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Samōdhāna: The Journal of Faculty of Social Sciences and Humanities
2015, Vol. 4 (I) 11-22pp

Ed. *Tissa Weerasekara*
Pub. *Publication Section of the Faculty of Social Sciences & Humanities, Rajarata University of Sri Lanka, Mihintale.*
ssh.samodhana@gmail.com

A Measurement for Financial Liberalization: An Application to Sri Lanka

AM Priyangani Adikari[1]

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ශ්‍රී ලංකා ආර්ථිකය තුල 1977 න් ආරම්භ වූ විවෘත ආර්ථික ක්‍රමයත් සමඟ මූල්‍ය ලිහිල්කරණ ප්‍රතිපත්තීන්ද ක්‍රියාවට නංවන ලදී. මෙම අධ්‍යයනයේදී සිදුකරනු ලබන්නේ එම මූල්‍ය ලිහිල්කරණ ප්‍රතිපත්ති ක්‍රියාත්මක වීම සැලිකිල්ලට ගනිමින් දර්ශකයක් නිර්මාණය කිරීමයි. එහිදී 1977 සිට 2011 දක්වා වාර්ෂික කාල ශ්‍රේණි දත්ත (Time Series Data) භාවිත කරන ලද අතර Principal Components Method තුළින් දර්ශකය නිර්මාණය කරන ලදී. දර්ශකය නිර්මාණය කිරීම සඳහා මූල්‍ය ලිහිල්කරණ ප්‍රතිපත්ති 10ක් භාවිතා කරන ලද අතර, මූල්‍ය ලිහිල්කරණ ප්‍රතිපත්ති සඳහා 0 - 01 ත් අතර අගයන් ලබා දී ඇත. මෙම අගයන් ඒ ඒ වර්ෂයන්ට අදාලව 0, 0.25 ,0.5, 0.75 සහ 01 ආදී වශයෙන් ඇතුලත් කර ගණනය කිරීම සඳහා යොදා ගන්නා ලදී. මෙම අධ්‍යයනයේ ප්‍රතිඵලයක් ලෙස නිර්මාණය කරගත් මූල්‍ය ලිහිල්කරණ දර්ශකය (Financial Liberalization Index) මඟින් ශ්‍රී ලංකාව තුළ ක්‍රියාත්මක කරන ලද මූල්‍ය ලිහිල්කරණ ප්‍රතිපත්තීන් සමස්තයක් ලෙස අදාල වර්ෂය තුළදී කොතෙක් දුරටද යන්න මැන බැලිය හැකි අතර, මෙම දර්ශකය භාවිත කරමින් මූල්‍ය ලිහිල්කරණ ප්‍රතිපත්තීන් ආර්ථිකයේ විවිධ විචල්‍යයන්ට දක්වන බලපෑම අධ්‍යයනය සඳහාද උපයෝගී කරගත හැකිය. එබැවින් මූල්‍ය ලිහිල්කරණ ක්‍රියාවලියේදී ක්‍රියාවට නංවන ලද සියළු ප්‍රතිපත්තීන් සාරාංශ ගත කර එය එක් දර්ශකයක් මඟින් මැන පෙන්වීමට ගන්නා ලද උත්සාහයක් ලෙස මෙම

[1] *Senior Lecturer, Department of Social Sciences, Faculty of Social Sciences and Humanities, RajarataUniversity of Sri Lanka.* priyangani.adikari@yahoo.com

දර්ශකය නිර්මාණය කිරීම ඉදිරි පර්යේෂණ කටයුතු සඳහා ඉතා වැදගත්වන බව සඳහන් කළ හැකිය. ඒ ඒ වර්ෂයන් අනුව ක්‍රියාත්මක කරන ලද ප්‍රතිපත්තීන්ට අනුව දර්ශකය මඟින් 1977-2002 කාල සීමාව තුළ ශ්‍රීලංකා ආර්ථිකය තුල ලිහිල්කරණය සඳහා වැඩි නැඹුරුවක් දක්වා ඇති බව පෙන්නුම් කරයි.

ප්‍රමුඛ පද - මූල්‍ය ලිහිල්කරණ දර්ශකය , මූල්‍ය ලිහිල්කරණ ප්‍රතිපත්ති, විවෘත ආර්ථිකය

01. Introduction

At the time of independence Sri Lanka had an underdeveloped financial market. The participants in the market were a few commercial banks with a small number of market instruments. Since the mid-1980s the World Bank and International monetary Fund proposed financial liberalization as a basic frame work for developing member countries to accelerate economic growth. A major turning point in the financial sector in Sri Lanka came after liberalization policies were introduced in 1977.

The concept of financial liberalization can be traced as far back as Bagehot (1873), who argues that the financial system plays a critical role in the adoption of better technologies that effectively mobilize resources, thus encouraging economic growth. However, the concept really gained prominence following the seminal works of McKinnon (1973) and Shaw (1973), in which they argue that financial repression is a major impediment to or a drag on economic growth in developing countries (http://www.centralbank.org.bb/Publications/).

They define financial repression as the set of government legal restrictions imposed on the activities of financial intermediaries, preventing them from functioning at their full capacity level. McKinnon and Shaw maintain that financial liberalization, involving the establishment of higher interest rate that equate the demand for and supply of saving ,in addition to the removal of credit controls, will lead to an increased saving ,faster a more efficient allocation of investment and contribute positively to economic growth.

Sri Lanka has implemented financial liberalization reform in order to widen and deepen the financial system under open economic framework. The whole liberalization reforms can be divided into two phases. The period from 1977-1989 is known as the pre and after 1989 it was known as post 1989 period. The first phase focused on interest rate, exchange rate and banking reform and the second phase focused on stabilization and further relaxation of remaining restriction on trade and payments (Cooray, 2003).

The study is an attempt of a construction an index that shows a summary of the key policy reforms implemented of financial liberalization in Sri Lanka as a single index.

02. Objectives

The study of impact of financial liberalization on various aspects of the economy is quite interested and debatable area among economists. Many researchers and scholars have constructed indices to evaluate the impact of financial liberalization policy on various aspects of the economy. But, very little researches have been undertaken to evaluate the impact of financial liberalization in Sri Lanka using an index. Therefore, objective of this study is to construct an index that reflect the level and consequences of financial liberalization policies in Sri Lanka. Further, this study aims to bridge the gap that lack of analysis financial liberalization package as a policy in open economy framework in the context of Sri Lanka.

03. Methodology

This study is mainly based on secondary data published in annual report of Central Bank of Sri Lanka. The time series data of 35 years (1977-2011) is collected to construct the index. In order to construct the financial liberalization index, the Principal Component Method is employed.

04. Literature Review

Measuring financial liberalization is not as easy task primarily given its multifaceted nature. Data are also not readily available on every dimension and even where they are available. They may be extremely fragmented. The following literature gives detail of the various efforts of measuring financial liberalization.

Quinn (1997) constructed international financial liberalization index. It measures the extent of a country's restrictions on the flow of international finance using the detailed text of the IMF's Annual Report of Exchange Arrangement and Exchange Restrictions (AREAER). Capital Account openness is scored on graduating 0-4 scale, Current account openness on a 0-8 scale and international agreements on a 0-2 scale, where the larger number represents more liberalized. The resulting 0-14 range indicator is an overall measure of the intensity of international financial liberalization. Quinn constructed the index for 1950-1997 for 21 OECD countries and for the years 1959, 1973, 1982, 1988, 1997 for 43 developing countries.

Montiel and Reinhart (1999) combine the IMF's AREAER indicator with country specific information to construct capital account liberalization intensity index. Taking on values 0, 1 or 2 with higher number represents stronger capital account restrictions.

Grilli and Milsi-Ferretti (1995) use share indicator to measure the proportion of years the country's capital account is reported as free of restrictions. The resulting variable is a 0, 1 indicator of the presence or absence of capital controls.

Bandiera (2000) developed financial liberalization index using 8 dummy variables representing the various dimensions of liberalization, interest rates, pro-competition measures, reserve requirements, directed credit, banks' ownership, prudential regulation, capital account and exchange rate liberalization. Laeven (2003) constructed financial liberalization index similar to Bandiera. He includes the six variables to measure financial liberalization. But excludes the measures related to stock market and external sector in his index.

Kaminsky and Schmukler (2001) examined the short-run and long-run effect of financial liberalization on capital market by constructing a comprenhensive chronology of financial liberalization in 28 developed and emerging economies since 1973. They used three measures of financial liberalization: capital account liberalization, domestic financial system liberalization and stock markets liberalization.

Kaminsky and Schmukler (2003) build financial liberalization index using average of domestic financial liberalization focus on interest rate regulations and complement with information on the regulations reserve requirements, credit allocation and foreign currency deposits, Capital account liberalization focus on offshore borrowing by non –

financial corporations, multiple exchange rate markets and control on capital outflows.

Demirguc-kunt and Detreagiache (1998) constructed domestic financial liberalization for 53 developing countries. They use the first date in which some interest rate were liberalized and create dummy variable with zeros for periods in which interest rates are subject to controls and ones for the liberalized periods. Financial liberalization index is used as measure of financial liberalization by Abiad and Mody (2005). They used six dimensions; credit/reserve requirement, interest rate controls, entry barriers and or lack of procompetition policies, restrictive operational regulations, the degree of privatization in the financial sector, and control on international financial transactions. For each dimension is given a score on a graded scale as; with zero corresponding to being fully repressed, one to partially repressed, two to largely liberalize and three to fully liberalized. Kraay (1998) constructed capital account openness to measure financial liberalization. He used data on actual capital inflows and outflows as a percentage of GDP. The sum of the inward and outward foreign direct investment, portfolio investment and other investment in the financial account of the balance of payment are considered as capital inflows and outflows. But Lane and Milesi-Ferretti (2001) have use portfolio and direct investment assets and liabilities as a percentage of GDP as an indicator of financial openness. Shrestha (2005) constructs a financial liberalization index for Nepal employing the principal component method. He uses eight variables of financial policies to construct the index. The index shows the degree of financial liberalization at a particular time. Bandiera et.al. (2000) construct an index of financial liberalization for eight developing countries using principal component method. They examine total effect of financial reform on aggregate private savings in Chile, Ghana, Indonesia, Korea, Malayasia, Mexico, Turkey and Zimbabwe.

Financial liberalization index for Sri Lanka is constructed by Paudel in 2007 employing principal component method. The study uses thirteen major policy components of financial liberalization. They are; Interest rate regulation, liberal exchange rate policy, banking policy reforms, easing of credit supply, introduction of prudential norms, money market reforms, share market reforms, bond market reforms, current account liberalization, capital account liberalization, bank ownership, reserve requirements and institutional reforms. The study covers data from 1963 to 2005 in Sri Lanka. The index contributes to show quality and extension of financial liberalization in Sri Lanka.

05. Results and Discussion

A financial liberalization reform includes several elements; as it reflects a variety of restrictions that were imposed. This includes capital account liberalization, banking sector liberalization and stock market liberalization. The financial liberalization index for Sri Lanka is constructed to include all the reforms during the different period after 1977. The index is constructed following methods by Bandiera et al. (2000) Laeven (2003) Shrestha (2005) and Paudel (2007). They have used major policy components of financial liberalization to construct financial liberalization index.

This study used directly related 10 major policy components of financial liberalization package in Sri Lanka to construct the index. The policy components and their indicators used to assign values to derive index are summarized as;

1. Interest Rate (IR)-Interest rate on Deposit and Lending
2. Exchange Rate (ER)-Decontrol of exchange rates.
3. Reserve Requirements (RR)-Changes of Reserve requirements.
4. Credit Supply (CS)-Removal of Credit ceilings.
5. Capital Account Liberalization (CAL)-Foreign direct investment and capital inflow.
6. Current Account Liberalization (CAAL)-Balance of payment statistics.
7. Share Market Reform (SR)-Share transactions and permission to share investment in foreign investment.
8. Bond Market Reform (BMR)-Treasury bond transactions and permission to issue certificate of deposits for commercial banks.
9. Money Market Reform (MMR) - Treasury bill market transactions and set up reverse repurchases market.
10. Banking Policy Reforms (BPR)-Removal of entry barriers to foreign bank and foreign commercial banks.

06. Econometric model

In order to construct the financial liberalization index, some arbitrary value is assigned to each of the selected policy components. Each policy component takes value between 0 and 1depending on the implementation status of the policy. When a particular policy component is fully liberalized, that variable takes a value of 1 and when the variable remains regulated it takes a value of 0.If liberalization occurs in a gradual process in some contexts 0.25,0.5 and 0.75values are assigned as some selected variables have been liberalized in different phases. The assigned values presented in their implementation status are used to construct the index (see Appendix A). The weight of each of the component is calculated by employing the Principle Component method. The index can be expressed as following formula.

$$FLI_t = w_1IR + w_2ER + w_3RR + w_4CS + w_5CAL + w_6CAAL + w_7SR + w_8BMR + w_9MMR + w_{10}BPR \quad ..(1)$$

Where:

FLI_t = Financial Liberalization index at respective year

W_i = weight of the component given by the respective eigenvector of the selected principle component. The Eigen values and Eigenvectors of the correlation matrix of financial liberalization policy variables are shown in table 1.

Table. 1 Eigen values and Eigen vectors of policy components

Variables	Eigenvector
	λ_1
IR	-0.330851
ER	-0.342447
RR	-0.179867
CS	-0.239233
CAL	-0.328136
CAAL	-0.331420
SR	-0.348414
BMR	-0.337198
MMR	-0.359872
BPR	-0.318697
Eigen value	7.385342

Source: Author computed using E Views 5

For the analysis, the first principal (λ_1) component is selected, because it covers 73% of total variance.

Table.2 Weight of selected policy variables

Variables	**Eigenvectors** λ_1	**Weight of variables** $W_i = \lambda_1 / \sum\lambda_1$
IR	-0.330851	0.106174
ER	-0.342447	0.109895
RR	-0.179867	0.057721
CS	-0.239233	0.076772
CAL	-0.328136	0.105302
CAAL	-0.331420	0.106356
SR	-0.348414	0.11181
BMR	-0.337198	0.10821
MMR	-0.359872	0.115487
BPR	-0.318697	0.102273
Total ($\sum\lambda_1$)	-3.11614	

Source: Author computed

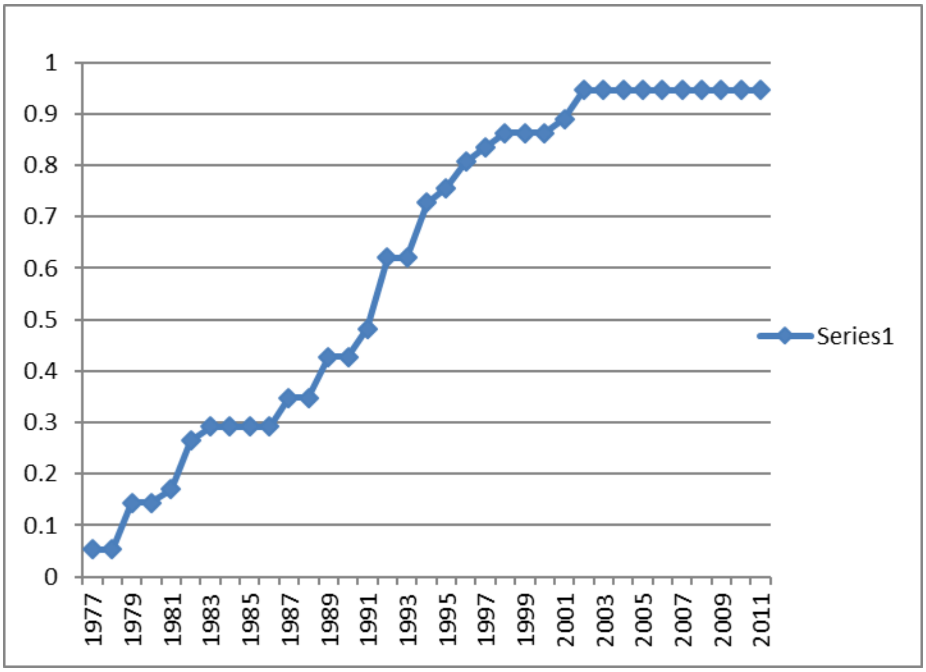
The index equation **(1)** *with the fixed values weight based on arrives at equation (2) as:*

FLI**$_t$* **= *0.106174IR + 0.109895ER +

0.057721RR + 0.076772CS +

0.105302CAL + 0.106356CAAL + 0.11181SR + 0.10821BMR + 0.115487MMR + *0.*

Then equation (2) with weight of variables multiply the correspondent value for all ten variables,the index for the individual policy components was calculated. Finally the financial liberalization index for each year is obtained by summing up the calculated values of all 10 policy variables for the respective year. The figure of the calculated *10**2273BPR** ...(2)*



Financial liberalization index is presented in figure 1.

Figure No.1. Financial Liberalization progress in Sri Lanka 1977-2011

The index shows that the major policy steps of financial liberalization process in Sri Lanka have followed from 1987 to 2002 period.

07. Concluding Remarks

The financial liberalization index for Sri Lanka has been constructed by including ten policy components implemented during the period 1977 to 2011.The liberalization index is based on principal component method and also takes in to account the different phases of liberalization process. Most of the past studies considered only full liberalization level or non-liberalization level for their calculation. But in this study liberalization has considered not only non-liberalization and full liberalization but also partial liberalization levels too. Because of financial liberalization is a gradual process in the context of Sri Lankan economy. Ignoring partial liberalization levels may misguide when evaluating the impact of liberalization on various aspects. Therefore, the way of calculation this index is important to guide a real path for financial liberalization evaluation in Sri Lanka. This index would make it easy to further studies on financial liberalization Sri Lanka.

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Appendix. A.

Financial liberalization process in Sri Lanka by year and policy components

Year	IR	ER	RR	CS	CAL	CAAL	SR	BMR	MMR	BPR
1977	0.25	0.25	0	0	0	0	0	0	0	0
1978	0.25	0.25	0	0	0	0	0	0	0	0
1979	0.25	0.25	0	0.5	0	0	0	0	0	0.5
1980	0.25	0.25	0	0.5	0	0	0	0	0	0.5
1981	0.5	0.25	0	0.5	0	0	0	0	0	0.5
1982	0.5	0.25	0	0.75	0	0	0.25	0	0.25	0.5
1983	0.5	0.25	0	0.75	0	0	0.5	0	0.25	0.5
1984	0.5	0.25	0	0.75	0	0	0.5	0	0.25	0.5
1985	0.5	0.25	0	0.75	0	0	0.5	0	0.25	0.5
1986	0.5	0.25	0	0.75	0	0	0.5	0	0.25	0.5
1987	0.5	0.25	1	0.75	0	0	0.5	0	0.25	0.5
1988	0.5	0.25	1	0.75	0	0	0.5	0	0.25	0.5
1989	0.75	0.25	1	0.75	0	0	0.75	0	0.25	0.5
1990	0.75	0.25	1	0.75	0	0	0.75	0	0.25	0.5
1991	0.75	0.5	1	0.75	0	0	0.75	0.25	0.25	0.5
1992	0.75	0.75	1	0.75	0	0.25	1	0.25	0.5	0.5
1993	0.75	0.75	1	0.75	0	0.25	1	0.25	0.5	0.5
1994	0.75	0.75	1	0.75	0.5	0.25	1	0.25	0.5	0.5
1995	0.75	0.75	1	0.75	0.5	0.25	1	0.25	0.75	0.5
1996	0.75	0.75	0	0.75	0.5	0.25	1	0.75	0.75	0.75
1997	0.75	0.75	0	0.75	0.5	0.25	1	0.75	0.75	0.75
1998	0.75	0.75	0	0.75	0.5	0.25	1	0.75	0.75	0.75
1999	0.75	0.75	0	0.75	0.5	0.25	1	0.75	0.75	0.75
2000	0.75	0.75	0	0.75	0.5	0.25	1	0.75	0.75	0.75
2001	0.75	0.75	0	0.75	0.5	0.5	1	0.75	0.75	0.75
2002	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2003	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2004	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2005	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2006	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2007	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2008	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2009	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2010	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75
2011	0.75	0.75	1	0.75	0.5	0.5	1	0.75	0.75	0.75

Source: Author computed
Note: The liberalization progress is cumulative from 0 to 1