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FINANCIAL INNOVATION AND SUSTAINABILITY OF STATE BANK OF INDIA –AN APPLICATION OF MULTIPLE DISCRIMINANT ANALYSIS

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ABSTRACT

This study looks at the various forms of financial innovations that have continuously taken place in the provision of financial products /services in India over a period of 5 years. Over a period of time, India has experienced continued growth in the adoption of various non-cash modes of payment hence the need for continuous studies to establish the effect of these financial innovations in the financial services sector. The objective of this study was to establish the effect of financial innovation on bank sustainability. Though various yardsticks or indicators for banks sustainability have found in literatures; but primarily it depends on economic sustainability. Hence, we have taken mainly financial performance measurement parameters for measuring bank sustainability. The present study is descriptive as well as analytical in nature. The State Bank of India has been selected for study deliberately being the largest commercial banks in India having wide coverage spreading throughout the country. The data, for the purpose of study, were collected from the annual reports of SBI, Bank Sustainability Report of SBI, journals and other relevant published documents. The study was conducted for a period of 5 years, from 2011-12 to 2015-2016. In order to achieve the first objectives, the annual reports of State Bank of India were examined to elicit required information regarding innovative product/services introduced by the bank. For the purpose to examine the impact of product/service innovation on sustainability, Multiple Discriminate Analysis (MDA), a multivariate technique, was used. Findings lead to the conclusion that. The analysis of data leads to the conclusion that financial innovation has increased over the period of time. However financial innovation has less impact on bank sustainability in Indian banking sector.

Keywords- Financial innovation, bank sustainability, financial performance, Multiple Discriminate Analysis (MDA).

INTRODUCTION:

Innovation means the introduction or application of something new- either new goods and services or new ways of producing them. Innovation differs from invention in one essential aspect. Innovation consists of firms developing new products or new production processes to better perform their operations, in which case the new products could be based on the new processes (Tufano, 2002; Lawrence, 2010)[i]. Lerner (2002)[ii] puts forward that innovations are not just critical for firms in the financial services industry, but also affect other companies; for instance, enabling them to raise capital in larger amounts and at a lower cost than they could otherwise and that innovation is an important phenomenon in any sector of a modern economy.

Financial innovation has been an integral component of economic activity for several millennia (Goetzmann, 2009)[iii]. Financial times Lexicon has defined financial innovation as "the act of creating and then popularizing new financial instrument as well as new technologies, institutions and market. It includes institutional, product and process innovation". According to Nofie (2011)[iv], innovations in the finance sector is the arrival of a new or better product and/or a process that lowers the cost of producing existing financial services. Akamavi (2005)[v]also notes that innovation in the financial services sector has led to recent fundamental changes including; deregulation, increasing competition, higher cost of developing new products and the rapid pace of technological innovation, more demanding customers and consolidation of corporations. Financial innovations are the outcomes of various government regulation, tax policies, globalization, liberalization, privatization, integration with the international financial market. Financial innovation is the process through which finance manager add value to existing plain vanilla products that satisfy the user needs. According to John Finnerty "Financial innovation involves the design, the development and the implementation of innovative financial instruments and process and the formulation of creative solution to problems in finance".

BANK SUSTAINABILITY

Bank sustainability means using money with conscious thought about its economic, environment and social impacts and with the support of savers and investors who want to make a difference, by meeting present day needs without compromising those of future generations. This definition of bank sustainability captures the spirit of the concept as originally proposed by the WCED (or which is popularly known as Brundtland Report) in 1987.Thus, it takes into account three aspects, viz.- economic, environmental and social performances made by the banks which together happen to make the concept of 'sustainability' as originally proposed by different international bodies.

<u>Economic performance</u>-Economic/ financial performance refers to how well a firm can use assets from its primary mode of business and generate revenues. Generally financial performance may be used to refer to firm's overall financial health over a given period of time, and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. There are

many different ways to measure economic performance. Tavitiyan, Zhang and Qu (2012)[vi] indicate that return on assets (ROA), average annual occupancy rate, net profit after tax and return on investments (ROI) are the commonly used financial or accounting indicators by firms. According to Bagorogoza and Waal (2010)[vii] other measures of performance are profitability, productivity, growth, stakeholder satisfaction, market share and competitive position.

Environmental performance: Environmental aspect of sustainability means performing activities in such a way that maintain stable resource base, avoid over- exploitation of renewable resource systems or environmental sink functions.

Empirical research from 1990 concluded that traditionally banks were not interested in their own environmental situation or that of their clients. But this situation is now changing. There is growing awareness in the financial sector that environment brings risks (such as a customer's soil degradation) and opportunities (such as environmental investment of funds) Banks are now conscious of the environmental impact of their policies as it might affect the quality of assets and also rate of return of banks in the long run(Sahoo & Nayak,2008)[viii].

Social performance: A socially sustainable system must achieve fairness in distribution and opportunity, adequate provision of social services including health and education, providing better quality products or services to the society.

Strengthening business ethics, providing better quality products/services, protecting rights of customers, setting up channels for customers to address complaints etc.-these are common societal performance elements of banks. Addressing these elements along with their core business, help the banks to improve the level of customer satisfaction for increasing market share and profits ultimately.

Though various yardsticks or indicators for banks sustainability have found in literatures; but primarily it depends on economic sustainability. If a bank sustains economically, then a bank may pursue other indicators to draw competitive advantage.

FINANCIAL INNOVATION AND BANK SUSTAINABILITY:

The financial crisis has created a new realisation of our financial world, leading to the destruction of institutionalised practices and depicting an emerging motivation for change. The link between the financial sector and sustainability or sustainable development is financial innovation. As a concept, financial innovation "embraces changes in the offerings of banks, insurance companies, and investment funds and other financial service firms, as well as modifications to internal structures and processes, managerial practices, new ways of interacting with customers and distribution channels" (Mention and Torkkeli, 2012)[ix]. In other words, it encompasses the making and promotion of financial products and services, the development of new processes, as well as the interaction with customers and the development of new structures for the financial institutions (Mention, 2011). Financial innovation is perceived in the context of strategic approach and behaviour leading to value innovation or"conventional logic" (Costanzo et al., 2003). Studies on the service context by Gadrey et al. (1995)[x], by Frame and White(2009) [xi]and by Avlonitis et al. (2001), identify types of financial service innovations which "are associated with different development processes in terms of activities, formality and cross-functional involvement as well as performance outcomes" (Avlonitis et al., 2001)[xii]. Moreover, the emergence of the role of the user who is willing to contribute both to the development of a service, but also to the technology per se behind the implementation of collaborative services since"users often develop and self-provide important financial services before banks or other types of financial service producers begin to offer them" (Oliveira and von Hippel, 2011)[xiii]. Financial innovation is about understanding the customer, appreciating the information from the partner and differentiating from the competition. Financial innovation is strongly focused on the how, on the process of perceiving the specific needs of every customer, so as to make personalised offerings, so far as the regulation and other constraints permit. A stronger process innovation development leads to understandable tools, content and information ready for the future. Evolving under an organisational and competences-oriented perspective based on customer and partner needs easies the process of creating a competitive advantage by differentiation. This requires a clear strategy and the ability to make choices. Innovation means being able to decide, to admit to being wrong, to be able to realise quickly that if something is not working, it is the time to stop. Innovation means to be able to make hard and difficult choices and the ability to say no. In short, innovation is, first and foremost, a matter of prioritisation and choices.

REVIEW OF LITERATURE:

Some of the important empirical literature in context of financial innovation and bank sustainability are reviewed hereunder**:-**

According to Noyer (2007), [xiv]financial innovation has not only opened up new opportunities for the sector participants, but also increased new market players arising from new products in the financial market. These developments have increased the range of financing and investment opportunities available to economic agents besides changing the role of banks with expanded diversification choices in terms of portfolio and sources of financing.

Batiz-Lazo and Woldesenbet (2006) [xv]in their examination of the dynamic financial innovation in the banking sector in the U. K stipulated that a distinction between product innovation and process innovation is necessary as much as the adoption of each type of innovation has its own characteristics and has different impact on banking performance.

Shirley and Sushanta (2006) [xvi]studied the impact of Information Technology (IT) on the banking industry and analyzed both the theoretically and empirically how Information Technology; internet banking, electronic payments, security investments, and information exchanges related spending can affect bank profits via competition in financial services that are offered by the banks. Their studies covered 68 US banks for a period of over 20 years to estimate the impact of IT on profitability of banks. They found out that though IT might lead to cost saving, higher IT spending can create networks effect lowering banks profitability.

Agboola (2006) [xvii]in his study found out that technology was the main driving force of competition in the banking industry. During his study he witnessed increase in the adoption of automatic teller machines (ATMs), electronic funds transfer (EFT), smart cards, electronic home and office banking, and telephone banking. Agboola (2006) indicates that adoption of ICT improves the banks' image and leads to a wider, faster and more efficient market.

Simpson (2002) [xviii]suggests that e-banking is driven largely by the prospects of operating cost minimization and operating revenues maximization. A comparison of online banking in developed and emerging markets revealed that in the developed markets, lower costs and higher revenues are more noticeable.

RELEVANCE OF THE STUDY:

The relationship between the growing investment in technology based bank innovations and banks' sustainability needs to be studied to establish whether innovations have contributed to the sustainability of the banking sector. The origins of financial innovations have attracted little empirical scrutiny. Frame and White (2009) point out that one of the major barriers to the study of financial innovation has been a paucity of data. The literature on financial innovation is still evolving as new financial instruments; financial services and operational techniques continue to enter the market. The existing scanty literature has focused on evolution of the financial system in the developed world with few studies focusing on developing countries.

Financial innovation needs to make the best use of limited resources and contribute to the organisation's sustainability as well as for social progress. It is simply a matter of incentives. Hence it has become imperative to develop a new financial system based upon commonly interrelated regulatory policies, efficient technologies, trust, ethics, transparency and collaboration for value co-creation and competitiveness. The pillars under which financial innovation should be developed are related to the real and not virtual demands of the economy and finance, in line to the development of global, national and local economy, in accordance to the consumer/user financial maturity and needs and under effective and efficient regulatory framework and supervision.

RESEARCH QUESTION:

From the above discussion, it is observed that during recent times a number of innovations have been made in products/services of banks around the world to ensure sustainability through the process of enhancing contribution towards profitability and providing new products/services to customer at lower costs. Though, banks have been doing a lot in this direction for some time, certain questions, as researcher, arises as to-

1. What are the various innovative products/services introduced by banks, particularly in developing countries like India?
2. What is impact of financial innovations on bank sustainability?

OBJECTIVES:

This study was conducted to assess various financial products/services innovations and their impact on sustainability in banking industry, particularly in case of State bank of India, the largest commercial bank in India. More specifically-

1. To examine the nature and extent of financialproduct/service Innovations adopted by State Bank of India.
2. To assess the impact of financialproduct/service Innovations on sustainability of State Bank of India.

METHODOLOGY

The present study is descriptive as well as analytical in nature. The State Bank of India has been selected for study deliberately being the largest commercial banks in India having wide coverage spreading throughout the country. The data, for the purpose of study,were collected from the annual reports of SBI, Bank Sustainability Report of SBI, journals and other relevant published documents.The study was conducted for a period of 5 years, from 2011-12 to 2015-2016. In order to achieve the first objectives, the annual reports of State Bank of Indiawere examined to elicit required information regarding innovative product/services introduced by the bank. For the purpose to examine the impact of product/service innovation on sustainability, Multiple Discriminate Analysis (MDA), a multivariate technique, was used. This technique was used by Altman[xix]to predict corporate failure. Under this technique, a single Discriminant score, called Z, is calculated for each five year by using five financial ratios taking variables- Total Assets, Working Capital, Retained Earnings, EBIT, Market Value of Equity, Book value of total Debt, and sales (Revenue). The formula used to calculate-

$Z= 0.012x_1 + 0.014x_2 + 0.033x_3 + 0.006x_4 + 0.999x_5$

Where, x_1= working capital/total assets [to measure liquidity]

X_2 = Retained earnings/ total assets [to measure reinvested earnings and past profitability]

X_3 = EBIT/ total assets [to measure profitability]

X_4 = Book value of equity/ book value of total debt [to measure financial leverage]

X_5 = sales/ total assets [to measure asset efficiency]

For the purpose of prediction, bank having Z score of 2.99 and above was considered to be healthy, score between 2.99 and1.81 was considered in ‘Risk Zone’ and score below 1.81 was as to be potentially sick.

SCOPE OF THE STUDY:

For the purpose of the study, the word “Financial Innovation” is confined only to financial product and financial process innovation. Product innovation refers to development of a totally new product or improved product or service. The product innovation is limited to the outcome of process. Process innovation refers to finding a novel way of achieving an output which was traditionally done in different way. In the process innovation the final product is not touched, but the method of bringing out the product is improved.

The “Bank Sustainability” was measured in terms liquidity, retained earnings, profitability, financial leverage and assets efficiency.

FINDINGS

TABLE 1: Nature of Financial Product/Service Innovations adopted

Product	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
No. of ATMs	22141 nos.	25274 nos.	40768nos.	42454 nos.	42740 nos.
Debit card holders	11 crores	12 crores	15 crores	20.50 crore	23.30 crores
Internet bank users	89.63 lakh	94 lakh	1.77 crore	2.20 crores	2.55 crores
Mobile banking users	36.45 Lakh	64 lakh	95 lakh	1.35 crores	1.77 crores
Rupay Debit cards				2.97 crores	4.21 crores
E corners	-	-	-	-	1200 nos.
Customer technology learning centres	-	-	-	-	385 nos.
SWAYAMS(barcode based passbook printing KIOSKS)	-	-	-	-	6000 nos.
Green channel counters					Rs 7.40 lakh
Pos (point of sale)machine			135853	2,00000	Rs 3.02 lakh
Electronic Fund Transfer	NA	NA	NA	NA	NA

Table 2: Trends of Financial Product/Service Innovations adopted

Product	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
No. of ATMs	100	114	184	191	193
Debit card holders	100	115	136	186	211
Internet bank users	100	105	197	245	284
Mobile banking users	100	175	260	370	485
Rupay Debit cards	-			100	141
Customer technology learning centres	-		100	130	233
SWAYAMS(barcode based passbook printing KIOSKS)	-	-	-	100	400
Green channel counters	-	-	-	100	740
Pos (point of sale) machine	-	100	360	522	740

In the above table, the initial year is taken as the base year. Theimportant interpretations drawn from the above are:

1. The no. of ATMs have continuously increased in all the years upto 2015-2016. The percentage in 2015-2016 in 193 as compared to 100 in 2011-2012. The increase in ATM is quite satisfactory.
2. The no. of debit card holders have also increased from 2011-12 to 2015-2016. The increase in 2015-2016is more as compared to earlier years.
3. The no. of internet banking users has substantially increased. In the year 2015-2016, it has increased more than double.
4. Mobile banking users have shown a very significant trend. In this 5 year period the increase in trend percentage is considerably high as compared to the base year.

A bank's sustainability, to a great extent, depends on banks economic performance in terms of liquidity to meet short term and long term obligations, earnings from retained profit, overall profitability, financial leverage to increase shareholders wealth,asset efficiency to ensure optimum ustilisation of resources. Table 3 exhibits the some important financial variables of the studied period.

Table: 3 Financial Highlights of SBI during 2011-2016 (Rs in Lakhs)

Item/Year	2011-12	2012-13	2013-14	2014-15	2015-16
Working Capital	11,12,87,368	9,36,93,998	12,89,51,129	19,78,48,696	177862214
Total Assets	133551900	156626100	179274800	204808000	225906300
Retained earnings	1171334	1410532	1559631	1902667	1484047
EBIT	1848300	1995100	1617400	1931400	1377400
Book Value of Equity	1217.78	1394.79	150.34	160.84	176.84
Book Value of Debt	1,69,18,271	1,27,00,557	17,92,23,460	27,00,11,002	29,70,89,764
Revenue	12087300	13569200	15490400	17497300	19184400

Table:4 Multiple Discriminant Analysis- Variable-wise

Item/Year	2011-12	2012-13	2013-14	2014-15	2015-16
X1	1.833	0.90	0.82	1.97	0.99
X2	0.009	0.009	0.009	0.009	0.007
X3	0.013	0.12	0.009	0.009	0.006
X4	0.007	0.01	0.008	0.006	0.006
X5	0.09	0.08	0.19	0.09	0.08
Z score	1.95	1.12	1.036	2.084	1.18

The above table exhibits that in terms liquidity, the bank's performance shows a fluctuating trend. Year 2014-2015 shows a satisfactory liquidity position of the bank where as the liquidity position of the current year shows a downward trend. While in respect of earnings from retained profits year 2011-14 reveals a stagnant trend. But the year 2015-16 shows a decreasing trend. Further, in case of profitability, the trend isdeclining. The financial structure shows variations in the trend. Year 2012-2013 shows the lowest trend. And with regard to optimum utilization of assets, the performancealso depicts a fluctuating trend. Year 2014-15 shows the highest assets efficiency.

The Z score for the study period reveals thatthe financial health of the State Bank of India for the year 2011-2012 is in Risk zone. For the year 2012-2013 and 2013-2014 the financial health can be said to be potentially sick. However the financial year 2014-2015 shows a healthy trend in terms of financial performance. Lastly the current year reveals potentially sick financial health.

CONCLUSION:

The study accounts for financial innovativeness, identifying the relationship between financial innovation and bank sustainability. The analysis of data leads to the conclusion that financial innovation has increased over the period of time. However financial innovation has less impact on bank sustainability in Indian banking sector. The financial performance of the bank is found to be less than the expected level. The key financial indicators of the bank should be given due emphasis to have competitive advantage over the new age private sector banks.

REFERENCE:

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[i] Tufano, P. *(*2002). Financial innovation. cited in www.econ.sdu.edu.cn/jrtzx/uploadfile/pdf/books/handbook/10.pdf. Lawrence, J.W. (2010). Technological Change Financial innovation and Financial Regulation in the US, the Challenges for Public policy, cited from citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.155.1655

[ii] Lerner, J. (2002). Where does State Street lead? A first look at finance patents, 1971- 2000. *Journal of Finance*, *57*, 901-930.

[iii]Goetzmann, W. N. (2009). Financing Civilization. mimeo, Yale University

[iv]Nofie, I. (2011). The diffusion of electronic banking in Indonesia, Manchester Business School

[v] Akamavi, R.K. (2005). A research agenda for investigation of product innovation in the financial services sector," Journal of Services Marketing, 19(6), 359-378.

[vi]Tavitiyaman, P., Zhang, H. Q., and Qu, H. (2012). The Effect of Competitive Strategies and Organizational Structure on Hotel Performance. *International Journal of Contemporary Hospitality Managemen ,* 24 (1), 140- 159

[vii]Bagorogoza, J., & Waal, A. D. (2010). The Role of Knowledge Management in Creating and Sustaining High Performance Organizations the Case of Financial Institutions in Uganda. *World Journal of Entrepreneurship Management and Sustainable Development*, 6 (4), 307-323

[viii] Sahoo,P., & Nayak,B.,'Green Banking in India',*Indian Economic Journal,* 2008,p.1-2.

[ix]Mention, A.-L., Torkkeli, M. 2012. Drivers, processes and consequences of financial innovation: a research agenda, International Journal of Entrepreneurship and Innovation Management, 16 (1/2), 2012

[x]Gadrey, Faïz Gallouj, O. W., 1995. New modes of innovation: How services benefit industry. International Journal of Service Industry Management, 6(3), 4-16.

[xi] Frame, W. S., & White, L.J. (2009). Technological change, financial innovation, anddiffusion in banking. *Working Paper 2009-10.* Federal Reserve Bank of Atlanta

[xii]Avlonitis, G. J., Papastathopoulou, P. G., and Gounaris, S. P., 2001. An empirically-based typology of product innovativeness for new financial services: Success and failure scenarios. Journal of Product Innovation Management, 18(5), 324-342. Blackwell Publishing.

[xiii]Oliveira, P., and von Hippel, E., 2011. Users as service innovators: The case of banking services. Research Policy, 40(6), 806-818.

[xiv] Noyer, C., (2007). Financial Innovation, Monetary Policy and Financial Stability. *Spring Conference, Banque de France.*

[xv]Batiz-Lazo, B. & K. Woldesenbet, (2006). The dynamics of product and process innovation in UK banking. *International Journal of Financial Services Management*, 1(4), 400-421.

[xvi] Shirley, J. H., & Sushanta, K. M. (2006). The impact of information technology on the banking industry: theory and empirics. Retrieved on 20th September, 2015 from ***http://webspace.qmul.ac.uk/pmartins/mallick.pdf***

[xvii]Agbloola, A. (2006). Information and communication technology (ICT) in banking operations in Nigeria: An evaluation of recent experiences. From ***http://unpan.1un.org/intradoc/groups/public/documents/AAPAM/UNDPAN026533.pdf.*** Retrieved on 11 September 2016.

[xviii]Simpson, J. (2002). The impact of the internet in banking: Observations and evidence from developed and emerging markets. *Telematics and informatics,* 19, 35-330.