



Financial Engineering and Risk Management Practices: A way ahead to the Innovations in India

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Abstract: *In the interest of all financial intermediaries including commercial and corporate banks, insurance companies and other financial institutions, the last three decades have witnessed a phenomenal growth in innovations in financial markets. Globalization, Liberalization and Privatization have appended both the risk and rewards to these innovations. This paper discusses various new financial innovations in the field of banking, insurance, capital market and mutual funds in India by comprehending the salient features, advantages and disadvantages of the various financially engineered products and processes. The paper also tries to discuss the way ahead for India in the field of financial innovations.*

Keywords: Innovation, Banking, Insurance, Capital Market, Mutual Funds

I. INTRODUCTION

There are numerous definitions of financial engineering, but most revolve around managing and reducing financial risk. A few definitions from popular books and web sites include the following: "The process of financial engineering can be ... viewed as the 'fine-tuning' of an existing financial product to improve its return or risk characteristics in light of changing market conditions. It can be considered as a process which allows existing financial products to be overhauled and restructured to take advantage of changed taxation, legal or general economic climate."

The rapidity with which corporate finance, bank finance, and investment finance have changed in recent years has given birth to a new discipline that has come to be known as financial engineering. The field of financial engineering has attracted people with an assortment of backgrounds and perspectives. The term financial engineering means different things to different people like commercial

bankers, investment bankers, corporate treasurers, corporate recruiters, financial engineers, financial analysts, and others. The field is not yet very well defined and each practitioner tends to view his or her own body of experience as the crux of that which constitutes the discipline. "Financial engineering refers to the application of various mathematical, statistical and computational techniques to solve practical problems in finance. Such problems include the valuation of derivatives instruments such as options, futures and swaps, the trading of securities, risk management and regulation of financial markets. No single set of mathematical tools, computational techniques or financial theory describes financial engineering. Rather, it is the synthesis of a variety of these elements. Financial engineering is a practical field and a practitioners' field by its nature. It is driven in large part by practical problems that arise in the course of daily business; the nature of the problems demand that practitioners draw from as broad a palate of tools as possible to find the best solutions to their problems. A second, related definition is

that financial engineering is the use of financial instruments such as forwards, futures, swaps, options, and related products to restructure or rearrange cash flows in order to achieve particular financial goals, particularly the management of financial risk."

OBJECTIVES:

The paper endeavors to track the growth of:

1. New financial instruments,
2. New forms of mutual funds,
3. New types of life insurance products,
4. New form of residential mortgages and
5. New risk management instruments introduced in India.

II. LITERATURE REVIEW

To counter inflation Modigliani and Lessard (1975) discussed CPI linked home mortgage instrument, Blinder (1976) discussed instruments that can hedge inflation risk related to commodities and finally Merton (1992) suggested indexing retirement annuities to aggregate per capita consumption. Merton's suggestion is based on the lifetime household optimizing behaviour model. The product is only conceivable for Indian markets if there is partnership between the government and the private sector to make this type of product possible.

Dufey and Giddy (1981) in their theory of innovation in international market found that innovations in international market arise usually when the financial institutions are able to fulfill one of the four functions: (a) Liquid and standardized instruments for payments in individual currencies;

(b) Mechanism for conducting monetary exchange between currencies; (c) Institutions and market for channeling savings internationally; and (d) As a mechanism for allocating, diversifying and compensating for risk.

Silber (1983) identified the exogenous cause for financial innovations in US for a period from 1970-82. He found that inflation (level of interest rates, general price level and tax effects), volatility of interest rates, technology, legislative initiatives and internationalization are the factors responsible for financial innovations. Finnerty (1988) identified 11 factors contributing to the growth of financial engineering. The factors include tax advantage, reduced transaction cost, reduced agency cost, risk reallocation, increased liquidity, regulatory and legislative factors, level and volatility in prices and interest rates, accounting benefits and technological developments. Finnerty has also analyzed how each of the factor contributes to the growth of the selected debt innovations, selected preferred stock innovations, selected convertible debt / preferred stock innovations and selected common equity innovations.

Bodie (1990) found that pension funds have contributed significantly in the development of new debt and equity securities and derivative instruments. A pension plan generally tends to offer annuities providing a guaranteed flow of return.

Verghese (1990) concluded that the Indian financial system consists of gaps and deficiencies which need to be filled in. India can not afford rapid proliferation of financial products. The systemic risk arising from regulated financial innovations is significant and hence can't be ignored. Financial innovation provides opportunities for hedging risk and reducing

individual transaction cost but at the same time exposes economic units to additional costs and risk by creating new risk and sometimes resulting in ballooning of transactions.

Merton (1992) saw financial innovations performing six very important functions including moving funds across time and space, pooling of funds, managing risk, extracting information to support decision making, addressing moral hazard and asymmetric information problem and facilitating sale or purchase of goods and services through a payment system.

Frame and White (2004) surveyed and summarized existing empirical literature on financial innovations. They found that regulations tend to spur a series of financial innovations. There exists a positive relation between adoption and diffusion of new technologies and institution size.

III. GLOBALIZATION, FINANCIAL ENGINEERING AND THE CRISIS

Innovative financial products which were mismanaged by the bankers and customers are often criticized and held responsible for the Global financial crisis (2008). It should however be noted that financial engineering is a profession which is to be governed by the conduct of professionals. The passion to succeed and greed to earn supernormal profits marred the foresight of the professionals from estimating the risks associated with financially innovated products. To service the bonds backed by sub -prime mortgages, the banks started using the income stream of their prime/default free mortgages. This laid the foundation for financial crisis. Hence, there was collapse of many big players including Freddie Mac, Fannie Mae, AIG, Lehman Brothers and Merrill Lynch. Hence the crisis can be linked to the bad performance of a large number of top

executives in the financial engineering profession and not to the profession of financial engineering itself. The solution to the current global financial crisis will be there only by using the financial innovations intelligently and by incorporating the objective of social welfare in mind.

India as an emerging nation is seeing a spate of innovations in the area of financial engineering. These financial innovations are a result of number of Government regulations, tax policies, globalization, liberalization, privatization, integration with the international financial market and increasing risk in the domestic financial market. Alternative financial institutions including nationalized banks, commercial paper houses, insurance companies and investment banks play a significant role in creation, development and dissemination of new financially engineered products in the society. The following section discusses the recent innovations in Indian banking sector.

IV. FINANCIAL ENGINEERING IN THE BANKING SECTOR

Banks in India have traditionally offered mass banking products and most common deposit products being Savings Bank, Current Account, Term deposit Account and lending products being Cash Credit and Term Loans. Due to Reserve Bank of India guidelines, Banks have had little to do besides accepting deposits at rates fixed by Reserve Bank of India and lend amount arrived by the formula stipulated by Reserve Bank of India at rates prescribed by the latter. PLR (Prime lending rate) was the benchmark for interest on the lending products. But PLR itself was, more often than not, dictated by RBI. Further, remittance products were limited to issuance of Drafts, Telegraphic

Transfers, Bankers Cheque and Internal Transfer of funds.

In view of several developments in the 1990s, the entire banking products structure has undergone a major change. As part of the economic reforms, banking industry has been deregulated and made competitive. New players have added to the competition. IT revolution has made it possible to provide ease and flexibility in operations to customers. Rapid strides in information technology have, in fact, redefined the role and structure of banking in India. Further, due to exposure to global trends after Information explosion led by Internet, customers - both Individuals and Corporates - are now demanding better services with more products from their banks. Financial market has turned into a buyer's market. Banks are also changing with time and are trying to become one-stop financial supermarkets. Market focus is shifting from mass banking products to class banking with introduction of value added and customised products.

A few foreign & private sector banks have already introduced customized banking products like Investment Advisory Services, SGL II accounts, Photo-credit cards, Cash Management services, Investment products and Tax Advisory services. A few banks have gone in to market mutual fund schemes. Eventually, the Banks plan to market bonds and debentures, when allowed. Insurance peddling by Banks will be a reality soon. The recent Credit Policy of RBI announced on 27.4.2000 has further facilitated the entry of banks in this sector. Banks also offer advisory services termed as 'private banking' - to "high relationship - value" clients.

The bank of the future has to be essentially a marketing organisation that also sells banking products. New distribution channels are being used;

more & more banks are outsourcing services like disbursement and servicing of consumer loans, Credit card business. Direct Selling Agents (DSAs) of various Banks go out and sell their products. They make house calls to get the application form filled in properly and also take your passport-sized photo. Home banking has already become common, where you can order a draft or cash over phone/internet and have it delivered home. ICICI bank was the first among the new private banks to launch its net banking service, called Infinity. It allows the user to access account information over a secure line, request cheque books and stop payment, and even transfer funds between ICICI Bank accounts. Citibank has been offering net banking to its Suvidha program to customers.

Products like debit cards, flexi deposits, ATM cards, personal loans including consumer loans, housing loans and vehicle loans have been introduced by a number of banks. Corporates are also deriving benefit from the increased variety of products and competition among the banks. Certificates of deposit, Commercial papers, Non-convertible Debentures (NCDs) that can be traded in the secondary market are gaining popularity. Recently, market has also seen major developments in treasury advisory services. With the introduction of Rupee floating rates for deposits as well as advances, products like interest rate swaps and forward rate agreements for foreign exchange, risk management products like forward contract, option contract, currency swap are offered by almost every authorised dealer bank in the market.

Public Sector Banks like SBI have also started focusing on this area. SBI plans to open 100 new branches called Personal Banking Branches (PBB) this year. The PBBs will also market SBI's entire spectrum of loan products: housing loans, car loans, personal loans, consumer durable loans,

education loans, loans against share, financing against gold. Financial engineering in the banking sector tries to ensure that the banking becomes competitive and performance oriented. The recent innovations in the Indian banking sector have been discussed below:

1. Rollover Overdraft

In 2008 the brokers developed a perfectly legal process by which they remain afloat without having to pay. In this circuitous transaction a broker avails the overdraft facility from bank A with a provision that it has to be repaid in 5 days. Normally on day 4 the broker will issue a cheque to bank A from his account with bank B. During current liquidity crisis the broker may have insufficient funds in that account. To overcome this problem of insufficient funds the brokers have innovated a new financial process whereby the broker, bank A and bank B come together to overcome the liquidity crisis. The process is applicable only for high value cheques and if RTGS facility is offered by bank A and bank B. On day 4 being a high value cheque it is cleared on the same day by bank A which accept the cheque and agrees to cancel the outstanding overdraft amount even before the cheque has been encashed.

2. Electronic Fund Transfer

RTGS/NEFT facility enables customers to transfer fund from one bank to the other within a very short time. It has the advantage of making a customer closer to his own funds. There exists three mode of electronic payment: Real Time Gross Settlement (RTGS), National Electronic Fund Transfer (NEFT) System and Electronic Clearing Service (ECS). NEFT is available for transaction below 1 lakh while RTGS is available for transaction over 1 Lakh.

3. Prefunded Cheque

India is a country of large number of festivals involving exchange of gifts. Financial engineering has been innovatively combined with Indian culture of frequently giving gifts using prefunded cheques. Under this facility one can gift the prefunded cheques to any of his/her relatives or friends who can encash it. One of the advantages is that it can be gifted to anyone and is less expensive than a banker's cheque or a demand draft. It also provides safety as the sponsor of the gift does not require carrying cash for giving the gift. They have an upper limit inscribed on them and can be used as gift cheques, travelers cheques or as a normal cheque. In India, it is being used primarily during the festivity of Rakhi, Bhai Dooj and Dusshera.

4. Cheque Truncation System (CTS)

Banks have extended the CTS facility of same date clearing to cheques of even smallest denominations. Currently this facility is only available to high value cheques. It will replace the current Magnetic Ink Character Recognition (MICR) technology which requires physical movements of cheques. It will add huge value to the customers as it saves 1-2 days in getting collections through banking channels. Currently it is being tried on a pilot basis.

5. Biometric ATMs for National Rural Employment Guarantee Act (NREGA)

Financial engineering and Biometric technology have been combined very innovatively to implement disbursement under the NREGA (2005). To reduce corruption, the rural people under NREGP can get their thumb impression registered at the biometric ATM and can subsequently withdraw money using the thumb impression. It will greatly benefit large number of illiterate and

simple Indian rural citizens. Hence, in India, financial and technological innovations are being used to achieve the objective of social welfare. Apart from this, general biometric ATMs provide secure and convenient transactions and have the benefits of security pin as well.

6. Mobile Payment Service by Banks:

In 2008 banks have been permitted by RBI to provide mobile payment services, which enable customers to transfer up to Rs. 25,000 per transaction. Mini statements, checking of account history, alerts on accounts activity, passing of set thresholds, monitoring the term deposit, access to card statement, mutual funds/equity statement, insurance policy/ pension plan management and many other account information services provide the flexibility of anywhere, anytime banking and reduce transaction cost.

7. Fixed Deposit (FD) Products:

a. New Deposit cure Investment Product: A fixed deposit scheme with envisages investment of interest earned on term deposit in an equity mutual fund by a way of systematic investment plan. This has an advantage of giving safety on the principal invested in this fixed deposit and a possibility to earn additional return on interest earnings.

b. Gold Deposit: In this deposit one can ensure safety of idle gold and earn interest on it. Certain banks (like SBI) are accepting gold in any form with restriction of minimum gross quantity and thereby issuing interest bearing certificates against deposits. The certificates have fixed maturity period and premature payment is permitted only after certain lock in period.

8. Dual Facility on Single Card

There already exists credit card which offers a line of credit to the user with a condition that the credit amount will be paid back within a specified time period. On the other hand there exists Debit cum ATM card which allows an individual to use funds available in his bank account. Banks have innovated the dual facility on single card option whereby the user will have debit as well as credit facility in a single card. The card will reduce the cost, improve efficiency and free the user from the requirement of carrying multiple cards.

9. Reverse Mortgage Product

The reverse mortgage scheme available in India enables monthly payment against the mortgage of the home, so long as one continues to live at home. There is no repayment obligation on the owner, as the loan will become due only on the death of the owner or the last surviving spouse. This loan product does not have any income criteria to be met. The legal heirs will have the right to repay the loan. In case the legal heirs do not repay the loan the bank will sell the property and set off the outstanding loan amount.

V. CONCLUSION

The current research has made a noble attempt to discuss the application of financial engineering in the banking sector in India. Internationalization leads to a spurt of financial innovations in India and the world. The harm that has been caused by securitized instruments backed by subprime mortgages has been widely discussed in existing literature. The review of literature discusses the factors that have contributed to the growth of financial engineering and the lessons India can learn from international experience. While discussing the innovations in the banking sector the paper has discussed 10 innovations in this sector. The banking innovations aim at making customers

closer to their funds, reduce cost, improve efficiency and provide safety. The existing innovative financially engineered products lack the protection against inflation. In India, there is a great need of innovations especially for senior citizens, poor people, women, rural people as well as a large middle class. There remains scope for development of insurance exchanges, credit reinsurance market, carbon market, property future, weather derivatives, freight derivatives and inflation derivatives. As long as human ingenuity challenges its present for a better tomorrow, there will always exist the scope for financial engineers and financial innovations.

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