BBTA Journal

Thoughts on Banking and Finance

Volume 3 Issue 1
January-June 2014

Bangladesh Bank Training Academy
Mirpur-2, Dhaka-1216

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(A Journal of Bangladesh Bank Training Academy)

Volume 3 Issue 1

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For all sorts of correspondence:

The Executive Editor

BBTA Journal "Thoughts on Banking and Finance"

Research and Publications Wing

Bangladesh Bank Training Academy (BBTA)

Bangladesh Bank, Head Office, Mirpur-2, Dhaka-1216, Bangladesh

Phone: 880-2-8034672, Fax: 880-2-8032110

E-mail: bbta.respub@bb.org.bd

Price: Inland BDT 100.00

Foreign US$ 2.00

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Editorial Note

The monetary stance of Bangladesh Bank (BB) aims to bring average inflation down to 6.5% by end FY15, ensuring sufficient credit growth to stimulate inclusive economic growth. The risks to the inflation target include global food price volatility, any shocks to domestic crop output and the knock-on impacts of any upward adjustments in public sector wages. To achieve the FY15 inflation target is a challenge. BB intends to contain reserve money growth to 15.5% and broad money growth to, 16.0% by December 2014 using both monetary and financial sector policy instruments to lessen the inflationary pressures over the past few months. In these regard, BB raised the cash reserve requirement (CRR) by 50 basis points in June 2014 in consideration of cost-effectiveness of absorbing excess liquidity in the banking system. Banks are advised to lend only to creditworthy clients for productive purposes. In accordance with monetary and financial policies, economic growth supporting policies are being deepened. In order to promote exports, BB has recently increased the export development fund (EDF) from $1.2 billion to $1.5 billion. With a view to attracting foreign investment, BB has relaxed restrictions on foreign investor borrowing from the local market and their ability to access working capital financing from their parent company. In adoption of policies regarding the achievement of inflation target, inflation came down. Hence, finding out effectiveness of transmission of monetary policy is a key area of research.

Fiscal-monetary coordination is a must for achieving monetary target and containing government borrowing well within budgetary limits and avoiding any crowding out of private sector borrowing. Government borrowing from the banking system is now under the limit of budgetary target. But government borrowing from non-bank sources mostly through the issuance of saving certificates by National Savings Directorate has been surpassed due to the attraction of higher rate of interest. Moreover, efficient resource allocation of government fund is a vital issue for the economy. Government expenditure on building infrastructure and production supporting sectors can accelerate not only economic growth but also government revenue. Here, two issues on which research can be done: a) an enquiry into crowding out impact of government borrowing and b) the effects of government expenditure on the economic growth.

Financial system is needed to be stabilized through strong regulation and supervision. The role of central bank not only on concentrating on price stability through monetary policy but also on ensuring financial stability so as not to create a mismatch between assets and liabilities side of the banking system. Financial scams and loan default culture are barriers to achieve financial stability. Borrowing, write-off, provisions and maintaining other restrictive directives are the tolls for financial scams and loan default culture in banking system. Recently, BB has taken a lot of measures to check financial scams and loan default culture and to implement of these measures strong supervision is needed. In addition, integration of different segments of financial system is very important for financial stability because a high interest in one segments of financial system can adversely affect other segments with shortage of liquid fund. In this regard a research can be made on the

economic cost of loan default in the banking system in Bangladesh.

Inclusive financial growth strategy is a way to access unbaked people in the formal banking system. In support of guidelines of BB and the efforts of banks, about 15 million including farmers, beneficiaries under social securities programme, freedom fighters, school students and others opened bank accounts with only Taka 10. This inclusive growth strategy will not only strengthen the financial system by mobilizing financial resources but also contributes to sustainable economic growth. In addition, creation of small loans in favor of potential entrepreneurs of such accounts can accelerate economic activities of micro enterprises and thus outline the strong foundation of flourishing SMEs in Bangladesh. BB's guidelines and banks' support are also needed for making entrepreneurs from the newly included people in access of the financial system. In this regard a research can be done on the effects of inclusive financial growth strategy.

Savings plays crucial role on the economy. Savings are mobilized as deposits in banks and banks make loans from deposits which contribute to boost investment in the economy. It is very much difficult to say how much investment is needed to achieve a targeted growth. Currently, Bangladesh's GDP growth rate ranges between 6 and 7 percent. Bangladesh's economy needs to grow in near future GDP more than 7 percent to be joined to middle income countries in 2021. Therefore, investment should be increased in productive sectors especially through FDI and inflow of remittances. Improvement of service sectors including IT and telecommunication can also contribute efficiency and productivity. If productivity is increased, it is no doubt GDP can be increased with similar level of investment. It is thus necessary to increase both level of investment and productivity to achieve a higher GDP growth. Here an estimation of total factor productivity in Bangladesh may be an area of research.

These are the topics on which the papers of this issue are tried to address and the main points of the papers are listed below.

The first paper entitled **"An Institutional Analysis of Some Monetary Issues in Developing Economies" by** Eduardo Strachman and Marcos R. Vasconcelos show the difficulties that the increasing international mobility of capitals set to the execution of monetary policy in the development countries. In modern capitalist economies, more than ever, money should be viewed as an institution. Therefore, it is first necessary to understand what are institutions (being money one of them) in order to comprehend the institutional and theoretical prerequisites to monetary policies and monetary stability. In this discussion, they emphasize the challenges that the monetary and financial opening up of many national markets impose for the execution of economic policies. In this sense, we also examine some of the specific institutional prerequisites to monetary stability in the development countries, because of facts as the inconvertibility of their currencies, and the frequent inconsistency of their fiscal, monetary and exchange policies, etc. They try to demonstrate that those institutional difficulties are responsible for the growing appeal of proposals to a complete abandonment of some national currencies, or for the adoption of currency boards in which the policymakers renounce to their power to decide about the liquidity level of their economies, in spite of the formal existence of their national currencies. Finally, they present some suggestions to the solution of the referred problems.

The second paper entitled **"Studying Spectrum Allocation Methods: Applicability for Bangladesh" by** Syed Atif Jilani and Prof Valeed Ahmad Ansari view that allocation of public resources has always been a tricky issue for national government the world over. Primarily governments used beauty contests for selling coal blocks or for allocating oil drill licences. In some countries, lotteries and first-come-first serve methods were also employed. This paper studies the pros and cons of these methods with special reference to allocation through auctions. The Simultaneous Ascending Auction design, used by the FCC for allocation of spectrum licenses in the US in 1993 and later on copied in different countries, is analyzed in detail. As a case study, the recent spectrum auctions held in Bangladesh in September 2013 were studied and it was found that the auction would have performed better if the government would have been able to attract one more bidder.

The third paper entitled **"Integration of Financial Market and Its Implication on Stock Market Development in Bangladesh: An Evaluation"** by Mohammad Masuduzzaman, Md. Habibour Rahman and ShohelAhammed test integration among various segments of the financial market in Bangladesh. Both casual observations and statistical analysis presented in this paper indicate that certain components of the money market such as deposit money banks, nonbank financial institutions and government treasury securities market are highly integrated. The market for the instruments of National Saving Directorate is also integrated, albeit with some sort of divergent tendency due to existence of administered interest rate. On the other hand, the interbank call money market and the stock market are not integrated with the rest of segments of the financial system due to their high volatility in the recent past. Deposit rate of the banks is found to be the "reference rate" for the Bangladesh's financial system. Therefore, efforts must be made to make this rate as much market based as possible since most other rates tend to move in line with the movements of the reference rate. Effectiveness of monetary policy, which generally operates through the short end of the interest rate structure, would also depend on how it impacts the reference rate.

The forth paper entitled **"School Banking in Bangladesh: A Study on Sustainability"** by Dr. Mahmood Ahmed observes that there is a sustainability risk of school banking product. Such a risk has become a prestige concern to Islami Bank Bangladesh Limited, the largest private commercial bank in Bangladesh. Because recently the Bank has got the crest for contribution in school banking. Therefore the school banking of the IBBL has been undertaken as a case study for sustainability analysis of it. The study uses a cluster randomized design, with 50 schools randomly selected from the IBBL Chittagong zone. Data are from baseline survey with 1,515 student and 1,137 parents and guardians of the students who are from three levels: Primary, Junior High School, and High School. This research focuses on the financial knowledge, attitudes, and socialization of students under school banking of the IBBL as well as the financial knowledge of their parents and guardians with a view to understanding and increasing the students' 'financial capability' on which the sustainability of the school banking depends. Finally, it suggests four measures to increase the sustainability of the school banking product.

The final paper entitled **"Savings - Economic Growth Nexus in Bangladesh: Evidence from Causality, Cointegration and Error Correction Models"** by Laila Haseen and Mohammad Amzad Hossain find that the dynamic causal relationship between gross

national savings and gross domestic product remains a contentious and lively issue in the literature. Even though the literature on this issue is voluminous, however for Bangladesh it is quite nascent. The paper explores the dynamic causal relationship between gross national savings and gross domestic product in Bangladesh over a long period of time (1974-2010) by applying Granger causality test, Johansen and Juselius cointegration test and Engel and Granger error correction models considering the stochastic properties of the variables. The issue of the short run dynamics of savings and other variables within a long run relationship has also been examined in the paper. The estimated results show that both variables are nonstationary at their levels and stationary at first differences. Then using cointegration technique it has been found that both the considered variables are cointegrated, implying that there is a stable long run relationship between gross national savings and gross domestic product. The error correction model shows that the considered variables drift apart in the short run, however in the long run there is bidirectional causality between savings and economic growth. The implication of the result is that mobilising domestic savings are critical for capital accumulation and so for economic growth. The Granger causality test also shows the same result. Therefore,they recommend that attempts have to be made to increasenational savings for capital accumulation and output growth in Bangladesh.

Rokeya Begum

General Manager, Research Department
Faculty Member, Bangladesh Bank Training Academy
Executive Editor, BBTA Journal 'Thoughts on Banking and Finance'

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2. Inaugural Speech by Governor Dr. Atiur Rahman delivered at Green Finance for Sustainable Development held in Dhaka on December 13, 2014
3. Monetary Policy Statement, July-December 2014.

An Institutional Analysis of Some Monetary Issues in Developing Economies

Eduardo Strachman[*]
Marcos R. Vasconcelos[**]

Abstract

The paper shows the difficulties that the increasing international mobility of capitals set to the execution of monetary policy in the development countries. In modern capitalist economies, more than ever, money should be viewed as an institution. Therefore, it is first necessary to understand what are institutions (being money one of them) in order to comprehend the institutional and theoretical prerequisites to monetary policies and monetary stability. In this discussion, we emphasize the challenges that the monetary and financial opening up of many national markets impose for the execution of economic policies. In this sense, we also examine some of the specific institutional prerequisites to monetary stability in the development countries, because of facts as the inconvertibility of their currencies, and the frequent inconsistency of their fiscal, monetary and exchange policies, etc. We try to demonstrate that those institutional difficulties are responsible for the growing appeal of proposals to a complete abandonment of some national currencies, or for the adoption of currency boards in which the policymakers renounce to their power to decide about the liquidity level of their economies, in spite of the formal existence of their national currencies. Finally, we present some suggestions to the solution of the referred problems.

1. Introduction

At the end of the 50s, when the main countries of Europe gradually started to promote the return of their currencies to convertibility, after gathering important exchange reserves in dollars, the world began the trail back to the point where flows of international financial capital might regain their former pre-war importance in the international economy (Grabbe, 1996). The development of the Euromarket in the following years reinforced and accelerated the trend (Helleiner, 1996), culminating, in the beginning of the 70s, with the dismantling of the exchange rules established in Bretton Woods. After the first movements in this direction made by the United States and the United Kingdom in

* Eduardo Strachman is Associate Professor at the São Paulo State University (UNESP), Brazil. Address: Depto. de Economia, Faculdade de Ciências e Letras, Universidade Estadual Paulista – Campus Universitário, Rod. Araraquara-Jaú, km. 1, CEP 14.800-901, Araraquara-SP, Brazil. E-mails: edstrach@fclar.unesp.br. Phone: 55-16-3334-6214. Phone/Fax: 55-16-3334-6258.

** Marcos R. Vasconcelos is Professor at the Department of Economics of the State University of Maringá (UEM), Brazil. Address: Universidade Estadual de Maringá – Campus Universitário, Av. Colombo, 5790. Bloco D34-s. 115 (Departamento de Economia), CEP 87.020-900, Maringá-PR, Brazil. E-mail: mrvasconcelos@uem.br. This paper has a first Portuguese version as Strachman & Vasconcelos (2001). Reprinted with permission.

1971-73, several countries began to liberalise their finance systems, whether on a strictly domestic level or in terms of the flows in their capital account (Williamson & Mahar, 1998). From that moment on, a similar tendency for an opening up of the financial systems spread over the world, arriving at the developing economies in the end of the 80s. As a matter of fact, in the 90s, the world economy achieved a level of mobility in international financial capital not seen since the beginning of the twentieth century (Obstfeld, 1998).

One of the most visible effects of this process directly affected the degrees of freedom the countries have at their disposal to conduct economic policies for the achievement of internal goals. New conditions, including institutional ones, were imposed on the implementation of monetary, fiscal, and exchange policies. However, several economic analyses are still made under the presumption that we are living in closed economies. Such a stance is more readily noticeable in the literature that deals with monetary policy issues (Svensson, 1998).

At best, some models are developed in which the domestic interest rates are conditioned by the international ones and by expectations (defined almost invariably according to the canons of the rational expectations hypothesis) in relation to the exchange rate, and in which the national economies are subject to shocks which have their point of origin "elsewhere in the world". Furthermore, there are few discussions over the nature of national currencies in this open economies scenario, global finances and portfolios made up of different currencies. More than ever, the national currencies are seen as institutions under continuous evaluation by the markets (which are increasingly constituted, as explained before, by agents whose portfolios are made up of many different currencies) in terms of the ability of these institutions to clear debt contracts, that is, to show themselves as assets with great liquidity, not only in the national arenas but also in the international one.

This paper investigates the difficulties which such restrictions impose over the monetary policies in the developing countries. In the next section we discuss currencies as institutions. In the third part, we show the obstacles to the implementation of monetary policies in open economies. In the fourth section, the preconditions of currency stability are presented and, in the section that follows, we explain which are the institutional prerequisites necessary in order that these preconditions of stability are attained in the developing countries. In the sixth part, we analyse the proposals to jettison some national currencies or to adopt currency boards. Finally, we draw some brief conclusions, presenting some proposals for the solution of some important problems analysed in the paper.

2. Money as an Institution

Institutions are defined as rules and patterns of behaviour or interaction among people verified in one (or part of a) society, rules and patterns of behaviour which must acquire some stability, i.e., need to be repeated, even for a short time span. That is, institutions set up and, at the same time, restrict, the choices of individuals, at least in terms of what is socially recognised or considered acceptable and/or rational. Of course this does

not mean that these individuals must be conscious of these norms and rules, or of their meaning or function.[1] Institutions reflect and, at the same time, settle, the value structure of societies.[2] And, therefore, they prescribe the expected behaviour and performance of some social functions and situations, and also determine – together with some ways of rewarding and creating incentives,[3] and with sanctions against deviating behaviours – the motivations[4] for and the level of confidence that one can have in this behaviour and performance.

So, institutions can have an important role as a means of reducing uncertainty, through the coordination of formerly divergent expectations of some agents and the concentration of these expectations in certain ranges (Simon, 1991:39; North, 1990; 1991). For divergent expectations emerge more easily when some laws, norms and rules (formalised or not, and which reduce the possible range of behaviours of the agents) are not established, and thus a high level of confidence does not prevail.[5] Undoubtedly these are some of the classical problems analysed by Keynes (1936:148-9; 1937), that is, those concerning uncertainty and the state of confidence, with institutions in their role of "uncertainty reducers" contributing immensely to diminish "the likelihood of our best forecast turning out quite wrong."(Keynes, 1936:148).

1 Hall (1986:19); Elster (1989:99). Elster shows that social norms need to be shared by some (or many) people. Johnson (1992:26) includes among institutions the habits, routines, rules, norms and laws, as well as the organisations. I include communication between people in these patterns and rules of behaviour and interaction: As explained by Tool (1990:166): "Socially correlated patterns of behaviour are internalised by individuals and become habitual. Institutions, then, are made up of habits but they are not determined by habits. Being constituted of habits, institutions are often resistant to change. Rules, codes, customs, and attitudes, once established and embedded as habits, define expected behaviour and are presumed to be continuing." See also North (1990:4; 1991; 1994); Landesmann & Pagano (1994:199); Langlois (1986a:17; 1986b); Akerlof (1976:24) and Popper (1963:149-52).

2 Tool (1990:166). See also DiMaggio & Powell (1991a) for the visions and importance of values for Parsons and Bourdieu. For these authors, values are set before institutionalisation, i.e., they are preconditions to institutionalisation.

3 Popper (1963:156); Rizzo (1985:881-2); Elster (1989:99-100). That is why I prefer to define institutions as patterns of behaviour and not as rules which define or impose them, as, for instance, in North (1990:3). For rewards, despite the fact that they may be established by rules (at least in the majority of cases), can hardly be seen as restrictions.

4 Granovetter (1985); North (1990; 1991). In this definition of institutions I do not include ideologies, as, for instance, in Veblen (1899:110), or in some other important contemporary institutionalists (Friedland & Alford, 1991:243; Johnson, 1992:27-8). This does not mean that "mental habits" or the ideas of different individuals do not acquire some stability and routine characteristics — historically, culturally or personally determined — which cannot be included in a definition of institutions. The objection is to overburden this concept with the one of ideology, for ideologies, in spite of some collective aspects that they hold, have a marked individual nature, which escape the definition of institutions presented before. I define ideology as the way through which a person tries to explain "the world" as a whole, understood as everything which enters his/her field of perception, or on which he/she reflects (in this case it can surely also include things that do not exist). In a similar sense, cf. North (1990:16-23,137-8) and Fligstein (1991). See also Vasconcelos et alii (1999).

5 Therefore, institutional stability reduces uncertainty, through the narrowing of the range of expected actions in particular situations (Dopfer, 1991). It can also provide, as Lundvall (1992a:10) underline, "guide-posts for change. In this context, we may regard technological trajectories and paradigms which focus the innovative activities of scientists, engineers, and technicians, as one special kind of institution." Johnson (1988) also emphasizes the trade-off between the institutional flexibility and the function of institutions as guide-posts.

Institutions can be formal — as, for example, written rules and laws — as well as informal – as in the case of conventions, behaviours and codes of conduct.[6] According to North (1990:46), this distinction is only a matter of degree, which could perhaps be represented by a *continuum* that would go from taboos, customs and traditions — on the informal side — to constitutions, laws and written rules — on the formal one.

In this sense, as Keynes already recognised in *The General Theory* (Wray 1998), the various national currencies can easily be perceived as institutions,[7] for nowadays they are nothing more than mere symbols of value, since they possess no legal correlation with any material which possesses an intrinsic value, as they did formerly, at least in theory. However, even when paper-money represented metal values, we were still dealing with institutions, because this money (paper) represented nothing more than a contract which guaranteed the bearer that he (she) would receive a specified quantity of metal which represented determined values in paper-money. Once again, such an exchange depended on the trust that it would be honoured, which in turn would require the existence of sufficient metal reserves by the central banks and that these banks effectively would carry out their obligation to make the exchange in question.[8] As we know, in the majority of cases this trust did not have an indefinite support, even for the main central banks which managed the last two metallic standards: the Bank of England, during the gold standard; and the Federal Reserve, when the dollar-gold standard was in operation. In these two cases, history as ever, took it upon itself to bury all illusions held with respect to metallic restrictions on monetary policy.

The very advances, transformations and the deepening of the capitalist relations, especially those concerned with the finance and banking system, among countries and economic agents, impelled and demanded that the currency institution, whether in the national contexts or in the international ones, be freed of the necessity of reserves made up of assets with intrinsic and objective values and with a limited supply. The currency made itself autonomous as an institution and started to be managed contingently by a central entity (the central bank).

6 North (1990:36). It is important to notice that contracts can be in both categories, i.e., be formal — for instance, when they are written, with rights and obligations clearly stated as well as informal – when this does not occur. Cf. also Williamson (1979) and Pondé (1993).

7 That is, a convention for the liquidation of debt-credit contracts, including those relative to commercial positions "liquidated" in cash. These conventions are initially established by a central authority, but afterwards they are also adopted by private agents.

8 Hence, we can observe that even when metal money was in circulation, which was based on the value of gold and/or silver (e.g. gold standard; dollar-gold standard) or, mainly, on their representations on paper, copper, or other material, the de facto correspondence between the metal reserves and the M1 were always insufficient, which was one of the reasons why these standards were abandoned.

Concomitantly, the theoretical discussion about "technologies" in monetary policies, over the last decades, has passed, at least in the field of orthodox thought, through various phases: from the discretion and activism of the policy commended in the "hydraulic [and naïve] Keynesianism" (Coddington, 1983), as presupposed in the first version of the Phillips curve, to the rule of a constant growth of money supply defended by Friedman; from the discussion of the independence of the central banks to the defence of the implementation of inflation goals. To a greater or lesser degree, each one of these theories had the objective of finding and defining an optimum monetary policy on the basis of pre-established objectives: control of the general level of prices and of the fluctuation in inflation rates; promotion of a stable growth of the product; control of employment levels; stability of the monetary system; etc.

Nevertheless, it was during the seventies that a strong conviction emerged that the first and most important task of the central banks was to guarantee the consumer prices stability (Browne *et al*., 1998:4) and, therefore, an optimum monetary policy was that which achieves this objective at the lowest cost. This was the vision which prevailed in the eighties. But recently, Taylor refined the definition of optimum monetary policy[9] as being that which minimizes a weighed sum of the variance in income with the variance of inflation in comparison to its respective goals (Taylor, 1994). In terms of the minimization of a function of loss (z_t), it would be:

$$r_t = \pi_t + \alpha(Y_t - \hat{Y}) + (1-\alpha)\left[E_t(\pi_{t+1}) - \hat{\pi}\right] + \varepsilon_t \qquad (1)$$

Y_t being the level of the current aggregate product, $\hat{Y}$ the desired level *ex-ante*, by the economic authority, of the aggregate product, π_t the current inflation and π the pre-established target for inflation for the period t. The value of the parameter a depends on the preference of the economic authorities, which in turn is related to expected costs caused by the loss of product and by rates of inflation above the expected levels.[10] Still following this rationale, the operational/instrumental variable that the central bank would use to try to minimize these deviations would be the short term interest rate, which, one supposes, is related to stable parameters referred to by the target-variables, $\hat{Y}$ and π. This permits the following definition of the "function of reaction" (rule of Taylor), which leads to the conduct of monetary policy expressed by:

$$r_t = \pi_t + \alpha(Y_t - \hat{Y}) + (1-\alpha)\left[E_t(\pi_{t+1}) - \hat{\pi}\right] + \varepsilon_t \qquad (2)$$

9 That is, in what form the operational variables of monetary policy, the monetary base or short term interest rates, should alter in response to changes in the economic variables considered as target variables (Taylor, 1998:2).

10 On the costs of inflation see Driffil et al (1990)

in which Y_t, $\hat{Y}$, π, a were defined as in the equation 1, r_t is the real short term interest rate (operational variable); $E_t(\pi_{t+1})$ is the expectation of inflation for the period following the current management (t) of monetary policy, subject to the information about the economy which the central bank possesses at the time; and ε_t represents other variables which might affect the conduct of short term interest rates. One shall also notice that beyond current inflation, monetary policy should be regulated according to future expectations of deviations in relation to the inflationary target, because of the temporary gap which exist between the change in the interest rate and its effects on the economy.

Supporting this definition of an optimum monetary rule, there is the idea that the monetary policy cannot have only a stable growth of the product as its final objective but must also achieve price stability. A greater emphasis placed on one of these targets implies the acceptance of sacrifices with relation to the other, at least in the short term.[11] For as long as the preferences of the economic authority are undefined, the indetermination regarding the optimum rule prevails. Furthermore, any model which tries to delineate the characteristics of this optimum rule undergoes the questioning of the *ex-ante* confidence which it instills in the private agents in terms of the maintenance of the value of the currency in the long term. That is, the monetary policy has to be credible from the beginning to the economic agents, because if it were not, the costs in terms of the production level of a price stabilisation policy would be extremely high. It must be remembered again that those responsible for the monetary policy must conduct it with their eyes directed to the future, i.e., they need to react and counterbalance with anticipation — through changes in the operational variables of monetary policy — the future deviations expected for the product and/or inflation in relation to its targets, given the temporary gap between the execution of the policies and their effects on the economy.

3. Execution of Monetary Policy in an Open Economy

New difficulties are added to the management of monetary policy when it is applied to an open economy scenario. Traditionally, an economist is induced by training to think of monetary policy in terms of a closed economy, because it is in this context that different models related to monetary theory are presented to him/her, including the most famous of them all, the Quantitative Theory of Money. In many of the most favourable cases, the economist is trained to establish a rationale in the fashion of the Mundell-Fleming model, with full mobility of capital combined with the two canonic regimes of financial exchange: in the case of fixed foreign exchange, monetary policy becomes a mere appendix to foreign exchange policies, so it can only be really executed in a regime of flexible foreign exchange. But, in this latter instance, the variations in the

11 However, normally it is defended that the promotion of the price stability by the monetary authorities does not enter into conflict with the objectives of full employment and economic growth in the long run. On the contrary: price stability would be a pre-condition for the achievement of all these goals (Fischer, 1996; Mishkin, 1999).

money supply provoke fluctuations in the foreign exchange rate, which, through their effects on net exportations, the balance of trade, the level of income and the demand for money, affect interest rates, even without having repercussions on the stock of money. In this way, in the Mundell-Fleming model, monetary policy is, above all, the management of the money supply, and not of the interest rate. However, in the real world there is evidence that the central banks run their monetary policy through the management of the interest rates in the short term (Goodhart, 1995; Torres, 1999; Mishkin, 1999).

In addition to this, in an open economy scenario, especially in terms of the flows of international finance, the management of monetary policy becomes much more complex than this traditional model foresees. The effects of monetary policy on the management of private wealth decisions and on the general level of prices are not only felt through the means of interest rates, but also through foreign exchange rates (Ball 1998). That is one reason why, as Hicks stressed (1967:156), monetary theory is less abstract than the majority of economic theories, and its deeper relationship with reality cannot be avoided as it is sometimes in other theories.

Thus, the discussion on monetary policy should always be regulated by its respective institutional apparatus. In this sense, as the execution of monetary policy becomes increasingly complex, in a reality constituted by open economies, it is certainly important to discuss the remodeling of the institutions involved (in which, amongst other things, the operational structure in which monetary policies are chosen is established), including those choices on the very currency through which monetary policies are executed and on the foreign exchange regime related to them.

On the other hand, as Keynes had already recognised in 1923, in *A Tract on Monetary Reform*, the monetary policy making possesses an accentuated expectational dimension, for it has to be managed on the basis of both past and current information capable of subsidising prognoses of future events, whether they are related to inflationary pressures or to the stability of the financial system, in order to try to be positioned against them in advance. Clarida and Gertler (1997), for instance, in their recent analysis of the management of the *Bundesbank*, support this conviction. They discovered evidence that the decision makers of German monetary policy conducted it by trying to anticipate the future, which does not imply that such anticipations are always correct.

Hence, in open economies the relationship between interests and exchange rates deepens, far beyond that foreseen in the Mundell-Fleming model. The interest rate, while directly influencing the prices and the expected yields of the assets in the domestic monetary-financial markets, ends up indirectly affecting financial capital inflows and outflows to and from the several countries (and, therefore, the flows in the capital account of the balance of payments), thus changing the conditions of supply and demand in the foreign exchange market. In a scenario of fluctuating exchange rate, such changes will have repercussions on this rate and, through these repercussions, on the competitiveness of national products in international markets and also on the price level, principally because of the variations in the costs of inputs and of imported products in domestic currency (Vasconcelos & Strachman, 1998). This, for instance, greatly reduces the capacity of the

monetary policy to be conducted efficiently in the fashion of the "inflation target" regime, followed according to "the rule of Taylor" (Svensson, 1998). Yet with a fixed or managed foreign exchange, the effects can be noticed on the foreign exchange reserves of the central bank and on the liquidity level of the economy and, in the case of adoption of a sterilization policy of the inflows of capital, on the domestic public debt. The problem is that, in the real world, the two scenarios often intertwine, as much in their causes as in their effects, that is to say, many countries adopt "dirty" foreign exchange fluctuations, in which they try to maintain certain target zones for their foreign exchange, which may or not be declared (Tobin, 1998).

However the effects of the interest rates on the foreign exchange rate are not known *ex-ante*. The policy makers need to pay attention to the unstable relationship between interest rates and the exchange rate. Such a relationship is permeated by the volatile expectations and the unstable state of confidence (Dequech, 1998; 1999) of the investors with regard to a particular country, in much the same way as with the conditions of the international finance system, including what has already been said in relation to the interest rates of the assets denominated in currencies which carry out the function of international reserve of value.

In a scenario of an open economy deeply inserted in the international financial flows, the central banks do not restrict themselves only to issues such as liquidity positions, expectations and movements of the agents – especially the banks – which take part in the domestic monetary and financial markets. For the domestic currency and the assets denominated in it begin to compete daily with foreign currencies and also foreign assets for positions in the portfolios of the agents, which causes that the central banks have to try to anticipate variations in the demand for its own currency. More than ever the demand for the domestic currency reflects extremely volatile speculative motives of the agents, since they base their decisions not only according to expected variations in the price levels, but also according to the very value of the currency in relation to its foreign counterparts, which is subject to changes caused by modifications in private expectations, frequently not corresponding to any real change in the foreign exchange fundamentals (Vasconcelos, 1998; Williamson, 1999). In other words, the portfolio decisions of the economic agents are affected not only by interest rates, but also fundamentally, at some moments, by the expectations of exchange rate variations. This make it even more difficult for the monetary policy makers to anticipate the fluctuations in the demand for the currency and, thus, to efficiently manage the system liquidity, through manipulation of the stock of legal tender (currency and deposits in the central bank — Goodhart, 1995:32) and, as a consequence, to manage the basic interest rate of the market, that is, that which determines the price of the bank reserves and "anchors the other interest rates, permitting the transmission of monetary policy (…) to the entire financial system" (Torres, 1999:193).

Therefore, in the same way that there exists a causal relationship between the interest rate and the foreign exchange rate, there is also an inverse relationship, via expectations concerning the future values of the exchange rate. For anticipations of loss of the value of the domestic currency in relation to the most important foreign currencies in

the national exchange market make the agents reduce the share of domestic currency and of assets issued in it in their portfolios. So, the current and expected prices of these assets fall and, as a consequence, their interest rates increase.

Moreover, as indicated above, the basic interest rate expresses the cost of liquidity in the economy, i.e., the cost of the asset which functions as a means of settling contracts, and the central bank has the ability to determine at least the nominal value of this rate. The definition of the real value of this rate, however, depends on the expectations concerning the relative variation of other prices (Goodhart, 1995:34). And these prices are not just those which make up the index responsible for the price level, but also those which establish the price of real estate (land properties, houses) and of financial assets (shares, private securities), which, since the 1980s, have significantly increased their "share (…) in private wealth" (Coutinho & Belluzzo, 1998:137). The point is that in a scenario of an open economy and of growth of the "cross-participation of foreign investors, with the liberalization of the foreign exchange markets and the deregulation of controls on the flows of capital" (Coutinho & Belluzzo, 1998:137), these asset prices are extremely affected by the inflows and outflows of financial capital, which are strongly affected by the exchange rate expectations which predominate between the private agents. This is another way through which exchange rates may influence real interest rates, and hence, the nominal floor for the interests which the central banks have to guarantee if they do not want to be subject to rapid outflows of capital and to depreciations of the assets denominated in their national currencies.

Finally, it is important to underline that the effective operation of a monetary policy is only possible in economies which do not experience long periods of high inflation (Lopes, 1997). Therefore, one must establish which are the necessary conditions or institutional arrangements in order that a national currency may obtain from the private agents a sufficient degree of confidence to satisfactorily carry out its functions.

4. The Pre-Conditions for the Establishment of a Currency

So, what guarantees the confidence and, as a consequence, the capacity of an asset (currency) to carry out the functions of general wealth and of reserve in capitalist societies? As indicated above, the assets which in modern societies fulfill the function of currency, in the majority of cases do not have their values backed by any real asset with its value established by the market. In modern capitalist economies, the currencies are, above all, accepted institutions which are valued collectively in a determined territorial space, thus, being destitute of any intrinsic value. Therefore, would be the confidence in the agents who issue a specific currency (that is to say, at least in this case, the confidence in the governments issuing their respective currencies) a confidence founded on the belief that these agents will not abuse its capacity to issue money, avoiding that the supply of money just reach an equilibrium with the demand via a significant loss of its value? In other words, would there be confidence in that the issuer of the currency will always try to keep it as a scarce asset (Keynes, 1936: Ch. 17), within the economic system? The answer seems to be affirmative.

However, what determines the degree of confidence of the private agents in the monetary policy of these governments? In the final instance, it is precisely determined by

the evaluation of the possibility that the government may systematically issue more money than the private agents will consider acceptable, given the prior decisions and expectational decisions concerning the management of their wealth portfolios. If the agents believe that this possibility is significant, they lose confidence in the capacity of the government to guarantee, through time, the value of the currency which it issues and, in a limit situation (in hyperinflationary stages or in contexts of foreign exchange crises), they might look for another asset which fulfills, even if only partially, the functions of this currency. There is, without a doubt, a measure of uncertainty in this, because it involves evaluations by economic agents as to the future behaviour of the monetary authority. But this uncertainty arises from the very definition of currency as an institution which, even being imposed right from the start by a central authority, is permanently evaluated by private agents.

It is important to keep in mind that the degree of credibility of the monetary policy makers is strictly related to the fiscal stance of the government which issues the currency, for this is the main variable to which the agents attend in order to define the possibility of the government to follow or not an austere monetary policy. There are diverse ways by which the fiscal situation of the government affects the evaluation that the agents make regarding the perspectives of the monetary policy. The most commonly cited in the economics handbooks indicates that if the government is in a constant fiscal deficits situation, it might try to finance them through the issuing of money on a level higher than the demand for real cash balances by the private agents. That implies, once any of the versions of the Quantitative Theory of Money is accepted, that there would be an increase in the price-level.[12]

There is another possible outcome for this connection between fiscal deficit, public debt and interest rates: if there is a succession of fiscal deficits financed by means of the issuing of securities and, as a consequence, if there is an increase in the public debt, the policy maker might have, at some point in time, to adopt a monetary policy of high interest rates. This might implicate, according to private evaluations, in an explosive growth of the public debt, given the current and predicted rates of economic growth and the value of the primary deficits. In this scenario, still according to private evaluations, the government would either have to honour its debt instruments or try to reduce its value in real terms by promoting the acceleration of inflation. In both cases, there would be a deterioration in the expectations of the agents with regard to economic stability, in particular to the price (including of the assets) level. It is necessary to emphasise, however, that the effects of the state of the public finances on the private evaluations concerning the inter-temporal credibility of the monetary policy are not objectively defined, for such evaluations are permeated by volatile private expectations, which either underestimate or overestimate such a state.

12 For a critique of the presuppositions and conclusions of the Quantitative Theory of Money, see Costa (1999).

In conclusion, in order to maintain a stable currency in the course of more dilated periods, it is necessary to attend to a series of conditions: 1) that the public expenditures are adequately financed by fiscal receipts, which implies a desirable absence of public deficits (primary or operational), unless in exceptional circumstances (e.g. economic recession or military conflicts — Keynes, 1936; 1980; Kregel, 1983), or if such a result is not feasible in the medium term, at least in the possibility of adequately financing these deficits through the issue of long term debt instruments. That is, it must be practicable to finance these deficits without having to pay interest rates which could hamper this very financing in the long term, bringing about an explosive growth in debt and in the deficits to be financed.[13] For this would occasion a distrust in the market with regard to the possibility of the State maintaining and honouring this amount of debt in the future, without using the artifice of reducing this debt via an accelerated growth of inflation or the measures to control it; 2) the monetary policies must be consistent inter-temporally, which implicates in the imposition of certain restrictions on the liquidity to be assigned by central banks and, in this way, in securing the stability of the banking system, minimizing the risk of systemic crises by means of the role of these central banks as lenders of last resort (Keynes, 1936; Davidson, 1980; Mishkin, 1999); and 3) the foreign exchange policies need also to be consistent in the long term, which imply the impossibility of persistence of elevated deficits in current transactions in the long run, moreover if they are not compensated by future increases in the competitiveness of national goods and services, in comparison with those of foreign countries[14] – which might dissipate (or even revert) these deficits in the future. Or, if these deficits are not countervailed by sufficient surpluses in the capital account, or still further, by the existence of adequate foreign exchange reserves or by the capability to finance these deficits by means of seigniorage revenues obtained from the issuing of a currency which might be accepted and used as a reserve of value even by foreigners.[15]

Therefore, the persistence of elevated deficits in current transactions for long periods, only seems possible without a radical transformation in the goods and services international competitiveness of a country, in the case of the ones which issue hard currencies with a high acceptability in international foreign exchange markets.[16] For these countries are able to obtain revenues from the seigniorage of their currencies, which are widely accepted in the markets, and of selling national assets paying low interest rates (and even property assets) to foreigners, which imply the inflow of financial resources into their capital account, so countervailing these deficits in current transactions. It is the existence of both of these possibilities that explains the appreciation of the American dollar (Tobin,

13 As we know, interest rates represent amongst other things the mathematical factor through which a debt grows.

14 Kregel (1983:49n), quoting Keynes (1980:267) with respect to the necessity of Great Britain maintaining a stable balance of trade.

15 For the case of Argentina, a country which after March 1991 has shown huge deficits in current transactions because of the adoption of the currency board and of the economic policies which accompanied it, see Fanelli (1998) and Fanelli & Rozada (1998). The Brazilian case is succinctly described in Vasconcelos & Strachman (1999).

16 Even though these particular currencies are equally subject to depreciation in terms of other hard currencies of the international monetary system, when the deficits in current transactions are not compensated by favourable results in the capital transactions, at least when long term tendencies are taken into account.

1998:3), nowadays the international currency *par excellence*, in various periods, even with the existence of portentous deficits in the US current transactions (above all in the commercial transactions) since the beginning of the 1980s.

Nonetheless, in the case of developing countries, as we have seen, such a persistence of deficits in current transactions, without the compensatory entry of capital and without an improvement in their goods and services international competitiveness, is unviable in the long run. For such countries cannot obtain revenues from the seigniorage of their non-convertible currencies on the international market and because of the existence of stricter limits concerning the attractiveness of their assets for foreign investors, when compared to the developed countries, above all the most important ones.

5. Institutional Requirements to meet the Pre-Conditions of Stability in Developing Countries

On the basis of the analysis carried out in the previous section, it is possible to glimpse in advance some of the barriers which developing countries might face when trying to stabilise the value of their currencies. First, many of these countries perceive themselves as strongly handicapped in their attempts to keep their public accounts in a reasonable equilibrium, or with quite insignificant deficits easy to be financed without trouble for long periods. The difficulty in confronting the financing necessities of the public sector in these countries, which results in great part from their deficient fiscal and enforcing systems, from the impossibility of adequately taxing the privileged strata of society — which hold political power — as well as from the lack of commitment of these groups with the stability of the currency and/or with the development of their countries, make up a whole set of institutions which is very difficult to bypass. And this set of institutions often leads to enduring and completely dysfunctional public deficits, since they neither foster dynamically a more robust economic growth nor work as an instrument for the stabilisation of the fluctuations in the aggregate income (Keynes, 1980; Kregel, 1983).

Second, in the case of monetary policies, the maintenance of adequate levels of liquidity becomes equally difficult. For the liquidity is either excessively high — in the cases where the central banks do not possess the power or the political will to regulate it, ending up by rewarding with liquidity those who hold the power to pressure for it — or too reduced — in instances where interests exist in keeping alive managed exchange regimes which end up by sustaining quite overvalued exchange rate, or in which policy makers recur to excessively rigid price stabilisation policies. Furthermore, it should not be forgotten that a restricted liquidity provide high yields to capital owners, which are welcomed particularly in times in which there are no development projects of great scope being carried out.[17]

17 As we know, it is almost inevitable that serious conflicts will occur between those responsible for the economic and industrial development of the countries and those people and governmental institutions more (or even strictly) concerned with the stability of the currency and of the public finances. There are few instances in which the former win. For the case of France, see Zysman (1978, 1983; 1994) and Hall (1986); for the case of Great Britain, Zysman (1983; 1994) and Hall (1986); for the case of Japan, Zysman (1983; 1994) and Johnson (1982); for the USA, Eisner (1994); and for the case of Brazil, Lessa (1978). A general analysis of these processes can be found in Chesnais (1994).

And third, specifically in relation to the policies for the foreign exchange, the stability of the exchange and the lessening of the impacts of its variations over the prices in a particular country depends on the relative capacity of this country to finance occasional deficits in current transactions via surpluses in capital transactions or, if possible, by obtaining surpluses (or at least "equilibria") in current transactions which are not exceeded by huge net outflows in the capital account. Such a necessity is stronger in the case of developing countries, which, because of their non-convertible currencies with an almost negligible acceptance in the international markets, must pay higher interest rates than in the central countries in order to compensate the exchange risk.

Such conditions, however, might be made even more difficult as a consequence of the recurrent problems of foreign exchange shortage which these countries confront. Thus, in phases of accelerated industrialization, they frequently are hampered by insufficient amounts of foreign exchange when compared to the needs for it to cover some important and/or hardly compressible expenditures (Tavares, 1981). This leads some of these countries, when they are in these phases, to opt for a centralisation of foreign exchange in the hands of the national government and for the establishment of priorities for its use.[18]

Another type of problem may be the injudicious use of external debt, which results in later difficulties in fulfilling the obligations of these debts, with possible "cross" repercussions on public debt, when a substantial part of this debt is assumed by the State. In some cases, this indebtedness might be used, at least partially, to balance the shortage in foreign exchange, but in many instances this is not the case. Nevertheless, concomitantly, one can resort to an over-appreciation of the national currency (Fanelli & Rozada, 1998:14-5), so making imports and international trips cheaper in terms of this currency, but (mainly recently) without attaining important repercussions over investments (via cheaper importations of capital goods), especially because of the current refuse to centralise the foreign exchange in the hands of the national governments. For, as is well known, this expediency of over-appreciation of the foreign exchange in order to facilitate capital goods and other input imports has been used favourably by many developing countries, in certain historical moments.[19]

18 Cf. Johnson (1982), for the case of Japan, and Lessa (1964), for Brazil in the 1950s. Notice, however, that these subsidies for capital goods imports through an over-appreciated foreign exchange implies outflows of foreign currencies which could often be avoided if the national production of goods were stimulated, so maintaining the buying power within the national borders and stimulating the economy via multipliers and accelerators.

19 For the case of Japan during her phases of rapid industrialization, cf. Johnson (1982). For the Brazilian case in the 1950s, see, among others, Lessa (1964).

Therefore, in many cases, this heavy outflow of foreign exchange from the developing countries occurs as a result of inconsistent, if not irresponsible, economic policies,[20] which are chosen by the policy makers and supported by institutions and interests which foster such a choice.[21] On the other hand, since not even the institutions or ideologies are optima, one can try to understand the "irrational" systemic behaviour of the various individual agents, including that of the policy makers — even if they show a certain rationality when considered individually[22] — also as an adaptation to the current institutionality (for they have no manner to modify, at least substantially, the collective behaviour by means of individual decisions). And generally they do not question the systemic repercussions of their decisions, and sometimes do not even perceive the existence of such repercussions.

This path-dependent behaviour is common either with institutions or ideologies. One can also understand this kind of problem as a lack of co-ordination between the decisions of the various economic agents (Chang, 1994). But even in such a case, the State would have the possibility of favourably exerting this role of coordinator. Nevertheless, the opposite occurs in many cases, with the State acting to reinforce the systemic irrationality resulting from the actions of the various individual agents, sanctioning them, even yielding to the pressures of these selfsame agents in order to have guaranteed the profitability of their investments, whether or not productive, be they with clear speculative tendencies or not. Still, in such a case the State is only motivated to resolve, at least partially, certain systemic risks which manifest themselves precisely because of the uncoordinated action of the several agents, which is often corroborated by a deficient institutionality. But, any moral risk arising from such types of aid on the part of the States is better than the costs which arise from the consequences of a general crisis of liquidity and confidence, including the costs for those who, though not responsible for that crisis, might be severally hit by it, as a consequence of having less (or even no) means of protection against their effects (Tobin, 1998:20; Aglietta, 1998).

20 As Fanelli and Rozada (1998:15) emphasise, "the fundamental macroeconomic policies must be consistent with the chosen exchange rate regime. If they are not, sooner or later the regime becomes unsustainable, and in the interim, the economy will pay the costs in terms of risk." See also Fanelli & Rozada (1998:17,34).

21 Amongst them, perhaps the principal is the increasing liberal attitude of various countries in relation to capital flows (Tobin, 1998:7; Mishkin, 1999:9n), including of several ones which had been clearly anti-liberal throughout their history, as was the case with many nations of East Asia. However, many of these nations recently suffered vigorous attacks against their foreign exchange rates, while those nations which maintained an effective control on their capital account, like Taiwan, emerged relatively unscathed from these speculative waves, begun with the first foreign exchange crises in Thailand, in 1997 (Vasconcelos & Strachman, 1997; 1999). This recent liberal attitude is equally the case of Brazil, which had a history of strong restrictions of access to its official reserves until the end of the 1980s, in opposition to countries like Mexico and Argentina, which historically suffered recurrent and violent attacks against their foreign exchange rates. Nevertheless, countries like Chile and Colombia (Tobin, 1998:18; Fanelli, 1998:8; Fanelli & Rozada, 1998:34) have kept themselves relatively safe from such speculative waves, because they had imposed restrictions on the capital flows to and from their countries, which were more imperative when contrasted with the progressive volumes of financial flows on a global scale (Tobin, 1998: 18-20; Eichengreen, 1998:21-2).

22 E.g., in the bandwagon behaviours (Harvey, 1996; Vasconcelos, 1998; Vasconcelos & Strachman, 1999)

All of these affirmations might be illustrated by typical attitudes against the long term stability of the national currencies and/or the development of the countries, as has already been underlined in the examples of squandering of foreign currencies, but also of public receipts and/or expenditures, or even in deficient monetary policies. Hence, the countries might assume foreign debts which are inconsistent with their future capability to pay for the obligations which resulted from these debts; equally, they might cling to overvalued foreign exchange rates or to a deficient protection of their productive sectors, dissipating foreign currencies on quite useless goods and services — in terms of future increases whether of their productive capacity or of their productivity.

It is owing to these various long term inconsistencies in relation to the stability of the national currencies and to institutionalities which are not favourable to stability, and which at the same time are little open to changes,[23] that proposals arise in the developing countries of total or partial renunciation to national currencies as well as to the autonomy of the indigenous monetary policy makers. Therefore, it can be said that the adoption of a foreign currency, whether this adoption is complete or partial (i.e., by means of a currency board), implies the attempt to import a specific institution, a determined foreign currency, but without the necessity of building up the other institutions and preconditions which endow stability to a currency, as well as without adopting the entire institutionality which grants an increased rationality to the economy and society of the country which issues this currency..

Nevertheless, it is also necessary to emphasise that this maturity of developed countries concerning the institutional preconditions for the stability of their currencies (Mishkin, 1999:6,27-8,39) — with monetary, fiscal and exchange policies which are consistent with this objective — is a consequence, to a large extent, to the interests of the financial markets in reduced inflation rates and to the weight of these markets in the determination of economic policies, to the detriment of other goals (Hall, 1986; Chesnais, 1994; Minsky & Whalen, 19996-97: 165-6; Krugman, 19999; Mishkin, 1999:35-6).

6. Proposals for the Renunciation to National Currencies or for the Adoption of Currency Boards

As we have seen, proposals for the renunciation of independent national currencies appear as a possible solution to the problems of economic and monetary stability which arise from certain institutional characteristics found in many developing countries. Such a stance was defended by Milton Friedman, in 1972, during his *Horwitz Lectures*. He affirmed that any developing country with a central bank would be condemned, because a discretionary monetary policy making would lead to a combination of high inflation rates with low rates of economic growth, for reasons connected to their institutionalities (Hanke, 1999). The solution, in Friedman's opinion, would be to eliminate the central bank in these countries, amalgamating their national currency with a strong currency, whether through

23 As is inherent to institutions and institutionalities, in their mixtures with power relations, established interests etc. (North, 1990), all this assuming a set of characteristics having as their foundation a particular path.

an orthodox currency board system (which would issue money backed by a minimum of 100% in a strong foreign currency)[24] or through the official adoption of the dollar (Hanke, 1999). But it was only in the 1990s, with the successive foreign exchange crises which hit some developing countries and with the example of European monetary union, that this Friedman's stance gained strength in economic discussions.

Many authors propose that a first solution for the countries issuing "weak" currencies is to settle a fixed foreign exchange rate in relation to a foreign currency which would function as reserves and as an "anchor", a robust base for stabilising this weak national currency. An alternative to this solution is to establish certain moving targets for the exchange rate, in relation to this "anchor-currency" (Mishkin, 1999:2), or even in relation to a basket of currencies, generating a "crawling peg" system. But this last resource will not be analysed in more detail in this paper, because it concedes a much greater autonomy to national currencies, only establishing certain targets (formalized or not) for the foreign exchange rate, in spite of the restrictions which it implies to the monetary policies of the countries which resort to it (Mishkin, 1999: 4-11,30-1).[25]

Therefore, the first solution to be examined is the maintenance of a determined national currency, although formally and legally pegged to a hard currency, by means of the so-called currency boards.[26] As Tobin explains (1998:12), "[a] currency board requires 100 percent reserves in hard currency against the local-currency monetary base." And a second possible expedient is the pure and simple renunciation to a national currency which experience recurrent stability problems.

An initial issue emerges in the cases in which a national currency may be exchanged for reserves through means of cheques. For, as we know, the banking multiplier, M_1, might exceed by far the original monetary base, which implies the lack of guarantees that the central bank will be able to honour all the demands for exchanges of local currency (especially, those in the form of domestic bank liabilities) for hard currency, although it attempts to follow the established rules for convertibility (Tobin, 1998:12-13). One way of bypassing this issue would be through an increase in the compulsory reserve requirements of the banks. Consequently, there would be a reduction in the banking multiplier and in the M_1, because the banks would be under greater restrictions to widen

24 And which would not act as a lender of last resort, would not establish the reserves requirements of the commercial banks, would not carry out foreign exchange operations in future markets and would only obtain seigniorage revenues in the form of interests received from portfolio investments of foreign exchange reserves (Hanke, 1999).

25 For instance, because of the need to convey the changes in monetary policies in the country which issues the anchor currency to the countries which are pegged to it. For examples of several European countries which have pegged their national currencies to the Deutsch Mark, and also of other national and anchor currencies, and of the problems and advantages which they obtained, cf. Mishkin (1999:2-12). Nevertheless, it must not be forgotten that an increase in the interests in a country which issues a currency functioning as an international reference, as is the case for the American dollar, can force the other countries to follow their monetary policy, despite of any formal or informal crawling-peg, as it was the case when there was a sharp interest raise in the USA, from 1979 until the mid 1980s.

26 As Eichengreen observes (1998:22), there has been a firm recent increase in the number of member countries of the IMF which adopt currency boards.

their credit operations. Furthermore, there would be an increase in domestic interest rates, which in itself would hinder decisions to borrow, reducing the liquidity and the leverage of the economy in relation to the reserves which back the national currency.[27]

A second question is the one of huge reserves outflows, which happen as a consequence of national or even international currency exchange crises. In such instances, central banks are obliged to raise the interest rates, in the majority of cases to astronomical levels, in order to avert doubts related to their currency exchange commitment (Tobin, 1998:12).[28] But the currency scarcity and the resulting rise of interests, as well as the consequences over the domestic income and level of economic activity, may be so high that the central bank will need to modify its former rules of behaviour, whether through a much higher flexibility of conduct,[29] or even abandoning the initially established exchange parity (as it has been discussed for a long time and also currently, again, in the case of Argentina).

It may be noted that a similar effect must occur if the economic activity of the country which adopts the hard currency is to increase beyond the growth to a sufficient extent of its foreign exchange reserves, in order to adjust to and face the instituted convertibility (Tobin, 1998:12). In such an eventuality, in order to avoid attacks on the national currency, it would be necessary to diminish the rhythm of activity by means of an increase in interest rates and/or the adoption of recessive fiscal policies, or still the "simple" restraint of the banking multiplier with, once again, its repercussions on interest rates.

Therefore, since, the solution by means of a currency board is "a way — though a somewhat technically flawed way — of surrendering independent monetary policy and acknowledging vassaldom"(Tobin, 1998:15), why not simply increase the level of this vassaldom and surrender the national currency (though it is not a really independent currency, for the currency boards make the subordinated national currencies completely pegged to a hard currency) and adopt the hard currency itself as the means of circulation and in all other functions, in a country with recurrent problems of economic and monetary instability? For, as a matter of fact, the use of a currency board seems to be a slightly embarrassed way of adopting a foreign currency, without enjoying the eventual benefits

27 Thus, "[a] 100 per cent reserve requirement on bank deposits is a logical extension of the currency board idea… It would allow the system, originally used for British colonies dependent mainly on paper money, to catch up with the rise of bank deposits as the main medium of exchange."(Tobin, 1998:13).

28 As Tobin observes (1998:13-14), "[t]he currency board makes it impossible for the central bank to perform its normal domestic functions, either that of macroeconomic stabilizer or that of lender of last resort.(…) A currency board… sacrifices real macroeconomic performance in all its significant dimensions production, income, growth, trade, saving, and investment to the strength of the currency and indirectly to the prevention of inflation. When the successes of the device are touted, it is in these narrow terms. The currency board is an extreme form of the fixed exchange rate as a 'real anchor', a tactic of national self-discipline popular in recent years. However, the true test of successful policy is not conquering inflation by an open-ended sacrifice of prosperity but conquering inflation while achieving full employment and reasonable growth in economic well-being." Cf. also Fanelli & Rozada (1998: 14-6).

29 E.g. augmenting its capability of acting as a lender of last resort, as occurred in Argentina, in the course of the Mexican crisis of 1994. One shall also notice that that country had to receive an important financial help from the USA to maintain the confidence of the market in the established parity between its national currency and the US dollar (Fanelli & Rozada, 1998:2-3).

that this "vassalage" might bring to the country that submits itself to it. Thus, the pure and simple use of a reserve currency might facilitate the monetary policy making, and at the same time diminish the instability resulting of a lack of trust in the existence of sufficient reserves to back the national currency, since this would disappear, making unnecessary any further need of an intermediate currency, and, thus, pressuring for the elimination of the spreads which still exist between the domestic and the hard currency (Hanke, 1999).

However, the majority of the problems arising from the option of a complete use of a foreign currency are the same as those which exist when it is used only partially to back a national non-convertible currency, in the currency board schemes: in these cases there can also occur heavy outflows of reserves as a response to national or international foreign exchange crises, with central banks equally requiring increases in interest rates, in many cases to stratospheric levels, in order to maintain these reserves in a specific country. The currency scarcity and the resulting hike in interest rates might equally reach greater magnitudes, imposing insurmountable obstacles to the growth or even maintenance of the level of activity. These restrictions might be of such an order that some imperfect substitutes for money might emerge (Tobin, 1998:13), above all in their functions as means of payment, but not in the quantity and with sufficient quality to execute with perfection all the functions of money (Keynes, 1936; Davidson, 1972), making possible an avoidance of a severe crisis in the economy. Hence, the reappearance of a national currency might be seen as inevitable, owing to the pressures and the necessity of reassuming a national control over monetary policy (Eichengreen, 1998:26-9).

Certainly similar consequences might happen, as in the case of the currency board, if the level of economic activity of the country which is adopting the foreign currency increases too much, beyond any growth in the capacity of the international reserves to meet the circulation and reserves needs. Once again, in such a case, it would be necessary to reduce the level of activity by means of an increase in the interest rates (e.g., via higher banking reserves needs) and/or by means of the adoption of restrictive fiscal policies.

Another problem, which important economists and representatives of countries that issue hard currencies (Tobin, 1998:15; Aith, 1999) always emphasise, is that these same countries do not take into account the interests of the nations who vicariously adopt their currencies, when they have to decide about their monetary policies. These subordinated nations would likewise abstain from receiving the small amount of seigniorage revenues which even a mechanism like a currency board allows, even if only to a limited extent, given the restrictions on issuing money not sufficiently backed by hard currencies (Fanelli & Rozada, 1998:4-5). At the same time, even though a country may decide to use a currency issued by another, the international payments made in cheques, payment orders, etc., in hard currencies, on the part of the residents in the subordinated country, may be submitted to a discount tax, because of the lack of trust in the solvency of their national banks and corporations in general (Tobin, 1998:15).[30]

30 Nevertheless, such a lack of confidence can be mitigated with the dissemination of information concerning these corporations and banks, with the growth of transactions made with them, and also with the progressive facilities represented by the means of communication, capable of providing data concerning a specific client or debtor in real time.

The abdication of a national currency can also be an obstacle to the adjustment of the relative prices of goods in different countries, which might be made with some facility by means of appreciations/depreciations of the currencies (Tobin, 1998:3-6; Krugman, 1999:6; Mishkin, 1999:5-6). However, various obstacles might be imposed in the way of this potential flexibility of the exchange parities, as for instance the determination of certain exchange rate or parameters or even bands or adjustable parities, resulting in the loss of credibility of an economic policy which did not make great efforts to sustain such parity, which is fixed in advance in many cases, as we have seen, and sometimes in an equivocal manner.[31] These expedients of economic policy are responsible for an excessive erosion of foreign exchange reserves, and excessive increases of interest rates, with their repercussions on public finances and on the level of economic activity. These measures are taken in order to try to maintain the parities at the pre-fixed levels, which, generally speaking, is not achieved, because of the impacts of these high interest rates on the expectations concerning the future parity of a currency.[32]

There exists also proposals for some developing countries to give up their respective national currencies in favour of international (in this case regional) ones, issued by a group of them, e.g., those which are more strongly interconnected in an area of commerce and/or through special economic or political agreements. Amongst these interests are those behind the growing international trade of those countries participating in a determined area of commerce, which would receive incentives to grow in the case of a single currency shared by the participating countries; and to avert the political opposition of agents badly hit by sudden increases in importations resulting from rapid over-appreciation of their national currencies (Eichengreen, 1998:4-10,19-23).[33] However, amongst the risks of a single regional currency, there is the necessity of making the

31 "Indeed, a discreet change in an official parity is much more traumatic. It is a loss of face and a blow to pride. It is an administrative decision, that is to say a decision of policy and politics. It necessarily requires responsible officials finance ministers, chancellors, central bank chairmen to go back on their solemn word. Moreover, they or their successors have the unenviable task of choosing a new rate in a climate poisoned by distrust, clouded by uncertainties about the fundaments, and dominated by unpredictable psychology. It's easy to get the choice wrong, prolonging and aggravating the crisis. For all of these reasons, there is a great temptation to stick with an overvalued parity too long."(Tobin, 1998:8).

32 Tobin (1998: 8-12), Mishkin (1999: 5-6) But even the results of such a firmness in the defence of an pre-established exchange rate might be extremely expensive for a country. For instance, in the speculative attack against various European currencies, in September 1992, only France was disposed to defend the franc until the very end, while other currencies were devalued in relation to the mark. France took up higher costs to maintain this parity, in the form of much lesser growth rates, after 1992, than the other European countries which permitted their currencies to depreciate. The collective costs in terms of hard currencies reserves for the governments of Great Britain, France, Italy, Spain and Switzerland were around US$ 100 billion, to be added to the US$ 50 billion spent by the Bundesbank in the attempt to aid various European partners in the defence of their parities, with estimates of loss of between US$4 billion and US$ 6 billion in this intervention process, to be paid by the group of Treasuries (Mishkin 1999:5-6). In another example, there are estimates that if the interest rates in Brazil, in 1998, had been reduced to levels equivalent to those in Argentina, the Brazilian public deficit would have fallen from 7% to 3.2% of GDP (Eichengreen, 1998:26n).

33 Such a proposal arose between countries of the Mercosur, also as a result of a series of interests and unresolved questions. Amongst these questions was the over-appreciation of the Argentinean peso, which could be resolved by a regional currency, releasing that country from the trap imposed by the currency board without submitting to a depreciation of its national currency. One shall notice that when this proposal was initially made, a regional currency was seen equally as a way out for an over-appreciated Brazilian real, i.e., as a simultaneous solution to the over-appreciation of the two principal currencies of that agreement (Eichengreen, 1998:4, 25-6).

different interests of the various countries converge on common economic and monetary policies, in order to constitute an "optimum economic area" (Frankel & Rose, 1996).[34] This might be difficult, e.g., because of the differences concerning exports levels (and the goods and services which make up exports) and also in consequence of the different levels of industrialization of these countries, which require diverse reactions in terms of exchange rates to face variations in internal and external prices, in the prices of the commodities and of more sophisticated industrial products, and in the competition capability of the several sectors, etc. (Eichengreen, 1998:7-11,33). The point is that the very process of economic convergence between the countries proposing the adoption of a single currency might be only achieved after it is implanted, that is, the degree of necessary integration for the formation of an optimum monetary area might be only reached *ex-post*. In this way, there is the possibility that the first years of the implantation of a monetary bloc might become extremely costly in terms of losses of output and employment caused by external shocks (Frankel & Rose, 1996).

Nevertheless, it is equally necessary to mention the benefits of resorting to a foreign currency as a national currency, whether in its "pure" form or in the form of a currency board. Amongst these benefits there is the reduction of uncertainty in terms of the level of the future exchange rate (complete in the case of the extinction of the domestic currency) and also of the monetary and fiscal measures which could be necessary to counterbalance modifications in this rate and in the inflation rates (Fanelli & Rozada 1998: esp. 16-17). At the same time, the reduction in inflation rates which might follow such an option diminishes the dispersion between the various prices in the economy. In the specific case of the currency boards, this occurs particularly when this regime of exchange functions as a nominal anchor, mainly through an over-appreciation of the exchange rate, which generates a tendency to lower the price of imports in terms of the national currency. This lower prices stability, together with the fixed exchange rate, may increase the revenues of *seigniorage* obtained from stabilisation, especially if this makes the country more attractive to capital inflows.[35]

7. Final Remarks

The paper tried to present some relevant, but sometimes unconsidered, aspects for the discussions about monetary policy. The existence of new conditions restricting monetary policies in a world economy with generalised exchange liberalization and deregulation of capital flows is indisputable. Such restricting conditions are stronger in developing countries, because their currencies are at a permanent risk of not being accepted as liquid assets by the managers of multiple currency portfolios. To these new

34 An optimum monetary area might be defined as a region which is neither so small or open that it would be better to peg its currency to that of a neighbour, and nor so big that it would be better off separating itself into sub-regions with different currencies (Frankel & Rose, 1996:14).

35 E.g., in Argentina, there was a fivefold increase in the currency utilisation, after the Convertibility Plan, in March 1991 (Fanelli & Rozada, 1998:34–6).

contingencies one should add the pre-existing structural problems, which make it even more difficult for the monetary policy makers to execute over time a policy which is both coherent and compatible with some other objectives (income and employment growth, etc.), beyond that of defending the national currency against waves of lack of confidence in the international markets. In such a scenario, even the objective of making the monetary policy coherent through the establishment of inflationary targets shows itself, *a priori*, flawed, as a consequence of the unstable relations between interest rates, foreign exchange rates and prices.

However, given the recurrence of exchange crises in developing countries in the last years, there is a resurgence of the voices proposing the renunciation, whether partial or complete, of their national currencies, and each time these voices are stronger. Less informed people believe that through such a device, these countries will be forced to introduce the same institutions which guarantee economic stability (and prosperity) in the central countries. Perhaps a more viable solution has been given by a group of economies which are, when compared with those of the main developed or (even) developing countries, relatively small. Given the impossibility, at least for now, to impose any effective control on the free movement of capitals between the main developed countries (which are the sources of this capital as well as the beneficiaries of its profits, which explains the pressure for the maintenance of and even for an increase in this liberty of movement), the developing countries — given their much more limited opportunities of reasonably participating with impunity in such flows — must try to find a way to manage more carefully their interventions in these capital flows, without waiting for measures which necessitate the collaboration of the developed countries, given their aforementioned lack of interest. This is what Chile, Colombia and Taiwan have done. These countries, even benefiting only a little less from the initial inflows, could control the outflows in a more effective manner when the direction of the flows inverted, maintaining a much higher level of freedom concerning their economic policies — and achieving a much higher level of stability for their currencies — since they possessed (and still do) a greater control over their foreign exchange operations.

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Studying Spectrum Allocation Methods: Applicability for Bangladesh

Syed Atif Jilani *

Prof Valeed Ahmad Ansari **

Abstract

Allocation of public resources has always been a tricky issue for national government the world over. Primarily governments used beauty contests for selling coal blocks or for allocating oil drill licences. In some countries, lotteries and first-come-first serve methods were also employed. This paper studies the pros and cons of these methods with special reference to allocation through auctions. The Simultaneous Ascending Auction design, used by the FCC for allocation of spectrum licences in the US in 1993 and later on copied in different countries, is analyzed in detail. As a case study, the recent spectrum auctions held in Bangladesh in September 2013 were studied and it was found that the auction would have performed better if the government would have been able to attract one more bidder.

Key words: Spectrum allocation methods; Simultaneous Ascending Auctions (SAA); Bangladesh Spectrum Auction.

1. Introduction

Public resources are the property of any nations and governments have the reasonability to allocate them efficiently. Many of these resources are of genuine importance to society and therefore governments do not want to exploit them on their own. These resources include mobile telephony frequencies, radio frequencies, airport slots, public infrastructure, land for different uses, high voltage electricity cables, etc (Janssen, 2004).

There are many methods at the disposal of governments to allocate public resources to private companies. A government can use auctions, beauty contests, first-come-first-served, grandfather rights, and lotteries, to mention just a few common allocation mechanisms. In auctions, prospective buyer firms have to submit financial bids and the company with the highest bid wins the auction. In a beauty contest, firms are required to submit a business plan about how they are going to use the resource in future which is then evaluated by some government agency that determines who wins the contest. In the first-come-first-served mechanism, the firms which firs of all mention their intention to use an asset are given the right to do so. In grandfather rights, the government allocate

* Syed Atif Jilani is a Senior Research Fellow of Faculty of Management studies & Research of Aligarh University, Aligarh.

** Valeed Ahmad Ansari is working as Professor in Faculty of Management studies & Research of Aligarh University, Aligarh.

the resource to that company which has used the asset in the past. This method is typically used to allocate airport slots. Lotteries assign the right to use the asset to one of the interested companies at random. Janssen (2004) reported that in Netherlands, the scarce places to study medicine in universities are allocated through lotteries.

Amongst these, traditionally the most popular method has been the beauty contest, where companies are invited to submit business plans, and a government agency is designated to select those companies whose business plans seems to be most credible (Börgers and Damme, 2003). The credibility depends on the understanding of the agency about the ability of a particular company to deliver valuable services. However, recently auctions have become more popular method due to certain advantages that auctions enjoy over other methods.

Auctions undertaken by government as a seller are different than those conducted by any private seller. This is because where government acts as a seller, the concept of efficiency takes two meanings. Here economic efficiency is not equivalent to 'the licences ending up in the hands of those who value them the most' (Börgers and Damme, 2003). This is mainly due to many externalities that exist in licence auctions. A benevolent government will the sell the licence having consumer welfare in mind. Here the consumers are not directly involved in auctioning of the resource but government will auction the resource in such a manner that consumer interests are not compromised. In fact, selling licence to the firm that values it the most may not be the one that consumers prefer.

Allocation of spectrum rights to telecom companies through auctions has become a preferred mode in all the major economies. The governments prefer auctions to obtain market determined price of spectrum through a transparent manner. Auctions ensure efficient use of spectrum and avoid hoarding. They are an effective means of stimulating competition in the telecom sector and results in maximization of revenue for the governments. From July 1994 to July 1996, the Federal Communications Commission (FCC) conducted nine spectrum auctions, raising about $20 billion for the US treasury (Cramton, 1998). These auctions were described as "*The Greatest Auction in History*" (William Safire, New York Times, March 16, 1995) and "*The Auction of the Century*" (Liberation, Paris, March 15, 1995) because of their efficiency and sheer volume of revenue they generated (McAfee).

Auctions were first used by the New Zealand government in 1990 to sell spectrum rights. This electromagnetic spectrum is in high demand the world over. It is termed as the next growth driver for telecom industry after saturation in voice-based revenues. By mid 2010, there were nearly 132 countries having access to 3G technology, India joining late in April 2010 by auctioning off the 3G spectrum licenses. According to a report in Times of India (Shalini Singh, April 12, 2010), there are 4.7 billion mobile users worldwide, of which

nearly 10% are 3G users. For Asia-Pacific region only, the projections are pegged at 564million users by the end of 2013.

This is a conceptual paper based on literature available on spectrum allocation through auctions. In section 2 of this paper various methods of spectrum allocation are analysed. Section 3 covers the review of literature on spectrum allocation by auctions. In section 4, the design of spectrum auctions is discussed along with the activity rules. Section 5 carries the analysis of allocation of 3G spectrum licences in Bangladesh. Finally, section 6 concludes the study.

The specific objectives of this study are:

- To compare the different methods of spectrum allocation employed in different countries;
- To discuss the activity rules of spectrum auction allocation;
- To analyze Bangladesh's experience of auctioning 3G spectrum.

2. Methods of 3G Spectrum Allocation

Electromagnetic spectrum is now in much demand, not only for traditional use of broadcasting but also for new forms of mobile communication. Spectrum is a national resource which has to be allocated by the government. For efficient allocation the government needs to know how highly the firms value the licences. There are different methods like – administrative process, lottery, first-come-first-served and auction-economic theory - by which spectrum rights can be allocated to various firms but auctions works best (McMillan, 1994). Out of these four methods of spectrum allocation, the 1990's has seen a shift of preference from administrative allocation process to auctions. As of now auctions are widely used in United States, Colombia, India, United Kingdom, Argentina, Australia and Hungary.

Auctions and beauty contests (administrative process) have been the preferred option for the allocation of 3G spectrum in most of the countries. But in few places in Europe licenses were offered free of charge to the incumbent mobile operators in the Isle of Man, Liechtenstein and Monaco (ITU, 2003). There are arguments and counterarguments in favour and against of different methods of spectrum allocation.

Auction theorist consider that auctions lead to efficient allocation of spectrum among the bidders while proponents of beauty contest argue that auctions increases the price of spectrum, which has to be ultimately born by the customers. The following table provides a comparative analysis of various methods of spectrum allocation in practice:

Table 2.1

Comparison between Methods of Spectrum Allocation

S. No.	Method	Time Consumption	Efficiency	Revenue Generation
1	**Administrative process**	Time consuming	Marked by red-tape	Not much
2	**Lottery**	Time efficient	Least efficient	Not much
3	**First-come-first-served**	Time efficient	Less efficient	Not much
4	**Auction**	Time efficient	Efficient	More revenue

Administrative Process (Beauty Contests)

The earliest method used for spectrum allocation has been the administrative process, widely practised in Canada and European Union. This method is also sometimes dubbed as "beauty contest". The criteria for allocation of spectrum is developed by the government and then an in-house committee of experts scan various proposals in light of the government laid criteria. Such a process gives a lot of flexibility to the government in determining the acceptance of a particular proposal. Although, the process is time consuming but the process adheres more to the government plans.

However, this method is not free from critics. According to McMillan (1994) it's widely perceived that technical aspects are clearly defined in the criteria set by government but there are subjective criteria like the ability of firm to implement the proposal, the telecom industry concentration and the feasibility of proposal that can't be specified in concrete terms. Some of the criteria are vague and some are not even stated. It provides a lot of room for lobbying and favouritism. This creates a very difficult situation for the applicant firm. They are not aware of the weights assigned to various subjective criteria and not any kind of explanation for rejection of their application. It's the lack of transparency and time consuming nature because of which administrative allocation method is hugely criticised.

Lottery

The second method of spectrum allocation is lottery. It is perceived to be more quick and economical as compared to administrative process. Lotteries too are not free from some serious short comings. They are rejected on the grounds that they lead to speculation and the technical competence of the firm to develop, maintain and operate the license can not be determined through them. After rejecting the administrative process United States experimented with lotteries in allocating cellular licenses during 1980s. Lotteries attracted many speculative applicants, many of whom were not technically competent. Such applicants after winning the licences sold them off to other firms at exorbitant prices leading to notional losses to government coffers.

McMillan (1994) has reported that lotteries were rejected by Canadian government as they would attract more frivolous applicants and speculators. In addition to this, in case of lotteries there was no way the government could ensure that the successful applicant has the technical competence to develop, maintain, and operate a public telecommunication service. The United States allocated cellular licences by lottery system in 1980s. Although, this system succeeded in giving assigning licences quickly, but the possibility of windfall gain attracted nearly 400,000 applicants. Many of these applicants were not technically capable of providing cellular-telephone services and as a result many successful applicants resold the licences in secondary market. This resale resulted in delays in launch of services and considerable revenue loss for the government.

First-Come-First-Served

Under first-come-first-serve mechanism, the firms that first mention their interest in using the asset get the right to do so (Janssen, 2004). Some of the European Union members resorted to first-come-first-serve basis of allocation of mobile radio licences. This process has the time advantage but has the same disadvantage as the lottery.

Auctions

Economists have been campaigning for auctioning of radio spectrum since the times of Ronald Coase (1959). Auctions are considered to be more efficient in allocating the licence to that firm which can best make use of them. This is so because the firm which has the ability to start the services quickly, which can introduce new services and which believes it can utilize the spectrum more efficiently will value the spectrum more. This valuation will lead to higher bidding and more revenue generation for the government. Thus the auction designs which award the licences to those bidders who have the highest willingness to pay promote the efficient use of spectrum.

The advantages of auctions over other methods of spectrum allocation are:

1. Auctions help in revealing the value of a license as perceived by the bidders;
2. Auctions are quicker and more efficient as compared with administrative procedures;
3. Auctions are more transparent;
4. Auctions are flexible, i.e. can be moulded in such a fashion so as to suit the government policies.

In the year 1993, United States decided to switch to auctions for granting new mobile communication licences. The Federal Communication Commission (FCC) was asked by the US government to design and operate the auction process for granting licences. The commission came up with a novel method of auction termed as *the electronic simultaneous multiple round bidding auction*. This method has been copied round the world to sell over US$100 billion in radio spectrum (McAfee et al.).

From July 1994 to July 1996, the Federal Communications Commission (FCC) conducted

nine spectrum auctions, raising about $20 billion for the US treasury (Cramton, 1998). These auctions were described as "*The Greatest Auction in History*" (William Safire, New York Times, March 16, 1995) and "*The Auction of the Century*" (Liberation, Paris, March 15, 1995) because of their efficiency and sheer volume of revenue they generated (McAfee).

Binmore and Klemperer (2002) while advocating for auctions over beauty contests argued that the 'second generation' licenses fetched the UK government only 40,000 pounds as compared to 3G spectrum auctions which yielded about of GNP. Spectrum auctions proved that they can play a vital role in nation building by reducing the government debts and lowering the income taxes on public. They extract and provide information to governments which can't be accessed through beauty contests.

Allocation of spectrum through auction is not just about raising money but it also reveals the information how value the bidders believe the license to be. The Federal Communications Commission (FCC) of United States puts that "since the bidder's ability to introduce valuable new services and to deploy them quickly, an auction design that awards licenses to those bidders with highest willingness to pay" results in most efficient use of spectrum (McMillan, 1994).

3. Literature Review

Simultaneous Ascending Auction (SAA) was considered by Klemperer (1999) as the most important new auction design. According to him the germs of SAA can be traced to Vickrey, 1976 but the onus of practically designing such auctions for the first time goes to Milgrom, Wilson and McAfee who proposed the rules that were necessary to make the SAA effective in the context of US radio spectrum auctions. Cramton (1997) has analysed the six spectrum auctions conducted by FCC from July 1994 to May 1996. Cramton argues that this auction format had theoretical virtues which were never proven. FCC chose to innovate. The auctions went on smoothly with some minor hitches and were termed as very successful. Cramton adds a note of caution also that the success of these auctions doesn't imply that alternative methods were less successful and that the success is assured in future also. Although allocation of spectrum by auctions is a huge improvement over allocation by lottery or comparative hearings.

Klemperer (2002) while commenting on Börgers and Dustmann (2002) result's reports that the UK 3G telecom auction of 2000 is considered as the most successful of the Western European 3G auctions in terms of revenue raised per capita and efficiency. The aspect of revenue was most obvious. But the efficiency aspect was probed by different researchers and was found to be efficient or close to be efficient, in the sense of maximizing the sum of the valuations of the license holders. The pre-auction and post-auction data suggest that the four-incumbent firms in UK auction were having the highest valuations, so were the efficient winners. Moreover, Vodafone was having the highest incremental value for a large license and so the allocation of spectrum among the winner's was also efficient.

Lueck (1998) describes the opinion of S. Moreton and Pablo T. Spiller deduced from their

empirical study of the Personal Communications Service (PCS) auctions of 1995 and 1996 in USA, in which they have shown that the bidder behaviour is consistent with most economists' conceptions of competitive markets. They have also shown that firms competing in these auctions were able to aggregate licenses, thus offering vindication for simultaneous multiple-round auctions.

A detailed description of why auctions were used in spectrum allocations and which format of auction best suited such an allocation is given by Börgers and Damme (2003). They have argued that a seller wants to get the best price for the item which he/she is selling. This objective gets slightly modified if the seller happens to the government instead of a private-sector seller. Compared to revenue generation, the government will be more interested in achieving an efficient outcome – placing the license into the hands of those who value them the most. Although more revenues are also desired as they help the government to reduce the fiscal deficits and taxes. An ascending auction provides an attractive alternative, which itself can be modified to suit the particular need.

By empirically analysing the data from the 1995 US Broadband PCS auctions Klemperer and Pagnozzi (2002) have concluded that when the number of objects available exactly equals the number of "advantaged" bidders, revenues will be lower in an ascending auction. A fall in revenues is because of the reluctance of the weaker bidders to participate in the auction, and those that are present bid extremely cautiously because of the enhanced 'winner's curse' they face. In US, revenues were lower when there were exactly two "advantaged" bidders among the bidders for the two licences in an area, than when there were either few or more than two advantaged bidders. They have estimated a revenue loss of around 15% to the government in such cases.

Hafalir and Krishna (2006) have pondered over the idea of restriction on the resale of spectrum once sold in the secondary market. They believe that with asymmetric bidders, the resulting inefficiencies create a motive for post-auction trade. Even a ban on such a resale can be easily circumvented, as happened in 3G spectrum licences of UK. The government banned the resale of license and TIW, a Canadian company, bid successfully for the most valuable license "A". However, Hutchison, a rival company, then acquired the license by buying TIW itself.

4. Spectrum Auction Design

Thus, in literature auctions are considered as best mechanism, they appears to be efficient, clear, and fast, and in addition, if designed properly, they raise fair amount of revenue also. At the core of any successful auction is its design mechanism. In case of FCC auction for spectrum allocation the auction design was known as Simultaneous Ascending Auction (SAA). Under the method used - all licenses were open for bidding simultaneously and remained open until bidding on all ceases. This means that instead of selling licenses, one by one, they were open for bidding at the same time and all the licenses would remain open until bidding ceased on all of them. Bidding occurred in rounds and bids were announced after each round. This helped in containing the winner's curse and thus boosted the

confidence of bidders. They started bidding more aggressively.

Since the licenses are interdependent – there aggregate value may exceed the sum of their individual values - by simultaneous bidding, bidders were able to build efficient license aggregations. The FCC auctions are considered as the best example where synergies play a critical role by Katok and Roth (2004). Synergies often arise from owning licences in adjacent geographical locations or adjacent frequencies.

Bidders were having an initial eligibility based on their deposits and were supposed to remain active to maintain their eligibility. Activity was defined as the sum of standing high bids and new bids.

Activity = Standing high bids + New bids

Insufficient activity reduces the eligibility to win. The auction proceeded in three stages:

Stage 1: bid at least 50% of eligibility

Stage 2: bid at least 80% of eligibility

Stage 3: bid at least 100% of eligibility

Bidders were not supposed to bid more than their eligibility. If the activity of a bidder reduces than his/her eligibility to win the auction also get reduced. A withdrawal penalty was also imposed. If a winner wants to withdraw then he/she was to surrender the license. The process of auction will start again and the withdrawer would have to pay the difference between current highest bid and his final price in case the present bid is lower than the previous final price.

Janssen (2004) has argued that many aspects of auction design can have a considerable impact on the final outcome of an auction. The different auction forms will have different outcomes as they get affected by collusion, winner's curse, and entry deterrence differently. Collusion in an auction will lower the bids of individuals bidders and, hence, the revenues. Collusion is more probable in auctions that occur one after the other between same bidders. In a common value auction, where bidders' valuations are strongly correlated and uncertain, possibility of winner's curse will lower the revenue generation. Finally, when incumbent shave advantage over potential entrants; entrants are confronted with the question of whether they should take part in the auction at all as preparing for an auction will require considerable investment of time and money.

Apart from defining the auction design rules, an auctioneer is required to pay attention to some externalities also. These externalities include evolving market structure, political problems, loopholes in design, and credibility of auction rules.

Market Structure

While deciding on the rules and format of some auctions, like spectrum auctions, the auctioneer must also anticipate the type of market that will evolve after the auction is over. This approach of 'looking ahead and reasoning back' helps in avoiding collusion or predation efforts by the bidders. Cramton (2001) was also of the view that the allocation of

licences and auction design plays a critical role in determining the market structure or the future competition in the market.

From the social efficiency perspective, a market having strong competitors is preferred because competition will lead to better services, greater innovations and lower prices. Auctions are not usually designed for achieving social efficiency. The outcome of an auction is generally driven by the profits of the bidders. In some type of markets, like telecom markets, the joint profits of firms are more than their individual profits. So, it might be possible that some strong firms collude together in an auction to prevent the entry of new firms. Also a firm which is unable to meet its demand can make it easier for others to enter, by not going in the auction wholeheartedly. Both these outcomes are inefficient. Hence, it may be imperative for the auctioneer to predetermine the market structure, in order to prevent such kind of behaviour of the bidders.

Political Problems

Politics can put a number of constraints in policy implementation. It can act as major hindrance in economic growth, as in issues related to privatization, or its role could be limited, as in some spectrum auctions. Political interference in the US spectrum auction is reported by McMillan (2003), who states that in one such auction, only small firms were allowed. Easy repayment option of paying in instalments resulted in speculative overbidding by the firms and most of the top winner later on defaulted in payments.

Klemperer (2002) explores a few more possible arenas where politics can play spoilsport. Sometimes government officials may find it difficult to set some serious reserve prices, because they fear that the auction might result in failure if the high reserve prices will deter firms in participating in the auction. In sealed bid first price auctions, the winner would find it difficult to explain if after the end of auction he finds that he has bid too much for the object. Similarly, a loser who has lost by a narrow margin will also find himself in the same position. A second price auction can be much embarrassing for the auctioneer, if the difference between the highest and the second highest bid is too large. Such an outcome can be easily avoided by setting a minimum reserve price that the winner will have to pay.

Loopholes

Loopholes in auction design could prove to be very costly if the item to be auctioned is a high ticket one. The bidders can exploit the loopholes to take home unfair advantage. McMillan (1994) cited the example of Australian auction of satellite television licenses. Two bidders competed with each other fiercely, raising the prices but later on defaulted in payments because the government had forgotten to impose fines for defaults. Possibilities of default also arise when small underfinanced firms are allowed to participate in the auctions, as they can default on commitments by filing for bankruptcies.

Credibility of Rules

Plugging the loopholes by formulating rules is one aspect and credibility of such rules is

another aspect. Despite having best laid rules, it is possible that the auctioneer may face the problem that there are many numbers of bidders as are required for the auction to continue, and one of the bidders is violating the rules. In such a situation, the auctioneer must consider that if the auction is repetitive in nature than any relaxation in rules now may jeopardise the credibility of such rules in all the future auctions. Moreover, imposing some astronomically high penalties for defaults can also become a hindrance in the entry of some bidders. Whatever may be the rules for the conduct of auction process, they must be viewed as credible and enforceable by the bidders.

The huge success of simultaneous many-unit multiple round auctions has opened new arenas for efficient allocation and good revenue generation from similar natural resources. Auctions are now increasingly used in electric power generation rights, airport landing rights, off-shore drilling rights, and privatization of micro-wave spectrum.

5. Spectrum Auction: Bangladesh's Experience

Bangladesh is one of the largest and fastest growing mobile markets in the world. The country is home to 154 million people, out of which around 70% lives in rural areas on less than US$2 per day. It is one of the few countries in Asia which are still lacking behind in the nationwide deployment of high-speed mobile networks. Owing to low penetration level of mobile telephony (just around 40%), there is tremendous room for growth and expansion. Till 2013, the top four mobile operators, namely, Grameenphone, Banglalink, Robi and Airtel, were offering data services solely on 2G-GSM networks. These operators control nearly 97% of the country's mobile connection market (GSMA Intelligence, 2013).

Bangladesh started its journey of 3G internet services in October 2012, when Teletalk - a government owned telecom operator, was awarded the license to operate 3G services. Next year, on 8th September, 2013, the Bangladesh Telecommunication Regulatory Commission (BTRC) conducted the auction of 3G spectrum in 2.1 GHz band (BTRC, 2013). The top four cell phone companies in Bangladesh participated in the auction which finished in three rounds of bidding. The reserve price set by BTRC for one MHz spectrum was fixed at $20 million. The auction raised US$ 525 million from four bidders from the top four private operators. The Grameenphone bagged 3G license for 10 MHz spectrum at the price of US$210 million in the first round. In the second round, other three players: Banglalink, Robi and Airtel, each acquired 5 MHz spectrum at the price of US$105 million. There were no new bids received in the third round leading to ending of auction (Karim, 2013). The license was to be issued upon payment of the first instalment of 60%, payable within 30 working days, and the remaining 40% to be made within 180 working days.

It was expected that the launch of 3G services in the country would bridge the 'digital divide'. The companies would be able to tap more revenues from fast growing data services while reducing their regulatory costs under a new licensing regime (Karim, 2013). However, along with these high expectations, BTRC chairman S K Bose expressed doubt over the capability of operators, who got 5 MHz, in ensuring proper service quality in 3G services (New Age, 2013).

The final outcome of the auction would have been largely different if the auction had one more bidder. In the auction, four bidders competed with each other for just four licences. Several right groups have also protested against the behaviour of bidders in the auction process. They argue that bidding companies exhibited behaviour that is typical of oligopolistic firms which operate through tactic collusion (New Nation, 2014). Bangladesh's 3G spectrum auction failed in attracting new players, thereby, lasting for less than one hour. The entire exercise was apparently a predetermined game, in which bidders acted in collusive manner. As a result, the government sold licenses for 15 year period, for just $525 million as against initial estimates of $800 million.

6. Conclusions

Allocation of public resources such as spectrum rights, coal blocks, and oil leases have contributed enormously to government coffers in many cases. As a result the methods for their allocation have become a highly debatable topic in corporate, government and academic circles. The traditional method for such allocations had been the beauty contests where allocations were made on the basis of some pre-specified criteria. But this method was mainly criticized for being time consuming along with being more bureaucratic in nature. Other methods like lottery systems and first-come-first-serve also have their limitations of being low on efficient allocation and less profitable for the government. Auctioning of public resources came into limelight with the historic spectrum licences auction conducted by the FCC in the US in 1993. The remarkable success of this auction led other countries also to allocate natural resources through auctions. The auction design used by the FCC was simultaneous ascending auction where all licences were open for bidding simultaneously until bidding on all ceases.

Although, auctions have been successful in many cases but there utter failure in some countries have called for cautious approach. The success of the auction depends on the mechanism design. One size fit all approach would not be a good option for allocation of public assets. The allocation of spectrum licence through auctions is an example of this. The auction raised revenue marginally above the reserve price set by the government. A closer look reveals that if the government would have taken measures to combat collusion amongst bidders by encouraging other players, the final outcome would have been different.

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Integration of Financial Market and Its Implication on Stock Market Development in Bangladesh: An Evaluation

Mohammad Masuduzzaman
Md. Habibour Rahman
Shohel Ahammed

Abstract

This paper attempts to test for the integration among various segments of the financial market in Bangladesh. Both casual observations and statistical analysis presented in this paper indicate that certain components of the money market such as deposit money banks, nonbank financial institutions and government treasury securities market are highly integrated. The market for the instruments of National Saving Directorate is also integrated, albeit with some sort of divergent tendency due to existence of administered interest rate. On the other hand, the interbank call money market and the stock market are not integrated with the rest of segments of the financial system due to their high volatility in the recent past. Deposit rate of the banks is found to be the "reference rate" for the Bangladesh's financial system. Therefore, efforts must be made to make this rate as much market based as possible since most other rates tend to move in line with the movements of the reference rate. Effectiveness of monetary policy, which generally operates through the short end of the interest rate structure, would also depend on how it impacts the reference rate.

Key words: Integration, financial market, stock market, reference rate.

JEL Classification: E43, E44, G12.

Authors are Joint Director of Research Department, Joint Director of Chief Economist's Unit, and Deputy Director of Chief Economist's Unit, Bangladesh Bank respectively. The views expressed in this paper are those of the authors' own and do not necessarily reflect those of Bangladesh Bank.

Integration of Financial Market and Its Implication on Stock Market Development in Bangladesh: An Evaluation

1. Introduction

Financial market has been playing an increasingly important role in the development of Bangladesh. There are many segments of financial market including money market, stock market, bond market, insurance market, foreign exchange market and derivatives market, etc. However, money moves from one segment to another segment of the financial market due mostly to the relative rates of return in different segments. Normally, money goes to the segment in which the rate of return is higher. As long as the rate of return in a particular segment of the financial system is higher, the volume of investment in that segment will continue to grow. If the financial market is integrated, any opportunities for arbitrage will lead to an acceleration of investment in the segment with high rate of return and to a corresponding deceleration of investment in other segments of the financial market. Therefore, the integration of financial market and the consequent reduced opportunities for arbitrage are essential for stabilizing the flow of funds to different segments of the financial market promptly and efficiently. The integration of financial market is important for healthy and balanced growth of all the major components/pillars of the financial system and allows market participants to realize broadly similar rates of returns after allowing for risk and tenor in different segments of financial market.

The financial market in Bangladesh consists mainly of money market, stock market, bond market, insurance market, foreign exchange market and micro-financial market. Banks and nonbank financial institutions are primarily involved in money market. Banks play a major role in the financial market of Bangladesh. The capital market is now the second largest segment of financial system. Investment in the saving instruments issued by National Saving Directorate (NSD) is the third largest segment of the financial market of the country.

In recent years, the capital market in Bangladesh has grown much faster than the other segment of the financial market. The development in capital market was initially driven by stronger economic fundamentals relative to valuation of stocks and thereafter it was pushed by speculative forces taking market capitalization to unprecedented levels. This development negatively impacted on investments in other segments of financial market i.e. money market and investment in NSD saving instruments. During the periods of boom in the stock market, the rates of interest on bank deposits and NSD saving instruments were fixed, which played an important role in diverting investment funds to the stock market.

Diversion of investment funds helped to cause over-valuation and excessive growth in the market capitalization of securities listed in both Dhaka and Chittagong stock exchanges. Ultimately, the stock price indices tumbled due to economic fundamentals and as the flow of funds to the stock market dried up.

The objective of this paper is to focus on the degree of integration of the financial market in Bangladesh and identify the "reference rate" for the Bangladesh's financial system. The paper tries to determine the co-integrating relationship between the different segments of financial markets in Bangladesh.

After reviewing the literature in the second section, we discuss the characteristics of the financial market in Bangladesh in the third. In the fourth section, we analyze the issue of market integration in the context of Bangladesh's financial market. We explain methodology and sixth sections model specification in the fifth section and the analysis of empirical findings in the sixth. The concluding observations and some policy recommendations are presented in the final section.

2. Literature Review

According to Baele et. al (2004), the definition of an integrated financial market is a market for a defined set of financial instruments if all the potential market participants, with the same relevant characteristics, (1) face a single set of rules when they decide to deal with those financial instruments and/or services; (2) have equal access to the above-mentioned set of financial instruments and/or services; and (3) are treated equally when they are active in the market.

This definition of financial integration contains three important features: First, it is independent of all the financial structures within the region. These financial structures cover issues like defining the scope of all financial intermediaries and importantly the dynamics and interplay between these financial intermediaries with regard to the flow of funds from households, corporate entities and the government. Second, friction in the process of intermediation i.e. access to capital either through institutions or markets can persist after financial integration is completed. This implies that the essential objective behind financial integration is not removing these frictions, which hampers the optimal allocation of capital, but rather is concerned with the symmetric and asymmetric effects of such frictions on different areas. Thus, even in the presence of such frictions, several areas may be considered integrated as long as these frictions come to affect symmetrically (Baele et al., 2004).

Third, according to the definition advocated by Baele et al. (2004), the constituents of the financial market can be cleaved in two parts - being the supply of and the demand for investment opportunities. Accordingly, full integration entails the same access to banks or trading, clearing and settlement platforms for both investors (demand for investment opportunities) and firms (supply of investment opportunities, e.g. listings), regardless of

their region of origin. Furthermore, once access has been granted, full integration requires that no discrimination should exist among comparable market participants based solely on their location of origin (Baele et al., 2004).

According to the same authors, there are three benefits to be derived from financial integration: more opportunities for risk sharing and diversification; more and efficient allocation of capital among investment opportunities; and potential for higher growth. Accordingly, these three benefits are inter-related, as it has been shown earlier in literature that sharing risk across regions enhances specialization in production (Baele et al. 2004; Kalemli-Ozcan et al. 2001). Similarly financial integration should lead to an increase in fund flows for investment opportunities in specific regions as should be the case when financial integration helps facilitate the access to investment opportunities in those regions (Baele et al., 2004).

Hamilton et al. (2005) claimed that while deregulation and technological change have unleashed tremendous competitive forces on the global financial system in recent years, resulting in enormous growth and innovation in the provision of financial services, which in turn have provided substantial benefits to the wider economy by providing households and corporations a much wider menu of instruments with which to borrow. At the same time, the expansion of choice horizon as well as exposure to new risks has increased premium on high quality financial advice and knowledge.

In the context of the subcontinent, though, it may be said that there is a lot of scope for applicability of financial market integration. With respect to Bangladesh, the financial sector industry is highly fragmented, with limited degree of overlap between the formal, semi-formal and informal markets for credit, savings, insurance and various other non-bank financial services such as lease financing, mutual funds and mortgages (South Asian Network of Microfinance Initiatives, 1998). Accordingly, efficient market intermediation here is constrained by two crucial barriers- institutional and policy environment. The institutional rigidities in place serve to constrain the operating and implementing effectiveness while an almost obsolescent legal and regulatory framework also poses considerable barriers to market integration. Importantly asymmetry regarding knowledge of information may be cited as a crucial factor (South Asian Network of Microfinance Initiatives, 1998).

Using a derived methodology Mohsin and Qayyum in 2005 tested empirically for the degree of financial market integration in 5 countries of South Asia separately. In summary, the authors were able to rule out the null hypothesis of perfect capital mobility for all South Asian countries, while only during the 1990s there were evidence of some degree of capital mobility in Bangladesh and Nepal. According to the authors' estimates, India possessed the lowest degree of financial integration, while Bangladesh fell in between other countries.

Bhoi and Dal (1998) also attempted a study of financial integration on an empirical basis for India, and found that several segments of the financial market had achieved oper-

ational efficiency. India's financial markets were getting increasingly integrated at the short-end of the market, such as, money market, credit market, government securities market since April 1993. However, capital market was least integrated with the rest of the financial sector (Bhoi and Dhal, 1998). Thus their study regarding convergence of key financial markets yielded only mixed results, since evidence for convergence was observed only for short term markets.

In another study, Jain and Bhanumurthy (2005) also looked into the issue of financial integration in India. According to the authors, there appeared to be a long run relationship, or convergence (as discovered by the authors in the form of cointegration) amongst the call money rate, exchange rate and London Inter-Bank Offered Rate (LIBOR), which implied presence of a common stochastic trend between domestic and foreign market returns, and it was seen to be strengthening over time. However, the authors also warned that the financial reform programme (in the form of modifying policy and institutional infra-structure), must go in tandem with financial integration to reap the rewards properly.

Jena (2002) examined the degree of market integration empirically and attempted to provide some evidence on the market integration in India. He found that while the reform process had helped to remove institutional bottlenecks to the free flow of capital across various segments of the financial market; this had not yet been translated into complete integration among them.

From the above studies it may be observed that the concept of integration of financial market has a wide range of dimensions- regional, domestic, international, etc. The paper will follow integration concept expressed in the studies by Jain and Bhanumurthy (2005) and Jena (2002) to examine integration of domestic financial market in Bangladesh.

3. Characteristics of the Bangladesh Financial Market

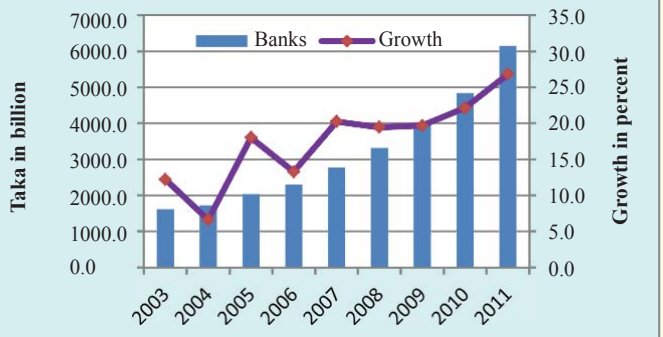
The financial market of Bangladesh mainly consists of money market actively participated by banks and non-bank financial institutions (NBFIs), government bond markets including NSD, insurance market, and capital market.

3.1 Money Market

Banking sector is the dominant player in the money market of Bangladesh. This sector is developing under full control and supervision of Bangladesh Bank (BB), the central bank of the country. At present there are 47 scheduled banks operating in Bangladesh of which 4 are state- owned commercial banks (SCBs), 4 are government-owned specialized banks (SBs), 30 are domestic private commercial banks (PCBs) including 7 Islamic banks and 9 are foreign commercial banks (FCBs). The major source of funds of banks is collecting deposits in the form of demand and time deposits from the public.

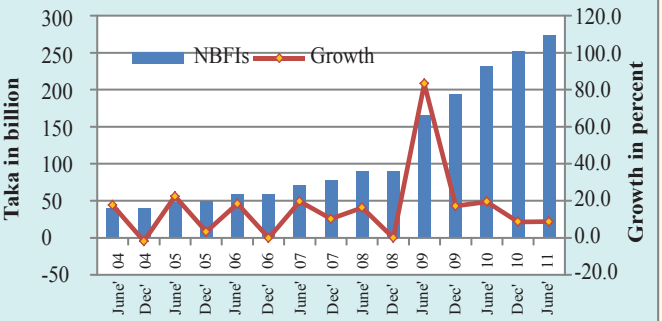
In recent years, though assets of the banking system has been growing, its share in the total assets of the financial system has been falling due to the growth of other segments of the financial market of Bangladesh mainly the capital market. In 2003, the share of banks' assets in the total assets of financial sector was 60%, which decreased to 51.2 % in 2011. The trends in the assets of banking sector and its growth are shown in Chart-1. Non-bank financial institutions (NBFIs) also takes part in money market but its role in the money market is insignificant as compared to the banking sector. The number of NBFIs has been growing under the supervision of Bangladesh Bank. At present there are 31 NBFIs of which two are fully government owned, one is a subsidiary of an SCB, 13 are initiated by domestic private and 15 are initiated by joint venture. Major sources of funds of the NBFIs are term deposits (at least six months tenure), credit facilities from banks and call money as well as bond and securitization.

Chart 1: Banking Sector Assets and its growth



Both the assets of NBFIs and its share in the total assets of the financial system has been increasing in recent years, but at times its growth is retarded by the growths of other segments of the financial market of Bangladesh mainly by the capital market. The share of NBFIs in the total assets of financial sector was 1.4% in 2003, which increased to 2.7% in 2011. The trends in the assets of NBFIs and its growth are shown in Chart-2.

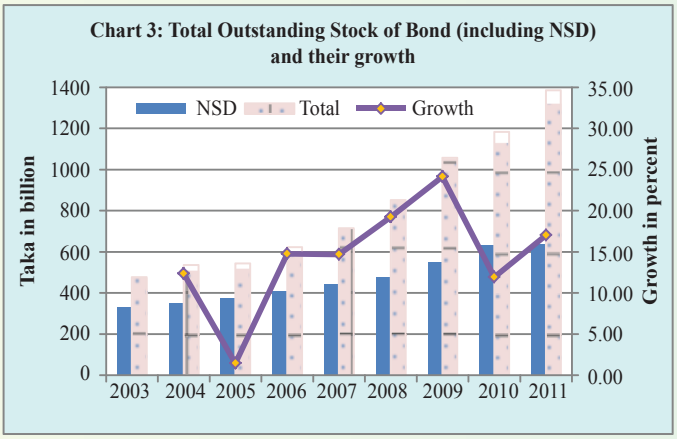
Chart 2: Assets of NBFIs and its growth



3.2 Government bond market

Government issued various types of bonds of different tenures for long term financing of its deficits, mainly from banks and NBFIs. Besides, for financing the budget deficit,

government issued different saving instruments through National Saving Directorate (NSD). NSD instruments are sold to the household and collection of money from the sales of such instruments depends mainly on the rates of interest offered by these instruments. If interest rates on NSD instruments are lower than the return on the instruments of other segment of financial market, government's collection of money from sales of NSD instruments falls.

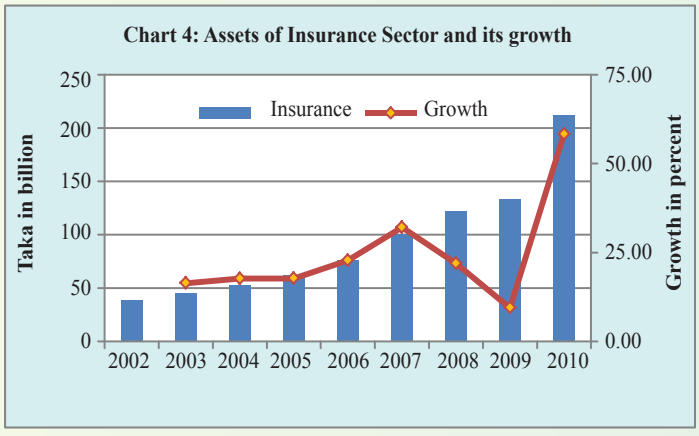


In recent years, the outstanding amount of bonds and NSD instruments has been growing, but its share in the total assets of the financial system has been decreasing. Since the government sells NSD instruments on an open window basis, return on the instruments in other segments of the financial market basically interest rates offered by banks and NBFIs or gain from stocks influences the household demand for NSD instruments. In 2003, the share of the outstanding amount of bonds and NSD instruments in the total assets of the financial sector was 32.8% which steadily decreased to 19.2% by 2011 due mainly to the decrease in sales of NSD instruments.

The trends in the outstanding amount of bonds and NSD instruments and their growth are shown in Chart-3.

3.3 Insurance Market

A total of 62 insurance companies have been operating in Bangladesh, of which 18 provide life insurance and 44 are in the general insurance field. Among the life insurance companies, except the state-owned Jiban Bima Corporation (JBC) and a foreign-owned American Life Insurance Company



(ALICO), the rest are domestic private entities. Among the general insurance companies, state-owned Shadharan Bima Corporation (SBC) is the most active in the insurance sector. The major source of fund of insurance companies is collecting insurance premium.

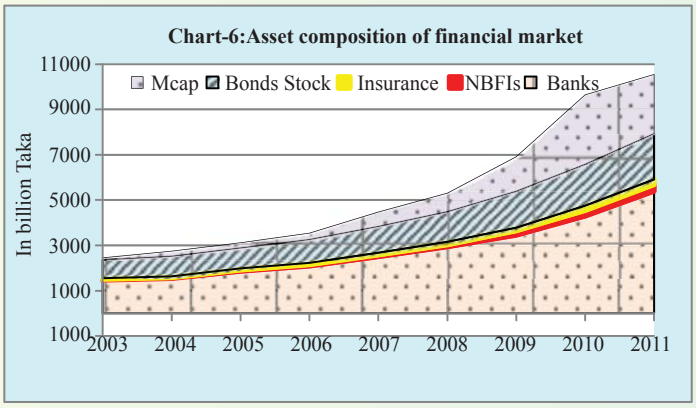
The insurance market in Bangladesh has been remained insignificant on the basis of its relatively small asset size. However, both the assets of insurance companies and its share in the total assets of the financial system has been increasing in recent years. But sometimes the growth of assets of insurance companies becomes stronger with growth of the capital market because a large gain from stocks can build a hand-sum premium easily. The share of insurance companies in the total assets of financial sector was 1.83% in 2003, which increased to 2.17% in 2011. The trends in the assets of NBFIs and its growth are shown in Chart-4.

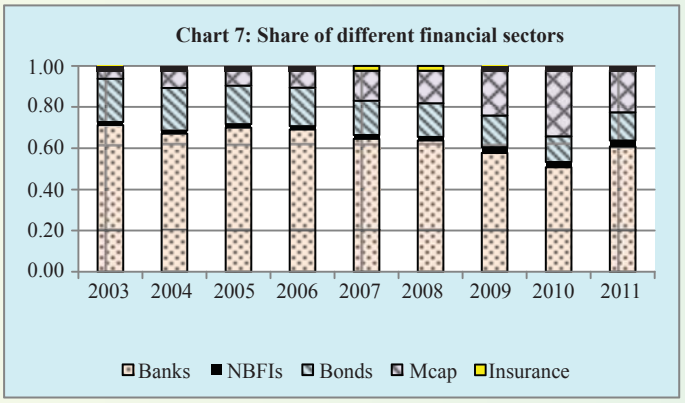
3.4 Capital Market

The capital market consists of two stock exchange companies-Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE). These two stock exchanges are regulated by the Securities and Exchange Commission (SEC). Recently capital market has flourished noticeably due to stronger economic fundamentals of the listed companies, various measures by its regulator SEC and opportunity of gaining more returns from holding stocks. Both market capitalisation of all shares listed in DSE and its share in total assets of the financial sector increased remarkably. In 2003, stock market capitalization accounted for only 4% of the total assets of the financial system, which increased sharply to 24.7% by 2011 despite a major downward market correction in 2011. Market capitalization of the stock market reached 31.8% of the total financial sector in 2010, when the capital market passed through a bubble phase. The trends in market capitalization and its growth are shown in Chart-5.

3.5 Comparison of different segments of financial market

There is no doubt the financial market in Bangladesh has been growing steadily. However, the asset composition of different segment of financial market is changing over the years. In recent years the capital market in Bangladesh has grown faster than other segments of the financial market. Yet, assets in the money market (namely assets of the banks) still remained the highest and dominant in the financial market. Capital market and government bond market remained in second and third positions in terms of asset size. The trends in asset composition and the relative shares of different segments of the financial market are shown in Chart-6 and Chart-7, respectively.



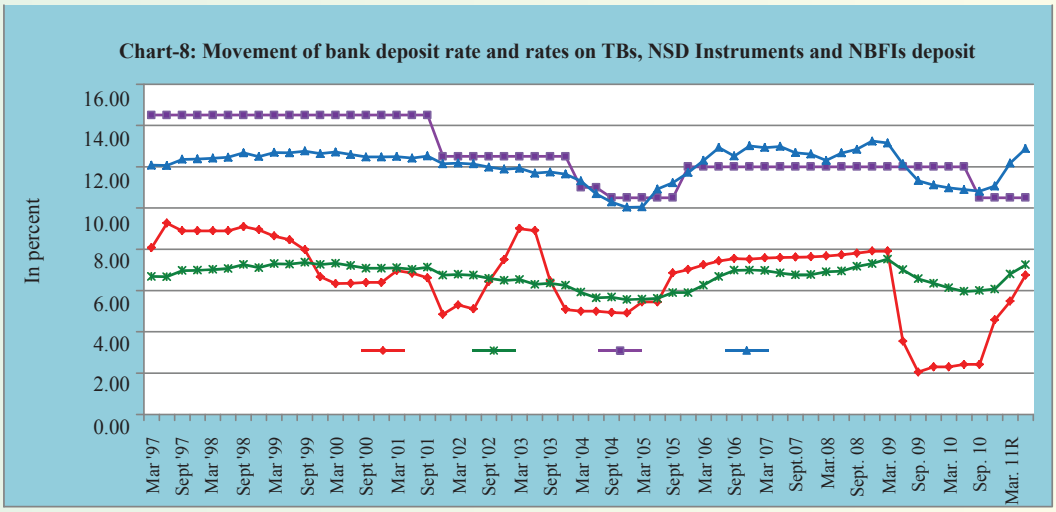


4. Integration of Financial Market in Bangladesh

Integration of different segments of the financial market is revealed on the trends of rates of return on investments in different segments. The various rates of return of different segments of the financial market reveal the variations of risk and return in each segment of the market, after taking into account the maturity structure of the financial instruments. A difference in rates of returns between two segments of the financial market creates arbitrage opportunities. In an integrated financial market, investible funds move from one segment of the financial market to another unless arbitrage possibilities are removed or disappeared.

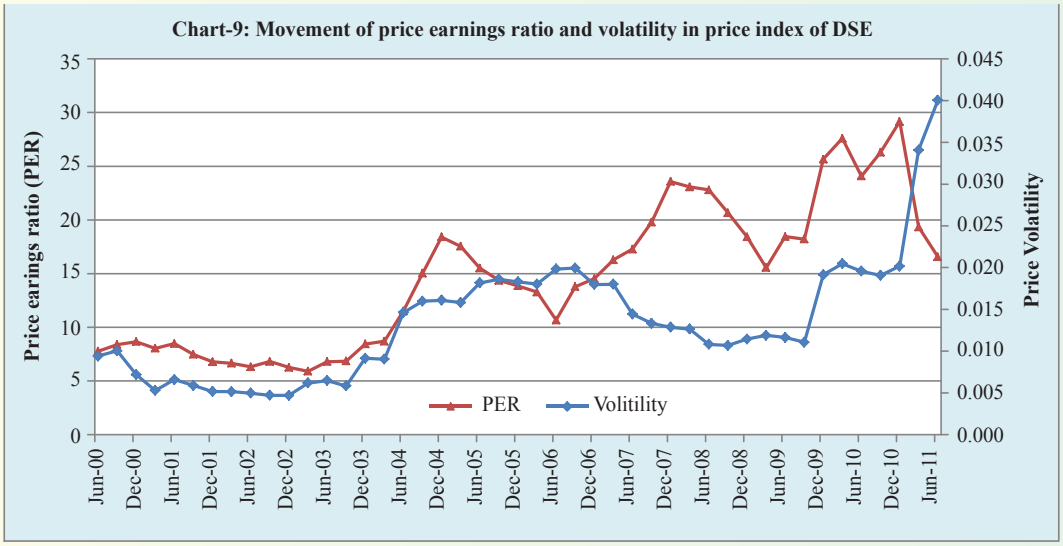
In Bangladesh, different rates of return in different segments of financial market reflect risk and maturity; therefore, the movements of rates of returns are different. The differences in interest rates on deposits both in bank and non-bank financial institutions, yields on treasury bills and interest rates on investment in the instruments of National Savings Direc-

torate (NSD) reveals primarily the differences in the maturity structure of these financial instruments. The movements of interest rates on bank deposits (BDR), interest rates on deposits of non-bank financial institutions (NBFIs), yields on treasury bills (TB) and interest rates on NSD instruments are shown in Chart-8.

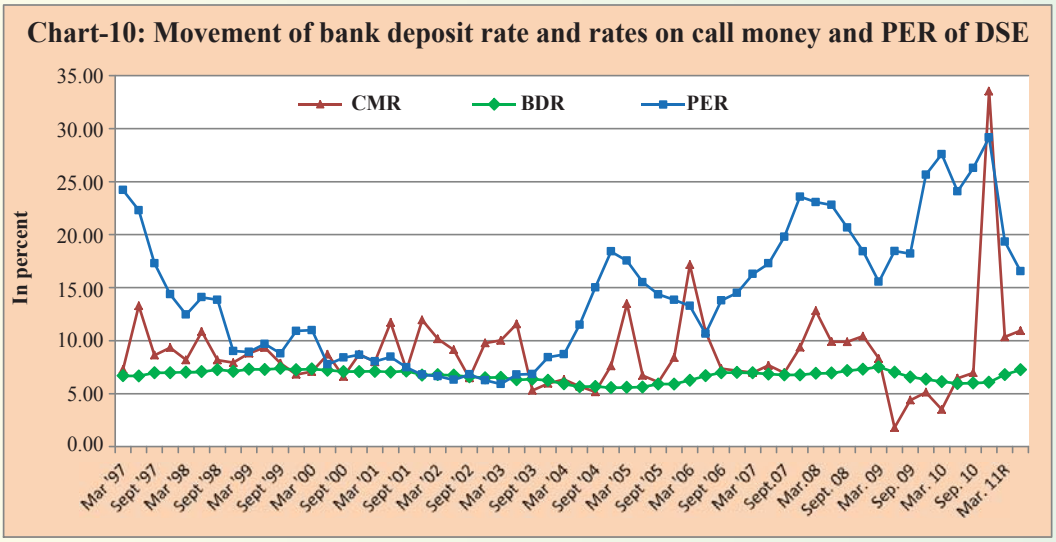


In Chart-8, it is observed that trends in interest rates on both the deposits of banks and non-bank financial instruments are very similar. The gap between the two rates at any single point in time reflects primarily the difference in maturity. Deposits in banks are kept for both shorter and longer maturity periods, but those in non-bank financial institutions are allowed for only longer time. Accordingly, the deposit rate of non-bank financial institutions is higher than that of banks. Since interest rates on NSD instruments are administered, its movement is not smooth. But interest rates on both deposits of non-bank financial institution and NSD instruments are alike, because both deposit rates refer to longer periods. Trends in the yield rate on 91-day treasury bill and bank deposit rate are also similar in except some variations in 2003, 2009 and 2010. Since there is no risk factor in investing money in different types of deposits, treasury bills and NSD instruments, these segments of financial market are stable. Furthermore, since there is scope of arbitrage opportunity, but there is no significant volatility in these segments of money market.

On the other hand, the returns from inter-bank call money market and stock market involve both maturity and risk factors. Therefore, the movements of rates of returns on interbank money transactions and equities in the stock market are volatile because of involvement of risks on transactions in such segments of financial market. The volatility in price index as measured by 3- year moving variance of quarterly growth in price index and price earnings ratio (PER) of DSE is shown in chart-9. It has been observed that there is positive correlation between price earnings ratio and volatility in price of stock.



The trends in interest rates on interbank money market transactions (CMR) and price earnings ratio of stocks listed in Dhaka Stock Exchange (DSE) are shown in Chart-10 along with the bank deposit rate.



It is observed that the movements in the average rate of return from the call money market and the stock market are indeed quite volatile. More interestingly it is found that, a somewhat positive relationship may be found between the rate of return in the call money market and the PER. In addition, the trends in rates of returns from the call money market and stock market remain generally higher than the rate of return from a stable segment of money market i.e. bank deposits.

The trends in the rates of returns among different segments of the financial market also manifested through correlations among them. The pair-wise correlation coefficients of different rates of returns are shown in Table-1.

Table 1: Correlation Matrix of Returns from Different Markets

Variables	TB	PER	NSD	NBFI	CMR	BDR
TB	1					
PER	-0.31	1				
NSD	0.5	-0.4	1			
NBFIS	0.64	-0.25	0.54	1		
CMR	0.19	0.18	-0.1	0.02	1	
BDR	0.52	-0.23	0.67	0.91	-0.03	1

TB= yield rate on 91-treasury bill, PER = price earnings ratio of stocks listed in DSE, NSD = interest rate on the instruments of NSD, NBFI =interest rate on deposits held in non-bank financial institutions, CMR= interest rate on interbank call money transactions and BDR= bank deposit rate.

Table-1 shows that the bank deposit rate is well-correlated with the rates of returns in other segments of the financial market. In particular, the bank deposit rate is highly and positively correlated with rate of interest on deposits held by NBFIs. It is also directly correlated with the interest rate on NDS instruments and the yield on treasury bills. However, bank deposit rate is weakly and negatively correlated with the rate of return on stock and the interest rate on money at call.

On the viewpoint of correlations among different rates of return on the investments in various segments of the financial market, the bank deposit rate may be considered as a reference rate-the rate with which other rates of returns tend to covariate-in order to postulate that the various segments of the financial sector are integrated.

It is mentionable here that during 2001 to 2008, the capital market in Bangladesh has grown markedly and independently due to the attraction of higher rate of return i.e. PER increasing at a much faster rate than the rate of return from any other segment of the financial market. In particular, in the year 2009 and 2010 the growth of market capitalization was excessive due to speculative pressures, excess liquidity expansion, and a downward trend in the rates of return from other segments of the financial market. These developments opened up the opportunity for arbitrage through diverting of liquidity from other market to the stock market. The Speculative bubble that was formed the process could not be sustained and the resulting stock market correction led to a reduction in the market capitalization in 2011.

5. Methodology and Model Specification

The paper will use econometric methods to find out the reference rate by using measures of the skewness and kurtosis of first difference series to satisfy the normality assumptions. In order to examine the issue of integration within the financial market, we need to see the cointegration relationship among the rates of return from different segments of the financial market. In this context, we first examine the stationarity properties of the variables by using Phillips-Perron test. After checking for the stationarity, we examine whether the short-run and long run rates of returns are cointegrated by using the Johansen un-restricted cointegration test for series BDR, TB, NBFI, NSD, PER and CMR. Afterwards, we estimate the normalized cointegration equation for the bank deposit rate as follows:

$$BDR = a\,TB + b\,NBFI + c\,NSD + d\,PER + e\,CMR + u$$

Where, BDR = bank deposit rate

TB = yield rate on 91-treasury bill

NBFI = interest rate on deposits held in non-bank financial institutions

NSD = interest rate on the instruments of NSD

PER = price earnings ratio of stocks listed in DSE

CMR= interest rate on interbank call money transactions

u = error term

Finally, we use a vector error correction framework to measure the speed of adjustment.

6. Analysis of Empirical Findings

With a view to identifying whether any of the rates of returns has the prospect to serve as a reference rate, the basic statistics of these rates in their first difference form have been calculated and shown in Table 2. The skewness and kurtosis measures of the first difference series indicate that none of the series could satisfy the normality assumption viz. zero skewness and excess kurtosis equals to zero. But considering both skewness and excess kurtosis, BDR satisfied normality assumption better than other variables. Therefore, BDR is regarded as the 'reference rate' for the Bangladesh's financial market.

Table 2: Basic statistics of return from different market (first difference).

Variables	Mean	Variance	Skewness	Excess Kurtosis	Jarque-Bera Stat
BDR	0.01	0.05	0.44	1.39	6.46
CMR	0.06	31.60	0.61	11.63	324.77
NBFIS	0.01	0.14	0.29	1.51	6.20
NSD	-0.07	0.19	-1.98	11.06	327.92
PER	-0.13	6.87	-0.50	2.70	19.70

To examine the co-integration the first step is to test the stationarity properties of the variables in the time series. Among the different tests for stationarity, we have used Phillips-Perron test for this study1. The results of the Phillips-Perron test are provided in Table 3. The Phillips-Perron test shows that only CMR does not have a unit root in levels. All other variables have unit root in levels and thus are non-stationary. However, due to high volatility of CMR, a 2-quarter moving average series of CMR (CMR2) is considered. This variable is now found non-stationary in level. Then, unit root test is conducted in first differences. All the series satisfied stationarity or, in other words, they are all I (1) process.

Table-3: Estimated z-statistic values for Philips-Perron test

Variables	Level form		First difference form	
	Without trend	With Trend	Without trend	With Trend
CMR	-6.53*	-6.48*	-39.44*	-47.65*
BDR	-1.95	-1.91	-4.42*	-4.40*
NBFIs	-2.28	-2.24	-4.30*	-4.27*
NSD	-1.03	-2.05	-7.55*	-7.48*
PER	-2.13	-3.36	-6.13*	-6.18*
TB	-2.25	-2.49	-5.19*	-5.17*
CMR2	-1.97	-1.47	-5.92*	-6.07*

*significant at 1% level; ** significant at 5% level

The results of Johansen unrestricted cointegration rank test for series BDR, TB, NBFI, NSD, PER and CMR are summarized in table-4.

Table 4: Johansen Un-restricted Co-integration Rank Test for Series: BDR, TB, NBFI, NSD, PER and CMR2

Null Hypothesis	Alternative Hypothesis	Test Statistics	5 percent Critical value	Conclusion
Trace Test				
r=0	r>0	128.32	94.15	One co-integrating equation at 0.05 level
r ≤1	r >1	61.7	68.52	
r≤2	r>3	38.87	47.21	
Maximum Eigen value Test				
r=0	r>0	66.62	39.37	One co-integrating equation at 0.05 level

[1] Other important tests for stationarity are DF and ADF tests. The test statistic proposed by Phillips and Perron termed as z-statistic, arises from their consideration of the limiting distributions of the Dickey-Fuller statistic, when the assumption of i.i.d. process for the disturbance term is relaxed. Further, the error term could be serially correlated and heterogeneous.

Both the trace and maximum eigen value suggest one cointegrating relation among the six variables indicating the long-run relationship in the system. Estimated normalized co-integration equation of bank deposit rate is shown in equation (1) and standard error is reported in parentheses.

$$BDR = 0.07\ TB + 0.20\ NBFI + 0.31\ NSD + 0.05\ PER + 0.29\ CMR \ldots\ldots\ldots (1)$$

S.E. (0.05) (0.12) (0.06) (0.01) (0.03)

In the model, it is found that yield rate on treasury bill, deposit rate by NBFI, interest rate on NSD instruments, CMR2 and price earnings ratio of DSE have positively influences on BDR.

The estimated adjustment coefficient of α for bank deposit rate (BDR) model is reported in table- 5. The speed of adjustment coefficient measures the degree to which the variable in equation responds to the deviation from the long equilibrium relationship. For example, the bank deposit rate is correcting about 14 percent every quarter to move long run equilibrium relation.

Table-5 : Adjustment Coefficient of α

Variable	α	Standard error
Δ BDR	**- 0.14**	**0.03**
Δ TB	- 0.018	0.19
Δ NBFI	- 0.15	0.06
Δ NSD	0.04	0.09
Δ PER	1.94	0.46
Δ CMR2	2.98	0.98

Moreover the speed of adjustment of yield rate on Treasury bill and deposit rate by NBFI are convergent towards the long-run equilibrium because they are highly integrated to the reference rate. On the other hand, short term dynamics reveal that call money rate and the price earnings ratio of DSE is divergent to the reference rate due to high volatility. In addition, the interest rate of NSD instrument is some sort of divergent from the reference rate perhaps because interest rate on these instruments is not determined by market forces.

7. Conclusion and Recommendations

An attempt had been made in this paper to test for the integration among various segments of the financial market in Bangladesh. Both casual observations and statistical analysis presented in this paper indicate that certain components of the money market such as deposit money banks, nonbank financial institutions and government treasury securities market are highly integrated. The market for the instruments of National Saving Directorate is also integrated to the above three segments of the money market, albeit with some sort of divergent tendency due to existence of administered interest rate. On the other hand, the call money market and the stock market are not integrated with the rest of the financial system due to their high volatility in the recent past.

Deposit rate of the banks is found to be the "Reference Rate" for the Bangladesh financial system. Thus efforts must be made to make this rate as much market based as possible since most other rates tend to move in line with the movements of the reference rate. Effectiveness of monetary policy, which generally operates through the short end of the interest rate structure, would also depend on how it impacts the reference rate. But there found a long-run relationship among different segments of financial market. Though short term dynamics reveal that market for the instrument of National Saving Directorate, call money market and stock market are divergent from the mainstream money market, yet corrective measures could bring these segments of financial market towards the path of integration in the long-run.

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School Banking in Bangladesh: A Study on Sustainability

Dr. Mahmood Ahmed *

Abstract

The study observes that there is a sustainability risk of school banking product. Such a risk has become a prestige concern to Islami Bank Bangladesh Limited, the largest private commercial bank in Bangladesh. Because recently the Bank has got the crest for contribution in school banking. Therefore the school banking of the IBBL has been undertaken as a case study for sustainability analysis of it. The study uses a cluster randomized design, with 50 schools randomly selected from the IBBL Chittagong zone. Data are from baseline survey with 1,515 student and 1,137 parents and guardians of the students who are from three levels: Primary, Junior High School, and High School. This research focuses on the financial knowledge, attitudes, and socialization of students under school banking of the IBBL as well as the financial knowledge of their parents and guardians with a view to understanding and increasing the students' 'financial capability' on which the sustainability of the school banking depends. Finally, it suggests four measures to increase the sustainability of the school banking product.

Key words: School, Banking, Sustainability

Background

With a view to enhancing financial inclusion of the country by ensuring the participation of school students in the economic *vis a vis* banking activities through savings and creating savings attitude among the student through involving them in modern banking service and technology, Bangladesh Bank (BB), the central bank, advised all scheduled banks to introduce School Banking in 2010. Students of the age of six years to below eighteen years will be able to open account under School Banking Operation with minimum initial deposit BDT 100/- only. The attested photocopies of birth registration certificate and institutional identity card/Certificate issued by Educational Institute/Receipt of School Fees of latest month of students have to be collected. All these documents must be preserved in the bank. The account has to be operated through father/mother or legal

* The Author is Executive Vice Persident of Islami Bank Bangladesh Limited.

guardian of the student. After completing eighteen years of the account holder and before converting into regular savings account, no withdrawal shall be allowed (Except account closure) in the period. Some banking facilities like, ATM card (Only debit card) can be issued against this type of account. Maximum limit of monthly withdrawal through ATM card and Point of Sale (POS) will be BDT 2,000/= only. This limit may be increased up to BDT 5,000/= on request of the Guardian. There will be a system of SMS Transaction Alert to the mobile number of account holder's guardian. No service charge/fee shall be imposed on this type of account except government fees. Banks can collect monthly fees of students on behalf of educational institutions through such accounts. Banks shall inspire the educational institutions so that the students of every school can be brought under banking services. Concerned bank branches may establish separate School Banking Counter/Desk to facilitate banking services to students. Moreover, bank branches may provide this service in one or more fixed day by opening booth in the premises of educational institutions by having their consent. All kinds of scholarship/stipend of students can be deposited through School Banking Account. In this regard, scholarship/stipend provider institutions have to sign a MoU with the concerned banks. Concerned banks can provide education insurance facility to these accounts if any student faces financial crisis to run his/her education due to family/natural causes then, it will be possible to facilitate them under this insurance coverage (BB, 2013). It is hoped that the product shall help the students to: (i) Make them familiar with banking services and technology; and potential future customers or employee of the bank; (ii) contribute to economic activities through savings; (iii) have a sizeable amount of savings after a certain period; (iv) instil the habit of savings from the early age; (v) acquire how to manage money that may be useful for rest of the life; (vi) know financial literacy; (vii) be sure of bearing study cost up to 18 years of the accountholder students, if they unfortunately lost their parents; and (vii) think about the financial sector from their early age. The deposited money under the school banking product will help not only accelerate financial inclusion and financial literacy across the country, but also have financial stability because such deposits remain stable at the banks for a certain period of time.

Introduction

Eastern Bank Limited (EBL) was the first bank that came up with school banking after the central bank issued the circular. The bank has introduced 'EBL Junior', a savings account of students. Other banks also introduced such accounts in different titles. Mutual Trust Bank introduced two products – MTB Junior and MTB Graduates – for students. BRAC bank introduced the 'Future Star Account.' ONE Bank introduced 'Student Savings Account (Minor). Islamic banks also came up with this service. Shahjalal Islami Bank has a deposit product named 'Mudaraba Shikhkha (Education) Deposit.' Islami Bank Bangladesh Limited (IBBL) introduced 'Student Mudaraba Savings Account' without daily product basis profit.

On the other hand, there is no 'education investment scheme' for higher education of the student who saves money regularly, up to a certain limit, in the 'Student *Mudaraba* Savings Account'. However, the Bank has opened 86,702 accounts out of 1, 87,000 school banking accounts opened in the country so; it has got the crest from the central bank for contribution in school banking on April 20, 2013 at the "First School Banking Conference-2013" held at Bangladesh Bank Training Academy, Dhaka (FE, 2013).

According to the central bank's report, the number of school accounts is 224,719 in 47 banks, until June 2013, showing deposit of BDT 1.28 billion. The average savings in these accounts work out to about BDT 6,096/- only. Students have 4,270 accounts in state-owned commercial banks. On the other hand, they have opened 4,279 accounts in specialized banks, 215,597 in private banks and 597 in foreign banks. Nine banks that recently got their license are yet to introduce school banking (BDnews24.com, 2013). It appears, therefore, that response to the school banking product is excellent.

But (Rahman, 2011) mentioned, "School banking is not new in Bangladesh. Some Banks including Muslim Bank, had introduced school banking programme in the 1960s, but it did not last long. It was some time before AB Bank (Formerly Arab Bangladesh Bank) launched the service in Sunshine Grammar School in Chittagong in 2003. But, that too did not work." Ali (2012) also reported bitter experience on school banking. He mentioned that one of the leading commercial banks launched school banking about one year back but did not get satisfactory response from the customers. There are two reasons behind the poor response: (i) instead of opening separate account for the school-level students, their parents are more intrested to open joint-account with their children; (ii) school headmasters normally did not issue certificate required for opening school banking account and the bank also reluctant to open such account by deposit of only BDT 100-200. It indicates sustainability risk of the school banking. Such a risk has become a prestige concern to the IBBL, the largest private commercial bank in Bangladesh, indeed. Because, recently, the Bank has got the crest for contribution in school banking. Therefore, the school banking of the IBBL has been undertaken as a case study for sustainability analysis of it.

A research question therefore has arisen: how could school banking be sustainable? It has been assumed that the 'students' financial capability' is the *raison d'être* of sustainability of the school banking product. Student financial capability refers to student's (i) financial knowledge; (ii) skills; and (iii) access to financial services (Child and Student Finance International, 2010; Sherraden, 2010). Studies in the United States reveal that student often have low levels of financial knowledge (Lusardi, Mitchell, & Curto, 2010; Mandell, 2008). Research shows that parents also influence their children's financial literacy, attitudes, and behaviours (American Savings Education Council, 1999; Bowen, 2002; Danes, 1994; Moschis, 1985; Serido, Shim, Mishra, & Tang, 2010; Shim, Barber, Card, Xiao, & Serido, 2010).

As the school banking has been launched again in Bangladesh in 2010, little research has been conducted to understand the students' financial capability to sustain in the school banking programme. This research is anticipated to fill some of these gaps.

There are three factors of students' financial capability, mentioned above. It has been assumed that two variables (Financial attitude and socialization of the students) help acquire the last two factors of the students' financial capability. These two variables therefore have been discussed with the 'knowledge' factor to understand the students' financial capability. Financial knowledge refers to the understanding one has of important personal finance concepts, like budgeting and saving. Financial attitudes refer to one's beliefs and values related to various personal finance concepts, such as whether one believes it is important to save money or profit is prohibited. Financial socialization refers to different ways that one may develop financial knowledge and attitudes, such as through classroom-based education or mass media.

Objectives

This research focuses on the financial knowledge, attitudes, and socialization of the student under school banking programme of the IBBL as well as the financial knowledge of their parents and guardians with a view to understanding and increasing the students' financial capability on which the sustainability of the school banking programme depends. It also suggests some measures to increase the sustainability of the school banking product.

Data and Methods

The study uses a cluster randomized design, with 50 schools randomly selected from the IBBL Chittagong North and South zones. Twenty-five schools were randomly assigned to treatment condition and another 25 schools were randomly assigned to control condition. Thirty students were randomly selected from each school for a total of 750 students in the treatment and 750 in the control condition with oversampling to take attrition into account. This process yielded a sample of 1,515 students.

Data from this research are from baseline surveys with 1,515 student and 1,137 parents and guardians of the students who are from three levels: Primary, Junior High School, and High School. Nearly equal numbers of girls (46%) and boys (54%) were interviewed. Students were also fairly evenly divided by level, including Primary (32%), JHS (33%), and HS (35%). The average age of student is 15.5 years. Seventy-five percent of student surveyed at baseline have a parent or guardian available who was also surveyed at baseline. Data were analysed using simple statistics and presented in tabular form.

The student survey included questions about demographics, education, health, financial

capability, asset ownership, living conditions, and future aspirations and expectations. The parent or guardian questionnaire included questions on household information, education, outlook and expectations, health, and financial well-being.

Discussion and Findings

A discussion on the financial knowledge, attitudes, and socialization of the student under school banking programme of the IBBL as well as the financial knowledge of the students' parents and guardians has been presented below.

Financial Knowledge and Attitudes

Studies in the United States reveal low levels of financial knowledge among students (Charles Schwab & Company, 2011; Lusardi, Mitchell, & Curto, 2010; Mandell, 2008). A better understanding of student financial knowledge and attitudes, and whether such knowledge and attitudes are associated with student's financial behaviours may support a case for offering student financial education. However, despite the conventional wisdom that financial knowledge is a prerequisite for positive financial behaviour (Hathaway & Khatiwada, 2008), the empirical relationship between financial knowledge and behaviour is not well established. It may be that savings behaviours are associated with factors other than, or even excluding, knowledge and attitudes (Chowa, Despard, Akoto-Osei, Issac, 2012).

In the School Banking Programme of IBBL, questions were intended to assess understanding of the concept of Islamic bank profit. For example, student and their parents or guardians were told to imagine having BDT 10,000 in a *Mudaraba* savings account with the IBBL that offered a certain provisional profit rate and asked how much money they would have after one year. Student and their parents or guardians were asked a nearly identical question about receiving a *Bai*-murabaha investment and being charged mark-up profit. Survey respondents were given credit for a correct answer if they provided the correct figure for each question based on a simple profit rate calculation.

Only 18% and 31% of student could correctly answer two questions about the savings and the investment profit, respectively. These results differ little among student based on gender, receipt of earned income, grade level, or age. Similar results are found among parents and guardians; only 23% and 22% could correctly answer the questions about savings and investment profit, respectively. However, because the questions require a simple calculation, these results may reflect limited numerical skills and not necessarily a lack of understanding of profit.

Fathers and other male guardians are more likely than mothers and female guardians to correctly answer the questions concerning saving (33% vs.18%; $p<.001$) and investment (32% vs. 17%; $p<.001$) profit. This may be because men have more opportunities and experience with formal financial services.

Student and their parents or guardians were also asked the following question to assess hyperbolic discounting: "Would you want a prize of BDT 100 now or a prize of BDT 150 in one month?" Most (62%) student report that they would wait a month for the bigger prize. This finding differs little by gender, grade level, or whether participants have earned income. A similar percentage of parents or guardians would wait a month to receive a larger reward (65%), and there is no difference by gender. These findings suggest that the majority of student may be willing—at least in theory—to delay gratification and defer consumption in order to save money.

Parents and guardians were also asked how they felt about their children's financial knowledge and behaviours by stating their agreement or disagreement with certain statements. Because parents and guardians guide the behaviour of their children, it is important to understand whether they favour and hence may be likely to support their children's financial learning and capabilities. Thus, parents and guardians were asked how important it is for their children to make careful spending decisions, learn how to save money, and use formal financial institutions. If parents and guardians feel that these things were not important for their children, they may not provide the support and encouragement that children may need to save money. Also, parents and guardians were asked how important it is that their children help support the household financially. This question was included because expecting children to make household financial contributions may suppress or offset support for saving. As seen in Table 1, parents and guardians generally have favourable attitudes concerning their children's financial learning and capabilities.

Table 1: Parent/Guardian Attitudes

Statement	**Mean***
It is important for my child to learn to make careful spending decisions.	9.26
It does not matter whether my child learns how to save their money.	3.31
It is important for my child to learn about financial institutions and banking.	9.32
It is important for my dependent child [study participant] to help pay for things	
people in our household need.	4.55

* Agreement with each statement was indicated on a scale with 0="strongly disagree" to 10="strongly agree."

How Student Learn About Money

Schools are an increasingly important source of financial education for student. In the US, the number of states with personal finance content standards for K-12 curricula has risen from 21 in 1998 to 44 in 2009. Governments in several other countries including Ghana, Kenya, Brazil, Indonesia, and Estonia are planning and/or implementing large-scale efforts to incorporate school-based financial education. Parents are also an important source for student to learn about money (Bowen, 2002; Danes, 1994; Moschis, 1985; Serido, Shim, Mishra, & Tang, 2010). To better understand student's financial behaviours, it is important to know whether these behaviours are associated with having received financial instruction from various sources such as school and parents (Chowa, Despard, Akoto-Osei, Issac, 2012).

It has been found in the study that parents and schools are the two main sources from which student learn about money, and this is true for both girls and boys. Seventeen percent of student report that they have received financial education in school. This result varied considerably between zones, which may reflect different levels of access to and use of public education. Most of the student (6%) who have received financial education in school reported that they have received less than hours of instruction.

Student report learning most about the following three topics:

• How to save

• Why it is important to save

• How to make good choices in spending

Most student report that they do not receive financial education but the focus of the education on savings can help to explain why student should have favourable savings attitudes.

The Role of Parents and Guardians

Parents are the primary sources for how student learn about money and can affect how their children's financial attitudes and behaviour develop (American Savings Education Council, 1999; Danes, 1994; Sallie Mae, 2009). Serido, Shim, Mishra, and Tang (2010) found that college students who perceived that they could discuss financial topics with their parents had lower levels of financial stress. In a qualitative study of 49 African-American high school students, Slaughter (2006) found that parents and other family members had a strong impact on students' financial knowledge, attitudes, and behaviour. Shobe and Christy-McMullin (2005) described how discussing money and observing the financial behaviours of parents and other family members shaped the

financial knowledge and attitudes of low-income African-American women participating in an Individual Development Account (IDA) program.

Cooper and Luengo-Prado (2009) found that low-income children whose parents saved more were more likely to move out of the lowest income quintile as adults than low-income children whose parents saved less. While the studies mentioned above were conducted in the US, they all indicate that parents and guardians may influence the financial lives of their children. Therefore, parents and guardians in the study area were asked about their financial interactions with their children to see whether these influences may be present in Chittagongian families as well.

Table 2 shows the frequency with which parents and guardians talk with their child about different financial topics. "Often" means that parents or guardians talk with their child at least once a month and as frequently as almost every day.

Table 2: Parent-Child Interactions

Topic	Often	Never
How my child can earn money	45%	46%
How my child can save money	62%	29%
How we manage and make financial decisions in our family	42%	49%

These findings vary little by gender, education level, or age. Smaller percentages (12%, 16%, and 15%) of parents and guardians talk with their children almost every day about how to earn money, how to save money, and how family financial decisions are made, respectively. Another finding is that 57% of parents and guardians never talk to their children about how they make financial decisions.

Most parents and guardians report frequently engaging in behaviours like careful spending that their children might observe and emulate. The most common reason why parents and guardians save is for unexpected expenses (45% of all possible responses), followed by paying for their children's school needs (30%). Fewer responses were given for future-oriented savings purposes such as buying a business asset (10%), paying for children's future education expenses (9%), and retirement (6%).

Interestingly, while 53% of student says that they have savings, only 26% of parents or guardians agree that this is true. However, across all student subgroups, student set aside money for short durations and mostly consumptive purposes. Thus, it may be that student and their parents and guardians think about saving in different ways. Student focus on near-term uses of money they set aside, while parents and guardians think about longer-term purposes and may be setting aside larger amounts accordingly.

Financial Socialization and Saving Behaviours

Student can have different social interactions—types of financial socialization—that may be associated with various savings behaviours. How much student say they save each month was examined in relation to three types of financial socialization: receiving financial education, talking to parents or guardians about money, and visiting a bank.

As seen in Table3, the average monthly amount that student report that they save is greater when they report having each of the socialization experiences. However, these greater amounts are statistically significant only for having received financial education ($p<.05$) and having visited a bank ($p<.001$).

Table 3: Average Monthly Savings By Financial Socialization Experience

Topic	N	Averag Monthly Savings (BDT)	P*
Parent explains financial decisions			
Sometimes, most of the time or always	2270	12.1	ns
Never or once in long time	2305	13.52	
Ever received financial education classes			
Yes	3461	14.16	0.5
No	1090	12.70	
Financial education hours			
More than 5 hours	304	16.30	ns
Less than 5 hours	2979	13.87	
Ever visited a bank with parent or other family member			
Yes	1925	15.56	.001
No	2624	12.55	
*p<.05, two-tailed independent samples t-test			

Conclusion and Suggestions

In order to understand the students' financial capacity, this study offers a first glimpse into the financial knowledge and attitudes of Bangladeshi student in Chittagong and their financial socialization experiences. Students learn about money mostly from school and parents, with an emphasis on saving. Parents feel that saving and using formal financial institutions are important for the children, though students and their parents or guardians

are likely to have different ideas about what savings means. About half of student talks to their parents or guardians about money at least some of the time, while the other half do so very infrequently or never. How much parent or student interacts about money appears to vary widely. Financial socialisation experiences are generally associated with greater student savings, suggesting that both school and parents may be important sources of guidance for student.

In view of the above, the sustainability of the school banking product may be increased implementing the following suggestions:

1. BB should continue programme of school banking in different parts of the country regularly, and the commercial banks should discuss the importance of school banking in its different customers meetings.
2. Financial management related topics may be included or increased in the curriculum of different levels of education. The focus of the education on savings can help to explain why student should have favourable savings attitudes.
3. As one of the purpose of school banking is ensuring the participation of school students in the economic *vis a vis* banking activities through savings and creating savings attitude among the student through involving them in modern banking service and technology, IBBL should maintain the 'Student *Mudaraba* Savings Account' on daily product basis, so that savings grow faster.
4. IBBL may launch 'education investment scheme' for the higher education of the student, who saved money regularly, up to a certain limit, in the Student *Mudaraba* Savings Account of the Bank.

Implementation of the above suggestions shall also increase the students' capability of school banking. In future, socio-economic impacts of the school banking may be studied.

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Savings - Economic Growth Nexus in Bangladesh: Evidence from Causality, Cointegration and Error Correction Models

Laila Haseen
Mohammad Amzad Hossain

Abstract

The dynamic causal relationship between gross national savings and gross domestic product remains a contentious and lively issue in the literature. Even though the literature on this issue is voluminous, however for Bangladesh it is quite nascent. The paper explores the dynamic causal relationship between gross national savings and gross domestic product in Bangladesh over a long period of time (1974-2010) by applying Granger causality test, Johansen and Juselius cointegration test and Engel and Granger error correction models considering the stochastic properties of the variables. The issue of the short run dynamics of savings and other variables within a long run relationship has also been examined in the paper. The estimated results show that both variables are nonstationary at their levels and stationary at first differences. Then using cointegration technique it has been found that both the considered variables are cointegrated, implying that there is a stable long run relationship between gross national savings and gross domestic product. The error correction model shows that the considered variables drift apart in the short run, however in the long run there is bidirectional causality between savings and economic growth. The implication of the result is that mobilising domestic savings are critical for capital accumulation and so for economic growth. The Granger causality test also shows the same result. Therefore attempts have to be made to increase national savings for capital accumulation and output growth in Bangladesh.

The Authors are Assistant Professor and Associate Professor of Department of Economics of Jahangirnagar University.

Savings - Economic Growth Nexus in Bangladesh: Evidence from Causality, Cointegration and Error Correction Models

1. Introduction

Economists have long been examining the causes and the process of economic growth. Despite that process of economic growth remains the most complicated and empirically contentious issues in the literature. Over time different schools of thought and economists like Frank Ramsey (1928), Allyn Young (1928), Frank Knight (1944), Joseph Schumpeter (1934) and Harrod (1939) & Domar (1946) analyzed growth process of the capitalist economies identifying different determinants of economic growth (Hossain, 2011a). Evidence shows that a stable savings-investment relationship is very crucial for sustained economic growth. This emanates from the fact that savings contribute to higher investment and hence higher GDP growth at least in the short run (Bacha, 1990; DeGregorio, 1992; Jappelli and Pagano, 1994).

The relationship between savings and investment and so economic growth has first been formally explained by Lewis (1955). The main idea of Lewis's (1955) traditional theory was that increasing savings would accelerate growth by accumulating capital in the developing countries. The idea of Lewis has been empirically tested by Domar-Harrod models. The H-D model specified investment as the key to promoting economic growth. On the other hand, in the 1950's and 1960's the neoclassical growth model of Solow-Swan variety became dominant in the thinking of the economists. Though these models are considered as exogenous, however argues that the increase in the savings rate boosts steady-state output by more than its direct impact on investment because the induced rise in income raises savings, leading to a further rise in investment (Hossain, 2011a).

Using the Solow-Swan model, authors like Jappelli and Pagano (1994), Alguacil et al. (2002) among others, reported that higher savings growth precedes higher economic growth. In fact, Olajide (2009) findings that a unidirectional causality runs from saving to economic growth suggest that the low level of saving may be responsible for the sluggish and unimpressive growth in Nigeria over time. In addition, the World Bank (1993) views that higher savings rates account the differences in economic growth between developed and developing economies. However, the proponents of the Keynesian hypothesis stressed that it is growth of output (or income) that causes growth of saving. The supporters of this theory argue that increases in investment leads to increase in income, thus raising the level of saving in the economy. For instance, the work of Carroll and Weil (1994) which suggested that economic growth preceded savings motivated further researches that aim at ascertaining the direction of causality between saving and economic growth. To this end, Gavin et al. (1997), Sinha and Sinha (1998), and Agarwal (2001) confirmed that higher economic growth precedes and causes higher savings.

The H-D and Solow and Swan type of long run growth model has come under challenge in the 1970s and in the early 1980s due to the fact of short-term fluctuations of economic growth as experienced by many countries. Economists then focused more on short run fluctuations than on long run economic growth. However, growth theories back in fashion in the mainstream economics in the late 1990s after the publications of Romer (1986) and Lucas (1988). These later growth theories are known as 'endogenous growth models' and are based on micro foundations to analyze macroeconomic issues. These models differ from the traditional growth models of Smith, Ricardo, Malthus and Marx and sheds light on the basic approaches of competitive behavior and equilibrium dynamics, the role of diminishing returns and its relation to the accumulation of physical and human capital, the interplay between per capita income and the growth rate of population, the role of technology and technological change in the growth process, discovery of new techniques and the monopoly power as an incentive for technological progress (Barro and Matin: 2004). The basic premises of these theories are also the direction of causation from savings to investment and economic growth. Empirical testing for savings and economic growth nexus in Bangladesh is thus imperative.

The major objective of this paper is to examine the long run relationship between gross domestic savings, and gross domestic product in Bangladesh i.e. to see whether they are cointegrated or not. It also sheds lights on the causal relationship between the considered variables using the time series data for the period 1974 to 2010. Data for gross domestic savings (GDS), and gross domestic product (GDP) were taken from the Bangladesh Bureau of Statistics (2012).

To examine the dynamic linkages among the variables the paper has taken into account of various modeling issues that arise in causality framework. The study considers the stationary properties of the data on output and investment by applying the Augmented Dicky Fuller (ADF) test. Then the Johansen and Juselius test has been applied to examine the cointegration i.e. the long run relationships among the variables. The Error Correction models and Granger causality test have been applied to examine the short run dynamics of long run relationships between savings and output.

The paper is articulated as follows. After introducing the issues in section 1, section 2 provides a brief review of the recent literature on the issue. Section 3 sheds light on the relationship among savings and economic growth trend in Bangladesh. Section 4 sets out the framework for testing stationarity, cointegration, error correction models and causality between the variables and also reports and interprets the results. Finally, section 5 concludes the paper with policy implications.

2. Brief Review of the Literature

The role of savings on economic growth has widely been discussed in both theoretical and empirical literatures. According to Keynes an increase in investment has additive effect on aggregate demand, which led to decrease in unintended inventory and consequently increase in output level (Froyen: 2002), while the classical economists explained the economic growth into the class division between the worker (labor) and capitalist class. According to the classical economists' labor as a class gets subsistence wage and consume all of their proceeds and thus do not contribute to economic growth. Capitalist, on the other hand contribute to the economic growth by investing part of their profit to the directly productive activities and on discovering new technologies for reaping more benefit. Hence in the classical model capitalists' savings and so the investment positively affects technology, which led to the upward shift of the aggregate production function and so the level of output (Foley and Michl, 1999).

Harrod (1939) and Domar (1946) models of growth, which are biased to Keynesian analysis in examining economic growth conclude that the new investments representing net addition to the capital stock is the engine of economic growth. However, empirical evidence for Harrod and Domar was not strong enough, thus led to the emergence of Solow (1956) and Swan (1956) model. These models are known as exogenous growth model and are based on new classical production function of Cobb Douglas variety and assume diminishing returns to each input and constant returns to all inputs together. However, the empirical evidence found that growth of the output is exogenously determined and most part of growth can be explained by Solow residuals. The implication is that the accumulation of capital stock has only the level affect on output, thus is not denying explicitly the role of investment (Hossain, 2011a:415).

Following Solow, authors such as McKinnon (1973) and Shaw (1973) supported the view that saving plays a crucial role in economic development. This is true because rising saving increases the level of investment, thereby accelerating economic growth (Sinha and Sinha, 1998). In the life-cycle hypothesis, Modigliani (1970) suggested that higher growth raises the life-time wealth of young (working) savers relative to retired (non-working) dissavers, thus raising the total savings of the economy. The increase in national savings in turn leads to higher investment and expansion of output.

Economists mislay their interests on the traditional growth theories of Harrod and Domar and Solow and Swan due to the lack of wide empirical evidence and in the backdrop of short run fluctuations of output due to mainly the oil shocks in many developing and developed countries. Bacha (1990) and Jappelli and Pagano (1994) claimed that savings contribute to higher investment and higher GDP growth in the short-run. However, the Carroll-Weil hypothesis (Carroll-Weil, 1994) states that it is economic growth that contributes to savings, not savings to growth. Thus, establishing the unidirectional causality from output growth to savings.

In the late 1980s long run growth theories back in fashion in the mainstream economic analysis after the publications of Romer (1986) and Lucas (1988). Their work has further been extended by Arrow (1962), Sheshinski (1967) and Uzawa (1965). These models ignored the diminishing returns to capital (which was the central assumption of the neoclassical exogenous growth models) by using a broad class of capital goods using the concept of human capital along with the tangible capital goods and concluded that individual investors invests a portion of their capital besides directly productive activities to research and development which thought to constitute social overhead capital and thus have positive impact on output. Thus the above discussion provides an indication that investment that resulted from the accumulation of capital (from savings) has causal impact on output growth. However, reverse causality has also been well documented (Chakravarty, 1993 and Solimano, 1997).

Sinha (1996) presented evidence that economic growth Granger causes growth of savings in Pakistan. Further, Sinha and Sinha (1998) found that causality was from the economic growth to growth of savings in Mexico. Sinha (1999) examined the relationship between the increase of savings and economic growth in Sri Lanka. In this study, the causality was from gross domestic savings to economic growth. However, Sinha (2000) did similar studies in the Philippines and found causality from economic growth to domestic savings.

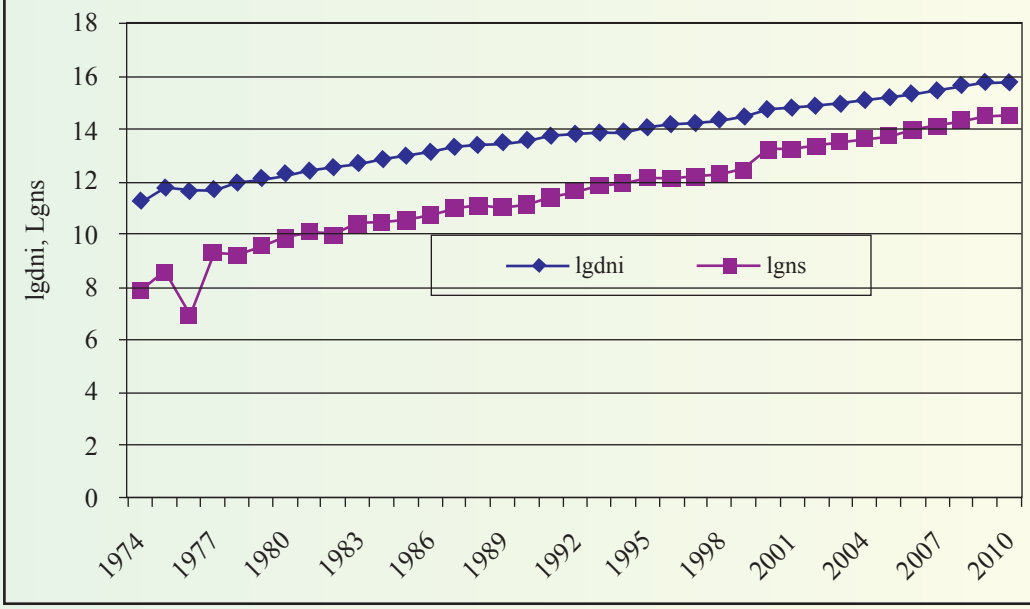
Olajide (2009) employed the Toda and Yamamoto (1995) and Dolado and Lutkepohl (1996) methodology to investigate the direction of causal relationship between saving and economic growth in Nigeria during the 1970 to 2006 period. The causality test results the existence of a unidirectional causality between savings and economic growth and the complementary role of FDI in growth.

Though the empirical literature on savings and economic growth are ample, for Bangladesh it is quite nascent that applied time series econometric techniques. An early study by Chowdhury (2001) examined the impact of financial liberalization on private savings in Bangladesh. A recent study by Agrawal and Sahoo (2009) emphasized on the determinants of savings and examined the impact of financial development (measured through the number of bank branches and financial policies, such as the interest rates on bank deposits and broad money) on the savings rate. This paper focuses mainly on the trends of saving and economic growth in Bangladesh as well as the direction of causality of the savings-growth relation.

3. Savings-Economic Growth Nexus in Bangladesh[1]

Bangladesh, a resource scarce country is burdened by over mass of population. However, is motivated to achieve economic growth since its independence in 1971. In a war-damaged economy, the domestic savings and so the accumulated capital was so low for investment in directly productive activities. The economy follows socialistic attitude in economic management and the government nationalizes all heavy industrial states. The rebuilding and using these states and so new addition to the capital stock was the sole responsibility of the state and the economy suffers from low economic growth. In the 1980s, being advised by the World Bank and IMF Bangladesh has adopted economic liberalization as a strategy to rapid economic growth. Private savings and investment in this period becomes substantial in the business and in the industrial sector. This results a sustained growth (though low) of output over a long period of time. The following figure gives some insights on the behavior of Bangladesh's gross national savings and gross national income over the period of 1974 to 2010.

Figure 1: Savings-Economic Growth Nexus Bangladesh



It is clear from the figure that although savings and output drift apart at times, they follow common stochastic trends implying that they are cointegrated. However, this needs to be addressed by using recent econometric development in the literature.

4. The Analytical Framework

4.1 Data

This study is based on the annual data for the period 1974 to 2010 taken from the various publications of the Bangladesh Bureau of Statistics (BBS). Data for gross national savings (GNS) and gross domestic product (GDP) as an indicator of economic growth were taken from the Bangladesh Bureau of Statistics (2012). Econometrics estimation has been done by using Eview-7.0.

4.2 Methodology and Results

The traditional practice in testing the direction of causality between two variables has been to use the standard Granger (1969) framework. In a two variables system the standard Granger causality test consists of estimating the following equations:

$$Y_t = \beta_0 + \sum_{i=1}^{m} \beta_i Y_{t-i} + \sum_{j=1}^{n} \alpha_j X_{t-j} + u_t \qquad (1)$$

$$X_t = \gamma_0 + \sum_{i=1}^{m} \gamma_i X_{t-i} + \sum_{j=1}^{n} \delta_j Y_{t-j} + v_t \qquad (2)$$

where u and v are mutually uncorrelated white noise error series and *t* denotes time period. Causality may be determined by estimating equations (1) and (2) and testing the null hypothesis that $\alpha_j = \delta_j = 0$ for all j's against the alternative hypothesis that $\alpha_j \neq \delta_j = 0$ and for at least some j's. If the coefficients's are statistically significant but δ_j 's are not, then Y is said to have been caused by X. The reverse causality holds if δ_j 's are statistically significant while α_j 's are not. If both α_j and β_j are significant, then causality runs both way.

The stationarity properties of the series are not taken into consideration in the standard Granger causality test which may report one-way, or two-way causality or no causality. However, if the variables are cointegrated, the modified Granger causality test rules out the possibility of no causality when the variables share a common trend. The estimation of the Granger causality test involves three steps. Step I includes the identification of the order of integration of the variables under consideration. Cointegration can be tested through the Engle-Granger two-step method (Engle and Granger, 1987) or by the Johansen and Juselius (1990) in step II. In this study we use the latter approach. In step III, we proceed with the standard Granger causality test by adding the residuals obtained from the cointegrating regressions (as error-correction terms) in estimating the modified Granger causality equations.

4.3 Testing for the Order of Integration

The first step consists of determining the order of integration of the variables under consideration. This is done by using the Augmented Dickey- Fuller (ADF) test (Dickey and Fuller, 1981) as follows:

$$\Delta Q_t = \phi_0 + \phi_1 t + \gamma_0 Q_{t-1} + \sum_{i=1}^{n} \psi_t \Delta Q_{t-1} + \varepsilon_t \qquad (3)$$

In the above equations, Q_t is a random walk with drift around a stochastic trend, Δ is the first difference operator, ε_t is the white noise error term. The null hypothesis that Q is a nonstationary time series is rejected if γ_0 is less than zero and statistically significant. The ADF test is carried out by replacing Q_t with GDP_t and GNS in equation (3) respectively.

The result is further justified by Phillips and Perron (1988) test. The results of these tests are presented in Table 1.

Table 1: Test for Integration

Variable	ADF		Phillips-Perron	
	Level	First Difference	Level	First Difference
lngdp	-1.185	-10.204*	-1.717	-10.280*
lngns	-1.209	-11.845**	-1.186	-17.217*

Note: * and ** denotes the rejection of the null hypothesis at the 1% level and 5% level respectively.

Source: Authors own formulations based on Eviews 7.0

Table 1 shows that the time series are non stationary i.e. *I(0)* at their levels, while first difference made them stationary. That is each of the series lngdp and lngns are integrated of order 1, *I(1)*.

4.4 Testing for Cointegration

The existence of a long-run relationship between economic variables is considered as cointegration (Thomas, 1993). In other words, a long-run relationship means that the variables move together over time so that any short-run deviations from the long-run trend will be corrected (Manning and Andrianacos, 1993). The main idea behind cointegration

is that if, in the long-run, two or more series move closely together, even though the series themselves are trended, the difference between them is constant. It is possible to regard these series as defining a long-run equilibrium relationship, as the difference between them is stationary (Hall and Henry, 1989). A lack of cointegration suggests that such variables have no long-run relationship and they can wander arbitrarily far away from each other (Dickey et. al., 1991).

Figure 1 shows that the series have a common movement that is they may be cointegrated. Empirically this calls for testing for the existence of linear independent and the so called cointegrating relationship:

$$\sum_{j=1}^{2} \chi_{jt} Y_{jt} = \nu_{it} \quad i = 1,\ldots\ldots,r \qquad (4)$$

The υ_{it} are *I(0)* series, although the Y_{jt} are *I(1)*. Under *I(0)* of υ_{it} the long run relationship of Y_{jt} (j= 1, ..2) is determined by 2-r common trends. This can be tested empirically either by Engle-Granger (1987) two step cointegration procedures or by Johansen-Juselius cointegration (1990) technique. We relied on Johansen-Juselius cointegration technique, which requires identifying the number of cointegrating vectors, namely the trace statistic and the maximum eigenvalue test statistic. The Trace test statistic for the null hypothesis that there are at most *r* distinct cointegrating vectors is

$$\lambda_{trace} = T \sum_{i=r+1}^{N} \ln(1 - \lambda_i) \qquad (5)$$

where, λ_i's are the N-*r* smallest squared canonical correlations between Y_{t-k} and ΔY_t (where $Y_t = (\text{In } gdp_t)$[1] and all the variables in Y_t are assumed *I(1)*), corrected for the effects of the lagged differences.

The maximum eigenvalue statistic for testing the null hypothesis of at most *r* cointegrating vectors against the alternative hypothesis of *r* + 1 cointegrating vectors is given by

$$\lambda_{\max} = -T \ln(1 - \lambda_{r+1}) \qquad (6)$$

Johansen (1988) and Johansen and Juselius (1990) shows that equations (2) and (3) have non-standard distributions under the null hypothesis and provides approximate critical values for the statistic, generated by Monte Carlo methods. Table 2 shows the results of the application of Johansen procedure.

Table 2: Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.430831	21.67765	15.49471	0.0051
At most 1	0.054257	1.952446	3.841466	0.1623

Note: Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 3: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.430831	19.72520	14.26460	0.0062
At most 1	0.054257	1.952446	3.841466	0.1623

Note: Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Authors own formulations based on Eviews 7.0

Table-2 and Table 3 shows the result of trace tests of Johansen and Juselius (1991) suggest that the considered time series are cointegrated. That is there is at least one cointegrated relationship at 1% level of significance implying that there is a stable long run relationship between gross national savings and gross domestic product in Bangladesh. That is additive savings have some important long run implications to changes in GDP in Bangladesh. However, we need to test what happens to their relationship in the short run, which is shown from the results of error correction models.

4.5 The Error Correction Models

Since the considered variables are cointegrated, the standard Granger causality test is modified by incorporating the error correction terms obtained from the cointegrating regressions as follows:

$$\Delta Y_t = \beta_0 + \rho_1 \eta_{t-1} + \sum_{i=1}^{m} \beta_i \Delta Y_{t-i} + \sum_{j=1}^{n} \alpha_j \Delta X_{t-j} + u_t \qquad (7)$$

$$\Delta X_t = \gamma_0 + \rho_2 \mu_{t-1} + \sum_{i=1}^{m} \gamma_i \Delta X_{t-i} + \sum_{j=1}^{n} \delta_j \Delta Y_{t-j} + v_t \qquad (8)$$

where all variables are stationary time series, is the first difference operator and and are the error correction terms which represents the lagged residuals from the cointegrating equations, *m* and *n* are the lag lengths chosen by the Akaike Information Criterion (AIC) and and are the disturbance terms. X is said to Granger- cause Y not only if 's are jointly significant but also if is significant. Similarly, Y is said to Granger- cause X not only if 's are jointly significant but also if is significant.

This equation system represents vector autoregression (VAR) in first differences, which also has error correction terms and allows examining the short run dynamics of the long run relationship among the considered variables. The coefficient of the error correction term must be seen as correcting towards and equilibrium subspace i.e. how adjustment is taken place in the short run to maintain stable equilibrium long run relationship among the considered variables. The coefficient of the lagged values of the variables show whether the independent variable causes the corresponding dependent variable (Ramos, 2001). The result of the causality tests are shown in table 4.

Table 4: Estimation of the Error Correction Models

Error Correction:	D(LGDP)	D(LGNS)
CointEq1	0.026054	1.47159
	[3.4855]	[5.5872]
D(LGDP(-1))	-0.04027	-0.65371
	[-1.9714]	[-9.0810]
D(LGDP(-2))	-0.18358	1.019805
	[-1.1776]	[1.9855]
D(LGNS(-1))	0.03822	0.281737
	[8.6266]	[1.9644]
D(LGNS(-2))	0.01916	0.16854
	[6.5946]	[1.9621]
C	0.13855	0.08754
	[4.1625]	[0.7464]

Note: Figures in the parenthesis represent 't' statistic
Source: Authors own formulations based on Eviews 7.0

Table 5: Pairwise Granger Causality Tests (Direction of Causality)

Sample: 1974 2010, Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
LGNS does not Granger Cause LGDP	35	5.40330**	0.00991
LGDP does not Granger Cause LGNS		18.0492*	0.00007

Note: * and ** denotes the rejection of the null hypothesis at the 1% level and 5% level respectively.

Source: Authors own formulations based on Eviews 7.0

The result error correction models and Granger causality models are explored in table 4 and 5. It can be seen that Granger test provides bidirectional causality from gross national savings to gross domestic product. The same is also true in the error correction models.

It is also clear from table 4 that both savings and output, respond to a deviation from long run equilibrium. The coefficient of the error correction term in both equations is statistically significant implying that both variables respond to the discrepancy from long run equilibrium. It is revealed from table 4 that the coefficient of the error correction term is not only statistically significant but also positive. That implication of the result is that changes in gross national savings causally affect gross domestic output in the short run.

5. Conclusion

The paper explores the dynamic causal relationship between gross national savings and gross domestic product in Bangladesh over a long period of time by applying Granger causality test, Johansen and Juselius cointegration test and Engel and Granger error correction models considering the stochastic properties of the variables. The main concentration of the paper is to address the issue of the short run dynamics of the savings and gross domestic product within a long run relationship. The estimated results show that both variables are nonstationary at their levels and stationary at first differences. Then using Johansen's cointegration technique it has been found that both the considered variables are cointegrated, implying that there is a stable long run relationship between gross national savings and gross domestic product. The error correction model shows that the considered variables drift apart in the short run. The study found bidirectional causality from savings to output. The result implies that savings can be an independent stimulus to the economic activity not only in the long run but also in the short run. The Granger causality test shows the same result. Therefore attempts have to be made to increase national savings so as to sustained increase in national output in Bangladesh.

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[1] This section draws heavily on Hossain, M.A (2011a).

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Main Coverage of BBTA Journal

The Main Coverage of BETA Journal is based on identifying the issues and questions emerged due to applications of monetary and macro-financial policy steps and measures and their practical implications on different markets aiming at help the policy makers. The thrust areas are:

(a) To review the current monetary policy framework of Bangladesh Bank to ensure continuing effectiveness of monetary policies: The monetary policy framework needs to evolve as market deepening and changes in degree of openness affect existing transmission channels and open up new ones monetary targeting retains relevance in less advanced, less open economies while inflation targeting is the more typical framework in advanced open economies. The linkages between prices and the various monetary variables utilized in the monetary policy framework need to be reviewed from time to time, to ensure relevance in the evolving market context.

(b) To review the linkages between price variables and monetary variables evolving with time in the Bangladesh economy: Review linkages between real sector growth variables (GDP,GNP), price variables (CPI, WPI, asset prices, interest rates, exchange rates) and monetary variables (M2, M3, credit growth, bop trade, current and capital account balances and so forth), examining the trends of correlations, leads and lags, examining the trends of correlations between real sector and financial sector prices, to ascertain the likelihood of inflation targeting being a suitable option for Bangladesh.

(c) To review the present regulatory and supervisory framework to identify needs of changes for enhancing financial sector resilience and stability: techniques of risk-based integrated supervision and regulation of banks and financial institutions need to be strengthened in line with Basel core principles to ensure solvency, liquidity, capital adequacy and sound risk management in banks and financial institutions of Bangladesh.

(d) To develop appropriate measures to further deepen financial markets in Bangladesh: financial markets in Bangladesh are shallow, with little in secondary market activity other than modest extent of trade in treasury bills and bonds. Liquid secondary markets in financials assets are important for increasing availability of funds for long term investments.

(e) To create opportunities and spaces for broader financial inclusion and access: large segments of population and of economic activities still remain unserved or underserved by financial market. Proactive thrust on fuller financial inclusion is important for rapid poverty eradication with inclusive growth.

Therefore, theoretical as well as empirical research papers, reviews, case studies etc. challenging the present paradigms, assumptions and on-going changes in the Bangladesh financial market are encouraged. **The thematic coverage includes but is not restricted to:**

Papers on Monetary Policy and Macroeconomics;

1. Uncertainty and Risk around the BB's Macroeconomic Forecasts
2. Thresholds or Dates in Monetary Policy Communications
3. Market Expectations for Monetary Policy in Bangladesh
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BBTA Journal

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Thoughts on Banking and Finance is a half-yearly peer reviewed journal of Bangladesh Bank Training Academy devoted to the examination and critical analysis of economic, banking and financial issues. The journal publishes original empirical, methodological, policy and theoretical papers, contemporary and historical case studies, conference reports, and book reviews that address the topical issues of the relevant areas. The journal seeks to serve a broad range of economists, banking and finance professional in academia and industries. While the journal welcomes divergent views on economic, banking and financial topics, the journal also publishes views from research scholars on other disciplines such as law, management studies, public policy, ethics, information science, environmental and societal challenges concerning sustainable development and sustainable future.

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Submissions of Manuscripts are invited on significant, original, and previously unpublished research on all aspects of economic, banking and financial issues from both within Bangladesh and overseas. BETA will not accept any paper which, at the time of submission, is under review for or has already been published, or accepted for publication in a journal or to be presented at a seminar or conference. Papers will be subject to blind peer review. Selection criteria include accuracy and originality of ideas, clarity and significance of results and quality of presentation. Papers will be judged based on the usual measures of quality with consideration of the relevance to the theme. For complete instructions for authors, please see the following guidelines.

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Guidelines for the Paper Contributors

BETA Journal Thoughts on Banking and Finance is published twice in a year by Bangladesh Bank Training Academy (BBTA), Mirpur, Dhaka. It is a referred journal and publishes articles in the areas of economics, central banking, commercial banking and finance as well as problems of economic development, in particular of Bangladesh and

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All communications should be addressed to the following:

Rokeya Begum
Thoughts on Banking and Finance
General Manager
Research and Publications Wing
Bangladesh Bank Training Academy
Mirpur-2,Dhaka-1216
Telephone: 8034672, 01714339417, Fax: 8032110
E-mail: bbta.respub@bb.org.bd

Introduction to Bangladesh Bank Training Academy (BBTA)

Bangladesh Bank Training Academy (BBTA) is a training wing of central bank of Bangladesh, Bangladesh Bank pursues tasks of capacity building and human capital development in order to prepare skilled human resources in central bank as well as for commercial banks. BBTA organizes different training courses, training workshops, conferences, seminars and other related activities on main topics of economics, banking and finance, financial sector development, human resources development and macroeconomic management. It was established in 1977.

BBTA's Mandate

The purpose of the Academy is to undertake training activities for enabling the officials of central bank and the banking sector to perform their jobs efficiently well-equipped with the latest knowledge of economic, financial and banking developments. To this end, BBTA extends its all-out efforts to facilitate training to personnel engaged in the financial sector. It also works to modernize its library and information center to collect, systematize and disseminate information in the financial arena. Recently, a plan has been adapted to reorganize BBTA library as a **Knowledge Management Centre (KMC).** This new role puts more weight on BBTA for knowledge creation and application. Since information is important to create new knowledge for educating staff and professionals, we hope that it would contribute to the creation of knowledge and disseminate knowledge for use by others.

BBTA's Strategic Objectives

Bangladesh Bank has adopted its 5-year **Strategic Plan 2010-2014** and bestowed responsibilities upon BBTA (Strategy # 13, Objective 13.2) to adopt all-out efforts to enhance professional excellence and grooming of the officers of Bangladesh Bank. To fulfill the target of the plan document, BBTA has been employing its full capacity to providing need-based training to the officials both from central bank and commercial banks; continuously striving to diversify the contents of its courses in order to ensure their consistency with evolving training needs; facilitating the practical application aspects of knowledge of economics, banking and finance; and developing training as a scientific discipline.

In order to achieve the above mentioned strategic objectives, BBTA has introduced the following initiatives.

1. Building and enhancing training capacities of the trainers;
2. Improving quality, efficiency, impact and cost-effectiveness of training programs;

3. Linking training with real-world cases and experiences;
4. Building training partnership programs with the public and private sector domestic and overseas training institutions;
5. Building and maintaining the BBTA financial institutions information system,
6. Utilization of the Internet for dissemination of the Academy's biannual Journal 'Thoughts on Banking and Finance';
7. Building a database on trainers and training institutions in the field of banking and finance; as well as
8. Facilitating the digitization of BBTA documents.

Organization

The Executive Director is the head of the Academy. There are seven wings to look after the administration, training and research programs of the Academy.

Location

The Academy is located in Mirpur-2, Dhaka-1216, Bangladesh.

Mailing Address

Bangladesh Bank Training Academy (BBTA), Mirpur-2, Dhaka-1216, Bangladesh
Telephone: 88-02-8032801-10, Fax: 88-02-8032110 Web: www.bb.org.bd

Volume 3 Issue 1 Thoughts on Banking and Finance January-June 2014

Published by General Manager, Department of Communications and Publications, Bangladesh Bank, Head Office, Dhaka, Bangladesh. website: www.bb.org.bd
Printed by Perform Color Graphics (Pvt.) Ltd. 180, Fakirapool, Dhaka-1000.
DCP-3-2015-1000