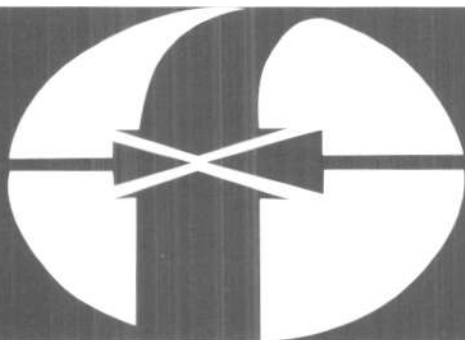


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Quarterly Review - No. 4 - 2004 - XXVIII



Savings and Development

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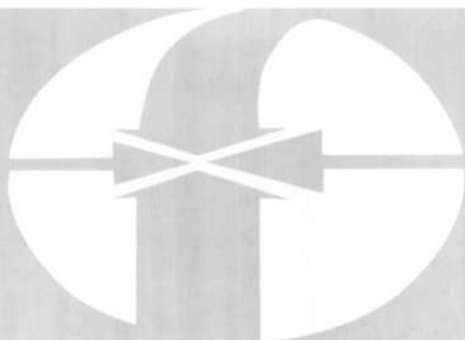
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Quarterly Review - No. 4 - 2004 - XXVIII

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FINANCIAL STRUCTURE, RURAL CREDIT AND SUPPORTIVE INSTITUTIONAL FRAMEWORK IN SRI LANKA: AN EMPIRICAL ANALYSIS

J. Wickramanayake*

Monash University, Australia

1. Introduction

Historically developing countries including Sri Lanka have been experiencing financial dualism, urban bias and lack of monetisation. In this regard, the lack of financial development and the large informal sector have been major contributory factors. Successive Sri Lankan governments have been improving the supportive institutional framework in the rural sector. Such improvements include guaranteed price schemes for farm products, formal rural credit scheme and crop insurance.

No previous study has examined financial dualism and urban financial bias in Sri Lanka. As for the level of monetisation in Sri Lanka, survey data do not seem to have been used to get a perspective over a long period time. Even though a substantial number of descriptive studies are available dealing with rural credit schemes in Sri Lanka, not a single empirical study has been carried out on rural credit and the supportive institutional framework. This study fills up all these gaps.

This paper is structured as follows. Section 2 examines Sri Lanka's dualistic financial structure with focus on financial urban bias and monetisation. Savings, investments and loan financing arrangements in the informal sector are examined in Section 3. Both Sections 2 and 3 use the latest cross-section data available. After a brief overview of rural credit scheme in Sri Lanka in Section 4, empirical models are formulated for rural credit scheme and the supportive institutional framework in Section 5. Empirical results of the models using time-series data are discussed in Section 6. The paper concludes in Section 7.

2. Dualistic Financial Structure of Sri Lanka

Sri Lanka inherited from the British a dualistic financial system whereby the organised or institutional credit markets mostly catered to the modern (formal) sector, while the unorganised or informal (non-institutional) credit markets served the needs of the traditional (informal) sector. On the one hand the Currency Board or the cen-

* Author would like to thank participants of International Islamic Banking Conference, Prato, Italy (9-10 September 2003) and Central Bank of Sri Lanka Research Seminar (19 September 2003) for their constructive comments. The views expressed in the paper are those of the author who takes sole responsibility for any remaining errors or omissions.

tral bank, commercial banks, savings institutions, co-operatives and the share market served as the sources of formal (organised) finance. On the other hand it was the money-lenders, indigenous bankers, pawn-brokers, traders and merchants, landlords, friends and relatives who acted as intermediaries in the unorganised credit market. Interest rates that prevailed in the unorganised market were higher than those in the organised market.

Sri Lanka's dualistic financial system evolved in a manner typical of a developing country, best described by Myint (1970). Myint distinguished between the open-economy model of financial dualism and the closed-economy model of financial dualism in developing countries. In Sri Lanka's case up until 1960, before the phase of import substituting industrialisation (ISI), the traditional sector faced only the single barrier of obtaining credit in domestic currency under the open-economy model. To put it differently, since there was no exchange control as the second barrier prior to late 1950s, the unorganised sector of the economy had easy access to foreign exchange whenever it needed. However with the commencement of ISI, exchange and import controls imposed after 1960 within the framework of closed-economy model acted as the second hurdle for the traditional sector. The controlled regime continued in varying degrees of intensity up until 1977 when Sri Lanka opted for an open-economy model. However, even today, the dualistic nature of the financial system has not completely disappeared.

The two main indicators of financial dualism in the Sri Lankan economy are (i) the gap (if any) between the interest rates prevailing in the informal and the formal credit market; and (ii) the proportion of rural debt taken from informal sources. With respect to the formal sector while time series data are available, it is only the cross-section data that are available for different periods in relation to the informal financial sector. Table 1 shows data on the two indicators. As shown in columns 2 and 3 there, since early 1980s the interest rates in the formal and informal sectors seem to have converged with the high formal interest rate regime prevailing. This supports the view that financial dualism is gradually disappearing in Sri Lanka. There is also further evidence from columns 4 and 5 in Table 1 that financial dualism has been disappearing gradually over the years as the proportion borrowed from the informal sources in the rural sector has declined.

On financial development involving financial dualism and financial urban bias (discussed in the following section), Stiglitz and Weiss (1981) raised the theoretical argu-

ment that root causes of the gap between demand and supply of financial services are high transaction costs and risks due to information asymmetries and moral hazard. They emphasized building sustainable institutions, institutional innovation to reduce costs and risks, thus improving market-driven provision of financial resources.

Table 1: Interest rates and proportions of debt in the rural sector: formal and informal Classification 1957-1997

Year	Interest Rates (%)		Proportion of Rural Debt (%)	
	Formal†	Informal	Formal	Informal
1957	4.5-8.0	12.0-18.0	7.8	92.2
1969	7.5-11.0	26.0‡	25.0	75.0
1976	8.5-14.0	16.0-50.0	45.4	54.6
1981/82	15.0-28.0	11.0-50.0*	42.9	57.1
1986/87	13.0-30.0	1.0 - 30.0**	60.2•	39.8
1996/97	14.5-29.0	1.0-30.0***	68.6	31.4

Notes:

† The representative indicator in the organised (institutional) market is taken as the commercial bank lending rate on loans secured by stock-in-trade.

‡ Weighted average as given in Wai (1977).

* 62% of the total rural borrowings have been at interest rates ranging between 11-50% p.a. See source (d) below, p.304.

** 40.5% of the total rural borrowings have been at interest rates ranging between 1-30% p.a. See source (g) below, pp.137-138.

• Total value of loans obtained from the non-institutional sources obtained by the household sector (including all three sub-sectors: urban, rural and estate sectors). See source (g) below, p.135.

*** 66.9% of the total rural borrowings have been at interest rates ranging between 1-30% p.a. See source (g) below, p.134.

Sources:

(a) Department of Census and Statistics-Survey of Rural Indebtedness (1957).

(b) Central Bank of Sri Lanka-Survey of Rural Credit and Indebtedness (1969).

(c) Central Bank of Sri Lanka-Survey of Rural Credit and Indebtedness among Paddy Farmers (1976).

(d) Central Bank of Sri Lanka - Report on Consumer Finances and Socio-Economic Survey-Part II (1981/82): Table 7.21, p.974.

(e) Hettiarachchi (1976), p.172 for commercial bank lending rates.

(f) Central Bank of Sri Lanka - Bulletin-May 1985 - Table 10.

(g) Central Bank of Sri Lanka - Report on Consumer Finances and Socio-Economic Survey - 1996/97 (Part I).

2.1 Urban Bias in the Financial System

Myrdal (1965, p.128) pointed out that 'studies in many countries have shown how the banking system, if not regulated to act differently, tends to become an instrument for siphoning off the savings from the poorer regions to the richer and more progressive ones where returns on capital are high and secure'. This backwash effect is reflected in the extent to which the deposit/advance ratio is higher in bank branches in rural areas than those in urban areas. This phenomenon can be described as an exercise of rural-oriented savings mobilisation and urban-oriented lending by banks

(Mauri 1985, p. 992). The financial urban bias has been formally defined as 'a net transfer of financial resources from rural to urban areas which is not justified by social returns and which reflects failures of rural financial markets' (Chandavakar 1985, p.24). Despite various measures, in particular, the selective credit policies adopted by government authorities in developing country, such a backwash effect of commercial banking has persisted.

As a sequel to financial dualism, in Sri Lanka an urban bias in finance seems to have taken root with two main features. Firstly as a reflection of urban bias in finance, only a small proportion of commercial bank advances (8% in the period 1988-2000 as shown in Table 2, column 2) have been granted to agriculture, the main occupation in the traditional (informal) sector. The second feature is that lending to the rural sector by rural banking institutions (RBIs) has been less than the volume of savings mobilised by them from the rural sector right throughout the period under review (Table 2, column 3). After the liberalisation of the Sri Lankan economy in 1977, the gap between deposits and advances of RBIs has widened as reflected in higher deposit advance ratio of 1.7. Despite these two features, urban bias in fact may be the result of decline in importance of the agricultural (informal) sector in the Sri Lankan economy with the emerging importance of industrial and service sectors as a result of economic development over the years.

2.2 Monetisation

Monetisation can be defined as the increasing use of money in economic transactions or more correctly '... the enlargement of the sphere of the monetary economy' (Chandavakar 1977, p.665). This phenomenon of financial widening is measured by the monetisation ratio, which is the monetised proportion of the total goods and services in the economy (Goldsmith 1969). Very often the ratio of money supply (M) to National Income (GNP) is used as a crude measure of the degree of monetisation. However on closer scrutiny it becomes clear that the M:GNP ratio reflects only the increased money supply emanating from the existing monetised sector and not the absorption of the money supply by the non-monetised sector. Hence in the absence of published time-series data on non-monetised income in national income accounts, cross-section data from surveys is used to measure the degree of monetisation.

Table 2: *Commercial bank advances to agriculture and deposit-advance gap of rural banking institutions: 1960-2000*

	A	B
Period	(%)	Ratio†
1960-64	2.9‡	1.4
1965-70	9.3	1.1
1971-77	13.9	1.1
1978-87	12.0	1.7
1988-2000	8.0	1.7

Notes:

A = Commercial bank advances to agriculture as a % of their total advances (period average).

B = Deposit-advance ratio of rural banking institutions (period average).

† When the difference is more than 1.0 it means that the funds mobilised in rural areas have been lent in urban areas.

‡ Average for the period 1961-64.

Source: Central Bank of Sri Lanka Annual Reports and Reviews of the Economy (various issues).

The degree of monetisation in Sri Lanka over the period 1963-1997 can be judged from the data summarised in Table 3 (last column), which indicates that only around 80% of the personal income is monetised while monetisation has declined on a fluctuating basis for the country as a whole. The salient feature is that monetisation in the rural sector has been fluctuating over the years. By 1986/87 and 1996/97 the level of monetisation in the rural sector has been 83.17% and 82.64% respectively (Table 3, column 3) higher than those (81.82% and 78.88% respectively – Table 3, column 2) in the urban sector. The above decline in the level of monetisation in the urban sector is a concern. Nevertheless it seems to suggest that economic development in Sri Lanka has made some impact on dualism and urban bias in finance in the rural sector over the years (Table 3, column 3). The two concepts of financial dualism and monetisation discussed above may be closely related to the level of financial development in the country.

Table 3: Monetisation - proportion of total income received in cash - 1963-1997

Years	Urban	Rural	Estate†	All Sectors
1963	85.50	80.50	87.60	81.50††
1973	85.40	71.90	80.60	76.00
1978/79	81.35	69.25	89.30	80.58
1981/82	84.50	75.90	87.60	78.90
1986/87	81.82	83.17	89.69	83.10
1996/97	78.88	82.64	89.72	82.03

Note

† The estate sector consists of all households in tea, rubber and coconut estates with 20 or more acres and with 10 or more resident workers (source: (d) below: Introduction).

†† Figure estimated having regard to the behaviour of all other figures in the table where the average of urban, rural and estate were higher than the all-island figure by around 3.0%.

Sources

- (a) Survey of Ceylon's Consumer Finances (1963)
- (b) Survey of Sri Lanka's Consumer Finances - 1973, Part II, pp. 92-3
- (c) Report on Consumer Finance and Socio-Economic Survey 1978/79, Part I, p. 103
- (d) Consumer Finances and Socio-Economic Survey 1981/82, Part II, pp. 213-216
- (e) Central Bank of Sri Lanka - Report on Consumer Finances and Socio-Economic Survey - 1996/97 (Part I)

3. Informal Sector: Savings, Investments and Loan Financing

This section provides a brief discussion of the salient features of investment, saving and loan arrangements in the informal sector in Sri Lanka in the mid-1990s. The following analysis heavily draws on the results of the Central Bank of Sri Lanka - Report on Consumer Finances and Socio-Economic Survey - 1996/97 (Part I).

Periodically Central Bank of Sri Lanka has been conducting Consumer Finances and Socio-Economic Surveys in 1963, 1973, 1978/79, 1981/82, 1986/87 and 1996/97. The latest cross-section (survey) data on the informal sector available relate to the mid-1990s as reflected in Consumer Finances and Socio-Economic Survey (CFSES) 1996/97. In all the surveys, data have been classified into three sectors: urban, rural (informal), estate (tea, rubber and coconut plantations).

Household savings are part of spending unit income which is not consumed. However, all expenditure made by spending units for purchases of consumer durables and jewellery was treated as part of savings. In the 1996/97 survey, the savings, investment and loan financing data are derived from values of income for one month.

The saving rate (% of income) for all three sectors in the mid-1990s was 10.4% while that of the informal (rural) sector was 10.0% which compares favourably with the former figure (CFSES 1996/97, Part I, p.123). Consumer durables accounted for 74% of savings in the informal sector while the respective figure for urban sector was 26%.

Household investment is defined as the allocation of household savings among different assets for future return or benefit (CFSES 1996/97, Part I). But, the expenditure on consumer durables is not taken into account, though it is included in the broader definition of household savings. The investment has been grouped into three main categories; financial investments, physical investments and net changes in claims. Financial investment includes savings accounts, fixed deposits, government bonds and securities, shares and cash balances in current accounts and cash in hand.

The investment rate (% of income) for all three sectors in the mid-1990s was 24.3% while that of the informal (rural) sector was 26.7%: the highest investment rate out of those of the three sectors (CFSES 1996/97, Part I, p.125). But the figure needs to be viewed cautiously according to CFSES report, in that this high investment rate may be partly due to the fact that town council areas which were treated under the urban sector in previous surveys have come under the rural (informal) sector in the present (1996/97) survey. Financial investments accounted for 1.7% of total investments while physical investment (mainly residential property) was 72.8% of total investments in the rural sector (CFSES 1996/97, Part I, p.125).

Changes in claims indicate the asset and liability position of the households (CFSES 1996/97, Part I). Positive changes in claims indicate accumulation of assets, while negative changes indicate accumulation of liabilities. The information on changes in claims was collected under five categories in this survey. They are life insurance premia, provident fund contributions, widows and orphans pension fund contributions, cheetus (collective informal savings) and loans granted. Changes in claims as a ratio of spending unit income in the informal sector were positive at 7.5% (CFSES 1996/97, Part I, p.127): a reflection of accumulation of assets (highest figure out of those for all three sectors). Cheetu (informal group savings) is the most attractive claim in all three sectors. In the urban sector its share was around 64.7% of changes in claims. The respective shares in rural (informal) and estate sectors were 34.2 % and 30.3 % (CFSES 1996/97, Part I, p.127). The collective thrift behaviour within small groups is equally popular amongst both low-income and high-income house-

holds. Even the informal business community has the practice of using cheetus with auctioning practices. These are the reasons for cheetus to have a relatively higher share in claims. As a method of accumulation of assets loans granted seemed to have become popular only among rural spending units.

Sources of loans in the survey can be broadly classified as institutional and non-institutional (CFSES 1996/97, Part I). Institutional (formal) sources comprise commercial banks, rural banks/regional rural development banks, cooperatives (including cooperatives, thrift societies and non-governmental organizations), financial institutions and formal sector employer. Non-institutional (informal) sources are moneylenders, friends and relatives and others. In all the surveys, moneylenders are defined as the informal lenders who charge an interest on lending. According to survey definitions, informal lending without interest was classified under friends and relatives. Informal (rural) sector obtained 68.6% of their loan amount from institutional (formal) sources, which compares favourably with the average of 67.3% for all the three sectors (CFSES 1996/97, Part I, p.136). The expansion of rural banking would have been a major contributory factor for this favourable outcome. Money lenders provided only 9.2% of loan amount comparing favourably with an average of 9.3% for all the three sectors (*ibid*). Largest informal source was friends and relatives providing 22.9% of loan amount comparing favourably with an average of 22.0% for all the three sectors (*ibid*). Trade and business was the main purpose of borrowing in the informal sector accounting for 55.6% of total loan amount, which compares favourably with an average of 50.2% for all the three sectors (*ibid*).

As the above discussion clearly shows financial dualism has been disappearing at a fast rate in the 1990s. Some funding mechanisms such as Cheetu (informal group savings) have become most popular in all the three sectors over the years.

4. Rural Credit Scheme in Sri Lanka

A number of rural economic surveys undertaken in 1936, 1948 and 1950/51 found a high level of indebtedness and high interest rates in the informal sector in Sri Lanka (Peoples Bank 1979). The Sri Lankan government introduced an institutional credit scheme for rice farmers from 1947 and credit was made available through co-operative societies. This government-funded credit scheme was replaced in September

1967 by the New Agricultural Credit Scheme, under which provision of agricultural credit was made the responsibility of the banking system. Government-owned Peoples Bank became the major commercial bank involved in this credit scheme. Central Bank of Sri Lanka introduced a scheme to refinance agricultural credit granted by commercial banks distributed through co-operative rural banks and co-operative societies. In addition to credit for rice farming, credit was also made available for production of other food crops. With the other government-owned commercial bank, Bank of Ceylon, joining the scheme, it came to be known as the Comprehensive Rural Credit scheme since 1973. The major problem with the institutional credit scheme was the high level of defaults on repayments annually averaging around 47.5% of loan amount granted to rice farming during 1947-1980 (Sanderatne 1980, p.98). But the level of defaults on repayments on credit for rice farming declined to around an annual average figure of 23% of loan amount between 1980 and 2001 (as calculated from data given in Central Bank of Sri Lanka, *Reviews of the Economy*, various issues).

Marga (1974) provides a comprehensive analysis of institutional rural credit schemes until the early 1970s. The later developments in the rural credit scheme are analysed in Peoples Bank (1979), Fernando (1986), Southwold-Llewellyn (1991) and various issues of Central Bank of Sri Lanka *Reviews of the Economy*. All these studies are purely descriptive studies and do not carry any empirical work.

To the present writer's knowledge, the only empirical study using survey data has been carried out by Wanasinghe (1982). It used data from a socio-economic survey carried out by the Agrarian Research and Training Institute of Sri Lanka in 1974 on small rice farms in Sri Lanka's wet zone. Using credit as a dependent variable it was found that credit was not an important variable in production relationship in small rice farms (Wanasinghe 1982). Credit also did not feature as a statistically significant explanatory variable in determining yield of rice, expenditure on fertiliser or the marketed surplus in Wanasinghe's study.

As the above discussion shows, there seems to be a gap in empirical research using time-series data of the credit scheme for rice farmers in Sri Lanka. Here an attempt is made to fill up that gap by undertaking a time-series study involving empirical work. The empirical analysis in this paper is limited to credit granted and repayments made under the credit scheme for rice farming in relation to supportive institutional framework. It does not cover aspects of rural saving mobilisation in Sri Lanka.

5. An Empirical Model for Rural Credit and Supportive Institutional Framework for Rice Farmers in Sri Lanka

The level of credit extended and repayments under a credit scheme for rice farming is dependent on a number of factors. Weather conditions, availability of irrigated land, fertiliser and seed rice and credit at a reasonable price (low interest rates), etc., are all important variables that would have a bearing in the credit scheme for rice farming in Sri Lanka (Jogarathnam and Schickele 1970). However, in this study preliminary experimentation with time series data for the above variables did not provide theoretically interpretable, statistically robust empirical results.

As stated earlier Stiglitz and Weiss (1981) and also Stiglitz (1989) later have emphasized building sustainable institutions to improve the environment for market-driven solutions in eliminating the gap between demand and supply of financial services (Zeller and Meyer 2003). Therefore it is worthwhile undertaking an empirical investigation on the supportive institutional framework for the credit scheme for rice farming in Sri Lanka.

Rural banking network has played a major role in the rural credit scheme for rice farming in Sri Lanka. Easy access to rural credit for rice farmers was provided by an increasing number of rural bank branches numbering only 3 in 1964 to a fabulous figure of 1517 branches in 2001 (Central Bank of Sri Lanka, Reviews of the Economy, various issues). The increasing number of rural banking branches would certainly have a positive impact on credit granted under the credit scheme for rice farming (Marga 1974).

The level of credit granted under the credit scheme can depend on the amount of credit repaid. In general, if the level of repayments is high, it is reasonable to expect credit suppliers to extend more credit under the credit scheme. Thus the level of credit granted is hypothesised to have a positive relationship with the level of repayments under the credit scheme.

Achievement of self-sufficiency in rice (staple food) has been a primary goal of successive governments in Sri Lanka. In order to achieve this objective a government sponsored guaranteed price scheme (GPS) for rice came into operation in the early 1950s. The GPS enabled the farm gate (open market) price of rice paddy to be maintained at a reasonable level so as to provide incentives for paddy farmers in Sri Lanka.

It can be hypothesised that higher farm gate price would have a positive impact on both credit extended and repayments made under the credit scheme (Wanasinghe 1982). But preliminary experimentation with data could establish a meaningful empirical relationship only between credit repayments made under the credit scheme and farm gate price.

Repayments made under the credit scheme can depend on the amount of loans extended. In general, at a time when the level of credit granted is high, the level of repayment can be high too (Wanasinghe 1982).

Since crop failure is a major factor in discouraging rice farming, a rice crop insurance scheme was put into operation in seminal form since 1958 (Peoples Bank 1979). By early 1970s the inherent defects of the scheme emerged as reflected in the very low insurance premia collected as well as high rate of indemnity payments. Therefore, The Agricultural Insurance Board (AIB) was established in 1973 and a compulsory crop insurance scheme for rice farming that began in 1975 is still in operation. It is reasonable to expect the compulsory crop insurance scheme to have a positive impact on credit granted and repayments under the credit scheme for rice farming.

On the basis of the above discussion the following empirical model is formulated:

$$\text{LRCG}_t = \alpha_0 + \beta_1 \text{LRBBR}_t + \beta_2 \text{LRCRP}_t + \varepsilon_t \quad (1)$$

$$\text{LRCRP}_t = \alpha_1 + \beta_3 \text{LRFGPR}_t + \beta_4 \text{LRCG}_t + \beta_5 \text{LRAIBP}_t + \varepsilon_t \quad (2)$$

Where

LRCG_t = Natural log of credit granted to rice farmers in Sri Lankan (SL) rupees millions in real terms;

LRBBR_t = Natural log of number of rural bank branches;

LRCRP_t = Natural log of credit repaid (SL rupees millions) by rice farmers in

real terms;

$LRFGPR_t$ = Natural log of farm gate price (or open market price) – rice paddy in real terms (SL Rupee/kg);

$LRAIBP_t$ = Natural log of crop insurance premia (SL rupees millions) in real terms;

α = Constant term; and

ϵ_t = Random error term.

The expected signs for the model parameters are:

$$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 > 0.$$

The rationale for the expected signs was discussed earlier.

In empirical work the selection modelling approach depends on the sample size amongst other factors. An error-correction modelling (ECM) approach is suitable for small samples (annual data for 1980–2001) like the one employed in this study (Banerjee, Dolado, Hendry and Smith 1986). According to Phillips and Loretan (1991), a number of error-correction formulations can be adopted in model specification. The ECM approach as advocated by Banerjee, Dolado and Mestre (1998) is used here since it also allows for testing the cointegration of the variables in the model. This approach based on an autoregressive distributed lag (ARDL) model has the advantage of avoiding the classification of variables into $I(1)$ or $I(0)$ and unlike standard cointegration tests, there is no need for unit root pre-testing. Moreover, Hendry and Ericsson (1991) argue that valid error correction models are obtainable even when cointegration tests do not reject the null hypothesis of no cointegration. Granger representation theorem (Granger 1983) also states if statistically significant error correction exists in a model, it implies cointegration of variables in that model. Moreover, according to Hall (1986), Phillips and Loretan (1991), Boswijk and Fransers (1992), and Kremers, Ericson and Dolado (1992), the coefficient values of the lagged level dependent variable of an ECM can provide a robust check of the existence of a long-run cointegrating relationship.

The error correction version of the ARDL model for equation (1) can be written as follows:

$$\Delta \text{LRCG}_t = a_0 + \sum_{j=1}^n b_j \Delta \text{LRCG}_{t-j} + \sum_{j=1}^n c_j \Delta \text{LRBBR}_{t-j} + \sum_{j=1}^n d_j \Delta \text{LRCRP}_{t-j} + \text{ECT}_{t-1} + \varepsilon_t \quad (3)$$

where Δ is the first difference of the variable concerned and error-correction term $\text{ECT}_{t-1} = \delta_1 \text{LRCG}_{t-1} + \delta_2 \text{LRBBR}_{t-1} + \delta_3 \text{LRCRP}_{t-1}$ incorporates the long-run effects of the variables concerned. Also model equation (2) above can be written as an error-correction model but it is not shown here for brevity. Having features of a partial adjustment model the above formulation in (3) can capture any expectations rice farmers may have on their level of credit utilisation as well as on the level of their credit repayments.

The long-run elasticities of the variables are incorporated in the error correction term (ECT_{t-1}). Banerjee, Dolado and Mestre (1998) provide critical values for identifying the existence of cointegration (long-run relationship) within a modelled equation by examining the t-statistic of the error-correction term. The long-run elasticities of the variables are incorporated in the error correction term (ECT_{t-1}) as shown in equation (3) above. If the t-statistics (in absolute terms) of the error-correction term exceed the critical values given in Banerjee, Dolado and Mestre (1998), there is adequate evidence to reject the null hypothesis of no cointegration.

The two models in their error-correction versions were estimated using data obtained from Central Bank of Sri Lanka Annual Reports and Reviews of the Economy. Annual data for the sample period 1980-2001 are used here. This sample period was selected on the basis that the Sri Lankan economy was liberalised in late 1977 and the consequent economic adjustment since liberalization would have had a substantial impact on rice farming as well as its supportive institutional framework. Moreover, data for agricultural insurance premia collected is available only after 1975. Using the value added deflator in the rice (paddy) sub-sector (1996=100) all nominal rupee values in the variable were converted into real rupee values.

6. Empirical Results

Table 4 shows the results of the two equations derived by ordinary least squares (OLS) regressions using the error correction model (equation 2). The two equations were also estimated using instrumental variable (IV) method to verify any endogeneity of independent variables in the estimated equations. Those results¹, not shown here for brevity, were quite similar to those obtained using the OLS method.

¹ The instruments used in generating the results using IV method are: lagged first differenced logarithmic variables in the models, and are available from the author on request.

Table 4: Estimates of the Error-Correction Model

	Equation 1 ♦	Equation 2 ♦♦
Sample Period	1980 – 2001	1980 – 2001
Dependent Variable	$\Delta LRCG_t$	$\Delta LRCRP_t$
CONSTANT	-4.6468 (4.982)***	1.4193 (6.1409)***
$\Delta LRCG_t$	-	0.962 (23.9274)***
$\Delta LRCG_{t-1}$	-	0.3301 (6.3382)***
$\Delta LRCG_{t-2}$	-	0.2035 (4.3548)***
$\Delta LRBBR_t$	0.713 (5.288)***	-
$\Delta LRAIBP_t$	-	0.0568 (2.6672)**
$\Delta LRAIBP_{t-1}$	-	-0.0834 (2.6715)**
$\Delta LRAIBP_{t-2}$	-	-0.1604 (6.0153)***
$\Delta LRCRP_{t-1}$	0.992 (20.959)***	-0.3986 (4.3204)***
$\Delta LRCRP_{t-2}$	0.093 (2.388)**	-0.2355 (3.2214)***
$\Delta LRFGPR_t$	-	0.6546 (4.3703)***
$\Delta LRFGPR_{t-1}$	-	-0.694 (5.5823)***
$\Delta LRFGPR_{t-2}$	-	-0.1066 (0.9622)
ECT_{t-1}	-1.408 (6.205)***	-1.0102 (7.2185)***
LONG RUN ELASTICITY COEFFICIENTS:		-
Rural bank branches: $LRBBR_t$	0.506	-
Credit repaid: $LRCRP_t$	0.976	-
Farm gate price: $LRFGPR_t$	-	0.517
Credit granted: $LRCG_t$	-	0.246
Agricultural insurance premia: $LRAIBP_t$	-	0.917
Adjusted R ²	0.97	0.99
F-Statistics †	F[4, 17] = 152.137	F[12, 9] = 253.143
Jarque-Bera Normality $\chi^2(2)$	0.415	0.409
First Order Serial Correlation (Godfrey)	F[1, 15] = 2.268	F[1, 5] = 0.7676
Heteroscedasticity (Koenker)	F[1, 15] = 0.458	F[1, 20] = 1.332
RESET (Ramsey)	F[1, 15] = 0.533	F[1, 5] = 0.015
Stationarity of Residuals: Dickey-Fuller	-4.98	-4.623

♦ ARDL (1, 0, 2) ♦♦ ARDL (3, 3, 3, 3)

* The t-test statistic passes the cointegration test. For 25 observations, the critical values for cointegration tests for three level variables incorporated in the error-correction terms in equations (1) and (2) are -4.92, -3.91, and -3.46 at 1%, 5%, and 10% level of statistical significance respectively from Banerjee, Dolado and Mestre (1998), p.276.

† All the diagnostic tests here, except Jarque-Bera (JBN), use the F distribution. The JBN uses the χ^2 distribution.

The regression diagnostics as shown in Table 4 indicate that the two estimated equations are reasonably well fitted and fulfil the conditions of normality of residuals, absence of serial correlation, homoscedasticity, model suitability and stationarity of residuals. Consequently, the estimated equations are capable of providing accurate and reliable inferences in relation to the determinants of level of credit and repayments in credit scheme for rice farms in Sri Lanka.

These results (represented by a "" against the error correction terms (ECT_{t-1}) in Table 4) seem to confirm that there is a long-run equilibrium (cointegrating) relationship between the variables included in the two models. Based on the statistically significant error correction terms, Granger Representation Theorem (Granger 1983) can be invoked to further support the long-run relationship between the variables.

Table 4 also presents the long-run elasticity coefficients for the independent variables included in the two models. Overall, the signs of these coefficients are consistent across all the estimated equations and thus they are in accordance with the basic models formulated in equations (1) and (2). The institutional variable: banking access ($LRBBR_t$) and the level of credit repayments ($LRCRP_t$) exert a positive influence on the level of credit granted as shown in column 2 of Table 4. The credit repayments ($LRCRP_t$) variable has the most significant influence on the level of credit granted as shown by the bigger elasticity coefficient. As shown in column 3 of Table 4, credit repayments are positively influenced to a small extent by the level of credit granted ($LRCG_t$). The other institutional variables: farm gate price of paddy ($LRFGPR_t$) and crop insurance premia ($LRAIBP_t$) both have a positive impact on repayments under the credit scheme. In the case of credit repayments, crop insurance premia ($LRAIBP_t$) turns up as the most important variable with the largest influence.

7. Conclusion

This study began with an analysis of financial dualism, financial urban bias and the level of monetisation in Sri Lanka. The analysis showed that substantial progress has been made since the early 1980s in the gradual elimination of financial dualism and increasing the level of monetisation. As for the financial urban bias the conclusion need to be cautious since the very nature of economic development involves the creation of financial urban bias with the industrial and service sectors becoming important as opposed to the agricultural sector in the economy. The latest cross-section data on savings, investment and loan arrangements in the informal sector provides further support that financial dualism has been gradually declining since the early 1980s. This paper also carried out empirical work on the credit scheme for rice paddy farmers and the supportive institutional framework. The empirical results clearly show that supportive institutional framework involving rural banking access, farm gate price of paddy (very much influenced by the guaranteed price scheme for rice paddy) and crop insurance have all contributed positively to the successful operation of the credit scheme for rice farmers in Sri Lanka during 1980-2001. This paper has provided empirical support for importance of building institutions as emphasized by Stiglitz and Weiss (1981) and Stiglitz (1989) to overcome the mismatch in demand and supply of financial services. Main policy implication of the empirical analysis is that the supportive institutional framework should be maintained and improved (where necessary) in order to uplift economic conditions in the informal sector.

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Abstract

This is a study on Sri Lanka's dualistic financial structure and changes in investment and financing arrangements in its informal (rural) sector. The paper uses both cross-section and time series data since mid-1950s to examine the supportive institutional aspects of financing (Stiglitz and Weiss 1981, and Stiglitz 1989). The first part of the paper provides a descriptive analysis of Sri Lanka's dualistic financial structure, urban bias in finance and the degree of monetisation of the rural sector. The second part of the paper is devoted to an analysis of savings, investment and loan arrangements in the informal sector using the latest cross-section data available. The third part of the paper provides an empirical analysis of rural credit scheme for rice (paddy) production in the informal sector in Sri Lanka. This part of the paper involves use of regression analysis on time-series data for the rural credit scheme for the period 1980-2001. The results of the regression analysis show that the level of credit extended is positively related to the number of rural banks branches and the level of repayments under the credit scheme. The analysis also shows that the level of credit repayments is positively influenced by crop insurance, farm gate price of paddy and the level of credit extended. This paper indicates that gradual but considerable progress has been made since the early 1980s in overcoming financial dualism and improving the level of informal sector financing in Sri Lanka. The main policy implication of the empirical analysis is that formal institutional arrangements such as rural credit scheme, rice marketing, rural banking access and crop insurance should be continually reinforced to improve the economic conditions in the informal sector.

JEL CLASSIFICATION: E21, E22, O16, O17, Q14, Q18, R51

KEY WORDS: informal sector, financial dualism, urban bias, monetisation, rural credit, rice production, rural banks, crop insurance, Sri Lanka.