-90, and Connolly and Silveira (1979) pp. 448-54.

Sri Lanka's experience during the period chosen for this study allows us to examine applicability of the model to two types of exchange rate regimes namely a fixed exchange rate regime with severe trade and payments controls and a relatively flexible exchange rate regime with substantially relaxed trade and payments controls.

In a small country with a fixed exchange rate system and a high degree of capital mobility, excess supply of domestic credit will lead to an offseting outflow of external reserves.[2] The signs of exchange market pressure, in this case, will be reflected in both current and capital accounts of the balance of payments. If there are controls on imports and capital flows the resulting exchange market pressure will be reflected in other ways such as development of a parallel market for foreign exchange and illegal capital flight.[3] Also the final outcome in the balance of payments excluding official grants and loans will indicate an outflow of reserves. Sri Lanka's experience during the pre-1977 period is a particularly good example for the fixed exchange rate system senario. In a country with a flexible or a managed floating system of exchange rates an excess of domestic credit will lead to either an outflow of foreign exchange reserves or a depreciation of the value of the domestic currency or a combination of loss in reserves and depreciation. The signs of exchange market pressure will be evident in the current and capital accounts depending on the degree of integration with international capital markets. Sri Lanka's experience during the post-1977 period can be tested in relation to this second senario.[4]

The presentation of the paper is as follows. Section 1 below discusses the model on the basis of four essential components namely, demand for money, supply of money, price relationship and the monetary equalibrium. Section II reports the statistical results of the model for Sri Lanka. Section III summarizes the major findings and concludes with a brief note on the policy implications relating particularly to domestic credit.

---

2. Dornbusch (1980) pp. 175-72.

3. *World Development Report* (1985) of the World Bank defines capital flights as the sum of gross capital inflows and the current account deficit less increase in official foreign reserves. (*See* pp. 63-65). According to this definition pluses in errors and omissions in the balance of payments are also a part of capital flight.

4. See Annex A for a brief note and a listing of exchange rate systems which prevailed in Sri Lanka during the period 1954 – 85.

1. Exchange Market Pressure Model

As an initial step of the model a demand for money function is specified as the demand for real balances with constant elasticities with respect to real income and interest rate.

$$\frac{MD_t}{P_t} = k\, Y_t^{a1}\, R_t^{a2}\, \xi_t \quad \ldots\ldots\ldots\ldots\ldots (1)$$

where MD = Demand for nominal balances
P = General price level
k = A constant term
Y = Permanent real income
R = Real interest rate
ξ_t = A serially uncorrelated random variable with zero mean
a^1 = Income elasticity of demand for money
a^2 = Interest rate elasticity of demand for money
t = Time period

This demand for money function can be re-written to indicate the demand for nominal balances as :

$$MD_t = k\, P_t\, Y_t^{a1}\, R_t^{a2}\, \xi_t \quad \ldots\ldots\ldots\ldots\ldots (1^1)$$

The functional forms (1) and (1^1) assumes that the demand for money is free from money illusion and that (1^1) specifically implies that the demand for nominal balances is proportional to price changes or the price elasticity of the demand for nominal balances is equal to one.[5]

As the second step of the model we specify the money supply process in the form of an identity. It is quite common to consolidate all deposit money banks and the Central Bank into a single banking unit and indicate the stock of money (MS) as the sum of net foreign assets (NFA) and domestic credit (DC).

$$MS_t \equiv NFA_t + DC_t \quad \ldots\ldots\ldots\ldots\ldots (2)$$

---

5. For more details see Laidler (1985) pp. 135-137.
If one drops the assumption that the price elasticity of demand for money is equal to one, an alternative specification of the demand for money function would be

$$MD_t = k\, P_t^{a3}\, Y_t^{a1}\, R_t^{a2}\, E_t \quad \ldots\ldots\ldots\ldots\ldots (1'')$$

where $a3 \neq 1$

According to this identity a change in the stock of money can come about from two sources, foreign or domestic. For example, given the level of domestic credit an increase in net foreign assets due to a surplus in the overall balance of the balance of payments will increase the stock of money. Similarly, for a given level of net foreign assets an increase in domestic credit will increase the stock of money. In this model we are not looking at the disaggregation of domestic credit among various sectors of the economy such as the government, public corporations or private sector. What matters from the point of view of this model is the change in the level of total domestic credit during a particular period.

As the third step, we make the small country assumption and express the domestic price level as a weighted average of the prices of major trading partners converted into one unit and multiplied by the relevant exchange rate. This means that domestic prices reflect foreign prices via the exchange rate.

$$P_t = E_t . FF_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

where E = Exchange rate
PF = Foreign price level

As the final step of the model we assume that the stock of money adjusts quickly to the quantity demanded so that the equilibrium condition in the money market holds.

$$MD_t \equiv MS_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

It is quite clear that by using equations (1^1) and (3) with the two identities (2) and (4) we get a relationship in the following form.

$$NFA_t + DC_t = k\, E_t\, PF_t\, Y_t^{a1}\, R_t^{a2}\, \xi_t \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (5)$$

$$Ln\,(NFA_t + DC_t) = Ln\, k + Ln\, E_t + Ln\, PF_t + a1\, Ln\, Y_t + a2\, Ln\, R_t \quad (6)$$

Differentiating this equation and expressing the result in terms of percentages we get.[6]

---

6. If the demand for money equation given by (1") is used to derive this relationship e will be defined as the percentage change in exchange rate weighted by the price elasticity and pf will be the percentage in foreign price also weighted by price elasticity of demand for money.

$$nf - e = - dc + pf + y + r \quad \ldots\ldots (7)$$

Where nf = the change in net foreign reserves or the overall balance as a proportion of the total money stock.

e = the percentage change in the exchange rate. A positive sign indicates depreciation

dc = the change in net domestic credit as a proportion of the total stock of money

pf = the percentage change in foreign prices

y = rate of growth of permanent income weighted by the income elasticity of demand for money

r = the percentage change in the interest rate weighted by the interest rate elasticity of demand for money

According to equation (7) an increase in the rate of expansion of net domestic credit for given rate of change in permanent income, world prices and interest rates will lead to an equiproportionate reduction in net foreign assets with no change in exchange rate or equiproportionate depreciation of exchange rate with no change in net foreign assets or any combination of these two effects.

II. Empirical Results for Sri Lanka

The model was tested for Sri Lanka using quarterly data for the period 1972-1985. Quarterly GDP data used in this study were obtained from the estimates done by Savundranayagam (1985)[7]. The figures on net external assets are those reported in the quarterly balance of payments for Sri Lanka. Net foreign assets figures at the end of each quarter was converted into rupee terms by applying the end of period exchange rates. Figures on money supply and net domestic credit are those recorded under monetary survey of the International Financial Statistics (IFS) of the IMF. The exchange rates used to obtain the percentage changes are the simple averages of the monthly average

7. Savundranayagam (1985)

Rupee/US.$ rates. Data for variable PF (foreign price), were derived as a weighted average of the prices of traded goods in the consumer price index adjusted for exchange rate changes in each year. Money supply, domestic credit and GDP figures have been adjusted for seasonal variations.

Two variants of the model were estimated for Sri Lanka, one using 'Narrow Definition ' of money (M1) in the demand for money function and the other using ' Broad Definition ' of money (M2). To incorporate M1, the model was adjusted by substracting quasimoney (MQ) from both sides of Identity (2). Therefore, we have

$$NFA - DC - MQ = M1 \quad \ldots\ldots\ldots\ldots (2)$$

The two variants of the model estimated are as follows:[8]

With M1 in the demand for money function we get,

$$nf - e = - dc + pf + y + r - mq \quad \ldots\ldots\ldots\ldots (I)$$

With M2 in the demand for money function we have,

$$nf - e = - dc + pf + y \quad \ldots\ldots\ldots\ldots (II)$$

As the price, income and interest rate elasticities of demand for money enter into the model specifically, several regressions were run to obtain these elasticities for the entire period with separate estimates for the two sub-periods. The regression results are shown in Appendix B. A dummy variable (D) taking value one in the period after the fourth quarter of 1977 was used in the equations for 1972-85 period. Price deflated average 12 months deposits rate was used in the equation for the demand for narrow money together with price and income variables.

---

8. It is important to notice the differences in the definitions of some of the variables in the two variants. In both variants y and r are changes in real income and the real rate of interest respectively. nf, dc and mq in Equation (I) are defined as the changes in net foreign assets, domestic credit and quasi-money as a proportion to the stock of M1. In Equation (II) nf and dc are the changes of NFA and DC in proportion to the stock of M2. In Equation (1) pf and e are the percentage changes of PF and E weighted by price elasticity of M1 whereas in (II) they are weighted by the price elasticity of M2.

Demand for broad money was treated as a function of price and income variables. It was found that the price elasticity of demand for both narrow money and broad money was smaller during the latter period than in the former. Income elasticity was larger during the 1978-1985 period than in the preceeding period. These changes in the elasticity coefficients of the demand for money has raised a question about the stability of the demand for money function in Sri Lanka. However, a discussion on the question of stability of demand for many function is beyond the scope of the present study.[9] Elasticity coefficients used in the exchange market pressure model are given below.

TABLE 1

Period Variable	1972 - 85	1972 - 77	1978 - 85
Narrow Money :			
Price ..	0·755	1·039	0·697
Income ..	1·494	0·855	1·400
Interest Rate ..	—	—	-0·100
Broad Money : ..			
Price ..	0·736	0·779	0·720
Income ..	1·805	1·626	2·276

The regression results of the exchange market pressure model are given in Table 2. The model performed relatively better in the period 1972-77 than in the latter. Observed signs of the coefficients for variables dc, pf, y and mq in all equations (except for y in equation II.b) are consistant with the theoretically hypothesized signs a negative for dc, and positive signs for others. Variable r was used only in (Ia) for period 1978-85. (*See* demand for money equations in Annex B) Regression Ia indicates a wrong sign for r.

All six regression results indicate negative sign for the rate of change in domestic credit. In all six equations variables dc was significant at 99 per cent level. Coefficient for dc during the period 1978-85 indicates a lower value (in both I and II) than in the preceeding period.

9. See for a discussion on the question of stability, David E. W. Laidler (1985), pp. 135-51.

TABLE 2

Exchange Market Pressure Model Results

		dc	pf	y	mq	r	R^{-2}	D·W.	F-Ratio
1972 – 85									
I	nf – e	– 0.412 (– 4.737)	0.529 (2.532)	0.209 (1.221)	0.333 (2.606)		0.417	1.965	10.752
II	nf – e	– 0.706 (– 4.689)	0.299 (4.737)	0.067 (0.561)			0.530	1.846	25.932
1972 – 77									
I.a	nf – e	– 0.739 (– 4.213)	0.720 (3.720)	0.028 (0.071)	0.851 (2.185)		0.703	1.797	14.229
II.a	nf – e	– 0.721 (– 3.463)	0.466 (3.396)	0.073 (0.431)			0.658	1.817	19.284
1978 – 85									
I.b	nf – e	– 0.406 (– 3.640)	0.484 (1.848)	0.560 (1.160)	0.370 (2.328)	0.253 (1.437)	0.425	2.016	4.437
II.b	nf – e	– 0.666 (– 2.137)	0.342 (6.146)	– 0.445 (– 0.862)			0.729	1.915	40.380

Coefficients for dc in period 1972-77 show that with *CETERIS PARIBUS* one per cent increase in the ratio of change in domestic credit to the stock of narrow money/broad money has had 0.74 percent/0.72 per cent increase in the pressure in exchange market (*i*: *e*. a decrease in the combined variable nf - e). Hence, the two variants of the model during this period has given more or less an identical result with respect to the impact of expansion of domestic credit on exchange market pressure. The model has performed somewhat differently in period after liberalization. Variant I indicates a smaller coefficient for dc than variant II. Results for variant I indicates that with *CETERIS PARIBUS* one per cent increase in the ratio of domestic credit to narrow money has caused a 0.41 per cent decline in the combined variable nf-e. Variant II, on the other hand shows that one per cent change in the ratio of domestic credit to stock of broad money has led to a 0.67 per cent decline in the combined variable nf-e.

III. Concluding Remarks and Policy Implications

The model performed somewhat differently in the two sub-periods considered in this paper. It was found that expansion of domestic credit has exerted a smaller pressure on external assets and exchange rates during the period after 1977 than in the previous period. This could be due to several factors which have not been specifically incorporarated into the model. One such factor is the change in import credit as a ratio of total money stock. The compositional changes in net domestic credit indicate that there has been a marked increase in the credit given to private sector proper. The share of credit given to private sector in total domestic credit increased from an average of 30 per cent during 1972-77 to about 50 per cent during 1978-84. Since a substantial amount of import trading was handled by the public sector organizations during 1972-77, the direct import leakage of domestic credit could have been higher during that period. Although some of these activities have been handed over to the private sector, there has been an expansion of credit to income generating activities in the private sector thereby helping to reduce the pressure in the exchange market. It should also be noted that the changing impact of foreign official capital inflows on the balance of payments has not been looked into in this paper.

The findings of this paper reveal that domestic credit could be expanded without exerting an equiproportionate pressure on the balance of payments and exchange rate.

ANNEX – A.1

RATES OF EXCHANGE WITH U. S. DOLLAR AND U. K. POUND STERLING FROM 1954

period	System or the change in per value	Official Exchange Rates		FEECs Rates*	
		U.S.$.	£	U.S.$.	£
1954–1966	Par Value System	4·7619	13·3333		
1967–January–November 21		4·7619	13·3333		
November 22	20% devaluation	5·95237	14·2857		
1968 January–May 5		5·95237	14·2857		
May 6–December 31	Establishment of dual exchange market with the introduction of Foreign Exchange Entitlement Certificates Scheme (FEECs)	5·95237	14·2857	8·5714	20·5714
1969 January–July 17	—do—	5·95237	14·2857	8·5714	20·5714
July 18–December 31	Depreciation of Certificate Rate	5·95237	14·2857	9·7262	22·1428
1970	No Change	5·95237	14·2857	9·2262	22·1428
1971 January–November 7	—do—	5·95237	14·2857	9·2262	22·1428
November 8–December 27	Rupee pegged to U.S.$.	5·95237	14·8500	9·2262	23·0175
1972 January 18–February 8	—do—	5·95237	15·4093	9·2262	23·8844
February 9–March 8	—do—	5·95237	15·4989	9·2262	24·0233
March 9–July 9	—do—	5·95237	15·6000	9·2262	24·1800
July 10–October 24	Rupee pegged to Sterling Pound	6·3593	15·6000	9·9127	24·1800
October 25–October 31	—do—	6·5213	15·6000	10·1080	24·1800
November 1–November 10	—do—	6·6938	15·6000	10·3754	24·1800
November 11–December	Depreciation of Certificate Rate	6·6938	15·6000	11·0448	25·7400
1973 January 7–May 23, 1976		6·6938	15·6000	11·0448	25·7400
1976 May 24	Official Pegging to the Pound terminated and Exchange rate was to be maintained in terms of an appropriately weighted basket of currencies	8·6451	15·6000	14·2644	25·7400
1977 March 12	Sri Lanka Rupee revalued from Rs. 14.97 to the £ to Rs 12.51 to the £	7·2817	12·5136	12·0148	20·6474
August 19	Rupee devalued from Rs. 12.51 to the £ to Rs. 12.77 to the £. This exchange rate action was followed by a series of changes on August 29th, September 7th, 12th and October 31 st. On 2nd November the rate was adjusted to Rs. 15.70 to the £	7·3361	12·7715	12·0456	20·0730
November 4	Rupee revalued from Rs. 15.70 to the £ to Rs. 15 .53 to the £	8·5000	15·6953	14·0250	25·8972
November 16	Foreign Exchange Entitlement Certificates repealed and the Convertible Rupee Account system abolished. Exchange rates were unified at Rs. 16 to the U.S.$. and Rs. 29.05 to the £. The Rupee was allowed to float	8·5990	15·5255	14·1884	25·6171
		16·0000	29·0550		

*Rate applicable to Foreign Exchange Entitlement Certificates.

Changes in Sri Lanka's Exchange Rate System

Sri Lanka maintained a strictly fixed exchange rate system up to November 8, 1971. The par value was 0.149297 gram of fine gold per rupee or Rs. 5,95237=U. S. $. 1. This exchange rate system was based on a fixed rate of Rs. 14.29 per Sterling Pound and the exchange rates for other currencies were based on the exchange rates of the respective currencies against Sterling Pound in London. Another effective exchange rate was in operation from May, 1968 to November, 1977. Under the latter, a substantially depreciated rate was applicable to transactions in Foreign Exchange Entitlement Certificates (FEECs) which exporters of non-traditional products and most other earners or recipients of foreign exchange were entitled to receive upon surrender of these FEECS.[10] During the period from December 27, 1971 to July 10, 1972 the rupee had been pegged to the dollar at the rate of Rs. 5.95237 per U. S. dollar. On July 10,1972 the rupee was pegged to the Sterling Pound at a rate of Rs. 15.00 per Sterling. The Sterling pegged period was extended up to end May 1976. On May 24, 1976 the official pegging to Sterling was terminated and the exchange rate was determined in relation to an appropriately weighted basket of currencies. The rupee was revalued at Rs. 12.51 to Sterling Pound on March 12, 1977 and devalued to Rs. 12.77 on August 19, of the same year. This exchange rate action was followed by a series of changes on August 29, September 7 and 12 and and October 31, 1977. On November 2, 1977 the exchange rate was revised up to Rs. 15.70 per Sterling Pound. Again on November 4, 1977 the rupee was revalued to Rs. 15.53 per Sterling Pound. A complete departure from this pegged system came on November 16, when the dual exchange rate system was repealed and the exchange rate was unified at Rs. 16 to the U. S. dollar thereby moving on to a more flexible exchange rate system.

In addition to these changes in the exchange rate system there were several other changes in economic policies which had a bearing on both exchange rates and external sector as a whole. These factors were not specifically incorporated into the model.

---

10. IMF Annual Reports on exchange restrictions. See issues from 20 to 29.

Annex B.

Demand for Money

	In k	In p	In Y	In R	D	R^{-2}	D. W.	F.-Ratio
1972 - 85								
1. In M1	- 9·436 (- 2·099)	0·755 (2·711)	1·494 (2·457)		0·020 (0·414)	0·972	2·236	595·0
2. In M1	-10·291 (- 2·293)	0·729 (2·636)	1·553 (2·540)	0·088 (0·875)	-0·007 (-0·119)	0·974	2·172	444·8
3. In M2	-12·679 (- 3·176)	0·736 (3·685)	1·805 (3·520)		0·003 (0·081)	0·961	2·274	415·3
1972 - 77								
4. In M1	- 4·834) (- 0·716)	1·039 (1·538)	0·855 (1·025)			0·984	1·619	618·0
5. In M1	- 5·382 (- 0·756)	1·037 (1·496)	0·898 (1·033)	0·032 (0·220)		0·984	1·580	359·5
6. In M2	-10·360 (- 1·502)	0·779 (1·166)	1·626 (1·862)					
1978 - 85								
7. In M1	- 6·531 (- 1·646)	0·697 (2·505)	1·400 (2·697)	-0·100 (-1·251)		0·967	1·941	298·3
8. In M1	- 7·025 (- 1·665)	0·542 (2·595)	1·373 (2·479)			0·968	1·896	448·6
9. In M2	-15·816 (- 4·370)	0·720 (3·937)	2·276 (4·780)			0·994	2·401	2,496·0

REFERENCES

Agheveli, Bijan B. and Khan, Moshin S., "The Monetary Approach to Balance of Payments Determination : An Empirical Test", *The Monetary Approach to the Balance of Payments*, IMF - Washington D.C., (1977).

Argy, victor, "Monetary variables and Balance of Payments". *IMF Staff Papers*, vol. 16 (July 1969).

Central Bank of Sri Lanka, *Annual Reports*, *Review of the Economy* various issues.

Connolly, M and Silveira, Jose D.D., "Exchange Market Pressure in Postwar Brazil : An Application of the Girton Roper Monetary Model", *The American Economic Review*, Vol. 69 (July 1979).

and Tayler D., "Testing the Monetary Approach to Devaluation in Developing Countries", *Journal of Political Economy*, Vol. 84 (Aug. 1976).

Dornbusch, R., "Devaluation, Money and Non-traded Goods", *The American Economic Review*, Vol. 63 (Dec. 1973).

Open Macro-Economics, Basic Books Inc., New York, (1980).

Flemming M., "Domestic Financial Policies Under Fixed and Floating Exchange Rates", *IMF Staff Papers*, Vol. 9 (1962).

Frankel, J. and Johnson, H. G., "The Monetary Approach to Balance of Payments : Essential Concepts and Historical Origins", *The Monetary Approach to Balance of Payments*, Frankel J. and Johnson H. G., London (1976).

Genberg, H.,"Aspects of Monetary Approach to Balance of Payments Theory : An empirical study of Sweden", ibid.

Ginton, L. and Roper D., "Monetary Model of Exchange Market Pressure Applied to Postwar Canadian Experience" *The American Economic Review*, Vol. 67, (Sept. 1977).

IMF, International Financial Statistics, Various issues

Johnson, H. G., "The Monetary Approach to Balance of Payments Theory", *Journal of Financial and Quantitative Analysis*, Vol. 7, (March 1972).

Mussa, Michael, "A Monetary Approach to Balance of Payments Analysis", *Journal of Money Credit and Banking*, Vol. 6, (Aug. 1974).

Mundell, Robert A., *International Economics* (New York 1968)

Mckinnon, R., and Oates, W., "The Implications of International Economic Integration for Monetary and Exchange Rate Policy", *Princeton Studies in International Finance*, No. 6, Princeton University Press (1966).

Polak, J. J., "Monetary Analysis of Income Formation and Payments Problems", *IMF Staff Papers*, Vol. 6, (November 1957).

Savundranayagam T.G, "Quarterly Estimates of Gross National Product", mimeo Central Bank of Sri Lanka, Colombo (1985)

World Bank, *World Development Report* 1985, Oxford University Press (July 1985).

Mr. R. A. Jayatissa is a graduate of the University of Sri Lanka, Peradeniya, holds a M. A. (Development Economics) degree from Williams College, U.S.A., M. A. (Political Economy) from Boston University, U.S.A. He is a Senior Economist and the Head of the International Finance Division, the Economic Research Department of the Central Bank of Sri Lanka. He is also the Secretary of the Sri Lanka Association of Economists.

INCOME DISTRIBUTION IN THE CITY OF COLOMBO

D. WASANTHA

ABSTRACT

Income distribution of the income receivers and spending units in Colombo has markedly deteriorated between 1973 *and* 1982. *A* 50 *per cent increase in the gini ratio was recorded.The factors that are attributed to this increase in income inequality are : expansion of employment opportunities for low age groups, mostly in low paid jobs, female employment and trade & services (wholesale, retail & transport). Further the high inflation experienced after* 1977 *has also adversely affected the income distribution. This was evident in both the low income groups and middle income groups who have suffered due to the escalation in prices within the city. However, towards the end of this period the lower income groups have recovered to some extent from the impact of rising prices. This resulted from the increase in income opportunities for the low income groups in the unorganized sector. The study expresses the belief that the development policies must focus on area that could increase employment opportunities for middle income groups to minimise the adverse effects of rapid economic growth and high inflation.*

Socio Economic Back Ground in Colombo

Colombo, the capital of the country for nearly 150 years has a population of about a half of a million today. The population density in Colombo (15,800 persons per Km^2) is over 65 times the country's average density of 230 persons per square kilometer. Colombo has a higher proportion of males than the country as a whole. For every 1,000 females in Colombo there are 1,256 males while the comparative figure for the country is only 1,039 males per 1,000 females. Youths between 14—25 years of age comprise 28 per cent of all persons in Colombo while the country's average is 25 per cent.

In general, women in Colombo marry early. The median age at marriage (the age by which 50 per cent of the ever married females were married) was estimated at 20.1 years. The all Island value is slightly higher than this. The city's higher percentage of Moors compared to the Island as a whole may be one of the reasons for the lower age of marriage since usually, Moor females contract early marriages.

In contrast to the general situation prevailing in Sri Lanka, the higher level of urbanization and the very low value of the Land/Person ratio have minimized the importance of agricultural activities in the city. This has

also been indicated by Colombo having the lowest percentage of income receivers (IRS) in the agricultural sector. Only 1 per cent of the total income receivers in the city derive their income from agricultural work and their contribution to the total income is negligible. On the other hand the percentage of IRS in the industrial sector is considerably higher in Colombo when compared to the Island as a whole.

When considering literacy and education, it is found that the literacy rate in Colombo residents is as high as 87.7. Furthermore, not only do the people in Colombo have high levels of literacy, but they also have outstandingly high levels of educational achievement. Nearly half of the people in Colombo have reached a secondary or higher level of education, reflecting the fact that the city has better educational facilities compared to the Island as a whole. On the other hand, Colombo experiences a high unemployment rate compared to the all Island average. The unemployment rate is much higher for women than for men and is higher among those who have passed the GCE(AL).

Table I compares some of the other important social characters in Colombo with those of All Island and overall urban sector values.

TABLE I

Some Socio-Economic Variables — Colombo
All Island & Urban Sector

Character	All Island	Urban Sector	Colombo
Average size of H.H. ..	5.23	5.48	6.11
Avg. No. of dependants per H.H. ..	3.67	3.84	4.19
Percentage of self owned Houses ..	79.47	66.39	51.20
Percentage of Rented Houses ..	6.85	22.98	34.40
Percentage of Houses with Electricity ..	15.81	42.20	59.60

Source : CFS 1981/82

The data given in the table clearly indicate that for almost all the variables considered, Colombo shows comparatively high values. Although the Colombo's housing stock has grown rapidly in recent years, approximately 3 out of 10 houses are rented. The percentage of houses having

electricity is still highest in Colombo. Three out of five houses have electricity but in the Island as a whole only eight out of fifty houses have this facility.

When the overall income distribution in Colombo is considered, 41 per cent of the total income is in the hands of 5.4 per cent of the total IRS those who are getting over Rs. 5,000/- per month. At the other end only 15.76 per cent of the total income is shared by 53.4 per cent of the total IRS getting less than Rs. 1,000/- per month.

The mean income per income receiver was estimated in the 1981/82 survey at Rs. 1,979 per month. This compares with Rs. 1,134 per month in 1978/79 and Rs. 278 in 1973. The same trend can be observed in the Spending Units (SU) as well.

The median is generally accepted as a more representative indicator of the average level of income, since unlike the mean, the value of the median is not affected by the presence of a few high or low income receivers in the sample.

TABLE II

Comparison of Mean and Median Income

(Rupees)

Average	1973	1978/79	1981/82
Mean income per IR ..	275	1,134	1,979
Median income per IR ..	224	501	966
Mean Income per SU ..	373	1,478	2,920
Median Income per SU ..	313	815	1,609

Data clearly indicate that there is a substantial increase in the mean and median nominal income of the IRS and as well as the SUS in Colombo from 1973 to 1981/82.

The majority of the income receivers in the city are males, the number of male income receivers being about 3 times the number of female income receivers. The median one month incomes of the two sexes are Rs. 1,235 and Rs. 729 respectively.

Income inequality, as indicated by the Gini ratio, too is comparatively high in Colombo.

Further, when the median income and the Gini ratio of all the zones are compared it can be seen that Colombo (Zone 5) plays a very important part in the country's overall income distribution (See table III). Colombo has the highest median incomes in both 1978/79 and 1981/82 and also shows the highest growth rate of median income from 1973—1978/79. The income disparity measured by the Gini ratio is also highest in Colombo in each survey year. All these facts clearly suggest that a detailed study on the income distribution of Colombo is of paramount importance.

TABLE III

Comparison of Median Incomes—Zones 1-5

Year	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
1973 ..	202(0.43)	223(0.35)	236(0.33)	137(0.39)	224(0.39)
1978/79 ..	451(0.46)	401(0.54)	451(0.51)	301(0.48)	501(0.59)
1981/82 ..	721(0.47)	641(0.51)	752(0.48)	534(0.24)	966(0.59)
Growth Rates					
1973—1978/79 ..	17.4	12.5	13.8	17.0	17.5
1978/79—1981/82 ..	17.0	16.9	18.5	21.0	14.5

* The figures in brackets show the Gini Ratio.

The Districts covered by each Zone are as follows :

Zone I —Colombo, Kalutara, Galle, Matara, excluding the housing units in the Colombo Municipality.

Zone II —Hambantota, Moneragala, Amparai, Polonnaruwa, Anuradhapura and Puttalam.

Zone III —Jaffna, Mannar, Vavuniya, Trincomalee and Batticaloa.

Zone IV —Kandy, Matale, Nuwara Eliya, Badulla, Ratnapura, Kegalle, & Kurunegala.

Zone V —Colombo Municipality.

Data Sources and Methodology

The 1973, 1978/79 and 1981/82 Central Bank Consumer Finance Surveys are the main data bases for this study of Income Distribution in Colombo.

The primary objectives of these surveys were to obtain direct data on personal Income, Expenditure and Savings. Table IV summerises some of the important features of these surveys.

TABLE IV

Sample Design of the Consumer Finance Surveys

Year	1973	1978/79	1981/82
Survey period ..	First 2 months of 1973	1st Oct. 1978 to 30th Sep. 1979	1st Oct. 1981 to 30th Sep. 1982
Sample size (All Island)	5,000	8,000	8,000
Sample size (Colombo) ..	163	320	256
Sampling fraction (Colombo) ..	0.21%	0.36%	0,30%
Sampling Method ..	2 stage stratified	3 stage stratified	3 stage stratified

Both 1978/79 and 1981/82 surveys were similar in various aspects such as sampling plan, the questionnaires used and duration of the survey. However, 1973 survey was confined only to first two months of 1973.

Methodology

In this study several statistical measures such as mean, median, quintile shares, Gini concentration ratio were used to assess various aspects of the income distribution.

In section (II) the effect of inflation on income levels of each quintile were compared. For the purpose of this comparison the following mathematical derivations were used.

$$R = \frac{Y}{P}$$

here R = Real mean income of a quintile
Y = Nominal mean income of a quintile
P = Price Index

Taking logarithams

$$\text{Log } R = \text{Log } Y - \text{Log } P$$

Differentiating $\frac{1}{R}\frac{dR}{dT} = \frac{1}{Y}\frac{dY}{dT} - \frac{1}{P}\frac{dT}{dP}$

This can be written as

$$A = B - C \text{ Where } A = \frac{1}{R}\frac{dR}{dT}, B = \frac{1}{Y}\frac{dY}{dT}, C = \frac{1}{P}\frac{dP}{dT} \text{ and}$$

A, B, C, are growth rates of Real income, nominal income and Price Index respectively.

$\therefore$ $B \gtrless C$ could be used to test whether $A \gtrless O$

In Section (III) the effect of inflation on the level of expenditures in each income group were studied. The following computation procedure was employed in the study.

$$E_{85} = M_i S_1 \left[\frac{I_{F,\,85}}{I_{F,\,81/82}}\right] + M_i S_2 \left[\frac{I_{C,\,85}}{I_{C,\,81/82}}\right] + M_i S_3 \left[\frac{I_{E,\,85}}{I_{E,\,81/82}}\right]$$

Where M_i — Mean income of income group i

$I_{F,\,85}, I_{C,\,85}, I_{E,\,85}$ — Index numbers (CCPI) of food clothing and energy for 1985

$I_{E,\,81/82}, I_{C,\,81/82}\ I_{E,\,81/82}$ — Index numbers (CCPI) of food clothing and energy for 81/82.

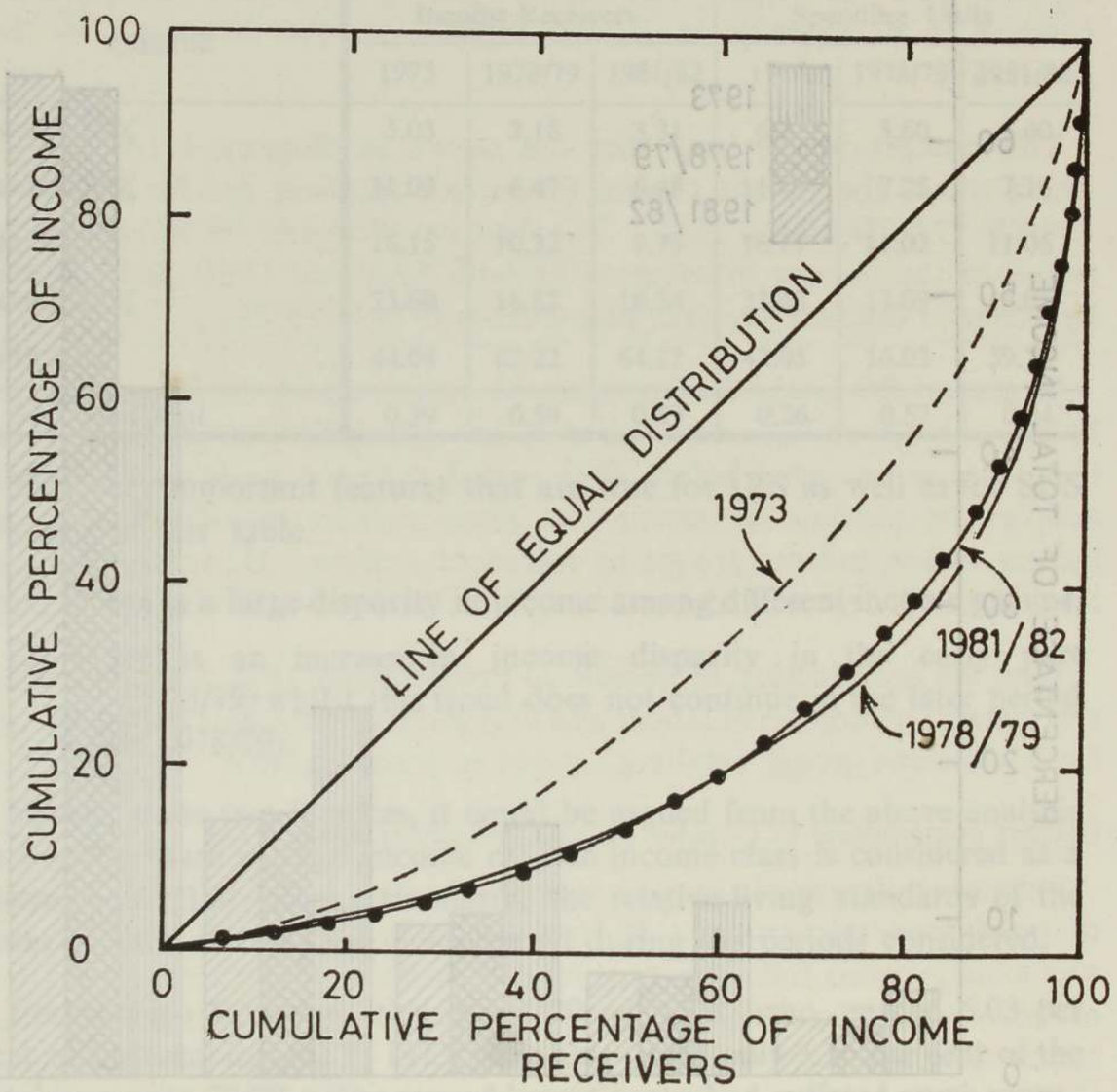
S_1 — Proportion of expenditure on food
S_2 — Proportion of expenditure on clothing
S_3 — Proportion of expenditure on fuel and light.

Income Distribution

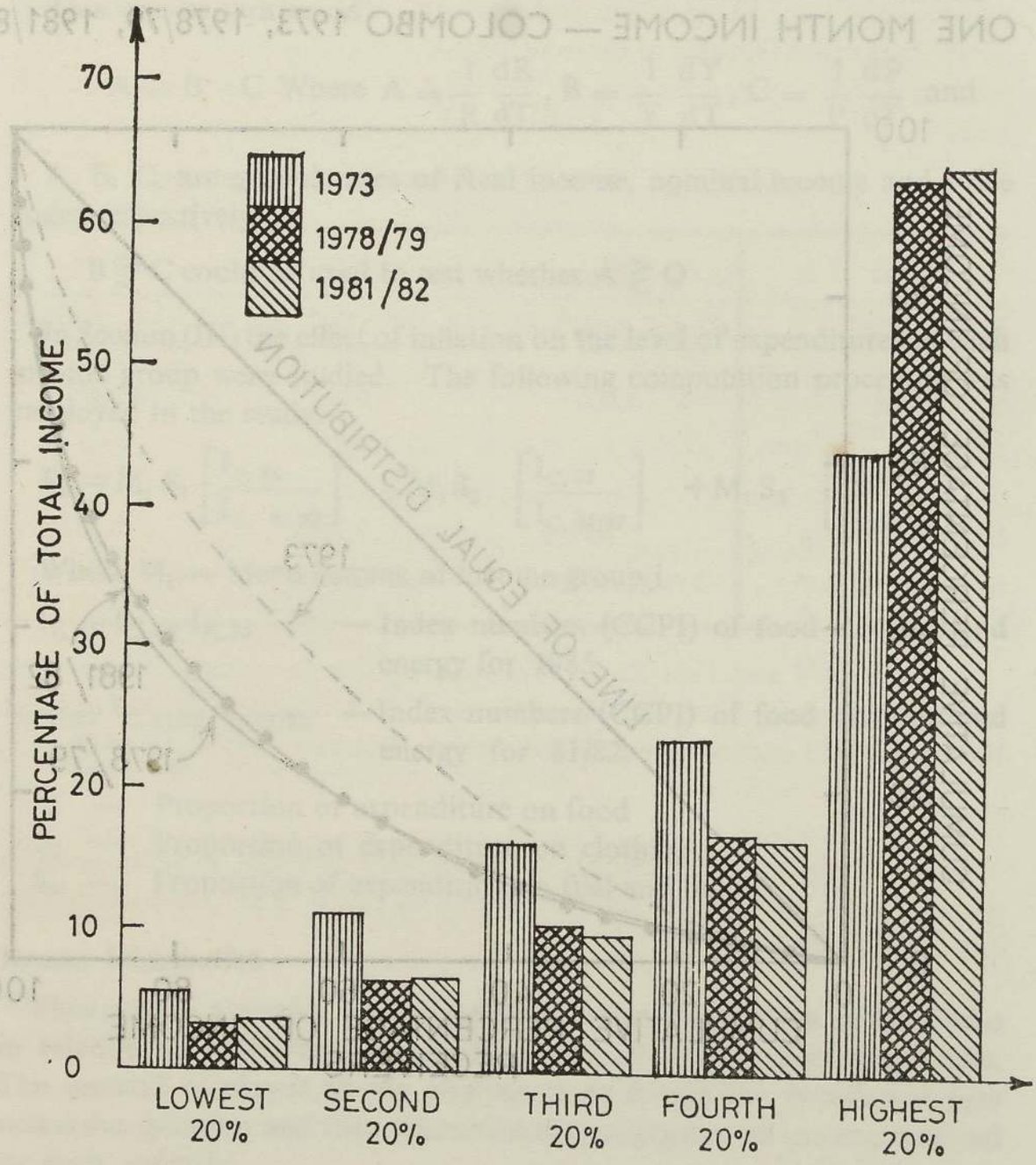
This section attempts to analyse the income distribution in Colombo in relation to individual Income Receivers as well as Spending Units. The method employed in the analysis is to divide the population into successive quintiles and then determine the proportion of income received by each quintile.

The share of the income received by each income group is one of the measures in income inequality. In addition to this, the Gini Concentration Ratio was also used as an indicator of the overall inequality.

LORENZ CURVE FOR INCOME RECEIVERS BASED ON ONE MONTH INCOME — COLOMBO 1973, 1978/79, 1981/82



PERCENTAGE OF TOTAL INCOME BY EACH 20% OF RANKED INCOME RECEIVERS — COLOMBO



Trends in Income Distribution—IRS and SUS

Table V presents the changes in the income shares over the period 1973—81/82 in terms of the quintiles of Income Receivers and Spending Units respectively.

TABLE V

Percentage of Total Income by each 20 per cent of Income Receivers and Spending Units

Quintile	Income Receivers			Spending Units		
	1973	1978/79	1981/82	1973	1978/79	1981/82
Lowest 20% ..	5.03	3.16	3.31	6.27	3.60	4.00
Second 20% ..	11.09	6.47	6.48	11.43	7.25	7.16
Third 20% ..	16.15	10.32	9.75	16.77	11.02	11.06
Fourth 20% ..	23.69	16.82	16.34	23.48	17.09	18.01
Fifth 20% ..	44.04	63.22	64.12	42.05	16.03	59.78
Gini Coefficient ..	0.39	0.59	0.59	0.36	0.57	0.54

Two very important features that are true for IRS as well as for SUS are seen in this table.

(1) There is a large disparity in income among different income groups.

(2) There is an increase in income disparity in the early part (1973–78/79) whilst this trend does not continue in the later period (after 1978/79).

Besides these two features, it could be argued from the above analysis that if the share of total income of each income class is considered as a measure of relative living standards, the relative living standards of the lower income classes have deteriorated during the periods considered.

For Income Receivers, the lowest 20 per cent who earned 5.03 per cent of the total income in 1973, were able to get only 3.16 per cent of the total income in 78/79. The second lowest group had suffered much more ; their share had dropped to 6.47 per cent from 11.09 in 1973. Again the fourth, quintile which received more than its proportionate share in 1973, slipped to 16.82 in 78/79 and to 16.34 per cent in 1981/82. The richer are getting richer ; the highest 20 per cent enlarges its size to 64.12 per cent in 1981/82.

With regard to Spending Units between 1973 and 1978/79, the share of income of the lowest 20 per cent has fallen from 6.27 per cent in 1973 to 3.60 per cent in 78/79. The trend in the 2nd, 3rd and 4th quintiles is very similar to the lowest quintile. Again the Spending Units in the highest quintile have increased their share from 42.05 in 1973 to 61.03 in 1978/79.

Between 78/79 and 81/82 there has been a marginal increase in the share of each income group except the second and the highest quintile. In the highest quintile, the income share decreased by 2 per cent from 61.03 in 78/79 to 59.28 in 81/82. The second quintile recorded a 1.2 per cent decrease in its share from 78/79 to 81/82. (see the diagram 2 in the Appendix).

The changes in the inequality are shown in diagram 1 (Appendix) which shows the Lorenz Curves for income receivers and for Spending Units in 1973, 78/79 and 81/82. The three curves clearly show the deterioration of the income distribution of both Spending Units and Income Receivers in the first five year period from 1973 to 78/79.

In general Sri Lanka has experienced a progress in the income distribution prior to 1973. Since then it has gradually deteriorated. The improvement recorded before 1973 was due to the egalitarian policies adopted by previous governments. These policies include transfer of income to low income groups by means of welfare. However, this has resulted a high degree of economic stagnation and non-utilization of labour.

With the introduction of liberalized policies since 1977 more emphasis was given to utilization of labour and thus more employment opportunities for low income groups resulting a rapid economic growth.

Factors contributing to Greater Income Inequality Since 1973

Increasing disparity in income in the early stage is one of the outcomes of rapid economic growth. It has also been pointed out that "rapid economic progress follows a transfer of income to urban centres because of the concentration of institutional, financial 'administrative' business and commercial activities in urban areas". The major economic reforms introduced in 1977 could further affect the income disparity in the city.

Changes in income distribution can arise from changes in the age distribution of Income Receivers. It is generally seen in a distribution of income that the person in the very young and very old age groups

contribute the highest percentage to the total income. The middle groups contribute the highest percentage. The income distribution according to age groups in the city in 1973, 78/79 and 81/82 is given in the Table VI.

TABLE VI

Percentage of Income Receivers in each age group and their percentage contribution to the total income

Age Group Years	1973		1978/79		1981/82	
	% IRS	%Contribution to the total income	% IRS	%Contribution to the total income	% IRS	%Contribution to the total income
0—25 ..	16.0	10.05	21.0	7.80	23.30	9.13
26—45 ..	45.0	49.15	46.2	43.64	46.10	44.04
46—55 ..	17.50	23.20	16.40	32.28	17.50	26.33
56—over ..	21.5	17.60	16.40	16.28	13.10	20.50
	100.0	100.00	100.0	100.00	100.00	100.00

It is apparent that the percentage of Income Receivers in the group 0—25 has increased from 16.0 per cent in 1973 to 21 per cent in 78/79. But their percentage contribution to the total income decreased in the same period from 10.05 per cent to 7.8 per cent. This suggests that the employment opportunities of younger groups have increased, mostly in low paid jobs.

Another important observation is that in 78/79 the percentage of 'daily paid' persons in the 0—25 age group is considerably higher than that of the age group 26—55. This comparison is not possible in the 1973 data because in the 1973 survey the income receivers were not categorised under daily paid as in 78/79. However, this clearly indicates that the income receivers are not evenly distributed according to the type of employment in all age groups.

It is likely that the net effect of this changes would have been to increase the disparity in incomes.

Greater inequality of income distribution can arise from a change in employment opportunities of male and female Income Receivers. The data in Table VII reveal that from 1973 to 78/79 the female employment rate increased faster than the male employment rate. The respective

percentage increases are 81.4 and 22.5 It is common knowledge that female labour is willing to work for lower wages. Therefore, it is not suprising that most female employees come under lower income categories. This is clear from the comparison of the mean incomes and females. (In 1973, the mean male income was Rs. 301.8 compared to female income of Rs. 164.3). The male : female income differential has also increased from 1.84 to 2.36. It could therefore be concluded that there could be a greater concentration of females in the lower income categories during this period. The net effect of this concentration during the 1973-78/79 period has been towards greater inequality of income.

TABLE VII

Income Distribution of Male & Female

	1975		1978/79		1981/82	
	Male	Female	Male	Female	Male	Female
No. of IRS	198	47	383	185	348	133
% of IRS ..	80.8	19.18	67.4	32.5	72.4	27.2
Employment Rate ..	69.9	38.14	85.71	69.20	91.10	77.20
Mean Income	301.8	164.3	1,397.0	591.2	1,785·0	2,497.0

The new economic policies that came into operation in 1977 brought about a significant expansion in the private and public investments. Under these new policies, the exchange rates were unified and allowed to float, most imports were liberalized, price controls were dismantled and the tax structure was simplified giving appropriate incentives for investment in high priority areas. The more prominent among them are changes in Trade and Services activities. Table (VIII) presents the distribution of IRS according to the type of industry.

The most notable change is the increase in the proportion of IRS and of income shares in the upper income group in almost all Industries. In particular, the income share of this upper income group in wholesale and retail trade recorded a six fold increase. However, in the government services the upper income group shows a decrease. The reason for this is that from 1973 – 78/79 new opportunities in government employment increased, but most of these carried comparatively lower salary scales.

This significant increase in the increases of the upper income group also fits well with the conclusion that the income disparity has widened during the period 1973 - 78/79.

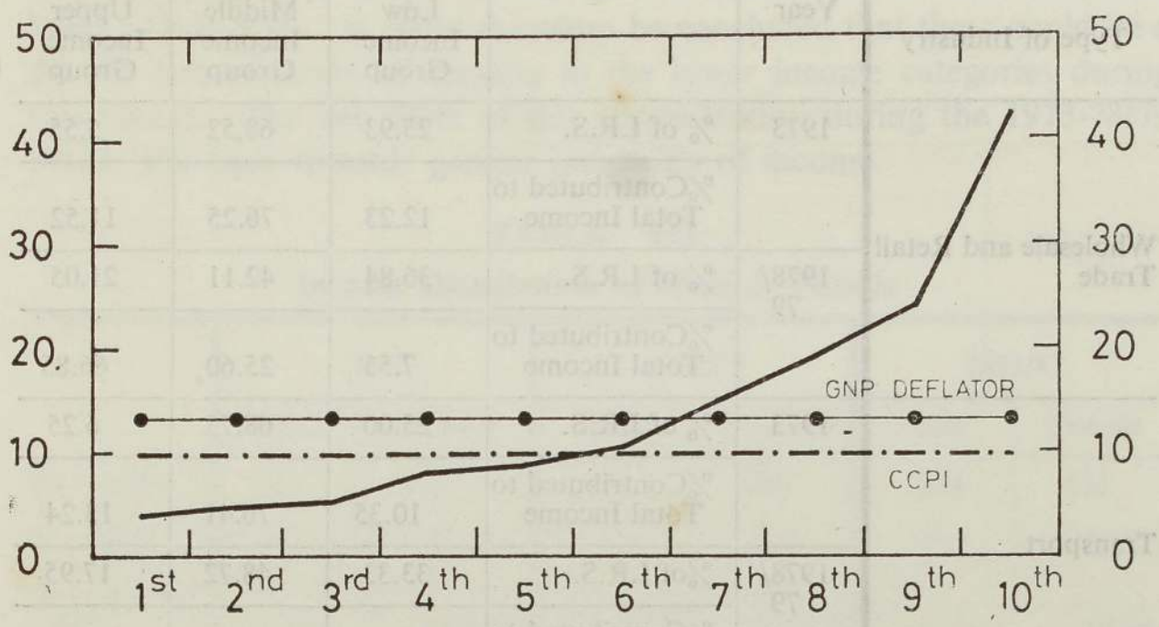
TABLE VIII

Distribution of Income Receivers by Type of Industry (1973 - 1978/79)

Type of Industry	Year		Low Income Group	Middle Income Group	Upper Income Group
Wholesale and Retail Trade	1973	% of I.R.S.	25.93	68.52	5.55
		%Contributed to Total Income	12.23	76.25	11.52
	1978/79	% of I.R.S.	36.84	42.11	21.05
		%Contributed to Total Income	7.55	25.60	66.85
Transport	1973	% of I.R.S.	25.00	68.75	6.25
		%Contributed to Total Income	10.35	76.41	13.24
	1978/79	%of I.R.S.	33.33	48.72	17.95
		%Contributed to Total Income	13.27	41.04	45.69
Business Services	1973	% of I.R.S.	16.67	66.67	16.66
		%Contributed to Total Income	4.14	44.50	51.36
	1978/79	% of I.R.S.	39.13	34.78	26.09
		%Contributed to Total Income	12.31	27.82	59.87
Government Services	1973	% of I.R.S.	6.98	58.81	37.21
		%Contributed to Total Income	1.62	39.65	58.73
	1978/79	% of I.R.S.	15.15	66.67	18.18
		%Contributed to Total Income	6.18	57.72	36.10
Income Receivers without Employment	1973	% of I.R.S.	51.85	40.74	7.41
		%Contributed to Total Income	15.63	40.46	43.91
	1978/79	% of I.R.S.	51.47	30.35	16.18
		%Contributed to Total Income	16.04	38.24	45.72

FIGURE 1

INCOME GROWTH IR – 1973 – 1978/79



INCOME GROWTH – SU – 1973 – 1978/79

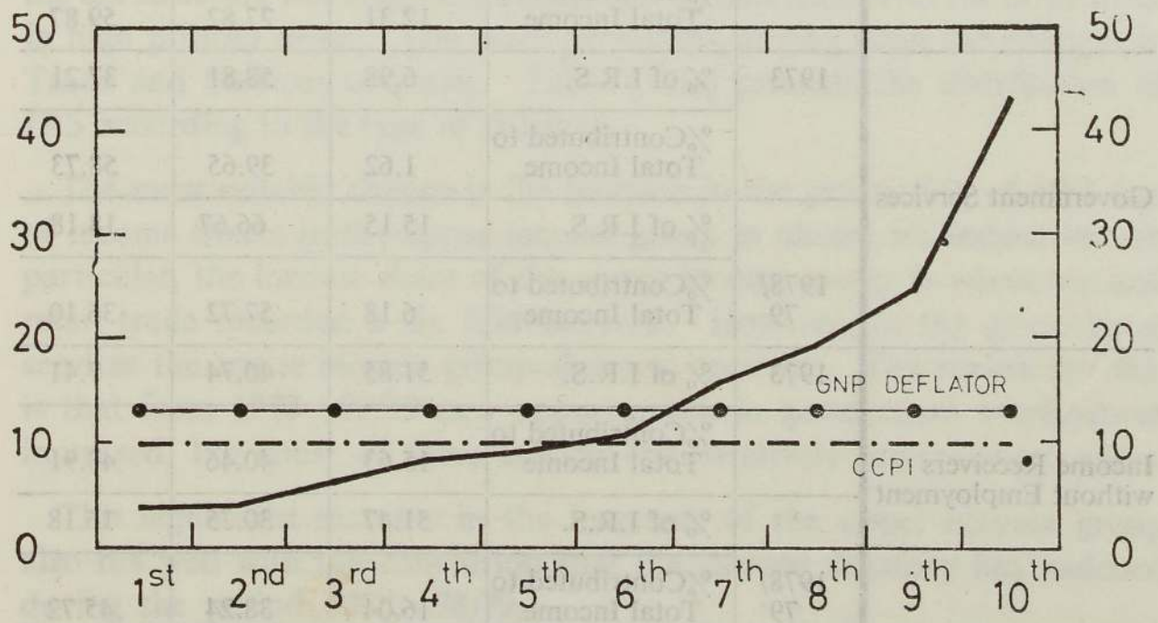
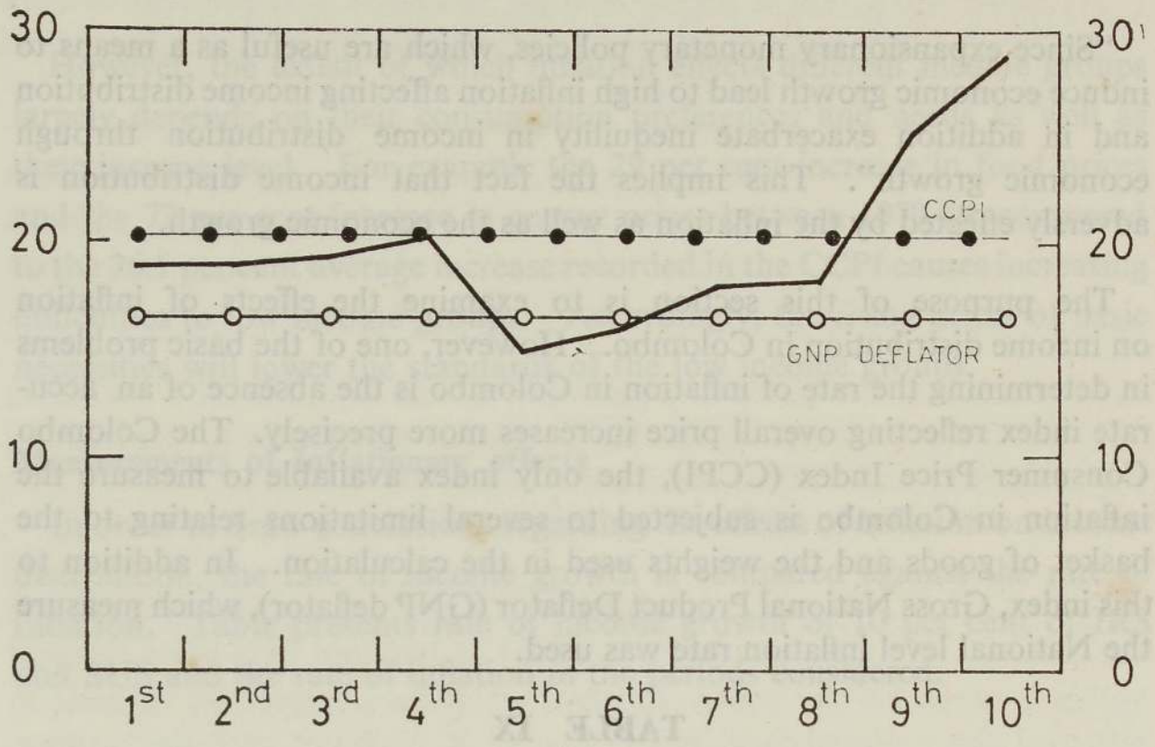
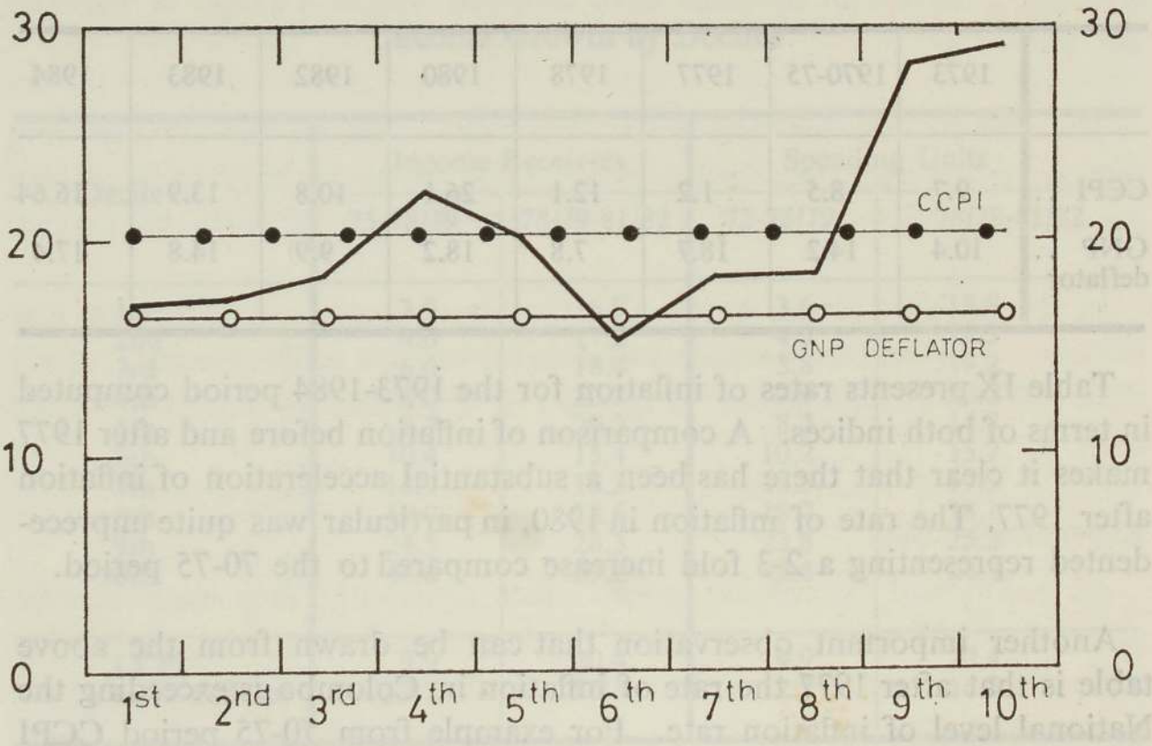


FIGURE 2

INCOME GROWTH - IR - 1978/79 - 1981/82



INCOME GROWTH - SU - 1978/79 - 1981/82



II Effects of Inflation on the Income Distribution in Colombo

Inflation and income distribution are highly interdependent fields. Commenting on this interdependency, Thirwall (1974) says :

"Since expansionary monetary policies, which are useful as a means to induce economic growth lead to high inflation affecting income distribution and in addition exacerbate inequility in income distribution through economic growth". This implies the fact that income distribution is adversly effected by the inflation as well as the economic growth.

The purpose of this section is to examine the effects of inflation on income distribution in Colombo. However, one of the basic problems in determining the rate of inflation in Colombo is the absence of an accurate index reflecting overall price increases more precisely. The Colombo Consumer Price Index (CCPI), the only index available to measure the inflation in Colombo is subjected to several limitations relating to the basket of goods and the weights used in the calculation. In addition to this index, Gross National Product Deflator (GNP deflator), which measure the National level inflation rate was used.

TABLE IX

Estimate of Average Annual Inflation Rates

	1973	1970-75	1977	1978	1980	1982	1983	1984
CCPI ..	9.7	8.5	1.2	12.1	26.1	10.8	13.9	16.64
GNP .. deflator	10.4	14.2	18.7	7.8	18.2	9.9	14.8	17.4

Table IX presents rates of inflation for the 1973-1984 period computed in terms of both indices. A comparison of inflation before and after 1977 makes it clear that there has been a substantial acceleration of inflation after 1977. The rate of inflation in 1980, in particular was quite unprecedented representing a 2-3 fold increase compared to the 70-75 period.

Another important observation that can be drawn from the above table is that after 1977 the rate of inflation in Colombo is exceeding the National level of inflation rate. For example from 70-75 period CCPI

increased by 8.5 per cent when compared to the 14.2 per cent increase in the GNP deflator. However, from 1977 onwards the increase in CCPI is higher than that of GNP deflator.

However, the extent of which inflation effects different income groups largely depends on their consumption preferences and needs as well as their income level. For example the 29 per cent increase in food prices and the 72 per cent increase in energy prices between 1979-80 compared to the 26.1 per cent average increase recorded in the CCPI causes increasing difficulties to low income groups. Accordingly, the rising prices of basic necessities will lower the standards of the low income groups.

Measurements of Inflationary effects

In order to draw conclusions regarding the effects of inflation on income distribution, the rate of income growth is compared against the rate of inflation. Table presents rate of income growth of 10 per cent of IRS and SUS and the rate of inflation in the periods considered.

TABLE X

Income Growth by Deciles

Decile	Income Receivers		Spending Units	
	73-78/79	78/79-81/82	73-78/79	78/79-81/82
1st ..	3.9	16.8	3.6	18.8
2nd ..	4.0	17.2	4.5	18.9
3rd ..	6.0	18.4	5.8	19.2
4th ..	8.0	22.2	7.9	20.2
5th ..	8.7	20.2	8.2	14.8
6th ..	10.4	15.4	10.2	15.7
7th ..	14.9	18.3	14.5	17.9
8th ..	19.0	18.6	18.7	18.1
9th ..	24.5	28.3	23.8	25.2
10th ..	43.0	29.2	42.4	28.9
CCPI ..	9.9	20.4	9.9	20.4
GNP deflator	12.7	16.5	12.7	16.5

A comparison between the income growth and the rate of inflation leads to draw the following conclusions—

(1) From 1973—78/79 period bottom 50 (decile 1-5) per cent of both Income Receivers and Spending Units have been adversely affected by the rising prices in Colombo.

(2) From 1978/79—81/82 period in addition to the bottom 50 per cent of the IRS and SUS, next 40 per cent have failed to match with the rising prices in Colombo. However, the low income groups seems comparatively better than middle income groups.

In addition to the above conclusions, it is seen from the table that from 73-78/79 income groups in the highest decile experiences a significantly highest growth rate of their real income compared to both CCPI and GNP deflator. However, it was not so high in the latter period.

From 73—78/79, when compared with 9.9 per cent increase of the CCPI the real income of the bottom 50 per cent of IRS and SUS have dropped within a range 1-6 per cent. Further, when the comparison is made in terms of the national level inflation rate of 12.7 per cent per annum, both the IRS and SUS in the bottom 50 per cent were more severely affected. There real incomes have dropped within a range of between 2-9 per cent.

The rate of inflation accelerated after 1977 and all indices depicting the rate of inflation recorded unprecedented increases ranging from 16.5 per cent per annum to 20.4 per cent per annum from 78/79—81/82 period.

In the middle income group also the above drop in real income was evident. Further the data shows that this group has suffered more severely than the low income group. Figures 1 & 2 graphically report the same data.

Expenditure Effect

As mentioned, increasing prices affect differently into each income group depending on the consumer needs and income levels. Following table shows the mean expenditure on food, clothing, fuel & light by income groups in 78/79 and 81/82.

TABLE XI

Expenditure on Basic Necessities

Income Group	1978/79 Mean Income Rs.	1978/79 Expenditure Rs.	1981/82 Expenditure Rs.	Rate of Increase
Low Income Group ..	400.80	385.3	578.0	50
Middle Income Group ..	1,038.40	978.0	1,515.90	55
Upper Income Group ..	4,509.20	3,201.5	4,066.70	27

The table clearly demonstrate that the middle income groups are mostly suffered by the rising prices from 78/79—81/82 and they require 55 per cent increase in nominal income to keep them with at the 1978/79 standard whilst the lower income groups require 50 per cent increase.

This also fits well with the conclusion that from 78/79—81/82 period low & middle income groups suffered heavily than upper income group.

In order to see this trend is continued, expenditure on food, clothing, fuel and light were estimated for low, middle and upper income groups (Table XII).

The table clearly indicates that up to 1985 Middle Income Group are mostly suffered and they require 52 per cent increase in their nominal mean incomes to match with the level of living standard in 1981/82. The lowest and upper income groups require 50 per cent and 45.2 per cent increase to match with rising prices in Colombo.

TABLE XII

Expenditure on basic necessities by Income Groups

	81/82 Mean(Rs.)	Proportion of Expenditure			81/82 Expenditure	1985 Expenditure	Rate of Increase
		Food	Clothing	Fuel & Light			
Low Income Group	814·02	70	4·6	5.6	578	867	50
Middle Income Group	2,122·30	65.70	9.4	4·5	1,515·90	2,304·18	52
Upper Income Group	8,728.69	39·50	8·6	2·0	4,066·67	5,904·80	45.2

Discussions on the Findings

The findings of this study on income distribution in Colombo could be summarized as follows :

(1) The income inequality measured by the Gini ratio suggests that there is an increase in the income disparity from 73 to 78/79. In particular, the inequality in income distribution remained constant at 0.59 for the years 78/79 and 81/82.

(2) Expansion in low paid employment for lower age groups, and the expansion of female employment are some of the major factors that tend to decrease the income share of the low income groups.

(3) The expansion in trade and services have benefitted the high income receivers as their contribution to the total income has increased.

(4) Rate of inflation has adversely affected to the income distribution of middle income groups in the city than that of low income groups.

The food stamp scheme is one of the other factors that could affect the income distribution of low income groups. This scheme was introduced in September 1979. (the last month of 78/79 survey). Therefore, the full impact of this scheme is not reflected by the 78/79 CFS data. However, the only available survey on the food stamp scheme, conducted by the Ministry of Plan Implementation in 1981 does not consider separately the City of Colombo.

The effect of inflation on the level of income could have been analysed more precisely if there were price indices for each income quintile. However, the computation of such indices had to be based on many subjective assumptions.

Before concluding this discussions on the findings, it is noteworthy to mention that some of the data collected in the past 3 surveys are somewhat inconsistant for a study of this nature. The classification of employment data was not the same for 1973 and 78/79 surveys. In the first one, employment was classified under the categories—self employed, employer, employee and unpaid family worker. In the second survey this was categorized as regular employment, daily paid, employer, self employed and unpaid family worker. This prevents comparing the employment in 1973 and 78/79.

REFERENCES

1. Chenery, H. B. et al (1974) Redistribution with Growth.
2. The Central Bank of Ceylon, Consumer Finance Survey 1973, 1978/79 and 1981/82.
3. Thirwall, A. P. (1974) Inflation, Saving and Growth in Developing Economies.
4. Ministry of Plan Implementation, Evaluation of the Food Stamp Scheme–1981.

Mr. D. Wasantha is a B.Sc. (Hons.) graduate of the University of Sri Jayawardenapura and holds a post-graduate Diploma in Statistics from the same University. His research interest is primarily in the area of Price Indices.

OPERATIONS OF PROVIDENT FUNDS 1980 - 1983

P. W. R. B. A. U. HERAT*

ABSTRACT

Decreasing foreign assistance makes it imperative that developing countries look to internal sources for funds for development. The study examines the only form of compulsory savings presently generated, the Provident Funds, in this context.

Three types of such funds, the Central Employee's Provident Fund, Private Provident Funds and the Employees' Trust Fund are currently in operation. The growth of the members' balances in these funds in the period 1980–1983 *are studied in absolute terms, in relation to each other and in relation to other macro variables of public finance.*

In view of the ultimate purpose of these funds, viz. the provision of retirement benefits to the members, the study also examines the return obtained by the investment of the monies in the funds and concludes that these are comparatively low.

Introduction

National savings finance the larger portion of savings in most Asian developing countries, though in the mid 1970's foreign savings (i.e. inflows of external financial resources) increased in importance as a source of finance for investment. However, it is believed that foreign aid is likely to experience a drop in the future[1].

If this view of a decreasing trend is indeed accurate, and the present economic difficulties faced by many traditional donor countries appear to substantiate such a belief, then modes of generating and mobilizing savings within the country acquire an enhanced importance. It is in this context that this study on the operations of provident funds in the period 1980—1983, is carried out.

---

* The writer would like to thank Mr. P. G. Jayasuriya and Mr. P. U. Ariyawansa of the Social Accounts Division of the Statistics Department for valuable comments, and also Mrs. H. M. Karunaratne of the same Division for undertaking the collection and tabulation of data.

1. Abbott. Graham J. (1984) ; *National Saving and Financial Development in Asian Developing Countries* ; Asian Development Review No. 2, Vol. 2 1984 ; Asian Development Bank.

One could argue that provident funds cover only those engaged in formal employment and hence have limited impact. Yet these funds are the only form of compulsory savings presently in operation. Moreover, the quantum of savings in these funds and their use clearly indicate that they are far from being economically negligible. As indicated in Table 5, the total increase in the Balances of the provident funds was approximately 13 per cent of the Domestic Savings of Sri Lanka in 1983.

For many years mercantile and other institutions had maintained funds for the provision of some form of retirement benefits to their employees. It was in 1958 however, that legislation was passed to set up a provident fund under state supervision. In this year, a centralized Employees' Provident Fund (EPF) was created, to be '..... a Provident Fund for the benefit of certain classes of employees.....'.[2] This fund, while initially being intended to be simply a scheme for the provision of retirement benefits to employees not entitled to receive a pension after retirement, has in recent years become an important captive source of finance to the Government. Since the central EPF is permitted to invest only in government or government-backed securities, its not inconsiderable funds can, to a large extent, be channelled according to the dictates of government policy.

Persons employed in a "covered employment" are subject to the EPF Act, which further states that any employment could be declared to be a "covered employment" by regulation. In practice to-day, this means that all employees not entitled to a pension after retirement, other than categories such as domestic aids, come under the purview of the EPF Act. The EPF Act also makes provision for "Approval Provident Funds" and "Approved Pension Funds". These are schemes which were in operation prior to the enactment of the EPF Act and whose operations satisfied certain minimum eligibility criteria. These schemes were permitted to operate independently, their members not being required to contribute to the central EPF. All other employees in "covered" employments and their employers are required to contribute to the Central EPF.

In 1980, legislation was passed creating another institution for the provision of retirement benefits to employees. This new institution, the Employees' Trust Fund (ETF), commenced operations in 1981. Though

2. Employee's Provident Fund Act. No. 15 of 1958.

this too is a retirement benefit fund administered under state supervision, certain fundamental differences exist between the ETF and the central EPF. The most basic of these differences being that whereas in the case of the central EPF both employees and employers make contributions, in the case of the ETF contributions are made solely by the employer. In addition, the ETF[1] is not constrained to invest only in government or government backed securities. In fact, on of the objects of the Employees' Trust Fund Board, appointed to administer the ETF, is the promotion of employee participation in management through the acquisition of equity interest in enterprises. Furthermore, unlike in the central EPF, there exists provision in the ETF Act for self-employed persons to become members of the ETF.

The rates of contribution to these funds, based on gross earnings, have gradually increased. The minimum contributions to the provident funds, which were 4 per cent from employees and 6 per cent from employers initially, had risen to 6 per cent and 9 per cent respectively by 1980 and became 8 per cent and 12 per cent thereafter. Contributions to ETF have been a constant 3 per cent since its inception.

Operating Results

Data on the operations of the central EPF and the ETF were obtained from the EPF Department and the Employees' Trust Fund Board. Information pertaining to the private (approved) provident funds could not be obtained from a centralized source. It was ascertained from the Commissioner of Labour, that there were 230 approved provident funds in operation. Questionnaires were sent to each of these and the study results are based on the replies received. Less than half the approved provident funds returned perfected questionnaires. However, there is reason to believe that the major private provident funds have responded and that the larger portion of operations in private funds is contained within the replies received. It is significant that in the results obtained for 1983, 77 per cent of the members' balances at the end of the year and 77 per cent of the total income earned by those private provident funds were contained in the replies of 8 per cent of the respondents.

Detailed operating results of the central EPF, private PF's and the ETF are given in Tables 1, 2 and 3.

---

1. Employee's Trust Fund Act, No. 46 of 1980.

TABLE 1

Operations of the Central Employees' Provident Fund

(Rs. Million)

Year	Members' Balanee in Fund	Gross Income	Income from Investments	Income from other Sources
1980 ..	4,620.3	392.6	391.3	1.3
1981 ..	5,596.6	547.8	546.2	1.6
1982 ..	6,840.3	749.0	745.7	3.3
1983 ..	8,341.9	1,004.1	1,001.4	2.7

Year	Total Expenditure	Compensation paid to Employees	Rent	Depreciation	Others	Net Operating Profit
1980 ..	11.8	4.8	1.0	...	6.0	380.8
1981 ..	13.7	5.6	1.1	0.1	6.9	534.1
1982 ..	17.1	5.9	1.2	0.1	9.9	732.0
1983 ..	18.2	6.8	1.3	0.1	10.0	985.9

Year	Operating Surplus	Interest allocated to Members	Value Added
1980 ..	380.8	392.7	385.6
1981 ..	534.1	531.7	539.8
1982 ..	732.0	684.0	738.0
1983 ..	985.9	1,001.0	992.8

Notes (1) ... Denotes a negligible quantity.
(2) Members' Balance is the balance in the Fund at the end of the year, prior to allocation of interest.
(3) Net Operating Profit = Gross Income – Total Expenditure.
(4) Operating Surplus = Net Operating Profit + Subsidies – Indirect Taxes.
(5) Value Added = Operating Surplus – Subsidies + Indirect Taxes + Compensation Paid to Employees + Depreciation.

TABLE 2

Operations of Approved (Private) Provident Funds

(Rs. Million)

Year	No. of Funds Reporting Results	Member's Balance in Fund	Gross Income	Total Expenditure	Compensation Paid to Employees	Rent	Depreciation
1980 ..	97	1,751.3	198.2	2.4	1.4	0.3	...
1981 ..	103	2,064.6	271.5	3.0	1.9	0.2	0.1
1982 ..	104	2,571.6	327.6	4.0	2.3	0.5	0.1
1983 ..	103	3,046.6	407.8	4.3	2.5	0.5	0.1

Year	Others	Net Operating Profit	Operating Surplus	Interest Allocated to Members	Value Added
1980 ..	0.7	195.8	197.6	179.9	197.3
1981 ..	0.8	268.5	271.1	243.6	270.5
1982 ..	1.1	323.5	327.4	323.7	326.0
1983 ..	1.2	403.4	407.8	392.7	406.1

Notes (1) ... Denotes a negligible quantity.
(2) Member's Balance is the balance at the end of the year, prior to allocation of interest.
(3) Net Operating Profit = Gross Income – Total Expenditure.
(4) Operating Surplus = Net Operating Profit + Subsidies – Indirect Taxes.
(5) Value Added = Operating Surplus – Subsidies + Indirect Taxes + Compensation Paid to Employees + Depreciation.

TABLE 3

Operations of the Employees' Trust Fund

(Rs. Million)

Year	Member's Balance in Fund	Gross Income	Income from Interest	Income from Dividends	Income from Other Sources
1981 ..	108.7	6.3	6.1	—	0.2
1982 ..	330.2	40.2	39.5	...	0.7
1983 ..	624.0	85.5	83.5	0.6	1.4

Year	Total Expenditure	Compensation Paid to Employees	Rent	Others	Net Operating profit
1981 ..	1.8	0.3	...	1.5	4.5
1982 ..	5.9	2.2	0.1	3.6	34.3
1983 ..	7.7	2.9	0.1	4.7	77.8

Year	Operating Surplus	Interest Allocated to Members	Value Added
1981 ..	4.5	3.1	4.8
1982 ..	34.3	32.4	36.5
1983 ..	77.8	70.6	80.7

Note: ... Denotes a negligible quantity.

DIAGRAM 1

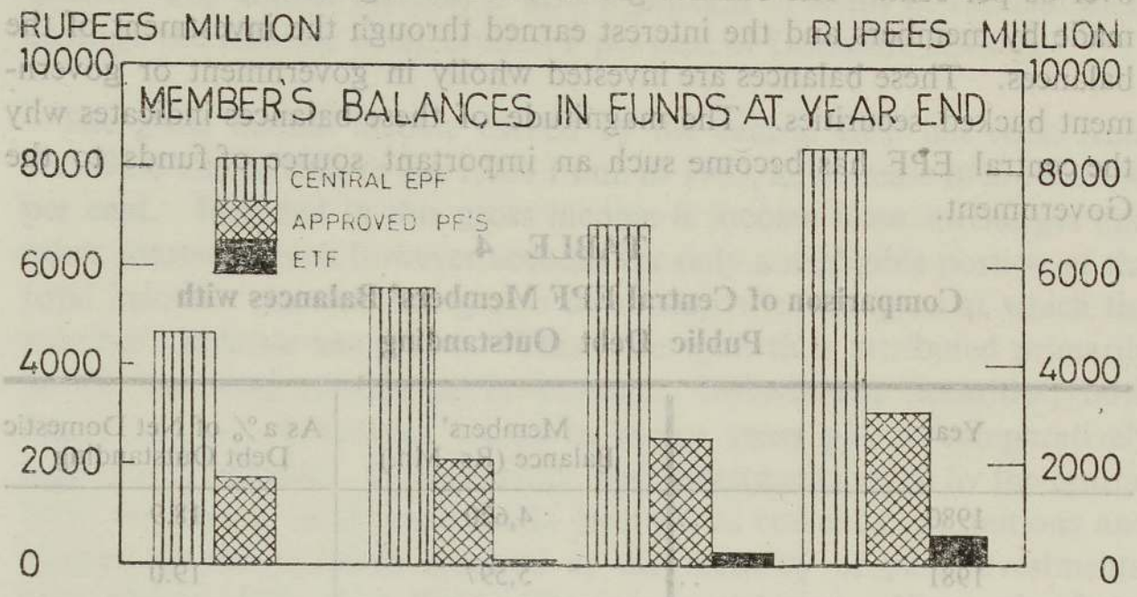
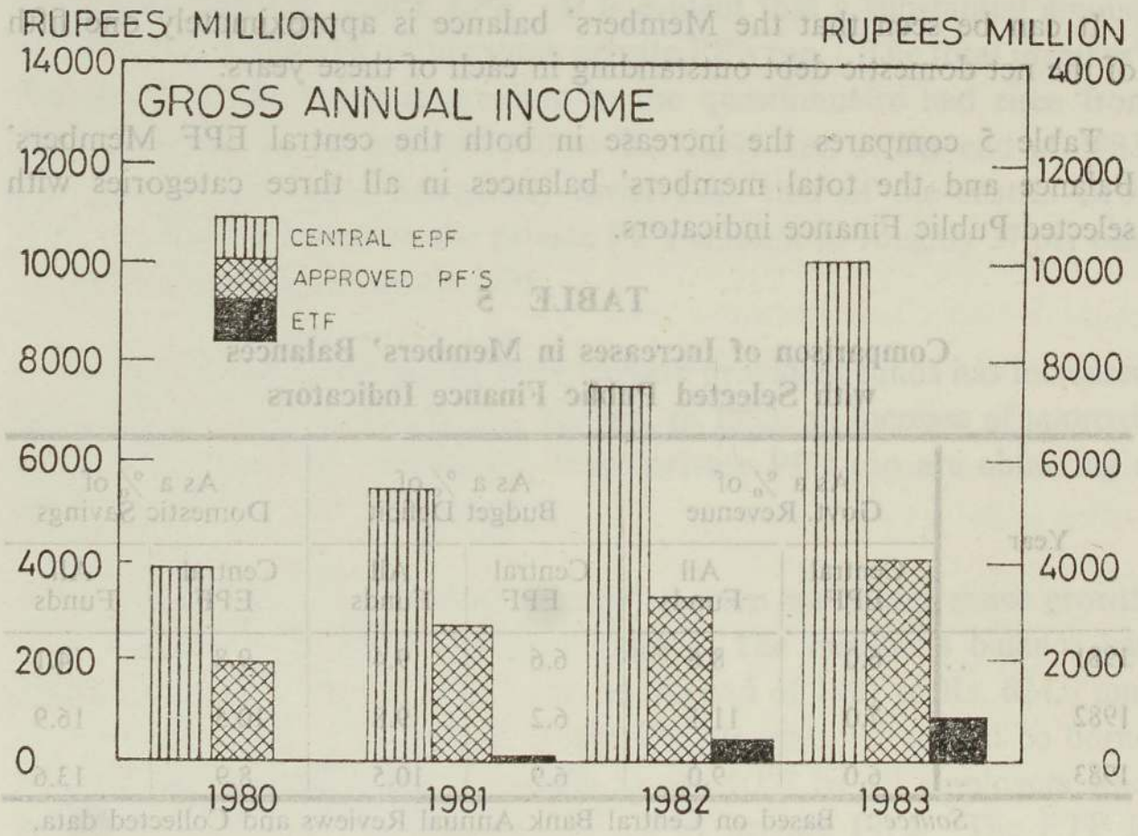


DIAGRAM 2



The member's balance in the central EPF has grown from Rs. 4,620 mn. at the end of 1980, to Rs. 8,342 mn. at the end of 1983, a growth of over 80 per cent. The balance grows both through the net contributions made by members and the interest earned through the investment of the balances. These balances are invested wholly in government or government backed securities. The magnitude of these balances indicates why the central EPF has become such an important source of funds to the Government.

TABLE 4

Comparison of Central EPF Members' Balances with Public Debt Outstanding

Year	Members' Balance (Rs. Mn.)	As a % of Net Domestic Debt Outstanding
1980 ..	4,620	18.9
1981 ..	5,597	19.0
1982 ..	6,840	18.7
1983 ..	8,342	20.6

Source : Based on Central Bank Annual Reviews.

It can be seen that the Members' balance is approximately one fifth of the net domestic debt outstanding in each of these years.

Table 5 compares the increase in both the central EPF Members' Balance and the total members' balances in all three categories with selected Public Finance indicators.

TABLE 5

Comparison of Increases in Members' Balances with Selected Public Finance Indicators

Year	As a % of Govt. Revenue		As a % of Budget Deficit		As a % of Domestic Savings	
	Central EPF	All Funds	Central EPF	All Funds	Central EPF	All Funds
1981 ..	6.0	8.6	6.6	9.4	9.8	14.1
1982 ..	7.0	11.1	6.2	9.8	10.5	16.9
1983 ..	6.0	9.0	6.9	10.5	8.9	13.6

Source : Based on Central Bank Annual Reviews and Collected data.

The annual increase in the members' balance in the central EPF is approximately 6 per cent of both government revenue and the budget deficit. The annual increase is also significant in terms of the Domestic Savings, the increase being around 9 per cent of Domestic Savings.

The gross annual income earned by the central EPF has risen from Rs. 392.6 mn. in 1980 to Rs. 1,004.1 mn. in 1983, an increase of around 150 per cent. Included in this gross income is income from surcharges and other sources, which however account for only a negligible portion of the total income. Income has grown at almost twice the pace at which the member's balance has grown. This faster growth is attributed primarily to the increased returns on investment. Government Securities, both long-term and short-term, issued in recent years pay a comparatively high rate of interest. Consequently, new investments made by the central EPF, whether it be through funds received as current contributions and interest or the proceeds received at the maturity of past investments, earn higher yields than the investments in the past. Hence the faster growth of income.

Significant factors are brought to light when the approved PF's are compared with the central EPF. It is evident that a substantial amount of savings is contained within these private PF's too. The total member's balance in those funds responding to the questionnaire had risen from Rs. 1,751 mn. at the end of 1980 to Rs. 3,047 mn. at the end of 1983, the growth rate being marginally lower than that of the central EPF. The members' balances in the private PF's amount to roughly 37 per cent of the balances in the central EPF.

The gross income earned by these private provident funds has increased from Rs. 198 mn. in 1980 to Rs. 400 mn. in 1983, an increase of approximately 150 per cent. Evidently, these private PF's too are obtaining a greater return on their investments.

The Employees' Trust Fund records an even more impressive growth than the well established provident funds. The member's balance has increased greatly from Rs. 108.7 mn. at the end of 1981 to Rs. 624.0 mn. at the end of 1983, a growth of nearly 475 per cent. It should be borne in mind that contributions are made to the ETF by all employers who contribute either to the central EPF or to private PF's. The ETF is

increasing in significance as a source of savings; for instance, its member's balance which was just 6 per cent of the members' balance in the private PF's and 2.4 per cent of the members' balance in the central EPF in 1981, increased by 1983 to 20 per cent and 7.5 per cent respectively of those balances. The increase in the gross income of the ETF is equally substantial, rising from Rs. 6.3 mn. in 1981 to Rs. 85.5 mn. in 1983, an over thirteen fold increase. It is noteworthy that even though the ETF has the ability to invest in the equity of enterprises, its income is derived almost entirely from interest earnings.

Total expenditure is low in all three categories, being highest in the ETF. Total expenditure is approximately two per cent of gross income in the case of the central EPF, one per cent for private PF's and nine per cent in the ETF. The comparatively high percentage in the ETF would be due to fixed overheads and this percentage would decrease with the increase in income that would be experienced in the future. The single most important segment of expenditure is the compensation paid to employees. Both the central EPF and the ETF maintain a separate staff to administer the funds whereas the majority of private PF's would use personnel on a part-time basis.

The low expenditure implies that the net operating profits are close to the values of gross income. Since no taxes, either direct or indirect, are levied on these funds and subsidies are very small in magnitude, the difference between net operating profit and operating surplus is marginal. As the values of compensation paid to employees and depreciation are, in general, minute when compared to net operating profit, the value added figures too do not differ significantly from the net operating profit. The value added as a percentage of net operating profit in 1983 was 100.7 per cent in the central EPF, 100.7 per cent in the private PF's and 103.7 in the ETF. Provident funds are a high-value added segment in the Financial Sector. This is clearly demonstrated by the fact that in 1983, the value added as a percentage of gross income was 98.9 per cent in the central EPF, 99.6 per cent in the private PF's and 94.4 per cent in the ETF.

These funds are operated entirely for the benefit of the members and hence their net income should be almost wholly distributed among the members. The information received indicates that this is generally true in the case of the central EPF and the ETF, where the interest allocated to members is approximately equal to the operating surpluses generated in all years. The results reported by the private PF's however indicate a slightly lower allocation, the allocation being approximately 95 per cent of the net operating surplus.

Return on Investments

The primary motive behind the setting up of these Funds was the provision of benefits, through savings, to employees at the time of retirement. It is therefore essential to evaluate the returns obtained on the investments of these Funds, more so because a part of the monies invested by the Funds constitute compulsory savings of members.

The returns on investments made are assessed by means of an index the ' Yield on Investments ' defined as follows :—

$$R_t = \frac{Y_t}{I_t} \times 100\,\%$$

where $I_t = \frac{1}{2}\,(B_{t-1} + N_{t-1} + B_t)$

R_t — Yield on Investments in year t

Y_t — Gross Investment Income in year t

I_t — Average Investment in year t

B_t — Member's Balance at the end of year t

N_t — Net Operating Surplus generated in year t

Although this index is not an exact measure of the return investment, it is sufficiently accurate to suit our purposes. The accuracy increases with a decrease in the proportion of net inflow within the year to the opening Member's Balance.

Table 6 indicates the yields on investments obtained.

TABLE 6

Return on Investments

Year	Yield on Investments			Annual Increase in CCPI(1)	Annual Increase in GNP Deflator (2)
	Central EPF	Approved PF's	ETF		
1980 ..	—	—	—	—	—
1981 ..	10.3	13.5	—	18.0	20.6
1982 ..	11.6	13.3	18.1	10.8	10.2
1983 ..	12.7	13.7	17.3	14.0	16.1

Notes.—(1) Indicates the percentage increase in the annual average value of "All Items" in the Colombo Consumer Price Index.

(2) Indicates the percentage increase in the Implicit GNP deflator of the 1970 based series of National Accounts.

It is apparent that the yield on investments of the private PF's is invariably higher than that obtained by the central EPF. This is only to be expected in view of the fact that the central EPF is constrained to invest only in Government or Government-backed securities, which give a relatively low return, whereas the private PF's are free to invest in other securities or in their parent company. Also observable is an increase in the yield on investments obtained by the central EPF. As explained earlier, this is due to an increase in the returns provided by the more recently issued Government securities. A similar increase has occurred in the yields obtained by the private PF's. This is probably a spin-off from the increased profitability of their parent companies and other commercial institutions in these years.

The ETF has succeeded in obtaining higher returns than either the central EPF or the private PF's. The ETF is permitted to and indeed does, invest in non-government securities. It is also permitted to participate in the equity capital of projects. Judging by the information received however, the ETF has either not acquired much equity capital or in the alternative, the enterprises in which equity capital was obtained have not as yet made any substantial declaration of dividends.

Since these funds provide savings for retirement, not only the nominal return on investments, but also the real return on investments deserves attention. In order to obtain an estimate of the real return on investments, the nominal returns are adjusted for two estimates of annual inflation, *i.e.* the change in the Colombo Consumer Price Index and the change in the Implicit Gross National Product Deflator. These estimates appear in Table 7.

TABLE 7

Real Return on Investment

Year	Real Yield-adjusted by CCPI			Real yield-adjusted by Implicit Price Deflator		
	Central EPF	Approved PF's	ETF	Central EPF	Approved PF's	ETF
1980 ..	—	—	—	—	—	—
1981 ..	- 6.5	- 3.8	—	- 8.5	- 5.9	—
1982 ..	0.7	2.3	6.6	1.3	2.8	7.2
1983 ..	- 1.1	- 0.3	2.9	- 2.9	- 2.1	1.0

$$\text{Real Yield } (r_t) = \frac{(100 + R_t - 1) \times 100\,\%}{100 + P_t}$$

where R_t is the Nominal Yield on Investments in year t
and P_t is the Annual Inflation Rate in year t

The results obtained are rather disturbing. In 1981 and 1983, the yields on investments obtained by the central EPF and the private PF's are below both measures of inflation, resulting in a corresponding negative real yield. However, the private PF's have performed relatively better than the central EPF. Only the ETF has consistently had a positive real return on investments. Moreover, it is generally conceded that neither the change in the CCPI nor the change in the Implicit Price Deflator capture the total prevailing inflation. Hence the true rates of inflation are probably in excess of the estimates and the real returns are probably even lower.

In this situation the question that most forcibly springs to mind is, 'If the real yield on savings is negative, what then is the point in saving?' This state of affairs seems to run counter to the basic principle upon which the Provident Funds were established, since the current value of savings would exceed the discounted present value of benefits obtained at retirement. It appears that the employee would be better off spending, rather than saving. If these Provident Funds are to serve the function of productive savings institutions, then a minimum yield on investment equal to the rate of inflation would be required.

Clearly, the low return obtained by the central EPF is due to the exclusive investment in government securities. Thus in the interest of the members, it would perhaps be advisable to explore the possibility of permitting investment in non-government securities. If however, government policy requires that these funds be channelled in a specified fashion, whether it be to contain inflation or to be a convenient captive source of funds for government expenditure, then perhaps the payment of a subsidy to increase the yield, as is done in the case of the National Savings Bank, could be considered.

The members of the private PF's too seem to be under the same disadvantage as the members of central EPF. Admittedly, the private PF's have performed better than the central EPF and the members of these private PF's have the advantage of relatively easier withdrawal of benefits ; nevertheless, the fact remains that the real return on investments is not a cause for much rejoicing. This low return is likely to be due to one of two reasons.

(*a*) the monies of the funds being invested in securities or in the operations of the parent company, with relatively low returns being paid on the investments ; or

(*b*) fund members being permitted to obtain loans against their savings balances, these loans being granted at a concessionary rate of interest.

If the latter is true, then the apparent real rate of interest, as computed above, is not truly indicative of the benefits to members, and the private funds could be justified on the grounds of the hidden benefit accruing to members through concessionary loans.

On the other hand, if the former is true, the parent companies are obtaining funds at less than the market rate with a consequential loss to their employees. This could well be construed as a breach of trust in the administration of the monies of the provident funds, and remedial action appears to be called for.

Concluding Remarks

Provident Funds in Sri Lanka can be divided into three main components, viz. the central EPF, private (approved) Provident Funds and the ETF. All these funds contain significant balances, the most substantial being the central EPF. The Member's Balance in the central EPF is approximately one fifth of the net domestic debt outstanding in these years. By virtue of the magnitude of its balances, the central EPF has become an important captive source of funds to the Government. The private PF's proved to contain an unexpectedly large amount of funds, possessing over a third of the balances in the central EPF. The ETF, which commenced operations in 1981, has also grown substantially in this short period.

All three funds obtain almost the entirety of their income in the form of interest. The return obtained on investments is highest in the ETF and lowest in the central EPF. In general, the ETF has a rate of return higher than the prevailing rate of inflation, whereas in both 1981 and 1983 the central EPF and the approved PF's as a whole, recorded a yield lower than the rate of inflation.This negative real yield is a matter for concern since it implies that the value of savings is being eroded over time. If the central EPF is to fulfil its primary task of providing retirement benefits to employees, its forms of investment may need to be revised in view of this negative real yield.

The author is an Assistant Director in the Department of Statistics. He graduated from the Sri Jayawardenapura University with a degree in Mathematics and Statistics. He is an Associate Member of the Institute of Cost and Management Accountants, London.

THE RESCHEDULING OF CULTIVATION LOANS : FIELD OBSERVATIONS FROM THE ANURADHAPURA DISTRICT*

NIMAL A. FERNANDO AND CHITRANI NANAYAKKARA

ABSTRACT

The Rescheduling Scheme was introduced by the Central Bank in 1981 *and the Bank of Ceylon commenced implementation of the Scheme in* 1982. *A major objective of the Scheme was to rehabilitate the non-wilful defaulters of cultivation loans extended under the Comprehensive Rural Credit Scheme. In early* 1985 *a field survey was undertaken by the Central Bank to gather data on various aspects of implementation of the Scheme. This study is based on the findings of the field survey. The study shows that a significant proportion of the target group-non-wilful defaulters did not participate in the scheme due to poverty : lack of adequate publicity and this had an impact on the poor performance of the scheme. The Bank branches in the study area have not played an active role in implementing the scheme due to a number of reasons. The study concludes that a different scheme is required for the hard-core non-participants, who are the poor.*

Introduction

From 1967 to the end of 1983, first under the New Agricultural Credit Scheme and later under the Comprehensive Rural Credit Scheme (CRCS), Rs. 1,495 mn. was disbursed for the cultivation of paddy and Rs. 473 mn. for the cultivation of other crops. As shown in Table 1 only Rs. 816 mn. of the paddy loans and Rs. 236 mn. of the other crop loans have been recovered by the end of 1983. This indicates a very high rate of default.

The liberalisation of disbursement of credit under the CRCS in 1977/78 contributed substantially to the sudden spurt in agricultural lending and the increase in the rate of default. The liberalisation was in fact a result of a Government directive to accelerate loans for cultivation purposes under the CRCS. However, since bulk of these loans were not repaid and the default guarantee of the Central Bank was withdrawn in 1978 the lending banks were compelled to tighten the criteria for lending. Thus, with effect from 1978 the defaulters were made ineligible for fresh loans

* This paper is based on a survey undertaken by Messrs K. A. Gunapala, K. B. Dissakaruna, W. L. L. Tissera of the Rural Credit Department (Central Bank) and Mrs. S. Sabaragamuwa of the Central Bank, Regional Office in Anuradhapura. The authors wish to acknowledge helpful suggestions received from Mr. G. M. P. de Silva, Director, Rural Credit Department and Dr. Nimal Sanderatne, Director of Economic Research, but remain responsible for any errors.

from the banks. The end result of these can be seen in the sudden fall in the number and amount of loans granted under the CRCS by the Banks. In 1978/79 only Rs. 106 mn. were granted under the scheme, which was about one fifth of the amount granted in the previous year. This meant that the majority of the farmers failed to gain access to credit from banks.

As this was considered an undesirable situation, a decision was taken by the Rural Credit Advisory Board (RCAB) in 1981 to introduce a Re-scheduling Scheme for the past-due crop loans disbursed by these banks.[1] The scheme was introduced with the intention of giving farmers an opportunity to rehabilitate themselves and become eligible for new loans and also to create the condition for a dialogue between commercial banks and delinquent borrowers, breaking the stalemate which existed under an earlier decision by commercial banks to prosecute them for the recovery of loans.

TABLE 1

Recovery of Agricultural Loans granted under CRCS (paddy & other crops)

(Rs. million)

Year	Paddy			Other Crops		
	Cumulative total of loans granted	Cumulative total of recoveries	% of recovery	Cumulative total of loans granted	Cumulative total of recoveries	% of recovery
1977 ..	638·2	362·1	56·7	213·0	93·6	43·9
1978 ..	1,088·6	471·5	43·3	296·4	121·5	40·9
1979 ..	1,155·7	525·5	45·5	311·7	140·1	44·9
1980 ..	1,208·4	579·3	47·9	337·0	164·7	48·8
1981 ..	1,299·1	658·8	50·7	413·3	200·9	48·6
1982 ..	1,428·6	735·1	51·5	438·5	217·9	49·6
1983 ..	1,494·9	816·3	54·6	473·3	235·7	49·8

Sources : Bank of Ceylon ;
People's Bank ;
Hatton National Bank and
Central Bank of Sri Lanka.

1. The RCAB consists of 10 members : Governor of the Central Bank (Chairman); Senior Deputy Governor of the Central Bank ; Secretary to the Ministry of Finance and Planning ; Secretary to the Ministry of Agricultural Development and Research; Secretary to the Ministry of Food and Co-operatives ; Secretary to the Ministry of Plan Implementation ; General Manager of People's Bank ; General Manager of Bank of Ceylon ; Chairman of the Agricultural Development Authority and Director of the Rural Credit Department of the Central Bank.

The Rescheduling Scheme

The Scheme was confined to crop loans granted during the period from 1st January, 1977 to 30th June, 1981 under the CRCS and meant for non-wilful defaulters. Under this Scheme, a farmer who has defaulted could become eligible for a new loan by paying 10% of the overdue loan (which has been consolidated and forozen as at 30th June, 1981) along with interest at 9% p.a. upto 30th June, 1981 and undertaking to pay the balance in 10 half yearly instalments. In consolidating the loan the penal rate of interest applied by the bank on the un-repaid amount was excluded. After making the down payment, at each harvesting season, farmer was expected to repay the balance amount of the loan over a period of 5 years. Where due to lack of irrigation facilities, double cropping is not possible and the defaulters are not able to repay the consolidated loan in 5 years, branch, managers were free to consider repayment periods in excess of 5 years upto a maximum of 10 years provided that they had obtained prior approval of the Regional Manager/District Manager of the area to offer longer repayment periods in respect of loans given in such un-irrigated areas. The scheme also provided an incentive to farmers to repay the rescheduled loan instalments regularly. Those farmers who pay the first 7 instalments regularly were exempted from the payment of the last 3 instalments.[2] When the scheme was introduced originally, the deadline for submitting applications for the purpose of rescheduling was announced as 30th September, 1982 but this was extended to 30th April 1983, as it was expected that improved publicity would attract more farmers into the Scheme.

Although both the Bank of Ceylon and the People's Bank faced the problem of high default on crop loans, the People's Bank did not agree to implement the proposed Rescheduling Scheme.[3] However, during 1982 the Bank of Ceylon commenced implementation of the scheme and, as at end of 1982 the total amount of consolidated loans in Anuradhapura district stood at Rs. 7.8 mn., while the amount collected as initial deposits amounted to Rs. 1.1 mn. This indicates that farmers who joined the scheme during 1982 have put down more than the specified 10% down payment. In 1983, the deadline for submitting applications under the

2. For more details on the Scheme see Department of Rural Credit, Rural Credit Operating Instructions No. 1/82 (Mimeo)

3. The People's Bank commenced implementation of the Scheme recently in January, 1986.

Scheme was extended to 30th June, 1984. However, there was not much progress in the scheme both during 1983 and 1984. Since successful implementation of the Rescheduling Scheme was considered crucial to achieving expansion in institutional credit to the small farmers in the country, the Rural Credit Department initiated a small scale study on the Rescheduling Scheme with a view to finding out the underlying reasons for the poor progress of the Scheme.

Objectives of the Study

The main objective of the study was to find out specific reasons which had a bearing on the poor progress of the Rescheduling Scheme. In the study an attempt was made to identify main socio-economic characteristics of both participants and non-participants in the scheme. Also the study was intended to find out the specific factors, if any, which prevented the banks from implementing the scheme effectively. It was assumed that the study would bring out the issues which may be of importance for policy formulation regarding the recovery of defaulted loans.

Methodology of the Survey

The survey was confined to loans granted by the Bank of Ceylon branches in the District of Anuradhapura. Anuradhapura District was purposely chosen for the survey owing to the fact that out of all the districts, it recorded the highest number of rescheduled loans. In addition to the farmers who agreed to reschedule their loans, those farmers who remained outside the scheme without joining were also included in the study since it was felt that the reason for their non-participation may be useful in policy formulation. For the purpose of the study two samples were drawn in the following manner :

(*a*) 5% random sample was drawn from those who have rescheduled their crop loans ; and

(*b*) 1% random sample was drawn from each bank branch out of the defaulters who have not rescheduled their crop loans by the end of 1984.

The total size of the sample of the participants in the scheme was 48 while the total size of the sample of non-participants was 171. Of these two categories, the team was able to interview 41 and 144, respectively. Three borrowers in the first category and 13 in the second category were reported dead. Detail distribution of the samples is given in Table 2.

A structured questionnaire was administered on the participants and non-participants chosen for the samples to obtain necessary information and data. The questionnaire sought information on a wide range of subjects from basic socio-economic data of the household, such as household size, age of the members and their educational status, to borrowings from institutional and non-institutional sources. In addition to the participants and non-participants in the scheme, the survey team interviewed all managers, except one, of the Bank of Ceylon branches in the district. In these guided interviews information was sought on factors relating to the bank managers' role in implementing the Rescheduling Scheme. Field work for the study was conducted during the period from mid-February to the end of February, 1985.

TABLE 2

Branch-wise Distribution of the Sample

Name of Bank Branch	Participants				Non-participants			
	No. Sampled	No. interviewed	No. dead	No. immigrated	No. Sampled	No. Interviewed	No. dead	No. immigrated
1. Thambuttegama ..	—	—	—	—	8	4	2	2
2. Rajangana ..	—	—	—	—	4	4	—	—
3. Bazzar Street ..	—	—	—	—	6	4	1	1
4. Shravasthipura ..	—	—	—	—	8	5	1	2
5. Eppawela ..	—	—	—	—	1	1	—	—
6. Mihintale ..	2	2	—	—	12	10	1	1
7. Kahatagasdigiliya ..	—	—	—	—	4	4	—	—
8. Galnewa ..	—	—	—	—	6	6	—	—
9. Epalogama ..	—	—	—	—	4	3	1	—
10. Thiruppane ..	1	1	—	—	5	5	—	—
11. Kekirawa ..	2	2	—	—	9	8	—	1
12. Elayapattuwa ..	2	2	—	—	14	11	1	2
13. Galenbindunuwewa ..	15	11	2	2	12	10	2	—
14. Maradankadawela ..	2	1	1	—	8	8	—	—
15. Galkiriyagama ..	17	15	—	2	7	7	—	—
16. Nochchiyagama ..	—	—	—	—	28	25	2	1
17. Horowpathana ..	—	—	—	—	7	6	—	1
18. Rambewewa ..	3	3	—	—	9	7	1	1
19. Pemaduwa ..	—	—	—	—	5	4	—	1
20. Medawachchiya ..	2	2	—	—	8	6	1	1
21. Kebithigollawa ..	—	—	—	—	3	3	—	—
22. Palugaswewa ..	2	2	—	—	3	3	—	—
Total ..	48	41	3	4	171	144	13	14

Socio-Economic Characteristics of Participants and Non-participants

The distribution of the borrowers by sex and age in the two samples are given in Tables 3 & 4. In both categories 85% of the borrowers were males. One fourth of the participants in the scheme were between 26 yrs and 35 yrs in age and a little over one fourth were in the age category of 36 - 45 yrs. About 39% of the participants were over 56 yrs in age. Thus, no correlation between age and the participation rate in the re-scheduling scheme could be observed. This is further confirmed by the fact that 20 per cent of the non-participants were also over 56 yrs in age.

TABLE 3

Distribution of Participants and Non-participants by Sex

Sex	No. of participants	(%)	No. of Non-participants	(%)
Female ..	06	15	21	15
Male ..	35	85	123	85
Total interviewed ..	41	100	144	100

TABLE 4

Distribution of Participants and Non-participants by Age

Age (yrs.)	No. of participants	(%)	No. of Non-participants	(%)
19 — 25 ..	—	—	4	3
26 — 35 ..	10	25	43	30
36 — 45 ..	12	29	34	24
46 — 55 ..	03	07	33	23
Over 55 ..	16	39	30	20
Total ..	41	100	144	100

The average household size was 5.2 and 5.4 for participants and non-participants, respectively. This is not much different from the average of 5.21 that has been reported for the entire dry zone in the Consumer Finance and Socio Economic Survey of 1981/82.

Both categories were similar in educational status. As shown in Table 5 nearly half the number of borrowers have had primary education below Gr. 6 level. The data on educational status tend to indicate no positive correlation between education level and participation in the Scheme.

TABLE 5

Educational Status of Participants and Non-participants

Educational Level	No. of participants	%	No. of participants	%	Total	%
No schooling ..	03	7	18	13	21	11
Grade 1— 5 ..	17	41	51	35	68	37
Grade 6— 8 ..	13	32	45	31	58	31
Grade 9—10 ..	8	20	24	17	32	17
Grade 11—12 ..	—	—	06	4	06	4
Total ..	41	100	144	100	185	100

Major occupation of about 90% of the participants in the Rescheduling Scheme and about 83% of the non-participants was cultivation. This indicates that loans have been granted mostly to genuine farmers. However, the fact that for 17% of the non-participants the major occupation was something other than cultivation, perhaps indicates that persons with no direct interest in farming have also obtained cultivation loans.

Though Agro-indentity card is a basic document a farmer should possess, 20% of the participants in the Scheme and 55% of the non-participants did not have the cards. The higher percentage of borrowers with no Agro-Identity Cards in the latter category may be partly due to the fact that major occupation of 17% of them is not cultivation.

Most of the borrowers were land owners and their agricultural land constituted both paddy holdings and highland holdings. The size distribution of these holdings is given in Table 6. About 83% of the

participants in the Scheme and 65% of the non-participants have paddy holdings over 2 acres in size. More or less, all the holdings were operated by owners themselves and the incidence of tenancy was insignificant in both categories.

TABLE 6

Land ownership of participants and non-participants

Size (acres)	Paddy Lands						High Lands					
	No. of participants	Percentage (%)	Cumulative (%)	No. of non-participants	Percentage (%)	Cumulative (%)	No. of participants	Percentage (%)	Cumulative (%)	No. of non-participants	Percentage (%)	Cumulative (%)
Without any Land	02	4·9	4·9	15	10·4	10·4	3	7·3	7·3	—	—	—
Less than 1 ..	02	4·9	9·8	13	9.0	19·4	28	68·3	75·6	62	43·1	43·1
1·1—2 ..	03	7·3	17·1	22	15·3	34·7	06	14·7	90·3	40	27·7	70·8
2·1—3 ..	25	61·0	78·1	56	38·9	73·6	01	2·4	92·7	20	13·9	84·7
3·1—4 ..	01	2·4	80·5	11	7·6	81·2	01	2·4	95·1	8	5·6	90·3
4·1—5 ..	03	7·3	87·8	07	4·9	86·1	—	—	95·1	5	3·5	93·8
More than 5 ..	05	12·2	100	20	13.9	100	02	4·9	100	9	6·2	100
Total ..	41	100·0		144	100·0		41	100·0		144	100·0	

Analysis of Participants

The main objective of the survey was to find out the reasons for poor performance of the Rescheduling Scheme. Participants were interviewed mainly to find out the reasons for their participation. It was expected that the analysis of these reasons would throw more light on the general performance of the scheme.

As shown in Table 7, out of the total number of participants in the sample, 51% had defaulted amounts exceeding Rs. 2,000/- while 22% had amounts exceeding Rs. 4,000/-. The participation appears to show no clear relationship with the amount in default.

TABLE 7

Distribution of defaulted loan amounts of participants in the Scheme

Amnt. defaulted (Rs.)	Participants (No.)	(%)
Less than 500	1	2
501—1000	6	15
1001—1500	9	22
1501—2000	4	10
2001—2500	3	7
2501—3000	8	20
3001—4000	1	2
Over 4000	9	22
Total	41	100

Table 8 presents a classification of participants by reasons for participation. This indicates that the majority participated in the scheme to make themselves eligible for fresh cultivation loans while about one fifth decided to join the scheme due to fear of legal action against them by the lending banks.

TABLE 8

Reasons for Participation in the Scheme

Reasons	No. of participants	(%) *
To obtain bank loans in future ..	35	85
To free from bank's legal obligations ..	09	22
To extend the period of repayment ..	01	03

* As a % of the total number in the sample.

Table 9 presents a classification of participants by type of persons who influenced them to participate in the Scheme. It is interesting to note that only 5% had joined the Scheme on their own initiative. Another 5% had done so due to the influence of their family members. This table reveals clearly that influence of, and pressure from, bank officers been more important in encouraging defaulters to join the Scheme.

TABLE 9

Classification of participants by type of persons who influenced them to participate in the Scheme

Category of persons influenced	Participants* No.	As a % of total No. of participants
Bank Officers ..	30	73
Cultivation Officers ..	05	12
Family members ..	02	05
Neighbours ..	02	05
Tobacco Corp. Officers ..	02	05
Self ..	02	05

* Since some respondents gave more than one answer, the total here is greater than 41.

Table 10 indicates that most of the participants (68%) have come to know about the Scheme through direct contact with bank officers and, mass-media appears to have played only a minor role in conveying the message about the Scheme. Most interesting aspect emerging from the data in Table 10 is that both village level officers, such as Mahaweli Unit Managers, and non-banking institutions operating in the area had not made a significant effort to provide publicity for the Scheme. Particularly, the passive role played by the Mahaweli Officers shows that there exists a lack of co-ordination among the banks, farmers and these officers as far as the implementation of the Rescheduling Scheme is concerned.

TABLE 10

Source of information on the Rescheduling Scheme

Main Source	No. of participants	%*
Radio ..	03	7
Newspapers ..	03	7
Advertisements/posters ..	09	22
Thro' Bank Officers ..	28	68
Thro' Cultivation Officers ..	03	7
Gramasevakas ..	01	2
Neighbours/relations ..	06	15
Mahaweli Publicity Meetings ..	02	5
Letter sent by Bank ..	01	2

* As a % of the total number in the sample (41)

In the survey, information was collected on participants' other business relationships with the bank at the time of the Survey. Table 11 indicates that 10% of the farmers had no other business relationship with the bank. This tends to indicate that these borrowers have joined the Scheme without any intention of enjoying various facilities offered by the bank, but due to fear of legal action by the bank.

TABLE 11

Participants' other business relationships with the bank

Type of relationship	No.	%
Maintains Savings A/cs. ..	29	71
Obtains agricultural loans ..	30	73
Obtains other loans ..	02	05
No relationship at present ..	04	10

It is interesting to note that out of 41 participants in the sample 11 (27%) had paid only the 10% down payment. They have failed to pay the instalments thereafter. Most of them, when they were asked for reasons for this stated that it was due to crop failure. Another reason given by them was that they had to repay the loans obtained from non-institutional sources first.

Analysis of Non-participants

The second sample, as stated earlier, consisted of 144 non-participants. These non-participants were interviewed with a view to analysing the reasons for non-participation.

Table 12 presents data on the distribution of non-participants by defaulted amounts. It is clear that both borrowers with small amounts as well as large amounts are found among non-participants. One cannot observe from the data, a close relationship between the amount in default and non-participation. This tends to indicate that non-participation in general, appears to be largely a result of other factors.

TABLE 12

Distribution of defaulted loan amounts of non-participants

Amnt. (Rs.)	No. of Non-partici-pants	%
Less than 500 ..	6	7
501—1000 ..	20	22
1001—1500 ..	14	15
1501—2000 ..	9	10
2001—2500 ..	10	11
2501—3000 ..	14	15
3001—4000 ..	2	2
Over 4000 ..	16	18
Total No. reported ..	91*	100

* Out of 144 non-participants in the sample only 91 had reported these data.

Data collected from these 144 non-participants revealed that 85 per cent (123) was not even aware of the Scheme. Therefore, the question of participation has not arisen in the case of those non-participants. Only 21 stated that they were aware of the Scheme. However, it is possible that some borrowers who were aware of the Scheme did not reveal their knowledge of the Scheme to justify their non-participation. But, in general the survey team felt that the message about the Scheme has not reached a majority of the defaulters, particularly those who live in remote areas, away from the bank branches.

Table 13 presents a classification of 21 non-participants who knew about the Scheme, by reasons for non-participation. Nearly 50 per cent stated that they did not participate because the instructions given to them by the bank managers were not clear. Nineteen per cent stated that 10% down payment required was beyond their capacity. It is important to note that only 9% did not participate due to the expectation that the loans would be written-off. In general the survey team observed that the economic status of about one fourth of the non-participants in the sample is such that they are not in a position to pay the downpayment and then the instalments regularly.

TABLE 13

Major reasons for Non - participation

Major reasons	No.	(%)
1. Proper instructions not given by the managers ..	10	48
2. Difficult to pay the 10% down-payment ..	4	19
3. Expected that the loan might be written-off ..	2	9
4. Would like to reschedule in the future ..	1	5
5. Reason not given ..	4	19
Total ..	21	100

However, the data on ownership of land and certain other assets by the non-participant households indicate clearly that a significant proportion of them do have the capacity to pay the downpayment and join the Scheme. Table 14 presents data on land ownership by non-participants. The data indicate that 54 per cent of them owned more than 3 acres each.

TABLE 14

Composition of Total Land Ownership of Non-participants

Size (Acres)	No. of Non-participants	(%)
Without any land ..	3	2
Less than ½ ..	7	5
·6 — 1·0 ..	2	1
1·1 — 1·5 ..	7	5
1·6 — 2·0 ..	7	5
2·1 — 2·5 ..	7	5
2·6 — 3·0 ..	33	23
3·1 — 3·5 ..	9	6
3·6 — 4·0 ..	7	5
4·1 — 5·0 ..	16	11
5·1 — 8·0 ..	33	23
8·1 —10·0 ..	3	2
More than 10 ..	10	7
Total ..	144	100

Data on ownership of other assets by the non-participants are given in Table 15. According to these data, most of them had radios and bicycles while about 17% had sewing machines. It is important to note

that there was one household with a four-wheel tractor while five possessed two-wheel tractors. Two non-participants were small scale rice millers. Thus, it is difficult to assume that they lack the capacity to join the Scheme. If enough pressure was brought to bear on them they would have joined the Scheme.

TABLE 15

Equipments Available in Non-participant Households

Equipment	No. of households	(%)*
Radios ..	91	63
Bicycles ..	95	66
Motor cycles ..	4	3
2—wheel tractors ..	5	3
4—wheel tractors ..	1	·7
Rice mills ..	2	1
Water Pumps ..	3	2
Bullock carts ..	10	7
Spraying machines ..	10	7
Sewing machines ..	25	17
Televisions ..	1	·7
Do not possess any of the above ..	23	16

* Percentage calculated out of total number of non-participants (144)

Also, in the context where there was no adequate institutional pressure to join the Scheme, many appear to have been discouraged by the long distance between them and the bank branch from which they obtained the loans. As shown in Table 16, fifty per cent of the non-participants lived at a distance of five miles or more from the bank branch which lent them. It is important to note here, for the purpose of comparison, that only 38 per cent of the participants lived 5 miles away from the Bank. Also, as mentioned earlier, the information on the Scheme has not reached many remote villages.

TABLE 16

Distance to the Bank Branch for Non-participants*

Miles	No.	%
Less than 1 ..	11	7·6
1 — 1·9 ..	13	9·1
2 — 2·9 ..	22	15·3
3 — 3.9 ..	14	9·7
4 — 4·9 ..	12	8·3
5 — 5.9 ..	19	13·2
6 — 6·9 ..	14	9·7
7 — 7·9 ..	3	2·1
8 — 8.9 ..	10	6·9
9 — 9·9 ..	6	4·2
More than 10 ..	20	13·9
Total ..	144	100·0

* The distance to the branch from which they have obtained loans.

It became clear in the study that there is a category of defaulters who did not participate in the Scheme simply owing to the fact that they still have access to bank loans. It was found that out of 25 non-participants in Nochchiyagama, 12 have obtained loans subsequently from the Hatton National Bank (HNBL) branch in the area. Therefore, they did not have any incentive to join the rescheduling scheme operated by the Bank of Ceylon. Except those defaulters who have had access to loans from HNBL, others have remained outside the banking network, though some of them still have dormant savings accounts.

The effects of non-participation appear to have been uneven. As one would expect, the poorest category of the non-participants appears to have become more dependant on non-institutional sources. This category lacks even jewellery to obtain loans through pawning. It is possible that they are now at various stages of losing their land ownership because land is the only significant asset they could offer to receive loans from non-institutional sources.

The poorest in the category may be already in the debt trap and there fore, may be beyond the point of rehabilitation through a rescheduling scheme. They are very unlikely to join the scheme even in the future. This category is the hard-core non-participating defaulters. A different strategy is certainly required for this category.

Another category of non-participants has resorted to pawning for their financial requirements. Out of the 144 non-participants, 46 stated that they have resorted to pawning during the period 1981-1984. Of considerable importance is the purposes for which they resorted to this method of financing. About 96 percent (44) of those who obtained pawning loans have done so to finance their cultivation activities. This appears to explain the increasing trend in the amount outstanding of loans granted by Rural Banks under pawning arrangements in the Anuradhapura District. At the end of 1979, the outstanding amount was only Rs. 2.4 mn. and this rose to Rs. 6.5 mn. at the end of 1983 and to Rs. 6.8 at the end of 1984.[4] Since the interest rate on loans under pawning is now 30 per cent well above the rate of interest charged for CRCS loans their interest cost has been extremely high. This tends to perpetuate the need for pawning and they appear to be caught up in a vicious circle.

TABLE 17

Year-wise Classification of Non-participants who had resorted to pawning during 1981—1984

Year	No.	(%)
1981	2	4
1982	5	11
1983	17	37
1984	22	48
Total ..	46	100

However, this category can be rehabilitated through the Rescheduling Scheme if steps are taken to bring them under the Scheme before their economic status gets worse and they fall into the hard-core category, mentioned earlier.

4. This increase reflects partly the rise in the value of gold during the period.

The most important among the non-participants are the affluent group who accounts for about 20 percent of the total number of non-participants in the sample. They have the economic capacity to join the scheme and some of them even are in a position to repay the loans in full in a few instalments. Since they are affluent the non-participation has not had any visible impact upon them. They continue their cultivation operations and finance them out of their surplus funds. Since this category constitutes wilful defaulters, they are not eligible to join the Scheme, even if they wish to do so. When the Scheme was introduced it was expected that the banks would take measures to recover loans from this category through other means. However, it was found in the survey that the banks have not taken adequate measures to bring to book a significant proportion of the wilful defaulters. Some non-participants even stated that no action whatsoever has been taken against politically influential defaulters or persons connected to families with very high socio-economic status. Such cases, in fact, appear to encourage other borrowers to remain as defaulters.

However, since the number of wilful defaulters appears to be fairly high, the banks may not be able to take legal action against all of them within a reasonable time span. Therefore, the best strategy may be to institute legal action against a sample of wilful defaulters, chosen from among the affluent group with high socio-economic status. This would encourage others in the same category to begin repayments.

Role of the Lending Banks

In the survey an attempt was made to gather information from the branch managers of the banks as to their role in implementing the Scheme. There were 20 Bank of Ceylon branches operating in the district at the time of the survey. However, only 10 branches have participated in the Scheme and the rest have not rescheduled a single loan up to the time of the survey. This, in itself, is a clear indication of the lack of interest in the scheme among some branch managers. The survey team had discussions with 19 branch managers.

In 1978, there were 31 Bank of Ceylon branches in the Anuradhapura District and this declined to 22 at the end of 1981, as a result of closure of some ASC branches and amalgamation of branches. The team was told that in this process of closure and amalgamation some records had been misplaced, thus hampering the implementation of the Scheme.

During the time lag between granting the loans and the introduction of the rescheduling scheme, some managers have been transferred and new managers who have come are not familiar with the defaulters. Thus, the recovery of previously defaulted agricultural loans in general and the implementation of the rescheduling scheme in particular appears to have received low priority.

Most of the branch managers in the district have not played an active role in giving publicity for the Scheme. It was found in the survey that three branches had not taken any action to give publicity because they thought that it was not a suitable Scheme. Several managers stated this to the survey team. As a result, the posters which were sent by the Central Office of the Bank have not been displayed. This however, raises a question of fundamental importance. Once a scheme has been approved and is put forward for implementation to the branch level, do the branch managers have a right to decide not to implement it ?

TABLE 18

Efforts taken by the Bank branches to implement the Scheme

Efforts	No. of branches	(%)
Visited defaulters ..	4	19
Informed defaulters by post ..	3	14
Assigned Development Assistants to handle this work	3	14
Displayed posters ..	10	48
Announced at the Kanna Meetings ..	4	19
Not made any effort ..	3	14

Only 10 branches out of 21 had displayed these posters. Even those branches that displayed them have done so inside the branch office and not in other places. Since defaulters do not usually come to the banks, it is unlikely that these posters had a significant publicity effect.

The lack of enthusiasm on the part of the managers in general was due to several factors :

(*a*) Managers felt, that bulk of those who are willing to reschedule simply want to take a fresh loan and most of them are likely to default again. Therefore, rescheduling of these loans will only aggravate the problem, from the point of view of the bank ;

(*b*) There was another category of managers who believed that most of the defaulters are wilful defaulters, hence not eligible to join the Scheme ;

(*c*) Several managers told the survey team that the implementation of the Scheme is cumbersome due to the large volume of clerical work involved in computing interest and the principal amount due, and it affects other work adversely since the branches are heavily under-staffed. It is interesting to note that, some managers have discouraged defaulters from rescheduling due to the fact that it would create additional work for the branch.

The survey team observed that all branches are heavily under-staffed and many lack an adequate number of field officers, required for the successful implementation of a scheme of this nature. Since managers were required, under existing systems of management to be concerned about profits of their branches and since they were not offered any special incentives for implementing the Scheme they appear to have made use of the liberty given to them under the Scheme and categorised many as wilful defaulters. Thus, on the whole, they have played a passive role. If managers were more active, the performance of the Scheme would have been much better.

This is confirmed by the data collected in the survey. Of the 10 branches which rescheduled loans, two branches accounted for 74 percent of 735 loans which had been rescheduled by end of January, 1985. The managers of these two branches, it was found, had taken a keen interest to organize meetings of defaulters and encourage them to join the Scheme, thus playing a more dynamic role. In contrast, at the branches where there were no such attempts the performance of the scheme was extremely poor.

Socio-Economic Profile of Selected Non-Participants

In a preceding section reference was made, in general, to affluent non-participants. In this section a more detailed socio-economic profile of two selected non-participants against whom the Bank has not instituted any legal action is presented. The profiles constructed are based on limited information that the survey team was able to collect and often represent underestimates of their true socio-economic status. Names given in the profiles are fictitious.

Non-Participant (1)

Mr. Borrow is married and has one child and two dependants. He is 47 years old and works as a trained teacher in a nearby government school. He has several sources of income, in addition to teaching.

(*a*) Income from 3 acres of paddy land he owns. This land is cultivated in both seasons. The estimated average yield per acre in Maha is about 60 bushels and in Yala about 50 bushels. He derives a net income of Rs. 10,500 per annum from the paddy holding.

(*b*) He has a rice mill which he bought in 1983 for Rs. 40,000. His net annual income from this source is estimated at Rs. 9,600.

(*c*) He has a 2 acre highland holding. This has not been properly utilized. There were 20 immature and 5 mature coconut trees on the highland.

He obtained a loan of Rs. 4,000 for paddy cultivation from the Bank of Ceylon in the 1977/78 Maha season which he defaulted. At the time of the survey his outstanding loans from non-institutional sources amounted to Rs. 12,000. He was aware of the rescheduling scheme, but did not want to participate in the Scheme.

Given his sources, and regularity of income and his social status he could have easily repaid the loan in full. Therefore, he may be classified as a wilful defaulter.

Non-Participant (2)

Mrs Repayment is 52 years in age. Her husband works as a Post-master. She has 3 grown-up children, of whom two are employed in the government sector, one as an Asst. Lecturer in a University and the

other as a teacher in a school. None of her children are married. They live in a very well built house. It is well furnished and equipped with a colour TV. Her household income is derived from several sources.

(*a*) her husband gets a monthly income from his employment of about Rs. 1,000.
(*b*) her son who is a lecturer gets a monthly income of about Rs. 1,500 ;
(*c*) her daughter who works as a teacher gets about Rs. 800 a month ;
(*d*) she owns 12 acres of paddy lands and 2 acres of highland. Cultivation is dependant on rain water, therefore it is uncertain. The total estimated net income during 1983/84 Maha from paddy was Rs. 9,000 ;
(*e*) she has a two-wheel tractor which is hired out for various purposes. The estimated net income from this source exceeds Rs. 15,000 a year.

She has obtained Rs. 6,000 from the Bank of Ceylon in the 1977/78 Maha season for 10 acres of paddy and defaulted the entire loan. Given her economic status, she certainly falls under the category of wilful defaulters.

Summary and Recommendations

The Central Bank introduced a Rescheduling Scheme in 1981 mainly with a view to rehabilitating non-wilful defaulters. The Scheme was implemented by the Bank of Ceylon, but the progress has not been satisfactory.

A survey was undertaken by a team of Central Bank Officers to find out the reasons which had a bearing on the poor progress. Information was collected from a sample of participants in the scheme and non-participants. The total sample size of participants was 48 while the total size of non-participants was 171. Of these, the team was able to interview 41 and 144, respectively.

The analysis showed no relationship between participation rate and educational status, age of borrowers and the amount borrowed. The data clearly indicate that a majority participated with a view to qualifying themselves for fresh bank loans while a few participated due to fear of legal action being taken against them by the bank. Many participants were motivated by the bank officers to join the scheme while a few have

come forward without any influence or persuasion by outsiders. The passive role played by the non-bank institutions dealing with the farmers is conspicious, and indicates a lack of support from other institutions in the implementation of the scheme. Minor role played by the mass-media in conveying the message about the scheme was a result of the fact that the banks did not make use of them extensively and effectively and should not be interpreted as a reflection of a poor link between the farmers and the mass-media. Though, personal contacts were used effectively in certain areas it was on a very limited basis.

In the case of non-participants, a majority revealed that they were not aware of the Scheme. The survey team found that the message about the Scheme has not reached many, particularly those in remote areas due to poor publicity.

The non-participants may be grouped under three main categories :

(*a*) Those who do not participate due to poverty. This category is estimated to account for about 25 percent of the non-participants and represent the hard-core non-participants ;

(*b*) wilful defaulters who have the economic capacity to repay the loans, even without the Rescheduling Scheme. This category accounts for about 20 percent of the non-participants ; and

(*c*) those non-participants in between the above two categories. This category accounts for about 55 percent of the non-participants.

The non-participation has had uneven effects on these categories. Those defaulters in the category 'C' appear to be using both non-institutional credit and pawning loans to finance their agricultural operations. Due to high cost of credit from those sources, they may get into a debt-trap and will be caught in a vicious circle, if they are not brought under the scheme soon. Some non-participants in the Nochchiyagama area have been able to obtain cultivation loans from the Hatton National Bank. Therefore, non-participation has had no adverse effect on their activities.

In the survey, it was found that the bank managers, on the whole, have not been keen to implement the scheme and poor progress may be explained partly in terms of this factor. Where the managers were keen to implement, progress was relatively better.

However, in fairness to bank managers, it must be mentioned that many do not have adequate human resources and proper incentives to implement the Scheme successfully. Therefore, often the managers have taken a negative attitude towards the Scheme.

It must be noted that the affluent non-participants are not eligible to participate in the scheme because they fall under the category of wilful defaulters. Though banks were supposed to institute legal action against this group, surprisingly they have not done so in the case of many such defaulters with high socio-economic status.

On the basis of the analysis presented in foregoing sections the following recommendations may be made for consideration of the Rural Credit Advisory Board and the lending banks.

(*a*) Implementation of the scheme should be continued and both banks should undertake implementing the Scheme ;

(*b*) More publicity be given to the Scheme through the mass-media, bank branch network and through personal contacts ;

(*c*) Lending banks be requested to consider an incentive scheme to motivate bank officers to implement the scheme effectively. The officers in those branches where percentage of participation is higher be remunerated. In evaluation the performance, participation rate be calculated against the total number falling under the third category stated earlier ;

(*d*) A different scheme be worked out and introduced for the hard-core non-participants, as the existing scheme cannot be used efficiently to rehabilitate them ;

(*e*) Lending banks without further delay, should institute legal action against a sample of affluent wilful defaulters with high socio-economic status. This will certainly encourage some of the others to begin repayments ; and

(*f*) Under the existing laws of the country the banks are not permitted to publish the names of defaulters. The amendment of the relevant laws to permit the publication of defaulters names would be useful in reducing the number of defaulters.

Dr. Nimal A. Fernando is Deputy Director of the Rural Credit Department. He graduated from the University of Ceylon, Peradeniya with honours in Economics and holds a Masters degree in Development Economics from Williams College, Massachusetts, U. S. A. and a Masters degree in Agricultural Economics from University of Wisconsin Maidson, U. S. A. He holds a Ph.D also from University of Wisconsin. His research interests include agrarian relations, poverty, income distribution, small holder agriculture in food crops and tree crops, rural financial markets and rural credit policy.

Chitrani Nanayakkara, a senior Assistant Director attached to the Rural Credit Department is a Geography honours graduate of the University of Sri Lanka, Colombo Campus. She holds a B.Phil degree from the same university. Her major research interests are rural credit and statistics.

AN EVALUATION OF THE SRI LANKA'S NON-TRADITIONAL EXPORT SECTOR

K. G. D. D. DHEERASINGHE

ABSTRACT

An attempt has been made in this study to examine the impact of exchange rate on unit prices of exports and the effectiveness of export promotion measures, in promoting the non-traditional export sector while maintaining their competitiveness. An analysis of the cost structure and sources of finances of the non-traditional exports was also made. The study observed that major policy reforms were introduced and export promotion was recognised as a priority in late 1977. *The exchange rate was a significant factor that affected domestic prices of exports but its impact depended upon the nature of agreement, denominated currency and terms of payment to some extent. The cost structure of export industries varied significantly depending on the nature of undertaking. The major source of finance in these industries was private sector commercial Banks.*

The objective of this paper is to

(*a*) identify non-traditional exports, by product, direction and invoiced currency to estimate the effect of exchange rate in determining the unit price received by exporters for their products.

(*b*) evaluate performance of each product taking into account various export promotion measures in order to examine whether or not such measures have been effective in maintaining competitiveness of non-traditional exports and to

(*c*) analyse the cost structure and sources of finances of non-traditional export industries.

Sources of data and methodology of the present study are illustrated in the Appendix. It was decided to use payments data on exports for two reasons *i.e.* to avoid inherent shortcomings in the Customs data and to obtain disaggregated information which the Customs sources do not provide. Consequently, a sample of form EC/Exp. 1 was selected for the purpose.[1] This sample constituted approximately 50 per cent of the country's non-traditional exports in value terms in both 1983 and 1984.

I wish to express my sincere thanks to Mr. J. L. E. Peiris, Mr. D. C. P. Rajapakse and Mrs. S. P. D. Nanayakkara for helping me to conduct the Postal Survey on export industries and in the collection and tabulation of data. My colleague Mr. R. A. Jayatissa, as usual made some valuable comments on an earlier version of this paper.

1. Form EC/Exp. 1 is the application form for licencing export goods on a commercial basis under the Exchange Control and Import/Export (Control) Acts.

A Postal Survey was conducted on export industries to obtain information on costs of production and sources of finance. Questionnaires were sent to a total of 258 exporters of non-traditional products but due to the poor response it was possible to collect information from only 54 industries. The data thus obtained directly from exporters were used for the analysis on costs, profitability and producer margins.

The Study is divided into three parts. In Part I, an attempt was made to evaluate performance of the non-traditional export sector and in Part II the analysis focussed on evaluating domestic institutional framework and policy implications. Finally, observations of the study are summarised in Part III.

PART I

The Non-traditional Export Sector – Definition, Composition and Performance in the Recent Past

There is no unique definition for non-traditional exports. However, the Inland Revenue Law and the Refinance Scheme of the Central Bank are widely quoted to overcome this problem.

According to the Inland Revenue (Amendment) Act No. 14 of 1984, export income from black tea in bulk, crepe rubber, sheet rubber, scrap rubber, coconut oil, desiccated coconut, copra, fresh coconuts, coconut fibre and gems are not eligible for tax exemption. These commodities other than gems are derived from traditional plantation crops and have a longstanding recognition of being the country's conventional exports.

For the purpose of the Refinance Facility of the Central Bank, exports are divided into two categories, *i.e.* 'Category 1' and 'Category 2'. Items which fall into 'Category 1' are tea, rubber, coconut and products derived from tea, rubber and coconut unless otherwise specified, garments, gems, marine products and petroleum products. All other export products in respect of which the grant of this refinance facility may be considered fall within the definition of non-traditional exports.

However, for a broader analysis, some deviation from the above standard definitions was resorted to, in this paper. Consequently, it was decided to re-define, ' non-traditional exports ' to include coconut fibre products, garments and precious and semi-precious stones. Therefore, non-traditional exports in the present paper mean all exports other than tea, rubber, coconut and coconut products in traditional form and petroleum products. The objective of this re-definition is to review the non-traditional export sector in a broader perspective.

1.2 Composition of the Non-traditional Export Sector

Sri Lanka's economy is heavily dependent on primary commodity exports of traditional nature. In 1984, the country's three main export commodities viz, tea, rubber and coconut kernel products accounted for 55.2 per cent of the total export earnings. The balance 44.8 constituted industrial exports, mineral exports, coconut fibre products and minor agricultural exports with unclassified exports accounting for 3.7 per cent of the total export earnings. Industrial exports other than petroleum products (24.9 per cent), minor agricultural crops (3.6 per cent), gems (1.6 per cent) and coconut fibre products (3.6 per cent), together accounted for 31.4 per cent of the total export earnings in 1984. The share of these exports in 1984 at 31.4 per cent was a decline of its level from 36.1 per cent of the total export earnings in 1983 contrary to the trend observed in recent years. This decline can be entirely attributed to the increased earnings from tea, rubber and coconut exports due to higher commodity prices which prevailed in 1984. It is very unlikely that high commodity prices will continue and therefore, long-term trend will follow the rapid growth experienced in the few years preceding 1984.

Although the absolute value of non-traditional export earnings increased, the trends did not follow anticipations. Industrial exports which accounted for more than one third of the value of total exports constituted approximately 60 per cent of garment and textile exports. Petroleum products accounted for more than 25 per cent of the industrial export earnings. These two products consist of low domestic value added ranging less than 5 per cent for petroleum products and 30 per cent for garments respectively.

Industrial exports other than textile and garments contributed les than 5 per cent (4.7 per cent in 1984) to the total export earnings of the country. Earnings from minor agricultural crops and precious and semi-precious stones remained stagnant though the potential existed for expansion.

1.2.1 Export Prices

As the export quantities cannot be uniformally measured due to accounting deficiencies, the derived unit prices are sometimes misleading. However, an attempt was made in the present study to avoid such misleading computations wherever possible.

Average unit prices realised for most industrial products indicated increases in 1984. However, articles of wood and furniture, tobacco, leather products, jewellery and gold smith ware, coconut coir fibre products, fruits and fruit extracts and ceramic ware were the main products which showed price increases. Among industrial products, unit prices realised for garments and coir yarn decreased.

TABLE 1.1

Industrial Products

Product	Unit	Unit Prices 1984(Rs.)	Percentage change over 1983 (%)
Articles of wood and furniture ..	Piece	5·93	40·8
Garments ..	Piece	87·05	- 2·9
Leather Products ..	Piece	191·25	4·5
Jewellery and Goldsmith ware ..	Piece	313·62	73·9
Coconut coir fibre products ..	Kg.	17·68	9·0
Coir Yarn ..	Kg.	13·88	- 2·3
Shark Fins ..	Kg.	355·96	8·4
Unmanufactured tobacco ..	Kg.	56·37	20·2
Fruits and Fruit extracts ..	Kg.	22·03	3·6

Source : Central Bank of Sri Lanka.

Almost all minor agricultural products indicated increases in unit prices in rupee terms with the exception of nutmeg shells and citronella oil. Volume of exports by individual products cannot be given in comparable terms due to diversity of units of measurements in terms of which

such information have been recorded. However, according to the Export Volume Index (Central Bank) for minor agricultural products, volume of non-traditional agricultural exports decreased substantially since 1981.

TABLE 1.2

Agricultural Products

Product	Unit	Unit Prices 1984 (Rs.)	Change over 1983 (%)
Live fish and water plants ..	Nos.	22·71	7·8
Betel nuts ..	Kg.	13·59	50 4
Kapok ..	Kg.	24·34	28·2
Papain ..	Kg.	370·94	2.5
Citronella Oil ..	Kg.	92·38	- 3·8
Castor Seeds ..	Kg.	11·91	55·1
Mace ..	Kg.	119·28	62·4
Cinnamon Leaf Oil ..	Kg.	165·30	5·3
Cinnamon Chips ..	Kg.	12·37	8·8
Pepper ..	Kg.	42.16	29.7
Cloves ..	Kg.	177·20	37·2
Nutmeg Shells ..	Kg.	27·61	- 14·3
Cardamoms ..	Kg.	585·55	64·9

Source : Central Bank of Sri Lanka.

According to Tables 1.1 and 1.2 prices of agricultural products indicated higher increases than those of industrial products. However, the long-term trends indicated that the prices of industrial products were more stable than those of agricultural products. It should be pointed out that prices of both agricultural and industrial products depended largely upon the quality factor although it is not possible to measure how effective the quality of products in determining prices. In the case of precious and semi-precious stones a sharp decline of unit price was observed due to the increased exports of treated stones which are of inferior quality compared to natural stones. However, the price of jewellery and goldsmith ware indicated a substantial increase.

The unit prices of commodities within each category varied significantly. This may be attributed to the quality factor and heterogencity of products. This was obvious in the cases of precious and semi-precious stones, garments, leather products, medicinal herbs, live fish and water

plants and silver and goldsmith ware. In the case of precious and semi-precious stones, export prices in 1984 varied from Rs. 61,709 per carat of Alexandrites to Rs. 60. per carat of moonstones. The price received for articles of wood and furniture ranged between Rs. 3 per piece and Rs. 14,225 per piece. The unit price of garments ranged from Rs. 46 to Rs. 202 per piece.

1.3 Market Distortion and Protection

Although 1977 policy reforms resulted in a substantial liberalisation of supply constraints, Sri Lanka as a marginal exporter has to accept the prices determined in the market. Its capacity to influence the market forces is minimal. More importantly growing protectionist measures adopted by importing countries have added a new diamension to world trade by constraining the demand. Most of the recent protectionist tendency is confined to non-tariff barriers. As far as Sri Lanka is concerned the imposition of quota and the U. S. countervailing duty on garment and textile imports is the main concern.

In a world of trade protectionism and distorted exchange rates it is important to devise a framework which should be analytically and at the same time practically useful for measurement of opportunity cost of producing goods in terms of foreign exchange. Due to the fact that Sri Lanka's non-traditional exports are dominated by products of low domestic value added it is important to measure the relative merits of each product in terms of foreign exchange earnings. Having this objective in mind an attempt has been made elsewhere in this paper to analyse the costs, profitability and producer margins of non-traditional exports.

Sri Lanka is a marginal supplier of most of its non-traditional exports in the world market. However, the country accounted for a sizeable share of the world supply of spices and precious and semi-precious stones accounting for 2.9 per cent and 2.1 per cent respectively. Table 1.3 indicates Sri Lanka's position in the world market in respect of selected non-traditional exports.

Most competitors of Sri Lanka are primary commodity exporters who are at various stages of development, judged in terms of GDP per capita. According to 1982 trade data, Sri Lanka was the nineth

largest supplier of spices in the world. Its total supply accounted for 2.9 per cent of the world supply. India, Singapore, Malaysia, Indonesia, Brazil, Tanzania, Madagascar and Spain accounted for 15.2 per cent, 12.9 per cent, 9.3 per cent, 7.7 per cent, 4.9 per cent, 4.6 per cent and 4.0 per cent of the world supply of spices respectively. These eight countries together with Sri Lanka accounted for more than two third of the total word supply.

Sri Lanka accounts for a sizeable share of total world exports of precious and semi-precious stones. However, due to high level of re-exports of precious and semi-precious stones by certain large importers, Sri Lanka's share is highly under-estimated, although the country is a main origin of gem exports. According to trade statistics for 1982 Switzerland was the largest exporter of these products accounting for 18.7 per cent of the total world supply. The other main exporters were Thailand, Hongkong, U. K., Federal Republic of Germany, U. S. A. and India which accounted for 13.8 per cent 9.9 per cent, 9.8 per cent, 6.9 per cent, 6.5 per cent and 5.6 per cent of the world exports respectively.

Sri Lanka, recently emerged as a significant exporter of garments. However, its textile and garment exports averages around one per cent of total world exports of such products. Hongkong, Italy, Republic of Korea together accounted for more than one third of total garment exports of all countries put together.

With a few exemptions of industrial goods exporters, Sri Lanka's competitors possessed similar features in their economies like high dependence on exports, deteriorating balance of payments, technological deficiencies and growing debt problem. In these backgrounds however, most of these countries have taken numerous steps to promote exports and maintain competitiveness. These measures include, mainly, exchange rate adjustments, direct financial and fiscal measures, bilateral and multi-lateral trade and payment agreements and various operational measures.

TABLE 1.3

Sri Lanka's Position in the World Market in Respect of Selected Non-Traditional Exports (1982)

Product	Largest Exporter		Sri Lanka	
	Value Rs. Million	Share of Total	Value Rs. Million	Share of Total
Spices ..	3,223	15.2	671	2·9
Cocoa ..	12,694	17·0	23	—
Unmanufactured Tobacco ..	32,380	36·4	31	—
Fruits and Nuts ..	28,884	14·0	915	0·4
Shell Fish ..	9,426	9·9	391	0·4
Pottery ..	9,530	24·8	68	—
Precious and semi-precious stones ..	5,444	18·7	616	2·1
Men's Outer Wear ..	20,456	14·8	1,061	0·8
Women's Outer Wear ..	33,044	19·3	1,315	0·8
Under Garments ..	13,110	27·3	468	1·0
Men's Shirts ..	10,336	31·0	431	1·3
Hand Bags ..	4,349	28·6	280	1·8

Source : Year Book of International Trade Statistics 1982.

1.3.1 Market for Sri Lanka's Non-traditional Exports

Sri Lanka's main markets for non-traditional exports are the U.S.A., EEC and Japan. The exports of wood products and furniture, leather products and coir fibre mattresses were exported mainly to the U.K., U.S.A. and Western European countries. Bulk of the leather products were exported to the U. K., garments and textile were exported mainly to the U. S. A. which accounted for approximately 70 per cent of total textile and garment exports. The other main buyers of Sri Lanka garments were the EEC countries. In addition to the two main buyers of garments viz. U. S. A. and EEC, sizeable exports have been made to Canada and Singapore.

As in the case of industrial products, U. S. A. and EEC were the main buyers of minor agricultural exports. The main agricultural products sold to these countries were citronella oil, pepper, castor seeds, cinnamon bark oil, cinnamon quills, cinnamon chips, coffee, papain, unmanufactured tobacco and live fish and water plants. A substantial volume of spices and medical herbs were exported to the South Asian and Middle

East countries. The main products thus exported were nux-vomica, medicinal herbs, cardamoms, betel nuts and sesame seed. Sri Lanka's markets for precious and semi-precious stones were mainly Japan, Australia, Hongkong, New Zealand, U.S.A. and Thailand. Jewellery and goldsmith ware were exported mainly to Singapore and Western Europe. A market-wise break-down of the shares of Sri Lanka's selected non-traditional exports are given in Table 1.4.

The EEC countries were the main buyers of Sri Lanka's leather, leather products, coir fibre mattresses, coir yarn, citronella oil, castor seeds, coffee, unmanufactured tobacco, goldsmith ware and live fish and water plants. The U. S. A. not only accounted for the largest share of Sri Lanka's garments but also was a major buyer of leather products, coir yarn, cinnamon quills, coffee and precious stones.

TABLE 1.4

Market Shares of Selected Non-Traditional Exports

Product	Market	Productwise Market Shares and unit prices (f.o.b.)			
		1983	Average Unit Price Rs.	1984	Average Unit Price Rs.
1. Industrial :			**per piece**		**per piece**
Articles of wood and furniture ..	U. S. A.	83·7	—	—	—
	EEC	16·3	**per kg.**	100·0	**per kg.**
Leather (Hides) ..	EEC	100·0	62·98	85·2	58.22
	India	—	—	14·8	61·05
			per piece		**per piece**
Leather Products ..	EEC	73·1	139·32	47·9	159·22
	USA	12·9	210·78	12·2	130·67
	Other	14·0	187·92	39.1	230.01
			per kg.		**per kg.**
Coir Fibre Mattresses ..	EEC	95·0	3·86	100 0	4·08
	Other	5·0	3·93	—	—
Coir Yarn ..	EEC	58·9	14·25	53·5	16·60
	USA	17·6	20·00	—	—
	Other	23·5	8·87	46·5	11·82
			per piece		**per piece**
Garments ..	U. S. A.	44·3	66·88	61·8	98·67
	EEC	34·8	91·95	33·6	90.24
	Other	20·9	64·19	4·6	46·15

(Continued.)

TABLE 1.4 (*Continued*)

Market Shares of Selected Non-Traditional Exports

Product	Market	Productwise Market Shares and unit prices (f.o.b.)			
		1983	Average Unit Price Rs.	1984	Average Unit Price Rs.
2. Agricultural Products			**per kg.**		**per kg.**
Citronella Oil	EEC	59·9	80·38	83·5	104·23
	USA	16·4	98·70	—	—
	Other	23·7	91·53	16·5	—
Nux Vomica	India	47·1	2·31	—	—
	EEC	28·7	6·38	13·1	6·84
	Other	24·2	4·39	86·9	9·22
Pepper	U. S. A.	52·9	29·98	5·0	40·87
	EEC	9·8	38·75	33·0	42·96
	Middle East	5·8	33.54	—	—
	Other	31·5	35·74	62·0	41·63
Medicinal Herbs ..	Pakistan	14·2	4·30	100·0	4·57
	Other	85·8	153·88	—	—
Castor Seeds ..	EEC	85·7	8·81	100·0	11·96
	Other	14·3	9·56	—	—
Cinnamon Bark Oil	EEC	94·8	3,787·50	94·6	3,577·16
	Other	5·2	2,886·50	5·4	4,701·50
Cinnamon Quills ..	EEC	15·3	61·61	16·2	35·84
	USA	10·9	47·36	27·5	28·74
	Latin America	65·0	47·65	43·6	29·87
	Other	8·8	75·50	12·7	27·14
Cardamoms ..	Middle East	51·5	296·53	61·7	601·74
	EEC	—	—	12·9	567·48
	Other	48·5	339·03	25·4	647·26
Coffee ..	USA	24·3	50·31	38·8	60·84
	EEC	75·7	49·05	61·2	64·98
Papain ..	EEC	40·0	308·78	14·2	255·85
	Japan	60·0	394·64	57·1	447·45
	Other	—	—	28·7	348·43
Unmanufactured Tobacco ..	EEC	100·0	48·94	100·0	54·13
3. Other Products			**per carat**		**per carat**
Precious stones ..	Japan	76·8	8,958·22	52·0	7,896·61
	U. S. A.	29·7	43,358·28	17·2	34,421·10
	Other	23·5	5,066·50	30·8	1,331·35
			per piece		**per piece**
Goldsmith Ware ..	EEC	81·2	237·46	67·6	143·63
	Other	19·8	100·57	32·4	55·16
Shark Fins ..	Singapore	92·2	328·36	91·1	345·54
	Other	7·8	319·17	8·9	332·50
Live Fish and Water Plants ..	EEC	95·2	266·76	94·8	271·67
	Other	4·8	26·95	5·2	282·16

Source : Central Bank of Sri Lanka.

1.4 Exports of Non-traditional Products by Denominated Currency and Exchange Rates

Table 1.5 shows the composition of Sri Lanka's non-traditional exports by invoiced currency.

Approximately 75 per cent of Sri Lanka's non-traditional exports were invoiced in U. S. Dollars. This may be attributed to the growing confidence of exporters over the U. S. Dollar as a strong currency and its gradual appreciation vis a vis the Sri Lanka Rupee in the past.

TABLE 1.5

Comparison of Non-Traditional Exports by Currency Denomination

(Percentage Share 1984)

Product	Invoiced Currency				
	USD	UKL	Other EEC	AMU	Other
Industrial Exports					
Leather ..	—	91.3	—	8.7	—
Leather Products ..	9·2	48·2	0·3	—	42·3
Fruits and Fruit Extracts ..	100·0	—	—	—	—
Fibre Mattresses ..	98·6	—	—	1.4	—
Coir Yarn ..	77·8	—	—	22·2	—
Wood and Furniture ..	5.0	80·8	14·2	—	—
Garments ..	100·0	—	—	—	—
Unmanufactured Tobacco ..	100·0	—	—	—	—
Agriculture					
Cinnamon Leaf Oil ..	73.3	12·4	—	14·3	—
Citronella Oil ..	92·4	7·6	—	—	—
Betel Nuts ..	39·0	—	—	61.0	—
Nutmeg ..	67·3	32·7	—	—	—
Pepper ..	74·2	3·8	—	21·9	—
Nux Vomica ..	39·5	—	—	60.5	—
Cinnamon Chips ..	89.3	10·7	—	—	—
Mace ..	42·7	—	—	57·2	—
Caster Seeds ..	100.0	—	—	—	—
Live Fish and Water Plants ..	99·5	—	—	—	0·5
Cardamoms ..	20·0	—	—	—	80·0
Precious and Semi-Precious Stones ..	100·0	—	—	—	—

Source : Central Bank of Sri Lanka.

The exchange rate has been a dominant factor that affected the earnings of exporters. It was evident from Table 1.5 that most of the export transactions has taken place in terms of U. S. Dollars. A sizeable amount of earnings were also received by exporters in other currencies such as those of the EEC and through the Asian Monetary Union (AMU).

A quarterly break-down of exchange rates indicated that all major currencies appreciated against the Sri Lanka Rupee till about the final quarter of 1980 since late 1977 when the free exchange rate system was first introduced. However, since the first quarter of 1981 the rate of appreciation of some currencies decelerated whereas some currencies began to depreciate. The cumulative net outcome of the movement of the U. S. Dollar showed a depreciation vis-a-vis the Sri Lanka Rupee until the end of 1979. The U. S. Dollar appreciated rapidly afterwards contrary to the trend observed in other currencies. The cumulative depreciation of the Sri Lanka Rupee since late 1977 till the end of 1984 was 39.11 per cent against the U.S. Dollar, 4.77 per cent against the U. K. Pound, 37.76 per cent against the Japanese Yen, 14.90 per cent against the Deutsche Mark and 12.65 per cent against the Indian Rupee. The Sri Lanka Rupee appreciated by 20.52 per cent against the French Franc.

One way to find out how far the increased rupee earnings have been effective in providing an inducement for export promotion is to deflate the increased earnings due to the currency factor by the increase in domestic price level. Although this quantification is difficult, it is a fact that the downward movement of the external value of the Sri Lanka Rupee resulted in increases in the unit prices of exports in terms of the local currency. Further, the change in the unit prices due to currency factor depended largely upon the particular currency in which export consignments were invoiced as the value of the rupee changed at varying degrees in respect of different currencies.

In a situation where exchange rate is allowed to float free, the terms of contract can result in either a loss or a gain to exporters depending on the direction to which the exchange rate is moving. In order to examine this situation unit prices realised for different commodities were computed for dates of contract, shipment and negotiation.

It was observed that two factors have been responsible for the deviation of unit prices at the times of contract, negotiation and shipment.

(*a*) Variation of the exchange rates.

(*b*) Nature of Contract and terms of payment.

It was also observed that in most instances, fulfilment of the contract, negotiation and shipment of goods have taken place within a period of less than 30 days. Therefore, if the payment was made on the basis of document against payment (DP bills), payments for export consignments would have been made with the delivery of documents to the buyer. Banks often finance the exporter by purchasing these bills on a "with recourse basis". In the instances of DP term bills therefore, the effect of exchange rate movement is minimal. If the agreed terms of payment is document against acceptance (DA bills) payment is not made at sight but after a period of time. The credit period runs from the date of acceptance of the bill by the importer or date of shipment or date of draft depending on the agreement between buyer and seller. As there is a delay in payment in this instance, the movement of the exchange rate can cause either a loss or a gain to the exporter depending on its direction of shift.

The effect of volatile exchange rates on export earnings can be measured by the rates that prevailed at the times of contract, negotiation and shipment. Data in Table 1.6 relate to the year 1984.

TABLE 1.6

Average Exchange Rates Prevailed at the Times of Contract, Shipment and Negotiation of Selected Currencies

Product	Currency	Average Exchange Rates in Rs.		
		Contract	Shipment	Negotiation
Articles of wood and furniture ..	USD	25·16	25·16	25·15
	UKL	35·12	34·95	34.64
	DMK	8·79	8·79	8·73
Leather Products ..	FFR	3·11	3·08	3.04
Raw Leather ..	INR	2.34	2·34	2·34
Coir Yarn ..	PAR	1.71	1·71	1·74
Work of Art ..	SID	11·94	11·94	11·94

Source : Central Bank of Sri Lanka.

The average time period taken by an export consignment to go through the process of contract, shipment and negotiation was around 15 days. During this period the highest volatility was observed in respect of the U. K. Pound. The value of other currencies varied in a reasonably narrow band.

The data given in the Table 1.6 on average exchange rates for selected products indicate an upward movement of the Sri Lanka Rupee in the particular year used for this analysis. The impact of the appreciations of the Sri Lanka Rupee should have been a decline in unit prices of exports. However, the unit prices given in Table 1.5 are not consistant with the trend observed in Table 1.6. The unit prices of certain commodities such as fruit products and mace at contract shipment and negotiation indicated an increasing tendency whereas the unit prices of leather products, garments, citronella oil and pepper declined. The unit prices of some commodities invoiced in U. S. Dollars remained unchanged. Similarly this behaviour of unit prices which contrasted with the exchange rate movement can be found in the products invoiced in all other currencies.

The behaviour of unit prices which is unexplainable by the exchange rate can be attributed to the international price changes and other qualitative factors.

1.5 Cost, Profitability and Producer Margins

Major components of cost production of non-traditional export products were on raw materials, wages and energy which accounted for nearly 75 per cent of the total cost. However, in certain products overhead costs such as administration selling and distribution and financial costs constituted sizeable shares. The largest share of total production cost was on raw materials.

The share of the material cost of the total production cost was 62 per cent and 60 per cent for 1983 and 1984 respectively.

Both domestic and imported raw materials have been significant in most export industries but domestic component of raw materials used was higher, and accounted for 64 per cent in 1983. However, the comparable figure for 1984 was 46 per cent. Accordingly, the share of imported raw materials accounted for 36 per cent and 54 per cent respectively for 1983 and 1984. A break-down by industry indicated that the share of raw material cost of the total cost ranged from 8 per cent to 75 per cent in 1983. In 1984, the comparable figures ranged from 4 per cent to 75 per cent. In both years, furniture and wood products industry indicated the highest share of the raw material cost while the lowest was minor agricultural products. The share of raw material cost was lower in agricultural products in relation to industrial products. Ceramics and packing material industries showed substantially low material costs.

In 1983, the wage bill accounted for 8 per cent of the total cost of production of non-traditional export industries. In 1984, this increased to 10 per cent. However, the share of the wage bill of the total cost varied from industry to industry and ranged from one per cent to 70 per cent in both years. The highest share of the wage bill of the total cost was in the gem industry while the lowest was in the fruit and fruit products industry.

The use of energy in non-traditional export industries varied widely from sophisticated commercial energy sources to traditional sources such as fuelwood. The share of petroleum was around 62 per cent and 65 per cent of the total energy cost in 1983 and 1984, respectively. The share of electricity cost was 37 per cent and 33 per cent in 1983 and 1984 respectively. Use of other sources accounted for only one per cent in 1983 and two per cent in 1984 and therefore, was negligible. When all industries were taken together, the share of energy cost component of the total cost was 5 per cent in both years. This varied from 0.04 per cent to 35 per cent, the highest share of energy cost being in the ceramics and packing materials manufacturing industries. Among other industries garments, jewellery, coconut fibre, laundry soap, minor agricultural industries registered low energy costs in their production cost structure. The percentage distribution of prime costs in selected export industries is given in Table 1.7.

The average profit margin as a percentage of sales of the non-traditional export industries was estimated to be 13 per cent and 11 per cent respectively for 1983 and 1984. In estimating the profitability, stock movements were neglected. Certain industries in the categories of garments and moulded rubber were among the loss making ventures. The profitability of industries such as pharmaceuticals, fish products, water plants and bulbs, gems, cigarettes and tobacco was higher.

1.5.1 Financing

Commercial banks were the main source of finance for non-traditional export industries. In addition to loans available under normal terms, credit facilities at concessionary interest rates were available to this sector under the Refinance Schemes of the Central Bank. Private commercial banks have played a significant role in providing financial assistance to the non-traditional export industries. Of the sample of

industries surveyed in the present study, 77 per cent of the industries have obtained loans from state banks whereas only 45 per cent and 32 per cent obtained credit from private banks and other sources respectively.

TABLE 1.7

Percentage Distribution of Prime Costs * of Selected Products

Product	Direct Wages		Direct Materials		Direct Expenses	
	1983	1984	1983	1984	1983	1984
1. Porcelain table ware, packing materials ..	12	12	29	29	34	34
2. Leather and Leather Products ..	22	20	49	52	04	03
3. Pharmaceuticals ..	20	24	52	49	3	2
4. Garments ..	06	07	68	67	01	01
5. Rubber Products ..	08	07	45	54	22	14
6. Furniture and Wood Products ..	18	16	49	50	08	09
7. Jewellery ..	20	17	53	57	02	01
8. Coir Products ..	07	07	66	66	02	02
9. Live Fish and Water Plants ..	35	35	38	37	02	03
10. Gems ..	69	70	—	—	06	05
11. Laundry Soap ..	04	—	70	74	01	01
12. Minor Agricultural Products ..	57	63	9	3	9	9
13. Cigarettes and Tobacco ..	13	15	59	58	3	2
Average of all products ..	8	10	62	60	5	5

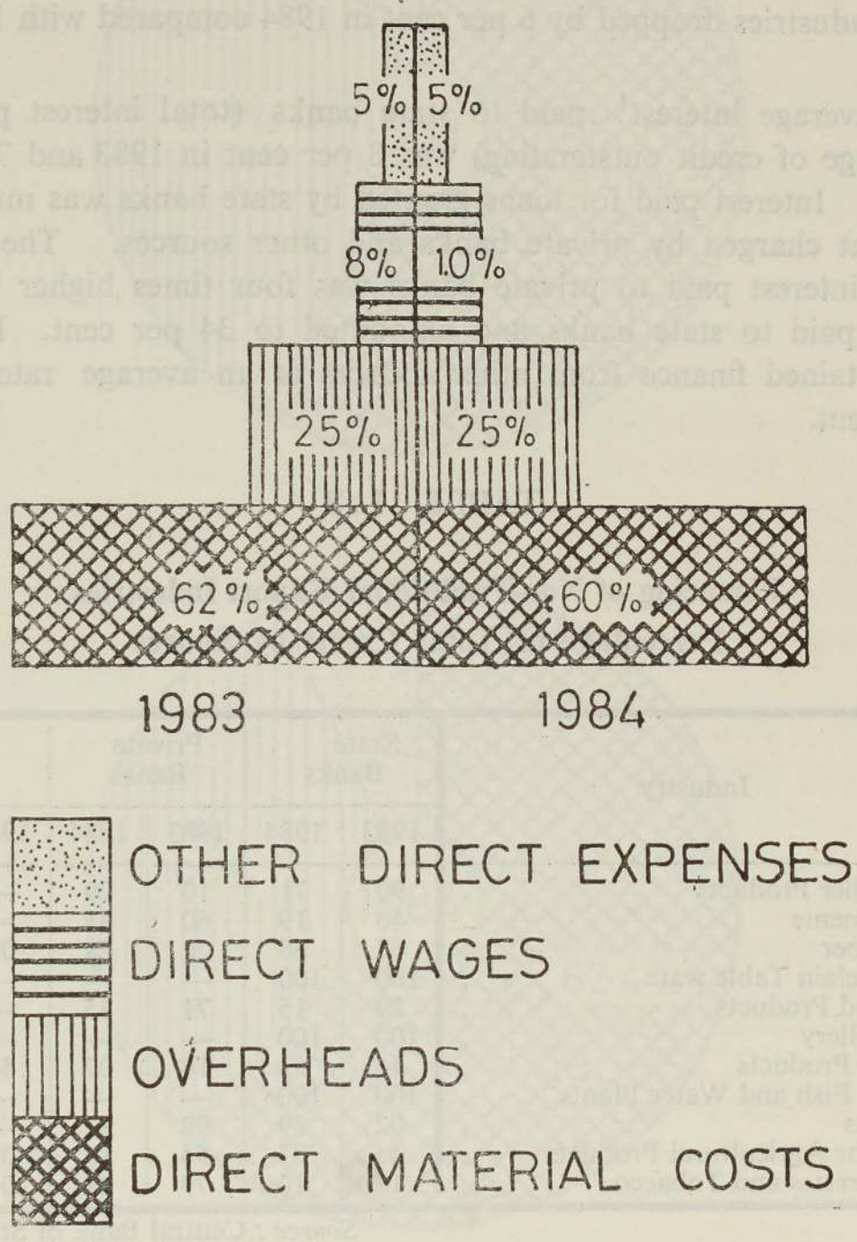
Source : Central Bank of Sri Lanka.

* Indicate direct wages, materials and other direct expenses.

State banks and private banks together have provided 96 per cent of the credit outstanding in these industries as at end of 1983. The increased share of the credit outstanding from 48 per cent in 1983 to 57 per cent in 1984 of the state banks indicated the increasing popularity of these banks as a source of finance among the exporters. Loan facilities provided by the non-banking sector accounted for only 4 per cent of the total credit. The share of credit facilities given by state banks for products such as spices, maldive fish chips, porcelain table ware, packing materials, jewellery, coir fibre products, furniture and wood items, laundry soap, minor agricultural products and live fish and aquatic

FIGURE 1.1

COST STRUCTURE OF NON-TRADITIONAL EXPORT INDUSTRIES



plants industries was relatively low compared to loans given to other industries. Borrowings by these industries from private commercial banks were more than those from state commercial banks.

As compared to 1983, the total amount of loans obtained from the state banking sector increased by 12 per cent in 1984, while those from private banks and other sources declined by 24 per cent and 9 per cent respectively. Total amount of credit outstanding in all non-traditional export industries dropped by 6 per cent in 1984 compared with 1983.

The average interest[1] paid to state banks (total interest paid as a percentage of credit outstanding) was 8 per cent in 1983 and 7 per cent in 1984. Interest paid for loans granted by state banks was much lower than that charged by private banks and other sources. The average rate of interest paid to private banks was four times higher than the interest paid to state banks and amounted to 34 per cent. Exporters have obtained finance from other sources at an average rate around 23 per cent.

TABLE 1.8

Financing of Non-Traditional Export Industries
Percentage of Total Credit by Source

Industry	State Banks		Private Banks		Other Sources	
	1983	1984	1983	1984	1983	1984
1. Leather Products ..	90	71	10	29	—	—
2. Garments ..	40	19	60	81	—	—
3. Rubber ..	67	66	26	28	07	06
4. Porcelain Table ware ..	100	100	—	—	—	—
5. Wood Products ..	29	15	71	85	—	—
6. Jewellery ..	100	100	—	—	—	—
7. Coir Products ..	46	53	10	07	44	40
8. Live Fish and Water Plants ..	100	100	—	—	—	—
9. Gems ..	02	69	98	31	—	—
10. Minor Agricultural Products ..	44	83	54	16	01	01
11. Cigarettes and Tobacco .	17	10	79	61	04	29

Source : Central Bank of Sri Lanka.

1. These rates considerably differed from prevailing market rates due to possible shortcomings of computation.

FIGURE 1.2

DISTRIBUTION OF FINANCE BY SOURCE

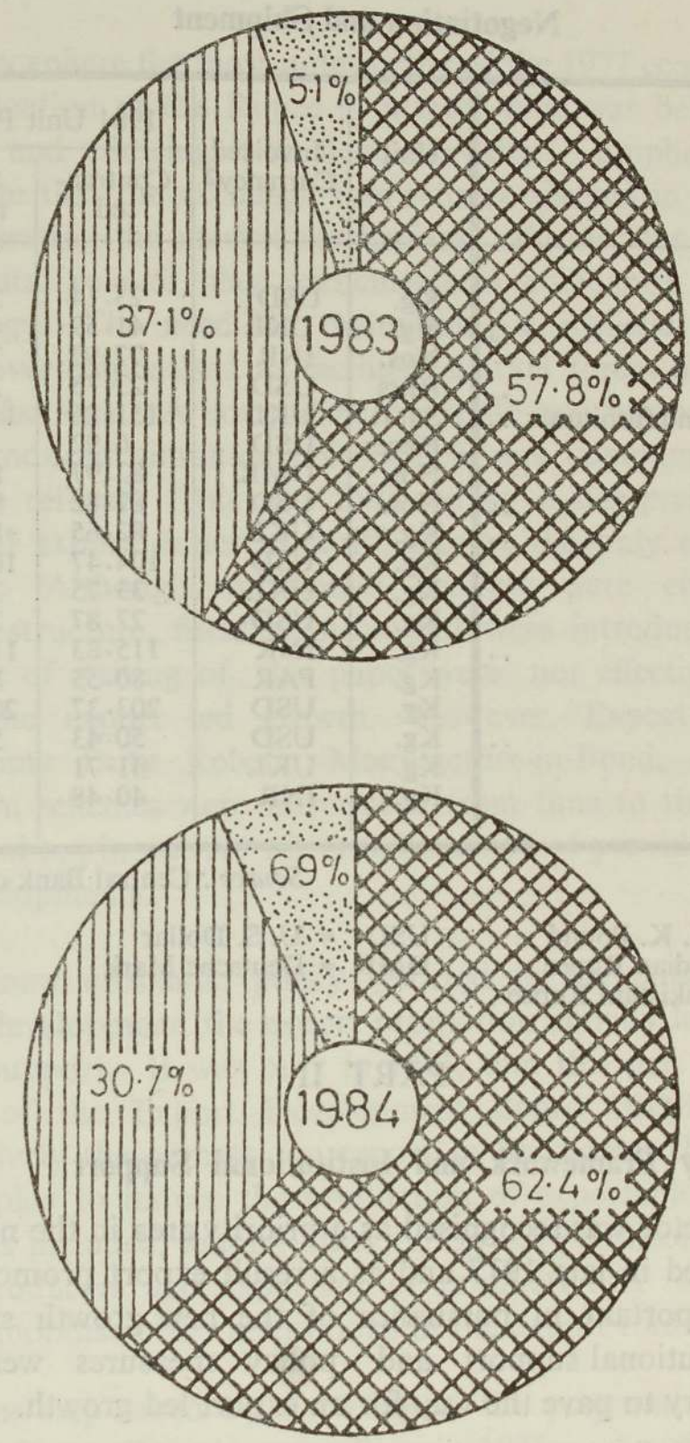


TABLE 1.9

Unit Prices of Selected Non-Traditional Exports as at Contract Negotiation and Shipment

Product	Unit	Invoiced Currency[2]	1984 Unit Price in Rs.		
			Contracted	Shipment	Negotiation
Fruit Products ..	Kg.	USD	23.14	23.15	23.15
Leather ..	Kg.	UKL	41.59	42.35	43.19
	Nos.	INR	77.92	77.92	77.92
Leather Products ..	Pairs	USD	23.75	23.83	23.75
Articles of wood and furniture ..	Sq. ft.	UKL	151.25	149.41	149.51
	Pieces	USD	6.92	6.92	6.92
	Nos.	DMK	82.97	82.87	82.37
Garments ..	Nos.	USD	87.82	98.13	85.36
Citronella Oil ..	Kg.	UKL	82.65	81.82	81.49
	Kg.	USD	104.47	104.21	104.23
Nutmeg	Kg.	UKL	33.75	33.76	33.77
	Kg.	USD	27 87	27.79	27.42
Mace ..	Kg.	INR	115.83	115.83	115.83
	Kg.	PAR	80.55	80.55	80.55
	Kg.	USD	203.37	203.37	203.86
Pepper ..	Kg.	USD	50.43	51.04	49.32
	Kg.	UKL	41.71	—	42.14
	Kg.	INR	40.48	40.48	40.38

Source : Central Bank of Sri Lanka.

[2] UKL = U. K. Pound
INR = Indian Rupee
PAR = Pakistani Rupee
USD = U. S. Dollar
DMK = Deutsche Mark

PART II

Domestic Policy Framework and Institutional Support

The export sector was recognised as a priority area in the new economic policy introduced in late 1977 and as a result export promotion became increasingly important in pursuance of the new growth strategy. An extensive institutional support and policy measures were therefore, deemed necessary to pave the way for an export led growth.

Diversification of the export sector was the main concern of the present policy and to pursue this objective financial and fiscal incentives were given to promote and yield a higher contribution from non-traditional

exports. In addition to direct involvement in promotion activity the newly setup institutions were expected to provide ancilliary services such as information and advisory services, export insurance etc.

In the policy sphere the most noteworthy of the 1977 economic reforms was the devaluation of the Rupee to a level what was believed to be a realistic level and allowing it to float thereafter. Empherical evidence clearly indicate that the exchange rate reform effected in 1977 has been pivotal in operating the market mechanism. Further the exchange rate had a very vital role to play particularly in pursuance of export led growth strategy. The need for maintaining a realistic exchange rate may not be over-emphasised to facilitate market forces and eliminating market imperfections. A comprehensive trade and payments liberalisation was introduced simultaneously which was complimentary to the exchange rate reform. This was followed by a comprehensive review of import and export duties as tariff became the only effective means of protection. Although substantial changes were effected in the domestic tax structure, fiscal reforms that were introduced since 1977 upto the time of writing of this paper were not effective enough to supplement the export led growth. However, Export Development Grant, Customs Duty Rebate, Manufacture-in-Bond, and Turnover Tax exemption schemes were introduced from time to time in addition to conventional tax incentives with the objective of providing an impetus to export developments.

Although, new economic policy resorted to an outward looking approach to development, the export promotion activity lacked adequate institutional support. It was only in 1981, that this gap was filled with the creation of the Export Development Board (EDB). In improving progressively the climate for export in Sri Lanka the EDB had a vital role to play to induce the production of exportable products and services. This included, among other things the provision of specialised services to producers and exporters of products and services and to organise and mobilise other institutions in the export trade.

A significant step taken by the EDB is the preparation of the five year National Export Development Plan in 1983. An effort was made in this plan to identify products and services that offer the potential for growth, enunciating clearly the factors inhibiting the rapid development of exports and formulating programmes for alleviating these constraints.

The National Export Development Plan envisaged a 12 per cent growth of exports during the planned five years and to achieve this an investment of Rs. 12 billion had to be generated from both the public and private sectors.

The magnitude of investment that was actually made during the first year of the Plan *i.e.* 1983 to 1984 is difficult to measure. However, the credit channelled through institutional sources may be used as a proxy to judge the levels of investment mobilisation in this sector. One main source of financing is the Central Bank Refinance Facility under the Medium and Long-term Credit Fund (MLCF). Under this scheme 70 per cent of the investment requirements is given at a rate of 12 per cent per annum for loans over Rs. 5 million and 11 per cent for loans less than Rs. 5 million if the projects are accepted by the EDB as export oriented. The total investment in the projects recommended by the EDB since the inception of the scheme until end of 1984 amounted to Rs. 1,298 million on 176 projects. Of this, a total investment of Rs. 113 million was made in 1984. Total refinance granted in 1984 amounted to Rs. 79 million. The other long-term source of investment was the equity participation of the EDB in export projects. The total equity participation as at end of 1984 amounted to Rs. 16 million on redeemable preference shares of 4 export projects.

It is important to make reference to the short-term financial assistance available to non-traditional export industries. There are two schemes operated by the Central Bank to provide exporters with working capital requirements.

(*a*) Pre-shipment Export Credit Refinance Scheme.

(*b*) Supplementary Refinance Facility on Selected Non-traditional Exports.

The former was introduced in 1977 and a facility of Rs. 1,778 million was available to commercial banks to be lent to exporters in 1984 at an effective interest rate of 12 per cent per annum. The latter was introduced in 1983 to promote non-traditional exports and to enable small exporters to obtain finance at concessionary rates. This facility is open ended with an effective interest rate being 8.75 per cent per annum borrowing, initially at 12.75 per cent and receiving a rebate of 4 per cent

when the proceeds are received in Sri Lanka. As at end of 1984 Rs. 271 million has been granted to export industries under this scheme. In addition to these two main schemes of financial assistance to expand export in the short-run, credit facilities to small scale export oriented manufactures and processors are available through the incentive package offered by the EDB.

Further to financial and fiscal incentives, the export development policy has laid emphasis on product development. Coconut fibre products, handlooms, marine products, gems and jewellery and garments were the particular non-traditional exports which have received attention in this respect in the past. The Export Production Village (EPV) Company Programme can be cited as a unique activity in the export development drive. As at end of 1984 there were 24 such companies. The total sales turnover of these companies in 1984 amounted to Rs. 7.7 million which was more than twice the sales turnover in the preceding year. The Export Business Intensification Programme and Exporters Forum were significant activities which were carried out in an attempt to achieve the objectives of the National Development Plan.

The establishment of the Sri Lanka Export Credit Insurance Corporation (SLECIC) was a noteworthy step in the annals of institutional development. The issue of insurance policies to exporters and guarantees to commercial bank by the SLECIC was effective in reducing the risk involved in export and export financing.

PART III

OBSERVATIONS

3.1 It was only since 1977 adequate policy measures were introduced and institutional support was provided in pursuance of the objective of export promotion and diversification although the export sector had long been recognised as a priority sector.

3.2 Non-traditional industrial exports grew faster than traditional exports but due to low domestic value added of particularly the industrial exports, favourable effects of such export growth on the country's balance of payments was minimal.

3.3 Garments and textile exports indicated the highest growth of non-traditional exports but due to protectionist measures such as quota, countervailing duty and high tariff imposed by the importing countries, the pace of growth of these exports will decelerate to a great extent. More and more items have been brought gradually under quota and as a result a number of items under quota increased considerably. It is therefore, important to explore non-quota markets in the future.

3.4 The year 1984 was generally favourable for agricultural products and consequently most of the minor agricultural products realised higher prices. Therefore, the comparison of 1984 prices with those of the previous year may be misleading. For a comprehensive analysis an examination of time series data is required.

3.5 It was observed that export prices of products were affected largely by the quality of particular products. This was clearly indicative in the case of precious and semi-precious stones where prices varied largely depending upon the quality of stones. However, it is very difficult to quantify the exact effect of the quality factor, unless specific studies are carried out for each product.

3.6 More than two third of Sri Lanka's non-traditional exports were exported to the U. S. A. and countries in Western Europe. In the background of protectionism, expansion of trade with these countries will be somewhat restricted. In such a context therefore, it is desirable to explore possibilities of export expansion with developing countries *i.e.* " South-South Trade."

3.7 Two factors have been responsible for determining the unit price received by exporters in terms of local currency. Although the most significant factor has been the exchange rate the nature of contract and terms of payment too had a role to play in determining the unit prices of exports.

3.8 Costs of raw materials, energy and wage bill accounted for approximately 75 per cent of the total cost of non-traditional export industries. However, individual cost components varied substantially from industry to industry depending on the nature of industry and method of technology used.

3.9 Most of the non-traditional export industries have adopted labour intensive technologies and as a result the wage bill resulted in a sizeable percentage of the total cost.

3.10 It is striking to note that a sizeable share of finance obtained by non-traditional export industries was from private commercial banks. The state commercial banks too have been the most significant source of finance to this sector. The share of finance from state banks as a percentage of total credit increased to 57 per cent in 1984 from its level of 48 per cent in 1983.

3.11 The average effective rate of interest charged for finances obtained from other sources was as high as four times the rate charged by state commercial banks.

3.12 It is quite premature to judge the effectiveness of some of the export promotion measurers due to the lags involved long time.

REFERENCES

1. *Central Bank of Sri Lanka Bulletin*, November 1977, February 1979, June 1979 and September 1985, Colombo, Sri Lanka.

2. *Central Bank of Sri Lanka Review of Economy*, 1977 to 1984, Colombo, Sri Lanka.

3. Central Bank of Sri Lanka Operating Instruction No. BD/01/85, Colombo, Sri Lanka.

4. *Commodity Year Book*, 1982, Turret Wheatland, Herts, England.

5. Direction of Trade Statistics, *Year Book*, 1985, International Monetary Fund, Washington D.C., U.S.A.

6. Government of Sri Lanka, *Inland Revenue Act*. No. 14 of 1984, Colombo, Sri Lanka.

7. Ministry of Finance and Planning, Budget Speech of the Government of Sri Lanka 1978-1986, Colombo, Sri Lanka.

8. ICCH Commodities and Financial Futures, 1983/1984.
Landell Mills Commodities Studies, London, U. K.

9. *International Financial Statistics* 1983, 1984 and September 1985, International Monetary Fund, Washington D. C., U. S. A.

10. Jayasundera, P. B. *Fiscal Adjustments to Sustain Economic Growth*—A Review of Post 1977 Experience in Sri Lanka, Sri Lanka Association of Economists, Annual Sessions, December 1985, Colombo, Sri Lanka.

11. Production Year Book, 1982 Food and Agricultural Organization, United Nations, Rome, Italy.

12. Public Investment Programme, 1984-1985, Ministry of Finance and Planning, Colombo, Sri Lanka.

13. Sri Lanka Export Development Board, National Export Development Plan 1983-1987, Colombo, Sri Lanka.

14. Statistical Indicators for Asia and Pacific, June 1984 Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand.

15. *Statistical Year Book* for Asia and Pacific, 1982 Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand.

16. *Year Book* for International Trade Statistics, 1982, United Nations, New York U. S. A.

Mr. K. G. D. D. Dheerasinghe is Senior Economist and Head of the Trade Division of the Economic Research Department. He received the Bachelors degree in Commerce from the University of Colombo. He holds a B. Phil. from the same University and a Masters degree from the Leeds University U. K. His major research interests are Transportation Economics, Energy and Trade.

DEMAND FOR NEW CURRENCY (NOTES AND COINS) IN SRI LANKA

A. G. KARUNASENA*

ABSTRACT

This paper presents a model for the currency authority to facilitate their estimation of new currency requirements for future periods. The model is constructed purely for forecasting purpose of currency requirements, hence the approach of this study is different from other studies of demand for currency analysing crucial underlying factors.

Additional demand, replacement demand and stock demand are identified as major components in demand for new currency. A simple model which takes account of these three components is formed by incorporating impact of economic activity and decisions of the currency authority. The model estimated for Sri Lanka is used in a forecasting experiment with a set of hypothetical values given for exogenous variables. Finally, possible policy alternatives under inadequate new currency supply conditions are briefly considered.

This paper presents a model to estimate the annual requirements of new currency notes and coins.

The Central Bank under the Monetary Law Act (MLA) is entrusted with the monopoly authority of supply of domestic currency. The amount of currency outstanding is demand determined since the Central Bank stands willing to provide all the currency that is demanded. Hence, in order to supply the required amounts of notes and coins the Central Bank must have sufficient knowledge of the currency demand conditions. The Bank must estimate appropriate requirements of currency based on the demand conditions and make necessary arrangements to produce and stock them to complete successfully their responsibility of currency supply.

The plan of this paper is as follows :—Section I describes briefly sources of demand for new notes and coins. In Section 2, a small model is developed to forecast new currency requirements. Estimation of

---

* The author is grateful to Dr. L. L. Gunaratne, Deputy Director of Economic Research, Central Bank of Sri Lanka for his valuable comments on the first draft of this paper.

proposed model and forecasted values for 1986 for a set of hypothetical values of exogenous variables are given in Section 3. Some available policy options for a supply constraint situations are briefly discussed in Section 4.

1. Demand Sources and Formation of the Model :

Sources of Demand for New Notes and Coins

New Currency[1] are produced in order to satisfy demand from three different sources.

1. Some new currency are required to add to the existing circulating amount of currency to satisfy new demand and it is called additional demand for new currency. The level of additional demand for new currency is primarily determined by the level of economic activity, price levels, monetisation of transactions, if any, and the public behaviour regarding use of currency.

2. Some new currency are required to replace old currency, which are considered unfit for further circulation (unserviceable currency). This is called replacement demand and its level is determined by the quality of currency, life of currency, habits of the public in usage of currency and the policy of the monetary authority regarding cancellation of unserviceable currency.

3. Some new currency are required to maintain a certain stock of currency for precautionary purposes. This is called stock demand and its level depends on the desired level of stock. The desired stock level depends mainly on flows of new currency, production conditions and storage facilities.

Since we have identified the basic components of demand for new currency and their sources the logical next step is to form and estimate an appropriate model.

---

1. In this study ' Currency ' is defined to represent both, notes and coins.

2. The Model

As shown above the total demand for new currency (D) consists of three components : additional demand (A), replacement demand (R) and stock demand ($\triangle$S). This can be written as below.[2]

$$D_t^i = A_t^i + R_t^i + \triangle S_t^i \ldots\ldots\ldots (1)$$

Where, superscript i represents i^{th} denomination of currency, and subscripts t represents year. Additional currency demand in a given year can be defined as the value of circulating currency which has been added in that year. Hence, the first difference of the value of currency in circulation (N_t^i) gives the additional demand.

$$A_t^i = N_t^i - N_{t-1}^i = \triangle N_t^i \ldots\ldots\ldots (2)$$

In this, study, public demand for each denomination of notes and coins (N_t^i) is treated as having a certain relationship to total value of currency in circulation (VCC_t). Hence, the total value of currency in circulation has to be determined first. The aggregate demand for currency depends primarily on the level economic activity and prices. Thus, the gross national expenditure at current market prices (GNPM) and implicit price index (IPI) as a proxy for expected inflation are taken as major explanatory variables.[3] The proposed behavioural equation for total value of currency in circulation is given below.

$$VCC_t = f(GNPM_t , IPI_t) \ldots\ldots\ldots (3)$$

Total demand for each denomination is determined as given in equation 4.

---

2. A similar model was developed by the Bank of Thailand in 1974. However, the formation of some component and the analysis of results are improved in this paper.

3. It should be emphasised that since this model is constructed purely for forecasting purpose, the approach is to establish a consistent relationship among demand for various denominations of notes and coins. Therefore, the approach of this study is different from other studies of demand for currency which aim at establishing underlying factors.

$$N_t^i = W_t^i * VCC_t \quad \ldots\ldots\ldots(4)$$

Where, W_t^i are weights.

These weights (W_t^i) can be determined by using past information and policies of monetary authority regarding the composition of currency.[4]

Replacement demand (R_t^i) can be defined in two ways. First, the replacement demand can be determined based on the age structure of the currency in circulation and expected life periods of currency. For an example, if the life time is two years of the i^{th} currency, the replacement demand of that currency is equal to the amount of that currency (in circulation) in the age group of over two years.

$$R_t^i = N_t^i - \sum_{j=0}^{n^i} (A^i + R^i)_{t-j} \quad \ldots\ldots\ldots(5a)$$

Where n^i is the expected life of i^{th} currency. Alternatively, replacement demand can be written as below, assuming unserviceable notes are replaced regularly.

$$R_t^i = A_{t-n}^{i\ i} + R_{t-n}^{i\ i} \quad \ldots\ldots\ldots(5b)$$

Secondly, replacement demand can be defined based on expected life periods of currency and amounts of currency in circulation.

$$R_t^i = r_{r*}^i (N_t^i + N_{t-1}^i)/2 \quad \ldots\ldots\ldots(5c)$$

Where $r_r^i = 1/n^i$ and n^i = expected life of currency ; number of years.

If we have more detailed data, the first method is more appropriate, specially, when there are more fluctuations in additional demand and replacement of unserviceable currency.

---

4. These weights are fairly stable during a normal period but they are changing significantly during a high inflation period and/or when new denominations are introduced. Also these weights can be based on cross section data collected on public preference of currency denominations. Alternatively, demand for each denomination can be formed as a behavioural equation, *i.e.* $VCC_i = f(GNPM_t, IPI)$.

The desired level of stock (S_t^i) depends on the outgo of the new currency from the authority and the production facilities of currency.

$$S_t^i = \delta * (A_t^i + R_t^i) \quad \ldots\ldots\ldots(6)$$

$$\Delta S_t^i = S_t^i - S_{t-1}^i \quad \ldots\ldots\ldots(7)$$

If the country does not have currency production (printing and minting) facilities or its production capacity is limited and more fluctuations appear in new currency flow from the authority, the value of δ is high. Therefore, the value of δ should be based on the country's experience and new currency supply facilities including the time lag.

Values of currency required to be produced (RC_t^i) are determined by

$$RC_t^i = A_t^i + R_t^i + S_t^i - S_{t-1}^i \quad \ldots\ldots\ldots(8)$$

Units of currency required to be produced (RCU_t^i) are given by

$$RCU_t^i = RC_t^i / VD^i \quad \ldots\ldots\ldots(9)$$

$$\text{Total units, } TRCU_t = \Sigma_i RCU_t^i \quad \ldots\ldots\ldots(10)$$

Where, VD^i = Value of each denomination.

The complete model is given in table 1. Figure 1 gives the structural diagram foı the model.

TABLE 1

Model for New Currency Demand

Total Demand for New Currency

$$(1)\ D_t^i = A_t^i + R_t^i + \Delta S_t^i$$

Additional Demand

$$(2)\ A_t^i = N_t^i - N_{t-1}^i = \Delta N_t^i$$

Total Value of Currency in Circulation[5]

5. The selection of appropriate price index varies from country to country and from time to time even for the same country. Other possible explanatory variable is the monetisation impact. A proxi variable like time trend or number of bank branches of the country or relative composition of GDP, can be considered to capture the monitization impact.

(3) $VCC_t = f(GNPM_t, IPI_t)$

$$\frac{VCC_t}{GNPM} > O \; j \qquad \frac{VCC_t}{IPI} > O$$

Value of Each Denomination in Circulation

(4) $N_t^i = W_t^i * VCC_t$

Replacement Demand

(5*a*) $R_t^i = N_t^i - \sum_{j=o}^{n^i} (A^i + R^i)_{t-j}$

(5*b*) $R_t^i = A_{t-n}^i + R_{t-n}^i$

(5*c*) $R_t^i = r^i{}_* \; (N_t^i + N_{t-1}^i)/2$

Desired Stock

(6) $S_t^i = \delta \; *(A_t^i + R_t^i)$

Stock Demand

(7) $\triangle S_t^i = S_t^i - S_{t-1}^i$

Value of currency required to produce (or order)

(8) $RC_t^i = A_t^i + R_t^i + S_t^i - S_{t-1}^i$

Number of currency units required to produce (or order)

(9) $RCU_t^i = RC_t^i/VD^i$

Total number of currency units required to producer (or order)

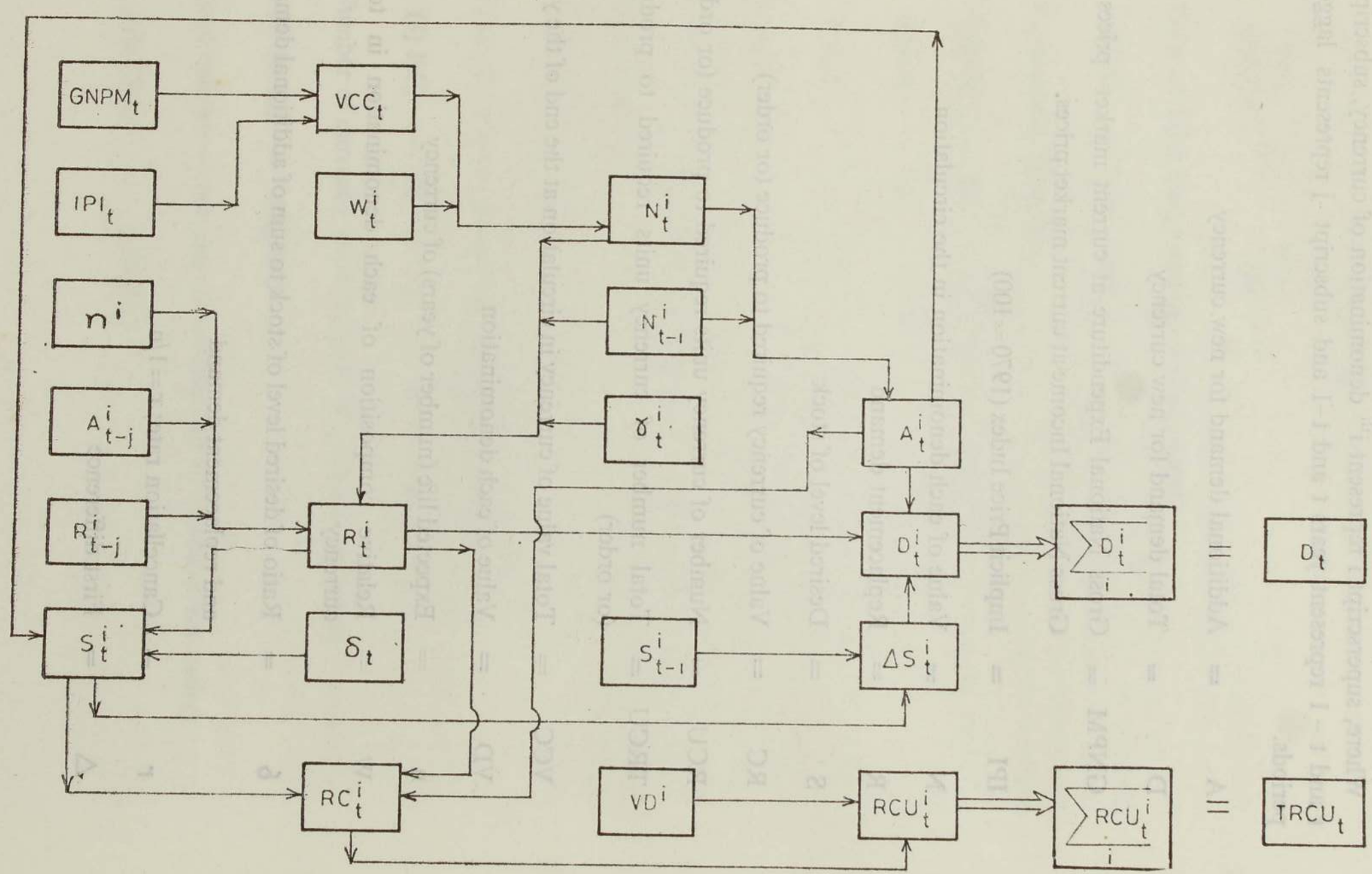
(10) $TRCU = \sum_i RCU_t^i$

Where, superscript i represent i^{th} denomination of currency, subscripts t and t – 1 represent years t and t–1 and subscript j represents lagged periods.

A	=	Additional demand for new currency
D	=	Total demand for new currency
GNPM	=	Gross National Expenditure at current market prices = Gross National Income at current market prices.
IPI	=	Implicit Price Index (1970 = 100)
N	=	Value of each denomination in the circulation
R	=	Replacement demand
S	=	Desired level of stock
RC	=	Value of currency required to produce (or order)
RCU	=	Number of currency units required to produce (or order)
TRCU	=	Total number of currency units required to produce (or order)
VCC	=	Total value of currency in circulation at the end of the year
VD	=	Value of each denomination
n	=	Expected life (number of years) of currency
W	=	Relative composition of each denomination in total currency
δ	=	Ratio of desired level of stock to sum of additional demand and replacement demand
r	=	Cancellation rate; $r = 1/n$
Δ	=	First difference

FIGURE 1

STRUCTURAL DIAGRAM FOR DEMAND FOR NEW CURRENCY



3. Estimation of the Model and a Hypothetical Example to Estimate Demand for New Currency

Only equation 3 has to be estimated econometrically. This equation was estimated with annual data for Sri Lanka. Different functional forms, sets of explanatory variables and data periods were tried in the estimation. The equation selected from them is given below.

$$VCC_t = \underset{(2.31)}{0.022067}\ GNPM_t + \underset{(4.96)}{11.56503}\ IPI_t$$

$$\bar{R}^2 = 0.99 ; F = 498.9; S.E. = 237 ; D. W. = 1.99$$

Method = OLSQ, period = 1978 - 1985.

Value for other parameters such as w_t^i, r^i and δ can be determined based on the recent observed values of them and judgement of the officials of the Currency Department of the Central Bank.

Alternative estimated forms of equation 3 are given in Appendix Tables.

Estimates of income elasticity and price elasticity of the total value of currency in circulation are given in Table 3. It is interesting to note that whenever real income variable is included, the price elasticity is closed to unity. These values are in the range of 0.949 to 1.015. This unitary elasticity behaviour is shown by both price variables ; CPI and IPI. The estimated income elasticity is high in the linear version equation compared with the log-linear version of the equation. The highest income elasticity is 0.76.

TABLE 2

Model Used for Forecasting Experiments

Total demand for new currency

(1) $D_t^i = A_t^i + R_t^i + \Delta S_t^i$

Additional demand

(2) $A_t^i = N_t^i - N_{t-1}^i = \Delta N_t^i$

Total value of currency in circulation

(3) $VCC_t = 0.022067 * GNPM_t + 11.56503 * IPI_t$

Value of each donomination in circulation

(4) $N_t^i = W_t^i * VCC_t$

Replacement demand

(5*a*) $R_t^i = A_{t-n}^i + R_{t-n}^i$

(5*b*) $R_t^i = r^i * (N_t^i + N_{t-1}^i)/2$

Desired Stock

(6) $S_t^i = \delta * (A_t^i + R_t^i)$

Stock demand

(7) $\Delta S_t^i = S_t^i - S_{t-1}^i$

Value of currency required to produce (or order)

(8) $RC_t^i = A_t^i + R_t^i + S_t^i - S_{t-1}^i$

Number of currency units required to produce (or order)

(9) $RCU_t^i = RC_t^i/VD^i$

Total number of currency units required to produce (or order)

(10) $TRCU_t = \sum_i RCU_t^i$

Values for W_t^i and r_i are given in tables 6 and 7.

TABLE 3

Elasticity Values of "VCC"
(Period 1978 - 1985)

	GNPM	GDPN	GNPMR	CPI	IPI
Log-Linear Version:					
(1) ..	0·760	—	—	—	0·017
	—	0.708	—	0·122	—
	—	0·685	—	—	0·166
	—	—	0·310	0.949	—
	—	—	0.296	—	0·969
Linear Version (Estimated at mean Values) ..	0·315	—	—	—	0·706
	0.359	—	—	0·621	—
	—	0·362	—	—	0·627
	—	0·411	—	0.566	—
	—	—	0·310	—	0·015
	—	—	0·473	0·953	—

Where : GNPM = GNP at current market prices
GNPN = GNP at current factor cost prices
CPI = Colombo Consumer Price Index (1952 = 100)
IPI = Implicit Price Index (1978 = 100)
GNPMR = (GNPM/CPI) or (GNPM/IPI)

A Hypothetical Example:

In this sub-section a hypothetical example is given to estimate the demand for the new currency for the (t + 1)th period or 1986.

The composition of currency, currency out-go (new currency issue) and expected lift of currency in Sri Lanka are given in Table 4–6.

The estimated value of VCC is Rs. 12,509 million for given values of Rs. 200 million of GNPM and 700 of IPI in 1986. Hypothetical values for the composition of currency in 1986 and available stock at end of 1985 are given in Tables 7 and 8.

Based on the above information the estimated new currency requirements are given in Table 8.

A Comparison with the Existing System:

In countries where detailed studies are not available, demand for new currency is estimated mainly based on the last year issue (out-go) of new currency. This method results a number of disadvantages compared with the system presented in this paper. First, it does not take into account changing economic circumstances to determine required levels of new currency. In a growing economy, this may result a cumulative shortages in currency supply. Also it does not estimate the replacement demand appropriately. These two factors together result high fluctuations in currency stock and make it difficult to achieve an efficient currency stock management. Furthermore, the under-estimation of the required new currency deteriorates the quality of circulating currencies since unserviceable notes can not be replaced successfully. Moreover, it does not give reasonable estimates when new denominations are introduced into the system.

However, an experienced officer may adjust successfully the last year's new currency out-go to derive future new currency requirements without a theoretical analysis like the one presented in this paper.

However, the accuracy level of these estimates mainly depends on the officer's experience and understanding of the changes in new currency demand.

4. Policy Alternatives under Inadequate Supply Condition:

Under normal circumstances the level of currency demand is determined by the demand condition as mentioned earlier in this paper. Demand for currency and the available stock together determine the requirements of new currency production. However, in certain years currency authority may face the supply shortages of new currency due to unexpected changes in the economy and or under estimations made in earlier periods.

The currency authority can select one of the following measures as a temporary solution for a supply shortage situation. A short-term practical solution is to control the replacement demand for currency. Under this the currency authority can keep the replacement demand, the largest component of the total demand for new currency at a minimum level by setting the lowest cancellation rate that is physically feasible.

Another short-run solution is the use of available stock. Under this measure instead of building up the stock toward the desired level, part of the existing stock can be used to fulfil the additional demand and replacement demand. Also, the authority can use any combination of these two policy measures.

In some years though the total value of new currency demand can be fulfilled with available supply, shortages may be seen for some denomination. Under this situation the currency authority can use the stock of closer denominations to satisfy at least part of the excess demand for a specific denomination.

In the long-run, the most efficient method is the improvement of estimates for new currency demand very regularly, by taking into account the available information and possible expected changes in the economy to derive more accurate estimates.

TABLE 4

Composition of Currency
(Percentage Values in December)

Denominations	Actual Values of W_i								Expected values W_i
	1978	1979	1980	1981	1982	1983	1984	1985	(t+1)
Notes									
Rs. 1,000 ..	—	—	—	0·51	16·27	24·61	28·01	33·24	34·00
Rs. 500 ..	—	—	—	—	14·13	18·76	20·67	20·20	20·00
Rs. 100 ..	52·28	55·41	53·49	56·69	39·23	29·27	28·26	27·06	27·00
Rs. 50 ..	23·96	23·73	25·75	24·51	15·68	14·31	11·00	7·72	7·50
Rs. 20 ..	—	—	3·28	4·74	3·05	2·93	2·34	2·01	2·00
Rs. 10 ..	13·39	11·82	9·39	6·41	5·07	4·03	3·80	3·69	4·00
Rs. 5 ..	3·75	2·99	2·17	1·82	1·56	1·48	1·50	0·87	0·30
Rs. 2 ..	1·63	1·74	1·79	1·15	1·11	0·71	0·39	0·26	0·20
Total (notes) ..	95·66	95·81	95·97	96·90	96·18	96·15	95·03	95·09	95·00
Coins									
Rs. 5 ..	0·09	0·07	0·07	0·12	0·20	0·19	0·17	0·95	1·22
Rs. 2 ..	0·11	0·11	0·10	0·18	0·21	0·52	0·78	1·11	1·10
Rs. 1 ..	1·64	1·16	1 52	1·49	1·35	1·25	1·27	1·25	1·20
Cts. 50 ..	0·83	0·82	0·82	0·81	0·75	0·68	0·66	0·62	0·59
Cts. 25 ..	0·70	0·65	0·60	0·59	0·54	0.52	0·50	0·46	0·42
Cts. 10 ..	0·40	0·44	0·45	0·44	0·39	0·35	0·31	0·27	0·24
Cts. 05 ..	0·27	0·29	0·29	0·28	0·25	0·22	0·19	0·17	0·15
Cts. 02 ..	0·14	0·12	0·11	0·10	0·08	0·07	0·06	0·05	0·05
Cts. 01 ..	0·08	0·07	0·07	0·06	0·05	0·04	0·03	0·03	0·03
Total (Coins) ..	4·33	4·19	4·03	4·09	3·82	3·85	3·97	4·91	5·00
Total value Rs. Mn.	3509	4321	5009	5643	6856	8173	9600	11319	13092
Change Rs. Mn. ..	290	812	688	634	1213	1317	1427	1719	1773
Growth Rate (%) ..	9·0	23·1	15·9	12·6	21·5	19·2	17·4	17·9	15·7

TABLE 5

New Currency Issues

(Rs. Million)

Denomination	1980	1981	1982	1983	1984	1985
Notes						
Rs. 1,000 ..	—	28·67	1,165·33	940·00	699·00	1,101·00
Rs. 500 ..	—	—	1,012·00	594·50	485·50	288·00
Rs. 100 ..	426·60	863·30	15·80	1,201·28	1,143·10	760·80
Rs. 50 ..	355·55	371·40	27·75	590·65	266·25	112·30
Rs. 20 ..	168·16	176·44	64·90	186·40	93·89	102·16
Rs. 10 ..	167·97	116·87	165·34	133·57	194·25	204·67
Rs. 5 ..	76·70	39·40	43·65	69·65	73·95	1·94
Rs. 2 ..	59·77	28·00	31·42	14·37	0·08	—
Total (Notes) ..	1,254·75	1,624·08	2,526·19	3,730·42	2,995·42	2,570·87
Coins						
Rs. 5 ..	—	—	—	—	—	92·51
Rs. 2 ..	—	—	—	27·59	33·01	50·81
Rs. 1 ..	6·61	8·39	7·96	9·69	20·33	19·56
Cts. 50 ..	5·63	4·80	5·44	4·59	7·79	6·76
Cts. 25 ..	2·10	3·54	3·54	5·44	5·61	3·68
Cts. 10 ..	3·93	1·97	1·78	1·91	1·15	1·28
Cts. 05 ..	2·04	1·28	1·77	0·99	0·63	0·74
Cts. 02 ..	0·06	0·07	0·03	0·01	0·02	0·01
Cts. 01 ..	0·11	0·05	0·01	—	0·01	0·02
Total (coins) ..	20·48	20.10	20·53	50·22	68·55	175·37
Total Value Rs. Mn. ..	1,275.23	1,644·18	2,546·72	3,780·64	3,023·97	2,746·24
Change Rs. Mn. ..		368·95	902·54	1,233·92	−756.67	−277.73
Growth Rate (%) ..		28.9	54.9	48.4	−20.0	−9.2

Note : These values are based on net-outgo of currency from the Central Bank. Hence some used serviceable notes are also included in these values. However, relative values of them are very small.

Source : Currency Department.

TABLE 6

Expected Life for Currency

Denominations				Expected Life (n^i)		Adjusted	r^i Values		
				Currency Department					
				1977	1986	1986(*a*)	1977	1986	1986(*a*)
Notes									
Rs.	1,000	..	Months	60	60	60	1/5	1/5	1/5
Rs.	500	..	,,	60	60	60	1/5	1/5	1/5
Rs.	100	..	,,	48	36	36	1/4	1/3	1/3
Rs.	50	..	,,	36	36	36	1/3	1/3	1/3
Rs.	20	..	,,	30	30	24	2/5	2/5	1/2
Rs.	10	..	,,	24	24	18	1/2	1/2	2/3
Rs.	5	..	,,	18	18	12	2/3	2/3	1
Rs.	2	..	,,	18	18	12	2/3	2/3	1
Coins									
Rs.	5	..	Years	35	35	35			
Rs.	2	..	,,	35	35	35			
Rs.	1	..	,,	35	35	35			
Cts.	50	..	,,	35	35	35			
Cts.	25	..	,,	35	35	35			
Cts.	10	..	,,	35	35	35			
Cts.	05	..	,,	35	35	35			
Cts.	02	..	,,	35	35	35			
Cts.	01	..	,,	35	35	35			

TABLE 7

Composition of Currency

Denomination	(1) Observed Values Rs. Mn 1985	(2) Expected Weights (Wi = %) 1986	(3) Forecasted Values Rs. Mn 1986	(4) r^i
Notes				
Rs. 1,000 ..	3,762	35·00	4,378	0·2
Rs. 500 ..	2,286	20·00	2,502	0·2
Rs. 100 ..	3,063	26·00	3,252	0·25
Rs. 50 ..	874	6·00	751	0·33
Rs. 20 ..	227	2·00	250	0·40
Rs. 10 ..	418	5·50	688	0·50
Rs. 5 ..	99	0·30	38	0·66
Rs. 2 ..	30	0·20	25	0·66
Total Notes ..	10,764	95·00	11,884	
Coins				
Rs. 5 ..	108	1·15	144	0·002
Rs. 2 ..	126	1·15	144	0·002
Rs. 1 ..	141	1·25	156	0·002
Cts. 50 ..	70	0·58	73	0·002
Cts. 25 ..	52	0·41	51	0·002
Cts. 10 ..	31	0·23	29	0·002
Cts. 05 ..	19	0·15	19	0·002
Cts. 02 ..	6	0·05	6	0·002
Cts. 01 ..	3	0·03	3	0·002
Total Coins ..	556	5·00	625	—
Total ..	11,320	100·00	12,509	—

TABLE 8

Demand for New Currency - in 1986

Denomination	Additional Demand (A_t) Rs. Mn.	Replacement Demand (R_t) Rs. Mn.	Stock Demand (S_t) Rs. Mn.	Total Requirement ($A_t+R_t+S_t$) Rs. Mn.	Available Stock (S_{t-1}) Rs. Mn.	Production Requirement RC Rs. Mn.	Production Requirement RCU Million
Notes							
Rs. 1,000 ..	616	814	143	1573	250	1323	1·323
Rs. 500 ..	216	479	69	764	300	464	0·928
Rs. 100 ..	189	789	98	1076	400	676	6·76
Rs. 50 ..	- 123	268	14	159	200	—	—
Rs. 20 ..	23	95	12	130	150	—	—
Rs. 10 ..	270	277	55	602	200	402	40·2
Rs. 5 ..	- 61	45	—	- 16	5	—	—
Rs. 2 ..	- 5	18	1	14	10	4	2
Total notes ..	1125	2785	392	4302	1515	2869	51·211
Coins							
Rs. 5 ..	36	0·252	3·6	39·852	40	—	—
Rs. 2 ..	18	0·270	1·8	20·070	25	—	—
Rs. 1 ..	15	0·297	1·5	16·797	15	1·797	1·797
Cts. 50 ..	3	0·143	0·3	3·443	2	1·443	2·886
Cts. 25 ..	- 1	0·103	—	- 0·897	4	—	—
Cts. 10 ..	- 2	0·060	—	- 1·940	0·1	—	—
Cts. 05 ..	—	0·038	0·0038	0·0418	0·1	—	—
Cts. 02 ..	—	0·012	0·0012	0·0132	0·1	—	—
Cts. 01 ..	—	0·006	0·0006	0·0066	0·1	—	—
Total coins ..	69	1·181	7·2056	77·3866	86·4	3·24	4·783
Total ..	1194	2786·181	399·2056	4379·3866	1601·4	2872·24	55·094

APPENDIX

TABLE 1.A

Estimated Results of Linear Version

									Period	$\bar{R}^2$	F	SE	DW
(1)	VCC	=	0·022067 (2·31)	GNPM	+	11·56503 (4·69)	IPI		1978–85	0·99	499	237	1·99
(2)	VCC	=	0·025031 (2·38)	GNPM	+	10·64393 (4·22)	CPI		,,	0·98	383	270	1·69
(3)	VCC	=	0·027124 (2·44)	GDPN	+	10·26340 (4·21)	IPI		,,	0·99	529	230	2·17
(4)	VCC	=	0·030784 (2·58)	GDPN	+	9·707359	CPI		,,	0·98	419	258	1·88
(5)	VCC	=	0·030243 (5·38)	GNPM	+	9·120893 (7·24)	IPI		1973–85	0·99	1421	243	1·59
(6)	VCC	=	0·042166 (7·17)	GNPM	+	6·506617 (4·91)	CPI		,,	0·98	782	326	1·61
(7)	VCC	=	0·039693 (5·38)	GNPN	+	7·450702 (4·76)	IPI		,,	0·99	1422	243	1·59
(8)	VCC	=	0·052787 (7·90)	GNPN	+	4·708138 (3·30)	CPI		,,	0·98	1278	261	1·90
(9)	VCC	=	−1220·378 (−1·89)		+	0·046078 (0·68)	(GNPM/IPI)	+ 16·61447 (7·57) IPI	,,	0·99	619	260	1·69
(10)	VCC	=	−2782·573 (−3·80)		+	0·158826 (1·86)	(GNPM/CPI)	+ 14·63622 (4·70) CPI	,,	0·98	292	377	1·66

APPENDIX

TABLE 1.B

Estimated Results of Log Linear Version

								Period	$\bar{R}^2$	F	SE	DW
(1)	LVCC	=	0·759698 LGNPM (6·37)	+	0·017211 LIPI (0·07)			1978–85	0·98	360	0·46	1·52
(2)	LVCC	=	0·684905 LGDPN (7·53)	+	0·165836 LIPI (0·96)			,,	0·99	489	0·39	1·53
(3)	LVCC	=	0·281064 LGDP (7·16)	+	0·9957775 LIPI (15·11)			,,	0·99	445	0·41	2·12
(4)	LVCC	=	0·294696 LGDP (5·81)	+	0·977129 LCPI (11·41)			,,	0·98	256	0·54	1·94
(5)	LVCC	=	0·295677L(GNPM/IPI) (7·04)	+	0·968726 LIPI (13·66)			,,	0·99	432	0·42	1·84
(6)	LVCC	=	0·310075L(GNPM/CPI) (5·79)	+	0·948548 LCPI (10·45)			,,	0·98	255	0·54	1·69
(7)	LVCC	=	0·708361 LGDPN (7·95)	+	0·121781 LCPI (0·72)			,,	0·99	455	0·41	1·95
(8)	LVCC	=	0·189518 (0·13)	+	0·722467LGNPM (1·49)	+	0·056552LCPI (0·08)	,,	0·98	145	0·51	1·52
(9)	LVCC	=	1·545876 (0·89)	+	0·231048 LGNPM (0·38)	+	0·765309 LIPI (0·88)	,,	0·98	173	0·47	1·92
(10)	LVCC	=	0·663160 LGDPN (3·10)	+	0·196725 LCPI (0·48)			1972–85	0·96	340	0·12	1·55
(11)	LVCC	=	0·609184 LGNPM (6·52)	+	0·303644 LIPI (1·68)			,,	0·98	758	0·80	1·68
(12)	LVCC	=	0·49441 LGNPN (6·14)	+	0·525157 LIPI (3·37)			,,	0·98	689	0·83	1·61
(13)	LVCC	=	−3·101286 (−1·14)	+	0·649719 L(GNPM/IPI) (1·71)	+	0·894654 LIPI (4·76)	,,	0·98	345	0·83	1·68
(14)	LVCC	=	−9·630267 (−2·20)	+	1·500846 L (GNPM/CPI) (2·22)	+	0·564664 LCPI	,,	0·95	122	0·14	1·87

(Continued)

Where ;

VCC	=	Value of currency in circulation (Rs. Mn.)
LVCC	=	Log value of VCC
GDP	=	Gross Domestic Production at 1978 prices (Rs. Mn.)
LGDP	=	Log value of GDP
GNPN	=	Gross National Production at current prices ; (Rs. Mn.)
LGNPN	=	Log value of GNPN
GNPM	=	Gross National production at current market prices (Rs. Mn.)
LGNPM	=	Log value of GNPM
CPI	=	Colombo Consumer price index (1952 = 100)
LCPI	=	Log value of CPI
IPI	=	GNP deflator (1978 = 100)
LIPI	=	Log value of IPI
L (GNPM/CPI)	=	Log value of (GNPM/CPI)
L (GNPM/IPI)	=	Log value of (GNPM/IPI)

$\bar{R}^2$ = Adjusted $\bar{R}^2$; F = F – value ; SE = Standard error of the regression ; D.W. = D. W. value; Estimation method Ordinary Least Square (OLSQ)

Dr. A. G. Karunasena, head of the Macro Planning Unit in the Department of Economic Research, received his B. A. Degree in Economics from the University of Kelaniya. He holds Ph. D and M. A. Degrees from McMaster University , Canada. His reserach interests are in the fields of Econometrics, Macro-Modelling, Commodity Modelling and Money & Banking.

PLANTATION AGRICULTURE IN SRI LANKA
ISSUES IN EMPLOYMENT AND DEVELOPMENT

Edited by

W. GUNARATNE AND D. WESUMPERUMA

(*Bangkok : International Labour Organization, Asian Employment Programme* (*ARTEP*), 1984 . *pp.* 257)

Plantation Agriculture in Sri Lanka is a collection of papers presented at a three-day national seminar on " Productive Employment Promotion in the Plantation Crop Sector of Sri Lanka " jointly organised by the ILO/ARTEP and the Sri Lanka Foundation Institute in December, 1982 at Colombo. The seminar was organized as part of ARTEP's on-going work on employment promotion in Asian agriculture with the intention of providing a forum for the exchange of participants' views and experiences relating to the potential role of the plantation crop sector in employment promotion, and, of identifying key issues and problems affecting this potential.

The volume is effectively structured so as to be equally useful to an expert in the field or a newcomer to it. The editors introduce the volume with a comprehensive overview of employment and development in the plantation sector in Sri Lanka (which refers to the three principal export crops of tea, rubber and coconut—both estates and small holdings). This serves not merely to provide a general background regarding the sector, but, as a forward to the ensuing papers, which are on more specific aspects of the issues raised. Thereafter, a section on the issues and problems faced by the plantation sector follows entitled " Structural Change and Employment " and another on possible solutions and policies titled " Prospects for Employment Promotion."

As the editors note at the onset, plantation agriculture in Sri Lanka has played and will continue to play an important role as a major foreign exchange earner, and as a source of employment generation. Unfortunately, this vital sector has stagnated and despite a recently increased focus on the problems facing this sector, its performance has continued to be poor. It has undergone several institutional and structural changes

in recent times, mostly resulting from the Land Reform Programme of 1972 and 1975. With the elimination of foreign ownership of plantation land and restrictions on private ownership there has been a significant growth in the state ownership of plantations as well as in the number of smallholdings, and consequently a similar alteration in labour utilization and labour within the sector. The reforms have created a "unique system of plantation agriculture" in a global context and this has clearly affected developments in the sector and the elements of change within it.

The effects of these structural changes and reforms on employment and income in the plantation sector are discussed in G. H. Peiris' and N. A. Fernando's articles. The labour imbalances created in this context, particularly in tea estates, are covered by M. Sinnathamby and P. Wickremasekera. And finally the international trade angle, of how variations in world market prices of plantation crops affect employment and income in the sector is dealt with by P. Athukorala.

Having handled the historical background, institutional framework and international context for the past poor performance of the plantation sector, an attempt is made to identify potential areas for increasing agricultural production, employment and rural incomes. Here we encounter possibilities that fall into three broad categories :

(*i*) Raising per hectare output of the three principle crops (*e.g.*infilling of tea, underplanting in coconut, increased fertilizer application and soil conservation.)

(*ii*) Crop diversification through the introduction of other crops (*e.g.* inter-cropping in coconut).

(*iii*) Introduction of other income generating activities within plantations (*e.g.* livestock development)

N. Sanderatne discusses these with specific reference to the estate sector and in the light of the management systems utilized ; A. B. Dissanayake deals with smallholdings in this respect and V. J. Jacob on uneconomic lands, both authors doing so in reference to the tea and rubber sectors ; and S. Tilakaratne focusses on the diversification of crops in coconut lands.

The volume concludes with a summary of the discussions that were instigated by the issues raised by the seminar papers. Participants noted the paucity of existing data and research and the need for continuous inter-disciplinary evaluation of developments in the sector. They characterised the present period as one of transition, during which some alternative system of " large-scale " agriculture must be made to evolve to revitalize the plantation sector and make it a viable entity suitable to the current and future needs of the country.

As such, any focussed and comprehensive analysis of the plantation sector is to be valued and not cast aside as " more and more of the same thing." What this volume offers is clearly an innovative analysis viewed from the important angle of employment promotion, which can be utilized in constructing a much needed and consistent policy framework for the sector, if not simply to be used by a layman for a comprehensive understanding of issues relating to a key sector in the economy.

Dinesha de Silva Wikramanayake,
Economist,
Central Bank of Sri Lanka.

A NATIONAL WAGE POLICY FOR SRI LANKA

By

CHANDRA RODRIGO

Colombo : Sri Lanka Institute of Development Administration, (1983. *pp.* 160)

Wage issues are of significance not only to the parties directly involved but to the labour force as a whole and to all those interested in the economy. The level of wages, their rate of increase and the timing of such increases have an impact on economic performance. Particularly in Sri Lanka, where wage determination partly depends on political factors and the bargaining power or the strength and weaknesses of the trade unions, a concept of national wage policy, is important especially for wage earners and employers. Such a policy package will not only be helpful to solve wage disputes between employees and employers and improve their living standares, but also assist in long run economic decision making. This is the central theme of Dr. Chandra Rodrigo's book on a National Wage Policy of Sri Lanka.

The book addresses itself to very many wage policy issues of a very broad nature and points out the necessity for a wages policy to be a tool to overcome various problems, anomalies and discriminations inherent in the area of wage determination.

The contents of the book can be broadly divided into two : one deals exclusively with a concept of wage and wage policy and the other, is mostly devoted to a review and analysis of the overall economic performance of the country during the preceeding three decades of the post independence era. Special attention has been given to analyse the behaviour of wages and prices during the period.

From the various sets of data presented from the findings of different surveys conducted by the authorities such as the Central Bank of Sri Lanka and Department of Census and Statistics, the situation of the labour market, unemployment, and income distribution pattern in the economy is analysed as a whole and in different sectors. In addition, it discusses the economic, social, demographic and political development

of the country. It highlights the various policy measures introduced by the governments during the period under review and analyses the causes, effects, and implications of those policies, especially to the working class. Policy developments in the 1970s are broadly analysed along with their effects due to their greater impact over the income of wage earners.

In the fields of wages and prices, which are the main areas captured by the author, she draws attention to the behaviour of wage indices for the government sector employees and the private sector employees covered by the Wages Boards Trades. Behaviour of price indices, specially the CCPI is discussed and an effort made to compare the movement of minimum wages and prices and to identify the effects of price increases for different categories of wage earners. It further attempts to identify the behaviour in actual earnings against minimum wages, which is more important for policy issues. However, the discussion on this basis has to be limited to selected categories of workers due to the unavailability of required data and the complexity of the issue.

The author has suggested different alternative policies to be used in wage determination and points out both the pros and cons linked with different approaches and the difficulties which have to be overcome in adopting any particular approach. The author herself favours a " Guided Bargaining " approach.

The book is an interesting study in the field of wages and related issues such as price, productivity, economic growth and unemployment. The significance in this book lies in the fact that it is not confined to an analysis of wage determination and wages policy, but provides an economic history of three decades since independence. This approach of placing wage determination issues in the broader context of economic performance makes the book more useful than its title indicates. A limitation of the book is that it deals with changes in wages during only the first three decades of post independence.

N. M. Dayaratne,
Assistant Director of Statistics,
Central Bank of Sri Lanka.

Printed at Swadeshi Printers,