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From the Editor's Desk ...

We are pleased to announce the publication of the seventeenth issue of *PJMTR*. The primary aim of *PJMTR* is to promote & exchange management information among researchers. Considering marked progress in management science, this issue brings in research papers and articles in the areas of marketing, financial management and agricultural management. The topics chosen for this issue are contemporary and will definitely ignite the minds of the readers.

To begin with, the Indian Smartphone brands are giving tough competition to each other and when you read the first paper of this issue, you will be convinced with this study.

The general elections are underway in April-May 2019. So the second paper gives you an insight into how social media campaigns influence individual voters in Karnataka.

The advanced use of digital technologies in agriculture has the potential to meet the growing global demand for food while ensuring the sustainability of primary production. The next paper focuses on innovative practices for complete digitalization in the Indian agricultural sector.

The fourth paper is an interesting read as India crafts its own 'string of pearls' to rival China's naval jewels in the Indian Ocean. To understand the concept of String of pearls and to examine the preparedness of India to combat China's string of pearls strategies of trade, do read the fourth paper.

The goal of sustainable agriculture is to meet society's food and textile needs in the present & in the future. The fifth paper takes you through the sustainable sericulture practices & allied farming of rural agripreneurs.

NPA woes continue to dog PSBs. However, the author of the sixth paper suggests that privatization of PSBs can be a panacea to get rid of their NPAs. Read the paper to understand how structural changes can bring in less deterioration of their NPAs.

Further, banking sector reforms have changed the face of the Indian banking industry. However, changing environment of the banking industry has put nationalized banks under performance pressure. To understand the determinants of profitability of banks, read the last paper of this issue.

I hope you enjoy this issue of *PJMTR* and do let us know your valuable inputs and we welcome your articles & research papers.

Happy reading and good luck!

Chief Editor

Dr. R. Venkataraman

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Customer Based Brand Equity of Indian Smartphone Brands: An Empirical Evidence from the Indian Market

Rajesh Sharma*

Abstract

This study intends to comprehend the active role played by Customer Based Brand Equity (CBBE) dimensions in brand equity creation of domestic Indian smartphone brands. This is a multistep study in which exploratory factor analysis (EFA) & regression analysis were employed for data analysis. Overall, 120 Indian Smartphone users were personally contacted for evaluating different domestic Indian Smartphone brands i.e. Karbonn, Micromax, Videocon, Intex & Lava. The empirical findings suggest that three dimensions of customer based brand equity—brand association & brand awareness, brand loyalty and perceived quality influence customer based brand equity in Indian Smartphone market but with different strengths. This study will enrich the literature by understanding the role of brand equity dimensions in strengthening brand equity. This study will help scholars & practitioners track brand equity on a regular basis.

Introduction

Brands are the primary capital across industries, therefore, brands are becoming areas of interest for academia as well as practitioners. The significant and intangible value of brands is leading to an increased focus of companies on brand equity (Lehmann et al., 2008). Brands are, therefore, essential constituents of any marketing and hence firm's strategy (Doyle, 1998; de Chernatony & McDonald, 1999).

Despite an intense debate on brand equity in literature, there is no consensus among researchers about what constitutes brand equity (Vazquez, Rio & Iglesias, 2002; Keller, 2003). Researchers (e.g., Pappu et al., 2005) have shown positive and significant effects of these dimensions (brand loyalty, perceived quality,

brand awareness, and brand association) on brand equity.

Yoo and Donthu (2001) have shown empirically that brand awareness and brand associations can be combined into a single dimension. Washburn and Plank (2002) endorsed these findings.

Jung and Sung (2008) examined brand equity with a change in culture. Three variables i.e. perceived quality, brand loyalty and brand association/awareness were used in their study. Apart from these three variables, by using brand loyalty as an additional variable, Tong and Hawley (2009) used brand loyalty and found that brand equity was directly and positively influenced by brand loyalty as well as the brand association(s). In Taiwanese mobile industry,

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Wang and Li (2012) further added two more dimensions i.e. perceived enjoyment and purchase intentions and found that they played a significant and positive role.

Thus brand equity research during the past has resulted in a number of brand equity dimensions. However, there is a commonality also as few dimensions are similar to dimensions in Aaker (1991) model (Keller, 1993; Motameni and Shahrokhi, 1998; Bendixen et al.,2003). Specifically, these dimensions include brand awareness, brand associations, brand loyalty, and perceived quality.

The Rationale for the Study

Although researchers have examined brand equity extensively across the globe, brand equity research in the Indian smartphone industry is still sparse. The Indian market has gained significance due to the fact that India has a huge base of smartphone users across the world after China (FICCI-KPMG, 2015). According to a report by Earnst & Young (2016), Indian millennial population comprises of young, tech-savvy consumers who have high disposable income. This demographic has a large and growing base. They continue to be early adopters of any new technology and new brands with innovative features. Inexpensive smartphones coupled with the rollout of 4G services and online retail is going to revolutionize the landscape of the smartphone market. The next phase of growth in the Indian smartphone revolution is expected from tier II and tier III cities, where the focus will be on enabling vernacular and regional content. The growth in this segment is expected to be influenced by low-cost smartphones, low charges of data plans; and smart cities or even nearby rural areas. In the Indian market, big

players such as Apple are focusing only at the premium segment which is just the tip of the iceberg. The bulk of the market lies in the lower segment where customers are still upgrading from feature phones to smartphones. Therefore, the Indian smartphone market is ripe for investments as the demographics are in favor of consumption. Chinese smartphone brands have also taken away the business of Indian smartphone makers such as Micromax, Lava, Intex and Karbonn resulting in a decline of the market share of Indian brands. There will be tough competition for local brands in the future. Thus understanding the process of building customer based brand equity for Indian smart phone brands demands immediate attention. The findings of current research will help scholars & practitioners to track and build CBBE in the Indian smartphone industry.

Objectives

The primary objective of the current study is to understand the comparative strength of CBBE dimensions in building customer-based brand equity in the Indian smartphone market. Specifically, the study intends to investigate:

- Which dimension such as perceived quality, brand awareness/brand associations, brand loyalty has a high impact on brand equity
- The directionality of the relationships, whether the relationships are direct and positive
- Development of a reliable & parsimonious scale
- To establish the multidimensionality of CBBE

Review of Literature

Brand equity has been acknowledged as a key concept in the literature (Aaker, 1996; Gronhaug et al., 2002). Customer based brand equity refers to understanding brand equity through the viewpoint of customers (Xu and Chan, 2010). Brand equity also refers to improvement in consumer's perception of a product's utility and desirability by virtue of its brand name (Lassar et al., 1995). Aaker (1996) defined brand equity as “a set of assets (or liabilities) linked to a brand's name and symbol that adds to (or subtracts from) the value provided by a product (or a service) to the customer”. A brand's equity is high “when apart from some strong, favorable and unique brand associations, there is high brand awareness and brand familiarity”(Keller,2003; Wang et al., 2008). Thus brand equity helps in explaining the importance of brands in the marketplace (Cobb-Walgren et al., 1995).

If the CBBE is positive, it can further improve a firm's revenues and profits while lowering the marketing costs (Keller,1993), creating a high customer demand; charging a premium and making a brand extension easier (Bendixen et al., 2003),providing a trade leverage (Pouromid and Iranzadeh, 2012), and designing effective marketing programs (Aaker and Jacobson, 1994; Aaker and Jacobson, 2001; Kimpokorn & Tocquer, 2010). In this research, we use customer-based brand equity for investigation and not the financial or economic brand equity.

Proposed Research Framework & Hypotheses Development

Although there are different conceptual frameworks for brand equity measurement, this study followed Aaker's (1991) framework

which has been followed frequently by scholars in past. Aaker (1991) has suggested that brand equity's essential components are perceived quality, brand loyalty, brand awareness, and brand associations. These components have drawn the attention of different researchers (Kim et al., 2003; Bhardwaj et al., 2010; Lee et al., 2011).

We now review relevant literature & build hypotheses.

Perceived Quality

Perceived quality has been defined as “the consumer's subjective judgment about a product's overall excellence or superiority”(Zeithaml,1988; Dodds et al., 1991). Perceived quality decides any brand's probability of being included or excluded from the consideration set. Perceived quality has been found to influence a brand's loyalty(Yang and Wang 2010) as it helps the firm in charging a premium and hence increased profits for reinvestment in the brand.

(Aaker,1991).Perceived quality is impacted by not only situational but also comparative and individual variables such as consumer's education level and even social background (Holbrook & Corfman, 1985).

Several researchers have shown interest in past in brand's perceived quality (e.g. Yaseen et al., 2011; Severiand Ling, 2013). Perceived quality constitutes brand value(Zeithaml,1988); and hence high-quality brand perception will, therefore, make a consumer select that particular brand and not competitors' brands. This study thus examines the following hypothesis:

H₀₁: Brand's perceived quality has a positive and significant impact on a brand's equity.

Brand Loyalty

Most businesses focus on building and sustaining customer loyalty (Dick & Basu, 1994). Loyal consumers have a favorable disposition towards a brand (Grover & Srinivasan, 1992). The firms having a strong orientation towards customer loyalty have high profits, low costs of marketing and strong competitive advantages (Reichheld & Sasser, 1990). Brand's loyalty also refers to a customer's bonding towards a brand (Aaker, 1991) or "the degree to which a buying unit e.g. a household, concentrates its purchases over time on a particular brand within a product category" (Schoell and Guiltinan, 1990). Brand loyalty is "a deeply held commitment to rebuy (or repatronize) a preferred product (or service) consistently in the future, despite situational influences and competitor's marketing efforts" (Oliver, 1997). Loyalty towards a brand is a key brand equity determinant (Chaudhuri, 1995; Dekimpe et al., 1997; Rundle-Thiele & Bennett, 2001). Thus, higher consumer loyalty, higher brand equity. This study will thus examine the hypothesis:

H₀₂: Brand's loyalty has a positive and significant impact on a brand's equity.

Brand Awareness and Brand Associations

Brand awareness refers to "the strength of a brand's presence in consumers' minds & is an important component of brand equity (Aaker, 1991; Keller, 1993) or the consumers' ability to recognize and recall a brand in different situations" (Aaker, 1996). Brand awareness has been defined as "the consumers' ability to identify or recognize the brand" (Rossiter and Percy, 1987). It has been proposed by Keller (1993) that brand awareness, which comprises of brand recognition as well as brand recall, can

place a brand in consumer's mind, & thus creates an entry barrier for new but un-established brands (Stokes, 1985); and can providing strong bargaining power among the channel partners (Aaker, 1992). Higher brand awareness can influence consumer purchase decision (Dodds et al., 1991; Grewal et al., 1998) since consumers will prefer a familiar brand (Macdonald & Sharp, 2000).

Brand association refers to "anything linked in the memory to a brand" (Aaker, 1991). Brand associations convey what a brand means for its consumers (Keller, 2003) and have different strength levels (Aaker & Keller, 1990) which depend upon the number of experiences with the brand (Aaker, 1991). Brand personality is also known for its contribution to brand equity. Aaker (1996), Keller (1993) and other researchers (e.g. Biel, 1993; Brodie et al., 2009) have also proposed brand personality to be a key brand equity constituent. Brand awareness/associations thus help customers by not only differentiating the brand but also creating favorable attitudes in the customers' minds. This study thus examines the following hypothesis:

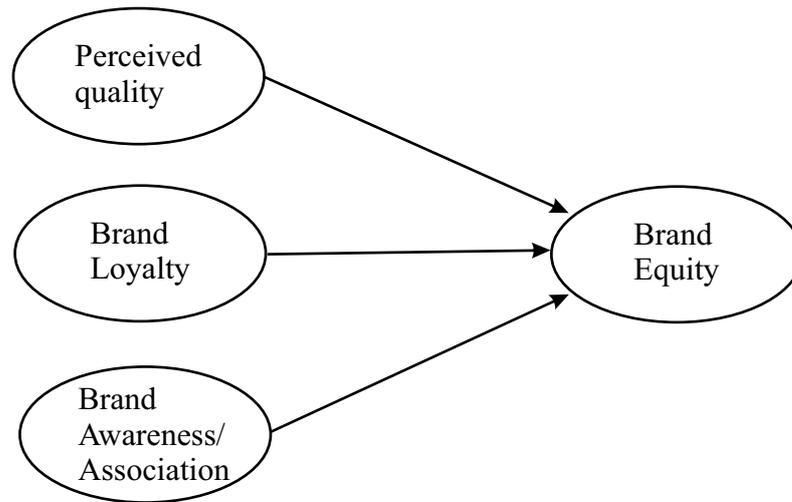
H₀₃: Brand's awareness/association (s) has (have) a positive and significant impact on a brand's equity

Research Design and Method

Measures of the Constructs

The literature review helped in pooling scale items to be used for questionnaire development (see Appendix), by following the guidelines provided by Churchill (1979). The brand awareness scale consisted of 6 items, 7 items were used for measurement of brand association. Similarly, 8 items were used to measure perceived quality, 7 items for brand loyalty, and 5 items for Overall Brand Equity.

Figure 1: Relationships between Dimensions of Brand Equity and Overall Brand Equity



Data Collection Procedure

The study used personal interviews for collecting data. The survey was conducted in four Indian cities i.e. New Delhi, Gurgaon, Faridabad & Noida, in the month of December 2018 and data collected from actual users of the brands being studied. Five domestic brands i.e. Karbonn, Micromax, Videocon, Intex & Lava were used. We conducted 142 personal interviews, which resulted in 120 valid responses. We surveyed 24 respondents i.e. actual users of each of these brands.

Smartphones were chosen to be product stimuli in this study because of their wide and frequent usage by the respondents in current research study sample so that current sample will be comfortable in connecting functionally and symbolically with smartphones.

We used non-probability sampling method i.e. quota sampling. We personally administered the surveys to respondents who were 18 years or older and collected data by using the 5-point Likert scale (1=strongly disagree, 5=strongly agree). Both the genders had equal representation (Table 1).

Data Analysis and Results

There were 30 pretest surveys collected from 5 corporate executives, 5 academicians, 10 research scholars & 10 management graduates. Based on the feedback, some items were refined in wording to enhance the scale's content validity. The data were analyzed in two stages. The first stage involved ensuring scale reliability and in the next stage, we tested the hypothesized relationships.

Reliability of Measures

Since brand equity is a multidimensional equity construct, we calculated Cronbach's alpha (Cronbach, 1951) of each construct by using 0.70 as a cutoff level (Nunnally and Bernstein, 1994). Items below the cutoff level were deleted. The items retained in the study have been marked * in the Appendix. The Cronbach alpha values (Table 2,3,4,5) for different constructs viz. brand awareness/ associations (0.731), perceived quality (0.784), brand loyalty (0.809) and overall brand equity (0.843) exceeded the minimum cut off value. The overall scale reliability was 0.834.

Table 1: Demographic Characteristics of Respondents

Demographic characteristics		(N=120)	
		F*	%
Gender	Male	60	50.00
	Female	60	50.00
Age (years)	18-25	46	38.33
	25-35	24	20.00
	35-45	33	27.50
	45-60	17	14.17
Education	Graduates	48	40.00
	Post-graduates	52	43.33
	Others	20	16.67
Marital status	Single	65	54.17
	Married & with kids	24	20.00
	Married but no kids	11	9.17
	Others	20	16.67
Household Annual Income (in INR**)	Upto 10 lakhs	52	43.33
	Between 10 lakhs – 20 lakhs	35	29.17
	Between 20 lakhs – 30 lakhs	11	9.17
	More than 30 lakhs	22	18.33

Note: * F-Frequency; **INR-Indian Rupee

All the correlations of the retained items of each construct were significant at 0.01 level of significance. The range of inter-item correlations of brand awareness/ association construct is between 0.289 and 0.539; of perceived quality between 0.387 and 0.524, brand loyalty between 0.498 and 0.672; and overall brand equity between 0.459 and 0.658. The correlations between each construct are also significant at 0.01 level of significance. The range of these construct correlations is between 0.566 and 0.734.

The inter-correlations between different dimensions of brand equity were all significant and positive (Table 6).

Relationships between Brand Equity and its Dimensions

This study used regression analysis for testing the proposed hypotheses (see Figure 1). The results provide strong support for all relationships, indicating positive and direct role of brand awareness/ brand associations ($\beta = 0.622$, $p < 0.01$), brand loyalty ($\beta = 0.703$, $p < 0.01$) and perceived quality ($\beta = 0.567$, $p < 0.01$), in affecting brand equity (see Table 7).

Discussion

There was sufficient support for all the three hypotheses. The research findings in this study are similar with those of Yoo et al. (2000) who approached brand equity from Aaker's perspective by using three different constructs i.e. brand awareness/association, brand loyalty, & perceived quality.

The results indicate the role of three constructs brand loyalty, brand awareness/ brand associations, & perceived quality, in decreasing order, in affecting brand equity. Perceived quality can improve a smartphone's equity in many different ways. In many cases or situations, a smartphone brand's perceived quality is the key reason for a customer to buy a

Table 2: Descriptive Statistics, Correlations, and Reliability of Brand Awareness / Association

ITEM	Item-Total Statistics				Inter-Item Correlations				Cronbach alpha
	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	BAW1	BASSO2	BASSO3	BASSO4	
BAW1	4.23	.782	.403	.734	1.000				0.731
BASSO2	3.66	.937	.534	.667	.323	1.000			
BASSO3	4.04	.797	.546	.658	.289	.429	1.000		
BASSO4	3.96	.838	.617	.614	.365	.485	.539	1.000	

All Correlations are significant at the 0.01 level (2-tailed); BAW- Brand Awareness; BASSO - Brand Associations

Table 3: Descriptive Statistics, Correlations, and Reliability of Perceived Quality

ITEM	Item-Total Statistics				Inter-Item Correlations			CONSTRUCT Cronbach alpha
	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	PRQ1	PRQ2	PRQ3	
PRQ1	3.96	.825	.593	.804	1.000			.809
PRQ2	3.92	.856	.726	.665	.585	1.000	.672	
PRQ3	4.08	.825	.659	.738	.498	.672	1.000	

All Correlations are significant at the 0.01 level (2-tailed); PRQ - Perceived Quality

Table 4: Descriptive Statistics, Correlations, and Reliability of Brand Loyalty

ITEM	Item-Total Statistics				Inter-Item Correlations				Cronbach alpha
	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	BLO1	BLO2	BLO3	BLO4	
BLO1	3.59	1.057	.540	.759	1.000				0.784
BLO2	3.92	.882	.627	.717	.465	1.000			
BLO3	3.33	1.069	.631	.709	.481	.524	1.000		
BLO4	3.81	.960	.576	.738	.387	.517	.509	1.000	

All Correlations are significant at the 0.01 level (2-tailed); BLO - Brand Loyalty

Table 5: Descriptive Statistics, Correlations, and Reliability of Overall Brand Equity

ITEM	Item-Total Statistics				Inter-Item Correlations				Cronbach alpha
	Mean	SD	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	OBE1	OBE2	OBE3	OBE4	
OBE1	3.45	1.103	.686	.799	1.000				.843
OBE2	3.52	1.063	.773	.759	.658	1.000			
OBE3	3.53	.989	.627	.823	.518	.637	1.000		
OBE4	3.54	.997	.635	.820	.559	.610	.459	1.000	
All Correlations are significant at the 0.01 level (2-tailed); OBE - Overall Brand Equity									

Table 6: Descriptive Statistics and Correlations of Constructs

CONSTRUCT	BAW_ BASSO	BLO	OBE	PRQ	Mean	SD
BAW_ BASSO	1				3.975	0.625
BLO	0.636**	1			3.665	0.775
OBE	0.621**	0.703**	1		3.511	0.857
PRQ	0.722**	0.734**	0.566**	1	3.988	0.711
**. Correlation is significant at the 0.01 level (2-tailed). BAW- Brand Awareness; BASSO - Brand Associations ; BLO - Brand Loyalty; PRQ - Perceived Quality; OBE- Overall Brand Equity						

specific brand. It also influences the consumer's inclusion or exclusion of brands from the consideration set. A smartphone brand's positioning depends to a great extent on customers' perceptions of its quality and can help the firm in charging a premium price. This

price premium, in turn, can increase its profits and thus provide additional resources to the firm for reinvestment in the brand. Perceived quality can also help a smartphone brand not only to motivate but also to gain control over retailers and other channel members in today's highly

Table7: Results of Regression Analysis

DV	IV	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		Beta	Std. Error	Beta		
OBE	BAW_ BASSO	.853	.072	.622	11.856	.000
OBE	BLO	.780	.053	.703	14.762	.000
OBE	PRQ	.683	.067	.567	10.247	.000
PRQ - Perceived Quality; OBE - Overall Brand Equity						

competitive world. In addition, high perceived quality can help the smartphone brand in launching brand extensions.

The findings also indicate that brand awareness and brand associations collectively impact brand equity of domestic smartphones. Brand

awareness of a smartphone alone may be effective up to a limit after which smartphone brands must concentrate on building strong, favorable and unique associations to ensure purchase and hence loyalty. This shows the significance of marketing beyond simply the

creation of awareness and incorporating brand associations at the same time for consumers in building brand equity for smartphones.

Customer loyalty's role in the creation of brand equity for domestic smartphone brands was not found to be as strong as that of other two dimensions, primarily due to increased transparency due to the pervasiveness of internet. The comparison of brands has become easier for consumers as a result of which they can always find a better deal elsewhere. A decline in customer loyalty also shows the brand's declining relevance or inability to differentiate in the competitive crowd, forcing the customers to make rational purchase decisions, thus losing emotional connections with the brand. Improvement in perceptions of brand quality can differentiate brands and thus improve customer satisfaction and build brand loyalty.

Managerial Implications

By virtue of their reliability, the scales developed in the current study will help brand managers in keeping a track of brand equity of domestic smartphone brands regularly and understand clearly the weak and strong points of a brand. Thus, managers can allocate resources efficiently across different brand equity dimensions for a better comprehension of the long-run impact of marketing activities.

We found that perceived quality was the most strong positive predictor of brand equity. With an increase in competition from store brands and service providers such as Reliance Jio, superior perceived product quality would provide the domestic Indian smartphone brands an advantage. Due to the ongoing digital revolution, consumers are increasingly demanding better features and their enhanced functionality. The features customers are

looking for in smartphones include quality of the camera, battery life, stylish design including ergonomics and a powerful memory. Consumers perceive Indian brands to be a “me too” or an imitating brand. Although these brands may provide or claim to provide unique features, there are hardly any innovations i.e. the originality is missing.

The challenge for Indian smartphone brand managers is thus to ensure a seamless brand performance in terms of speed and 4G compatibility at a competitive price. However, managers should be careful while offering frequent schemes, especially price discounts since such schemes lower consumer quality perception particularly when consumers have a tendency to relate the price of a smartphone with its quality. Since perceived quality depends upon subjective judgments of consumers, they form quality perceptions based upon their past experiences with the smartphone brand. Managers may spend any amount on advertising, online marketing, and even word-of-mouth publicity but nothing can replace a good quality customer service. Marketers, therefore, need to ensure unique brand experiences for consumers to ensure delighted. This delightment is a key determinant of positive word-of-mouth, ensures repetitive sales and hence loyalty.

Our findings suggest that brand loyalty does not influence brand equity as compared to the influence of other dimensions. One possible explanation could be that the technical superiority of a smartphone firm may not necessarily translate into the commercial success of a brand. Due to intense competition in the domestic smartphone market, the development and maintenance of innovative features are becoming difficult for firms. Smartphone brand managers thus need to improve their focus on building a relationship

between the customer and the smartphone beyond the product's features, its functionality and price to build a high customer commitment, so as to reduce their vulnerability to the offers of competitors.

Our study found that the dimension brand awareness/brand association has a significant impact on brand equity although lower than that of perceived quality on brand equity. A high awareness level leads to better quality perception which can build consumer brand loyalty. The creation of brand associations to create a distinctive brand image also has important managerial consequences. As the competition is increasing with the entry of local and global brands, the complexity of the consumer decision-making process is also increasing. The consumers, for example, may look for a smart phone's brand image than its functionality while making buying decisions. Managers can build a host of possible associations with a brand such as brand distribution through retailers with good store image so as to create more strong & favorable brand associations. There is a need for identifying attributes which are important for a domestic smartphone consumer while purchasing such as innovative brand, quality conscious brand, and brand's concern for the environment which are not already associated with any competitor. Managers can capitalize on these attributes to build brand equity.

Conclusion

The objective of this study was to comprehend the relative role of different brand equity dimensions in CBBE creation by using domestic smartphone brands as stimuli. This study explored the hypothesized relationships developed from the literature review. Our study provides a few important and significant

implications for the creation of brand equity in the Indian smartphone market. The findings in this study indicate positive, direct and significant relations between perceived quality, brand awareness/brand associations, brand loyalty, and overall brand equity. This study not only developed a reliable & parsimonious scale, but the findings contribute empirically the multidimensionality of CBBE, supporting Aaker's (1991) model. Furthermore, this brand equity model is distinct in the sense that it includes brand personality measures. Practitioners can track their brand's health by using these brand personality measures. Strategically, the current study will provide managers with a road map for building and sustaining the brands in an effective manner.

Research Limitations and Future Research

Although our study has been successful in exploring the role of brand equity dimensions in creating brand equity in the Indian smartphone market, the study is not free from limitations. The sample used in this study was from a select few Indian cities. Future scholars may thus conduct more such studies in other Indian cities and regions so as to ensure generalization of the findings from the current study to a wider population. The product stimuli in the current study were five dissimilar brands but from a similar category. We suggest more categories to be considered to make the findings more authentic and comprehensive. Moreover, since Indian smartphone brands face tough competition from global brands especially Chinese brands, future researchers may study only Chinese brands or even a comparison of Chinese & Indian brands. The non-probability sampling technique used in this study also restricts generalization of these findings completely. Research scholars in the future

may, therefore, use probability samples to ensure representativeness.

The current study is thus among few Indian empirical studies which have systematically examined the relative role of brand equity dimensions on the brand equity of domestic smartphone brands in India. However, there is a need to interpret these results carefully. While some findings can be translated to different product categories and even cultures, others may not. Replication of these findings across categories and cultures may help broaden the research scope.

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Appendix: Measures of Brand Equity & its Dimensions

Construct (No. of items)	Items	Source
Brand Awareness (6)	I can recognize brand X among other competing brands	Yoo <i>et al.</i> (2000)
	I am aware of X brand*	
	I know X brand	
	This brand X is not known to me ®	Rajh (2005).
	I am acquainted with this brand X	
	I know this brand X very well	
	This brand X is very well known to me	
Brand Association (7)	Some characteristics of brand X come to my mind quickly	Yoo <i>et al.</i> (2000)
	I can quickly recall the symbol or logo of brand X*	
	Brand X has a strong personality*	Villarejo-Ramos & Sánchez-Franco (2005)
	I have a clear impression of the type of people who use X brand*	
	Brand X is associated with sincerity	Hananto (2006).
	Brand X is associated with excitement	
Brand X is associated with sophistication		
Perceived Quality (8)	Brand X is of high quality *	Yoo <i>et al.</i> (2000)
	The likely quality of brand X is extremely high	
	The likelihood that brand X is reliable is very high*	
	Brand X must be of very good quality	
	Brand X appears to be of very poor quality ®	Villarejo-Ramos & Sánchez-Franco (2005)
	The likelihood that brand X will be satisfactory is very high	
	Brand X is a brand characterized by its continuous innovation*	
	Brand X is a quality leader within its category*	
Brand Loyalty (7)	I consider myself to be loyal to X brand	Yoo <i>et al.</i> (2000)
	Brand X would be my first choice*	
	I will not buy other brands if X is available at the store	
	Brand X fulfilled my expectations the last time I bought it	Villarejo-Ramos & Sánchez-Franco (2005)
	I will buy brand X again*	
	I will suggest brand X to other consumers	
	The price of another brand would have to be considerably inferior to not choose brand X	
	Even in the case of not using it, I would like to buy brand X	Hananto (2006)
I feel committed to brand X*		
Overall Brand Equity (5)	It makes sense to buy brand X instead of some other brand even if they are the same	Yoo <i>et al.</i> (2000)
	If another brand is not different from brand X in any way, it would still seem smarter to buy X*	
	If there is another brand as good as X, I prefer to buy brand X*	
	Even if another brand has the same features as brand X, I would prefer to buy X*	
	Even if another brand is identical to brand X, I would prefer X to other brands. *	

(r) reverse coded, * Items retained in the study

The Effect of Social Media Campaigns on Individual Voters in Karnataka: An Empirical Study

Shilpa S Kokatnur* & Vijeth Kumar**

Abstract

Purpose: The study aims to analyze the effectiveness of social media campaigns on individual voters in the state of Karnataka.

Methodology: Convenient sampling technique was used for collecting data from registered individual voters above the age of 18 years through social media. A sample of 200 respondents representing citizens majorly from south Karnataka was considered for the study. A questionnaire with close-ended multiple-choice questions (five-point Likert type scale) was administered for the respondents.

Findings: All the voters who responded were being inspired in 2018 Karnataka Assembly Elections fall under the age group of 18-39. The presence of social media in political campaigning positively influenced the respondents. This occurred as many of the voters were first-time voters and they looked up to social media for information on the candidates.

Limitations: The study was restricted to the south part of Karnataka with 200 respondents.

Implications: Social media offers political parties and candidates a new platform to market themselves, which could be more effective in the long run as compared to the use of traditional communication and marketing mediums.

Introduction

Social Media provides the benefit of being instantaneous, precise and target specific. Social media has gained popularity worldwide in recent years, however, the concept is not new. During the mid-'90s with widespread adaptation of personal computers users were also attracted to services like chat rooms, newsgroups, and instant messages. What is new is the expansion of social media (YouTube, Facebook, Twitter & Instagram) and it's used for more than just means of socializing on the internet.

Social media is such a comprehensive terminology that covers a large range of networking websites. However, one of the similarities between these websites is that it allows an individual to interact with the website and interaction with other people. Several of the social media websites are:

Social Bookmarking: It relates to the people by marking websites and searching through websites bookmarked by various other people.

Social News: Networking by voting for articles and marking and discussion on them.

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Social Networking: It includes the addition of friends, commenting on profiles, joining groups as per personal likings and having discussions in forums.

Social Photo and Video Sharing: Networking by sharing photos or videos with contacts and remarking on the other user submissions.

Wikis: Addition of the new articles and checking existing articles.

Blogs: A type of website which is typically upheld by an individual with regular entries of observations, explanations of events or other material such as visuals.

Social media is not just limited to these broad categories. Any website that invites individuals to interact with it and network with other existing or new users comes under the definition of social media. These sites, unlike all other sites, have its own importance and use. Initially, the messages on these social medium platforms were considered insignificant and were more often overlooked. They were just a means of either marketing to a targeted group or posting statements describing regular personal activities to listed friends on the network. In late 2006, when Twitter was launched, its creators stated that the purpose of tweets was to tell one's followers what they were doing (Jackson & Lilleker, 2011). However, social media in the second decade of the 21st century is used not just for triviality but is also used for disseminating serious social and political messages to the targeted audience.

Social Media and Political Campaigns

India's large and increasing population along with the increasing mobile density, especially in urban areas, has stirred a remarkable growth in the number of people online. Moreover, as the

middle class in the country expands, more and more Indians are expected to get online. The number of social media users is also increasing. However, traditional media is still significant in India. Indian metro cities are the centers for the digital outburst but the effects are yet to reach the more rural parts of the country.

The influence of social media sites on citizen's behavior in Indian political matters has recently become more visible than before. In September 2013, a relatively small leader of BJP political party Narendra Modi announced his candidacy for Prime Minister of India. Almost 9 months later, that small politician became the Prime Minister of India. Modi's party gets the credit for actively engaging masses on social media when mainly all the politicians were busy emphasizing the emerging social media tools as "waste of time" and impersonal way to connect to masses. Therefore, Modi's political campaigning was unorthodox; his campaign success has frequently been credited to his ability to inspire the people along with his public speaking. However, his use of the Internet and social media for engaging individual voters in India provided him with the level of support that most candidates never see.

Political information exchanges have been driven not by the government but by third parties, which is mostly the citizens and the foundations or non-profits organizations looking for encouraging the increased participation of young generation in Indian politics. Therefore, social media used in politics is bringing together the public through its rapid and two-way interaction.

The Internet and social media usage is certainly an evolving force in Indian politics, this gives rise to a key question: whether this rise is good

for Indian politics or not. While discussing the effect of the Internet on politics, Nelson (2010) argues that the Internet's power to disseminate information has created an environment in which any individual can possibly find and motivate like-minded people to take political actions.

Additionally, just how effective the use of social media can be on the electoral front in India was displayed when the Aam Aadmi Party (AAP) Party won and got elected in power for Delhi in December 2013. As many people have the ability to influence their families, that's what happened here, when kids who were active on social media asked their parents to vote in favor of AAP part instead of Congress after reading facts on social media. Social media in the next general elections will most likely influence these high impact constituencies where the Facebook users account for over 10% of the registered voting population (Indexonensorship.org, 2014).

Since independence for many years, election campaigns in India were designed around public rallies, public welfare schemes, and public related events or in the form of television or radio advertisements. Therefore, with political discussion now taking place on social media sites such as Facebook and Twitter give rise to a relevant question: could activities on these sites be a predictor of election results and prove to be an actual game changer by influencing voters in India. And is the use of these sites as a platform for political deliberations effective. And if so, to what extent can it be influencing in changing the decisions of the Indian registered voters.

Colin Delany stated in the Huffington Post article, that in the political world the Internet

could be used in many ways. It is highly adaptable and the use of it depends on the purpose it's being targeted for. For instance; it can be used for fundraising, recruiting, mobilizing people, grassroots organizing, advertising, messaging and geographic targeting. This is currently happening in India, as political parties and candidates are trying to use the Internet to enroll new members, create larger volunteer bases, and ask the Indian citizens for donations in addition to influencing them for casting their votes in their support.

During 2014's Indian Lok Sabha general elections, the political leader Mr. Narendra Modi made use of social media to a great extent as compared to the opposition leader Mr. Rahul Gandhi. Many people are attributing the win of Mr. Narendra Modi to the adaptation of technology of social media. For instance, the victory message by Mr. Narendra Modi was the highest re-tweeted message on Twitter in Indian history.

In the run-up to the 2018 Karnataka assembly polls, the three major political parties—Congress, BJP and Janata Dal (Secular), or JD(S)—have deployed considerable resources to strengthen their respective online platforms, especially after the 2014 Lok Sabha elections, where a significant portion of the BJP's success was attributed to its online campaigns.

A 2017 study by Mumbai-based knowledge creation and management organization Iris Knowledge Foundation states that out of the 543 Lok Sabha constituencies, 160 are "highly" influenced and another 67 are "moderately" influenced by social media. Though there is no exact way to measure if they can be translated into votes, online platforms like Facebook,

Twitter, YouTube, and WhatsApp are effective tools to disseminate information to millions.

Review of Literature

According to Han (2008), education is the main important variable followed by the income of the participants. An increased level of both variables raises the likelihood of voter participation in elections.

Gulatti and Williams (2011) - education, income, culture, age, and urbanization are all possible influences on a candidate's Internet use. Around, one in three young voters under the age of thirty-six rely on the Internet as their primary source of attaining political information (Panagopoulos, 2010).

Kushin and Yamamoto (2011) suggested that the growing online political behavior has been relatively accelerated by the latest emergence of new interactive and media-rich websites.

According to Tolbert and McNeil (2009), suggested that the internet becomes more widely used information tool for gathering political candidate information, therefore voters are more likely to be properly informed and later participate in the political process. To sum it up all according to them, the Internet can become the medium to fill the void, which television and broadcast news could not.

Nelson (2010) argues that the Internet's power to disseminate information has created an environment in which any individual can possibly find and motivate like-minded people to take political actions.

As per Claasen (2007) as per a model, citizens participate in a political process when their vicinity calculations display a non-zero policy stake in the election outcome. In other words, if an individual realizes his personal beliefs are not being challenged by either of the candidates in the election, they will not participate. However, if an individual realizes a leader challenges his personal beliefs, they will be willing to participate in the election. Claasen (2007) from the studies eventually established that extreme policy motivated individuals participated in the political process because of their extreme views regardless of the election, whereas vicinity motivated individuals only participated when they had an alleged stake in the outcome of the election.

Boyd (2004), in general sense, social media are the networking sites, which are Internet-based applications that allow the users to create a public profile within the secure and closed system, have a list of users whom they have a relationship with and can view their own friends list and that of others within the system.

Objectives

1. To understand the usage of various social media.
2. To analyze the effect of social media campaigns on Individual voters in Karnataka.

Hypothesis The usage of social media in a political campaign will positively affect participation among voters aged 18-39.

Research Methodology

All the registered individual voters above the age of 18 years make to be the population for this research. Convenient sampling technique was used for collecting data. As per Barrett (2007), a sample size greater than 150 is essential in order to enable an in-depth investigation during the research. Larger sample sizes generally lead to increased accuracy when estimating the unknown parameters and variables. There is only a 4.5% chance in terms of the margin of error when the sample size is chosen to be 500 (Niles, 2006). Therefore a sample of 200 respondents representing citizens majorly from South Karnataka was considered for the study.

As the research was based on social media, it appeared apt to use social media to collect the information. Doing so would assure that the respondents were familiar with social media portals and tools. The respondents included both known and unknown people who choose to answer the questions in various forums on social networking sites. In order to have more answers to the survey, the respondents were asked to share the survey link with their own network of contacts on social media or otherwise.

The online survey was administered through Google Forms, targeting 200 respondents through Facebook and WhatsApp. A questionnaire with close-ended multiple-choice questions with ordered responses was administered for the respondents. A five-point Likert type scale was used to establish the intensity of agreement and disagreement from the respondents. The analysis of the data collected involves descriptive statistics Viz., percentages, graphs, and charts. Microsoft Excel and SPSS software were used to analyze the data collected from the respondents.

Discussion

The purpose of the study is to understand the usage of various social media for political campaigns and to analyze the effect of social media campaigns on Individual voters in Karnataka. To fulfil the study objectives descriptive statistical tools viz., percentages, graphs, and charts are used for the analysis.

Usage of Social Media: It is observed that 40% of the respondents access Facebook, 25% confirmed to be active on Instagram, 15% on Twitter and 20% being active on Google+. This indicates that the popularity of Facebook in social networking platforms as compared to Twitter, LinkedIn or Google+.

Table 1: Usage of Social Media Platforms

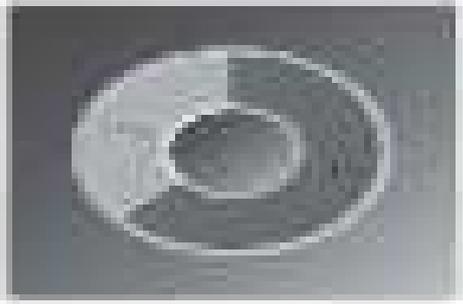
Social Media Platforms	Responses	Percentage
Instagram	50	25
Twitter	30	15
Google+	40	20
Facebook	80	40

Political Campaigns and Social Media: It is understood that 63% of the respondents follow political campaigning on social media platforms. Accessing political content from social networking sites like Facebook, Twitter, Instagram, and Google+ shows the signs of increased chances of a voter turning out to cast a ballot.

Table 2: Political Campaigns and Social Media

Particulars	Reponses	Percentage
Yes	126	63%
No	74	37%
Total	200	100

Figure 1: Political Campaigns and Social Media



Knowledge of Candidate's Profiles: From the analysis, it is understood that 51% of the respondents felt social media helped them in learning more about the candidate and opposition leaders during the 2018 Karnataka Assembly Elections. However, major portions of the respondents i.e. 22.5%, were unsure if social media helped them in any way to gain more knowledge of the political candidate. This shows that obtaining political information through online forums on social networking sites such can stimulate political engagement.

Table 3: Knowledge of Candidate's Profiles

Particulars	Response	Percentage
Yes	103	51.50%
No	52	26.00%
Maybe	45	22.50%
Total	200	100%

Figure 2: Knowledge of Candidate's Profiles

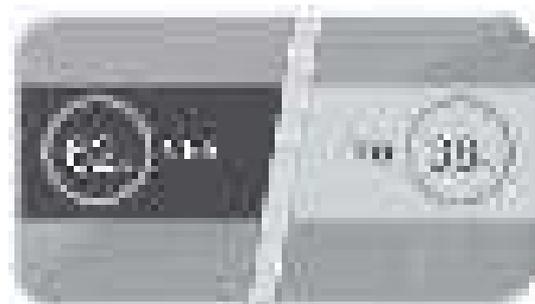


Political Updates: The quantitative survey analysis results show that 62% of the respondents who are active on social networking sites relied on social media in order to gain information about the political parties. Social media is helping the individuals to extensively access the profiles of politicians, consider their personal beliefs, opinions, and viewpoints under a microscope.

Table 4: Political Updates

Particulars	Reponses	Percentage
Yes	124	62%
No	76	38%
Total	200	100

Figure 3: Political Updates



Influence for Voting: 48% of the respondents are of the opinion that they were influenced to cast vote in favor of a politician based on the information and content they have read on social media. This is an interesting fact to note from the perspective of future elections; in the future, the citizens can be stirred through these social mediums to cast their final votes.

Table 5: Influence on Voting

Particulars	Response	Percentage
Yes	96	48.00%
No	58	29.00%
Maybe	46	23.00%
Total	200	100%

Figure 4: Influence of Voting



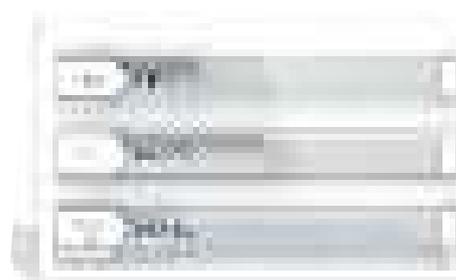
Change in Decision: Only 34% of the respondents agreed to withdraw their support for the candidate they like and vote for the opposing candidate after reading something negative about their candidate on social media. Around 46.5% of the voters have said to stick to their candidate even after negative publicity on social media. This indicates that citizens have their own opinion on political matters and they are not easily altered through some feeds of social media. Therefore, even if an opposition leader tries to misuse social media to influence voters to cast vote in their favor through manipulation it would not work.

All the voters who responded were being inspired in 2018 Karnataka Assembly Elections fall under the age group of 18-39. All the other respondents above the age of 39 were either motivated to vote because of the political party leader, political rally, political event or they did not vote at all. The presence of social media in political campaigning positively influenced the population between 18-39 years age group. This occurred as many of the voters were first-time voters and they looked up to social media for information on the candidates. The male voters were influenced more by social media updates compared to female voters.

Table 6: Change in Decision

Particulars	Response	Percentage
Yes	68	34.00%
No	93	46.50%
May be	39	19.50%
Total	200	100%

Figure 5: Change in Decision



Hypothesis: The existence of social media in a political campaign will positively affect participation among voters aged 18-39.

To test this hypothesis two questions were asked during the quantitative survey online - first the age of the respondent and secondly what inspired him to vote during the 2018 Karnataka Assembly Elections. Additionally, another question was asked if the respondent had voted before the 2018 elections. This was done to analyze how many first-time voters were part of 2018 elections and how many among them were young adults and how many of those young adults got inspired to vote because of political campaigning on social networking sites. These categorical variables and scale variable, which were compared against each other to test the hypothesis. The survey analysis results conclude that the hypothesis is supported by these results. All the voters who were answered being inspired and motivated in 2018 Karnataka Assembly Elections fall under the age group of 18-39. All the other respondents above the age of 39 were either motivated to vote because of

the political party leader, political rally, political event or they did not vote at all. The presence of social media in political campaigning positively influenced the population between 18-39 years age group. This occurred as many of the voters were the first time voters and they looked up to social media for information on the candidates. The male voters were influenced more by social media updates compared to female voters.

Conclusion

Social networking websites are becoming more and more extensively used as the latest channel for posting, finding and sharing information and content in India. This research highlighted that these innovative developments are embraced more by younger generations. In the intelligence exchange process, which is necessary for an election political campaign, traditional media and public opinion still take a significant position and social media updates still are in its nascent stage of growth. Not only the scope of online social networks is larger and undoubtedly with more contradictory opinions but also the political communication reaches people in a different way. Messages and information and opinions can come through numerous times a day either by friends, relatives or unknown persons.

The number of respondents who are actively using one or more social networking sites is huge and has increased the potential of growth in the future from the political aspect. Most of the respondents stated to be using these social media websites on weekly basis or even more often and on daily basis. This is the very first step for social networking sites to be influential. However, there is an age prejudiced in the respondent's sample size, which is even more strengthened by the already higher usage and activity level of the younger generation in India.

Although most people don't seem to be influenced by the political news and content on social media sites, they became heavily reliant on the political updates of social media. They make a note of and observe political content on these sites on regular basis. The respondents agreed to consider social media updates to be appealing to them after television being the next medium of information in terms of appeal. They also showed trust in traditional media with the presence of new media. However, this development is the first step for social media to be influential on the voter's decision-making process. It was expected to get a much diverse opinion from respondents in terms of the mediums that appeal to them, however, the survey resulted in close ties between a traditional medium and new mediums.

The participation in elections was not related to being a member of any of the social networking sites or being an active user of these platforms. Although social media bridges the age gap, does not discriminate between different demographic groups or political engagement of users, it does not appear to be having the influence on changing the final casting vote of a citizen in India. At least during this research, no such proof was found for it. The reason behind this might be taken from the fact that social media did not inspire or motivate the citizens during 2018 Karnataka Assembly Elections to cast their final ballots; it was the candidacy of the leader, which motivated them. This was the strongest influenced that decided the outcome of the result during the latest elections.

The choices of support of citizens are not altering easily. They stated that they would still be supporting the candidate they like even if something negative is published about the candidate on social media sites. They will not shift to cast a vote in favor of the opposition

leader from this event. But the respondents considered it to be of utmost importance for a political leader to have a user profile on these social networking sites.

The survey did a good job of apprehending the core of the research issue. Overall from this research, it can be concluded that the use of social networking sites in the latest elections of 2018 had a limited effect on individual voters. The younger generation was influenced more on political matters as compared to the older generation. Moreover, the survey has indicated that social media was highly successful in engaging the first time voters in the election as these voters are young adults mainly who have recently turned 18 and their usage activity of social media is regular, it would be more accurate to say that they use social media on daily basis. However, social media did not considerable increase voter participation in elections. The respondents mainly chose to vote on the basis of the political leader who was running during this election however, respondents certainly relied on social media for regular updates and news feeds. Also, both of the original hypotheses are supported by the survey result findings. The younger generation adults who are fed-up with issues that do not line up with their believes are more receptive to social media encouragement during elections. Social networking sites offer political candidates and parties a new possibility and option to market themselves, which could be more valuable in long run as compared to the use of traditional communication and marketing mediums.

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The Role of Digitalisation in Indian Agriculture Sector

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Abstract

India is blessed with many things and has started practicing digital application from Agriculture to Zoology. Post-globalization India is moving from traditional economy to the digital economy. In this digital era, all sectors of economies are successfully practicing digital applications in one or other stage. Agriculture is no exception because more number of commercial crops are grown for fulfilling the needs of crowd from Coriander to Coconut. Today yeoman are moving towards mechanized agricultural practices and farmers have started applying digital devices to different stages of agricultural activities from tilling the land to final harvesting. This paper mainly focuses on how our digital economy impacts agriculture and suggests innovative practices for complete digitization in Indian Agriculture.

Introduction

India is the world's largest sourcing destination for the Information and Communication Technology (ICT) industry, accounting for approximately 67% of the US\$124-130 billion markets. However, the emergence of farm technologies integrated with a robust Information and Communication Technology (ICT) framework is still evolving in India, and it holds tremendous potential to both positively impact agricultural performance and enhance farmers' income. The impact of technology in unlocking value for the people at the bottom of the pyramid and improving access to critical services is well demonstrated in the healthcare sector in India, as observed in the case of mobile technology-enabled telemedicine and low-cost devices that can address health conditions such as anemia in a large section of the population.

We Indians are witnessing an unprecedented growth in connectivity, data, and broadband which is accelerating India's transition to a knowledge economy. Digitization, which harnesses the power of connecting people, process, data and things, will transform our industries and change the way we work and how governments serve its citizens. As per the report of Columbia University, digitisation has a larger contribution to GDP than stand-alone technologies. It states that a 10 point increase in digitization yields a 0.74% increase in per capita GDP.

Our Honourable Prime Minister Narendra Modi launched Digital India on July 1, 2015, to create a digital infrastructure for empowering rural communities, enabling digital delivery of services and promoting digital literacy. Given

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that 68 percent of India's population is rural and agriculture is the main source of livelihood for 58 percent of the population, one must consider the role of Digital Agriculture within Digital India. Digital Agriculture can be defined as ICT and data ecosystems to support the development and delivery of timely, targeted (localized) information and services to make farming profitable and sustainable (socially, economically and environmentally) while delivering safe, nutritious and affordable food for all.

Smartphones are the other key intervention as they are equipped with GPS to track where photos of field infestations or hail damage have taken place for technical support or insurance claims. Mobile phones also enable farmers to integrate into structured markets based on approved grades and standards that can be verified using calibrated photos and settlements made through mobile money. While India has over 960 million mobile phones, only 17 percent of the population has a smartphone but this is changing quickly with over 204 million smartphone users projected for 2016. This percentage is much lower for rural consumers but this too is changing as the price point for smartphones manufactured in India is dropping as are phablets (phones and tablets that support rural education and extension).

Background of the Study

Figure 1: Role of Digital Technology in Agriculture



(Source: <http://agriculture.gov.in/>)

Digital technology will be key to increase agriculture productivity by delivering tailored recommendations to farmers based on crop, planting date, variety is sown, real-time localized observed weather and projected market prices. These recommendations will be based on advanced big data analytics related to down-scaled daily observed weather that is now 9 km x 9 km but will soon be under 1 km x 1 km and effectively field level that feed into crop growth models to estimate yields, harvest date and potential pest and disease outbreaks to optimise pest control measures. Remote sensing is another big data resource to support the development of derived weather products (radar), improved hydrology and watershed management, soil health, crop coverage and crop health estimates among other application. This is now complemented by Unmanned Aerial Vehicles (UAVs) that can capture multispectral images to assess crop health, damage and yield far more accurately than satellites.

The greatest impact Digital Agriculture will have is on the democratization of market pricing and compressing transaction costs so that farmers capture a higher portion of the produce's marketable value. Agricultural value chains are complex with several actors along the chain but information asymmetry between the farmer and aggregator or intermediaries results in farmers having to sell into saturated, weak markets that are not based on standards.

Digital Agriculture will also leverage social media platforms to build human capacity. One of the best examples originating from India is Digital Green. It uses participatory videos that have farmers explain best management practices to other farmers. While Digital

Agriculture is most advanced in the US, the concepts are scale neutral and are being successfully applied to smallholder farmers around the globe. We need to move with a sense of urgency to apply these new tools to accelerate the pace of agriculture development to not only realize the vision of the Prime Minister of a Digital India but to facilitate the achievement of Sustainable Development Goals before 2030. Digital agriculture will also help achieve the objectives of the National Food Security Act in the most efficient, effective and equitable manner to ensure ALL have access to safe, nutritious and affordable food.

Objectives

1. To study the digitalization impact of the Indian agricultural sector.
2. To suggest innovative digitalisation techniques.
3. To study the Government of India Schemes regarding Digitalisation of Agriculture.

Research Methodology

The present study is based on secondary data. Various secondary sources are Annual report of Ministry of Agriculture and farmer's welfare, department of agricultural cooperation India, Department of Animal Husbandry and Fisheries, Department of agriculture research and education, Indian Council of Agriculture, internet, newspapers, magazines, books, brochures, articles, and thesis etc. This research work is mainly concerned with the impact of Digitalisation on Indian Agriculture.

Digitalization Impact on Indian Agriculture

Indian agriculture has long, old and beyond memory history which begins the Indus valley civilization. One of the eldest water regulating structure in the world is Grand Anicut dam on river Kaveri (1st-2nd Century CE) and technological achievements of the pre-Harappan culture, including the plough. The farmers of the Indus Valley grew peas, sesame, and dates. Rice was cultivated in the Indus Valley Civilization. Indus civilization people practiced rainfall harvesting. At a recently discovered Indus civilization site in western India, archaeologists discovered a series of massive reservoirs, hewn from solid rock and designed to collect rainfall, that would have been capable of meeting the city's needs during the dry season.

The Ministry of Agriculture and farmers welfare is opening ways while formulating a well-planned strategy for the development of farmers as well as youth and initiatives like Pradhan Mantri Fasal Bima Yojana, e-NAM, Soil Health Card, Prampagat Krishi Vikas Yojana, Pradhan Mantri Krishi Sinchai Yojana, Skill Development would prove important in this endeavor. The Ministry has made a budget provision of Rs.3.52 crore for the year 2016-17 for implementation of the work of skill development so that training programmes may be organized through 100 Krishi Vigyan Kendras and distinguished training institutes of the Ministry.

As per the ministry of Agriculture various schemes had been launched to increase the income of the farmers i.e., Prampagat Krishi Vikas Yojana, National Agriculture Market (eNAM) Pradhan Mantri Krishi Sinchai Yojana, per drop more crop for water conservation,

Water Management, Water Harvesting, and Micro-irrigation. Rashtriya Gokul Mission.

Importance of Technology for Farmers

- To keep a tap on a day to day farming operations possible through the real-time flow of data from the plot to the company office.
- Right from sowing, the package of practices is set at a crop level on the plot and is communicated to the farmer through digital systems.
- Digital monitoring of the farm enables instant notification of the pests and diseases affecting the farmers' field to the right stakeholders.
- Another advantage that follows is pacing the farmer's activities on plots with the weather changes. This is of strategic importance to the field as weather play impacts the output.
- The digitization is going to change the agricultural practices in various means such as remote sensing of plots through satellite systems with precision as close to 5X5 meter resolution can help identify the pest or disease-affected areas of the plot. This can be done through Big Data Analytics, with indicators like Normalized Difference Vegetation Index (NDVI), Red Edge Index etc. It will be immensely helpful in weed and pest management.
- A field staff can also do quality checks on farms and see which a lot of his produce meets the customer order, in case of an exporting company - it can do Lab Test Integration and see if the inventory he has checked in to the system meets Maximum Residue Limits (MRL) requirement or not.

How Digital Agriculture Boosting Farmers' Income



Source: Author's Photo

The companies working with farmers are benefited in multiple ways, not only does digitization boost income but also reduce costs. This is essential to make this industry lucrative and motivate the farmer's son to take forward his father's profession with pride.

The cost of operation can be reduced by optimum usage of chemicals and fertilizers as well as time management of activities to control over spill of bottlenecks.

Around boosting income, timely management of activities on his farm, timely advisory on pest management by remote sensing, weather can ensure quality crop harvest increasing the marketability of his produce. This gives an added advantage, even in an online marketplace to bid better price for his crops. A buyer can see the farms entire story in pictures captured during the process. And therefore farmer will be able to give an end to end traceability. This is especially true for organic farmers and farmers who export and need such data to back their claims.

Innovative Digitalisation Methods in Agriculture

Latest Digital Trends in Agribusinesses

Agribusinesses should proactively take the challenge and adapt to the changing scenario.

Cultured Farming

Can you imagine that one-day Digitalized Agribusinesses will produce meat without animals, eggs without hens and milk without cows? It is possible with the help of Cultured farming where animal proteins are grown in the lab and there is no need to grow the whole animal. So no issue of Animal rights Group or nonvegetarian problem.

Nutraceuticals

We can see a number of workaholics who skip lunch or grab some unhealthy fast food keeping their eyes fixed on the computer screen. For such dedicated employees, nutraceuticals from bioengineered algae like Soylent and Spirulina are the most balanced drinks with all the essential nutrients is a boon. Algae culture is an emerging and promising Agribusiness venture.

3D Food Printing

Such Agribusinesses help deliver highly personalized diets by enriching food with various nutrients and medicines as per the consumer's requirements.

Supply Chain Innovation

Improvised sacks, refrigerators, trucks etc will reduce the losses while transporting to the remote areas and there is great demand for Agribusinesses which are into agri-logistics.

Urban Vertical Farms

These are gaining popularity which makes use of digitally controlled and manipulated indoor lighting systems, irrigation, and nutrient media to grow seasonal crops throughout the year without any environmental impact. The continued supply of raw material at the Agribusiness location itself is a boon.

Technologically Savvy Agribusinesses

Several Digital monitoring Apps in the local language and with simple GUI are highly beneficial. They make farmers life easy like Next Field Data analyses the soil type, climatic factors etc and determines the suitable crop and optimum time to sow seeds. GEOSYS's satellite-based remote sensing combines the historical records with real-time observations and helps in predicting problems even before the real symptoms appear.

Challenges Faced by GOI for Digitalisation of Agriculture

According to me, it's a good initiative but GOI has to face some challenges to make this plan successful. A proper training program, uninterrupted services, electricity, availability of smartphones, tablets, and computers to almost every farmer can be a big challenge.

Equipment Management

The initial use of wireless technology in agriculture focused on management of equipment to include a machine's location, fuel consumption, utilization, and status. Equipment management remains an important use of wireless in agricultural production. With wireless technology, farmers can manage their equipment from a smartphone or laptop from

any remote location; farmers can remotely detect and resolve equipment problems saving them valuable time and resources.

Drones

Unmanned drones are an example of a specific innovation employed to increase productivity and manage crop quality. Drones can be equipped with infrared cameras, sensors, and other technologies that collect a variety of relevant data to inform decisions regarding pesticides, herbicides, fertilizer, and irrigation.

Data Management

Interpretation and Accessibility Agricultural wireless technologies have advanced such that some systems not only provide farmers with richer information but also make recommendations based on the data they gather. As one Iowa State University professor stated, a wireless connection "can make the difference between actually taking advantage of what your data can tell you rather than simply producing colorful maps each year."

Wireless Technology in Irrigation Management

Wireless technology has proven to be particularly beneficial to agriculture for irrigation management and water conservation by reducing the labor intensity of farming and creating pathways for more precise information about growing conditions. Remote pivot controls give farmers the ability to direct pivot irrigation systems using satellite, cellular networks, or other telemetry systems rather than drive out to the fields and adjust their systems manually 13.

Remote Sensing

Starting in 2014's growing season, for example, new varieties of soy were tested throughout the American Midwest. Several farmers participated in the study to compare new varieties with existing ones. "Thanks to remote sensing techniques we were able to take stock of the crop's development much more efficiently", says Marshall Beatty, a Regional Agronomist with Bayer USA. The trial fields were analyzed with an airborne multispectral sensor mounted on a UAV. The resulting infrared images, for example, immediately showed which areas in the field needed more attention.

Decision Farming

Several start-ups around the globe are already trying their luck at harnessing and making sense of these gigantic data masses to tackle the challenges of food security and prepare agriculture to be more efficient for the future. One such start-up is green spin, a company based in Wuerzburg, Germany. "We believe that every branch of agriculture can be made more profitable if key information is made available at the right time", says Clemens Delatrée, the company's CEO. "Today a great deal of data already exists, and if it is used effectively, it can facilitate decision processes in agricultural management",

Collecting Data throughout the Season

There are thousands of different soil types around the world. But even in a region or a single field, a soil's quality can vary greatly. The more a farmer knows about his soils, the better he can decide which varieties to sow in a certain area to gain optimal yields.

As the crop grows, sensors on the tractor can detect the health of the plants by measuring their photosynthetic activity. Similar measurements

can also be done from space via unmanned aerial vehicles (UAVs) or satellites to cover a larger area while still delivering high resolution.

At the season's end, the combines harvesting the crop have built-in yield monitors that record fluctuations and automatically generate a detailed yield map of each field. This data can be used in the next season to further optimize cultivation.

Government Schemes Regarding Agriculture in India

Pradhan Mantri Krishi Sinchayee Yojana

Pradhan Mantri Krishi Sinchayee Yojana has been launched to provide relief to the farmers due to poor monsoon. Under this scheme, the emphasis is being put on "water to each and every farm" that is to say to provide facilities of irrigation to each and every farmer along with enhancement of water conservation skill.

Paramparagat Krishi Vikas Yojana

To promote bio-farming in the country, the NDA Government launched an initiative in 2015. According to the scheme, the farmers are being encouraged to adopt bio-farming by making clusters in the country. To be benefited from this scheme at least a cluster of 50 farmers is required along with an area of land with 50 acres. Under this scheme, every farmer will be provided Rs. 20,000/- per acre for the span of three years. Farmers will utilize this amount for the purchase of bio-seeds, harvesting and to transport the agricultural products to the local market.

Soil Health Card Scheme

The government has initiated a Soil Health Card scheme to provide farmers Soil Health Card in a

mission mode. This card will contain the know-how of the new trend in the soil and accordingly the required quantity of fertilizers. Through that farmers will be capable enough to obtain more products on their farms. Through this card, the farmers will know the fertility of their fields. The expert will sort out the problem concerned with soil. Though this card the farmers will monitor the change of quality related to the soil after prolong use of the farms in agriculture process and they will benefit from the soil card to maintain the health of the soil.

Pradhan Mantri Fasal Bima Yojna

The government of India has launched Pradhan Mantri Fasal Bima Yojna to provide relief to the farmers inflicted with the loss of crop damage. This is truly a farmer welfare scheme. Under this scheme, the burden of premium will be reduced and their cases will be sorted out expeditiously. Apart from the losses inflicted by crop damage, the provision has been made with this scheme to relieve the farmers from the losses in harvesting aftermath scenario. This scheme provides an assessment of local calamities along with a list on unseasonal rain form.

National Agriculture Market (e-NAM)

National Agriculture Market (e-NAM) is all India electronic trading portal which aims at to form a unified national market for agricultural products by making a network for the markets related to the existing Agricultural Produce Marketing Committee (APMC). The government made up its mind to develop a National Agriculture Market so as to transport the agricultural product from one market to another in a smooth way, to save the producers from a number of market duties and to provide

agricultural product to the consumers on a fair price. By September 2016 eNAM will cover more than 200 agricultural markets and by March 2018 such methodology will be developed for 585 markets which will facilitate the transportation of agricultural products to the market. At present, the farmers sell out their products through the Mandis or Bazar Committees which levy a number of duties on their products.

India Emergence Campaign through Village Emergence

The government of India has launched a campaign named as India emergence through village emergence so as to improve the means of livelihood amongst the rural, to accelerate rural development process to strengthen Panchayati Raj across the country to establish social equality to create awareness about the agricultural schemes.

My Village My Pride

A new scheme has been initiated to provide the methodology of scientific farming and new technology to every village. For this purpose, all the experts of Agriculture University and ICAR Institutes spread all over the country have been invited. Under this Scheme, 20,000 agriculture scientists have been engaged to adopt a village which is also involved to pay awareness to adopt the ways of sophisticated scientific farming and their implementation.

Conclusion

“Smart Farm’ making the farmers smart with innovations”

An all-inclusive digital platform for the agriculture sector will help improve yields and

meet the growing demand. The numbers around India's agriculture sector is staggering. It accounts for nearly 15% of India's gross domestic product. It constitutes 10% of the overall exports. Over 58% of rural households depend on the sector as their principal means of livelihood. Most importantly, it feeds more than 1.2 billion people. Driven by a growing population, in particular, an expanding middle class with higher incomes, the sector has seen a sustained increase in demand, especially over the past decade. India, however, continues to face significant bottlenecks in feeding nutritious food to a large chunk of the population, leading to issues around chronic undernourishment and malnutrition as well as lifestyle diseases. To feed the currently undernourished population, India would require a 3-4% increase in food supply. With the population expected to grow even further, the strain on the sector is likely to grow more in the coming years.

This is where the use of technology can be of immense help. Technologies such as automation, decision support system and agriculture robots are being widely adopted in the sector globally. Farmers are using the Internet of Things and smart sensors to get access to valuable information like soil moisture, nutrient levels, the temperature of produce in storage and status of farming equipment. The sector is also ripe for the use of big data analytics and artificial intelligence, technologies that have been deployed successfully in various sectors across the globe. However, the digitization and use of technology in agriculture have, thus far, been taking place in confined application fields. The logical step for the sector, especially in India, would be to build an all-inclusive digital platform. Meeting India's growing food demand requires improvements on multiple fronts: availability,

affordability, consumer awareness, quality, safety and access to food. A holistic digital platform can help address these and catapult Indian agriculture to the next level.

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The String of Pearls between India and China

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Abstract

India & China are the fastest growing economies in Asia. In this globalized era, both these countries have progressed in the field of scientific knowledge, space & technological development. It is imperative to have friendly relations with neighboring countries to promote trade, peace & understanding. The silk route has been a major network of trade between east & west which has facilitated cultural interaction between the countries. The silk route refers to trade in silk which began in the Han dynasty. The Han dynasty expanded the Central Asian section of the trade routes and took great interest in the safety of their trade products and extended the Great Wall of China to ensure the protection of the trade route. China, in order to control maritime navigation, has set up a string of pearls which are naval bases in Myanmar, Bangladesh, Pakistan, Sri Lanka & also to protect its oil shipments. China considers India as a threat for its development & therefore it has made huge investments in China India Myanmar Bangladesh Economic Corridor (CIMBEC) to check piracy & safety of Sea Lines of Communication (SLOC). The present paper tries to understand the concept of String of Pearls & examine the extent of preparedness of India to China's String of Pearls strategies & analyze the trends in trade between these two countries.

Introduction

South East Asian Tigers are the economies that have achieved rapid industrialization, high growth rates & high incomes. These economies became a role model for many developing countries. These are South Korea, Singapore, Hong Kong, Japan & Taiwan. In the 15th century, China ruled the eastern seas and India was a major trader. In 1500, China and India together accounted for nearly 50 percent of the total world output. China and India have shared a long history of cultural, scientific, and economic linkages. Asia's two largest and most dynamic economies, India and China, are

emerging as new trendsetters in global economic affairs.

Though India had trade contacts with the rest of the world, China was much ahead in the field of science & technology. Both countries have their own ancient history that marked the beginning of their growth & development. Both India and China possess manpower, scientific, industrial, technological & armed forces. These countries act as hegemony influencing global economy & politics. Trade between these countries increased after the formation of the BRICS trade

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block in 2006. The present study is an attempt to evaluate the strategies of India towards China's String of Pearls.

Historical Background

Cultural and economic relations between China and India dates back to ancient times. The Silk Route not only served as a major trade route between India and China but also it facilitated the spread of Buddhism from India to East Asia. More than 1600 years ago a Chinese monk Faxian (Fahein) made his maiden pilgrimage to India to look for Buddhist scriptures. The route which he traveled was called the 'Silk Road' & the route he chose to go back to China via the Indian Ocean was named as the 'Maritime Silk Road', this road embodies the spirit of peace, co-operation, openness & mutual learning. Maritime Silk Road or Maritime Silk Route refers to the maritime section of historic Silk Road that connects China to South East Asia, Indonesia, Indian Subcontinent, Arabian sea, all the way to Egypt & finally Europe. Formal relations between both these countries began in 1950. China and India share a long border, which includes Nepal, Burma (Myanmar) and comprises the present Indian state of Arunachal Pradesh. The first bilateral agreement between the two nations was in 1954 known as the Panchsheel Treaty which related to the Non-Interference in internal affairs and respect for each other's territorial unity, integrity, and sovereignty. This agreement stated the five principles as:

1. Mutual respect for each other's territorial integrity and sovereignty.
2. Mutual non-aggression.
3. Mutual non-interference in each other's internal affairs.
4. Equality and cooperation for mutual benefit.

5. Peaceful Co-existence

Review of Literature

- Meghnad Desai (2003), in his essay, describes the historical, political & economic relations between India & China. He provides a comparative analysis of economic performance between the countries where is the second largest economy accounting for 11.5% whereas India accounts for 7.7% both accounting for 19.2% in world GDP growth rate. T P Bhat (2006) explains competitiveness in the external trade sector between India & China.
- Christopher J. Pehrson (2006), emphasizes the rising importance of China's String of Pearls' in influencing geopolitical economy & diplomatic relationships. He examines the context of the post-cold war global security & to reap the benefits of strategic co-operation. He also explains how China wants to connect with the Middle East & Africa to share vital resources along the Sea Lines of Communication (SLOCs), modernizes military operations across the Indian ocean.
- Krishna Chaitanya V (2007), examines the political-economic ties between India & China, the extent of dependence & influence of trade along the string of pearls between these countries & also the Asian countries. The string of pearls which relates to the silk route that existed between the countries & facilitated trade has now become one of the strategic discussions & also to control maritime trade.
- M. Julie Kim & Rita Nangia (2010), have identified factors that influence

infrastructural development in India & China as both the countries have a huge population resulting in the supply of labor. They have tried to analyze how physical growth impacts inclusive development with special reference to the development of road transport between the two countries.

- Ganeshan Wignaraj (2011), compares economic reforms, regionalism & exports between India & China. He also highlights the significance of the silk route for China to expand its trade relations with the other countries & its efforts to have a competitive advantage & control over the string of pearls.
- Ram Tirth Goel (2012), gives an insight into bilateral trade & investment between the two countries. Trade between the two has been increasing since 2007. According to him, China prospers in the manufacturing segment whereas India's potentials lie in knowledge-based services.
- Mick Ryan (2012), analyze how India & China are emerging economically & how they have influenced the global economy. Both countries have achieved development in areas of space technology & nuclear energy. They examine the trade balance between China and India in 2030, also assess their relations with USA & Pakistan & how their strategic objectives of both the nation's influence competition between them & the rest of the world.
- Dr. Radha Raghuramapatruni (2012), examines the trade patterns between the two countries with a focus on trade in services & investment. According to him, these countries have a rich pool of talent & skilled manpower. He elaborates how

these countries are improving their international competitiveness & derive mutual benefits by using trade intensity & modified trade intensity index by considering the revealed comparative advantage index.

- Qasim Hameedy (2013), evaluates the relations between India & China emphasizing on bilateral & military relations. Both the countries aim at attaining peace in the Asian continent, China being one the prominent members of the United Nations Security Council has signed the non-nuclear proliferation treaty. The author compares the relations between the two countries focusing on the 1962 war environment and the present developments.

Objectives

- a) To understand the concept of String of Pearls
- b) To ascertain the preparedness of India to face China's String of Pearls strategy.
- c) To assess the trends in trade in both countries.

Research Methodology

The study is based on secondary sources from articles, newspapers & the internet.

a) The Concept of String of Pearls

The String of Pearls is a geopolitical theory on potential Chinese intentions in the Indian Ocean Region (IOR). The phrase 'String of Pearls' was first used in 2005, in a report entitled "Energy Futures in Asia" provided to U.S. Defense Secretary Donald H Rumsfeld by defense contractor Booz Allen Hamilton. It alleged that China was adopting a "string of pearls" strategy

of bases stretching from the Middle East to southern China to expand its naval presence by constructing civilian maritime infrastructure along the Indian Ocean region. These pearls were naval bases built by the Chinese in Myanmar, Bangladesh, Pakistani and Sri Lanka. China's rapid economic development has been heavily dependent on foreign sources of energy. The sea lines of communication that link the Chinese mainland with ports throughout the Middle East and coasts of Africa have become a major source of conflict with respect to China's future energy security. It refers to the network of Chinese military and commercial facilities and relationships along with its Sea Lines of Communication (SLOC), which extend from the Chinese mainland to Port Sudan. The sea lines run through several major maritime points such as the Strait of Mandeb, the Strait of Malacca, the Strait of Malacca, the Strait of Hormuz and the Lombok Strait as well as other strategic maritime centers in Pakistan, Sri Lanka, Bangladesh, the Maldives, and Somalia.

b) Preparedness of India to face China's String of Pearls Strategy

India's Look East Policy as Act East Policy emphasizes on developing infrastructure in the East Asian countries. India has recently extended over USD 1.75 billion in grants and credit to Myanmar. To build deep-sea military infrastructure at Sonadia in Bangladesh, India has promised USD 4.5 billion credit to Bangladesh. India has invested a lot of diplomatically and entered into multiple pacts with countries like Turkmenistan, Uzbekistan, Kyrgyzstan, Kazakhstan, and Mongolia - all surrounding China. Besides, India has good old friends like Japan, South Korea, and Russia which help in technology & space development. India has entered into commercial agreements with Indian Ocean African Rim group called

IOR-ARC (the Arrangement for Regional Cooperation), and India-Brazil-South-Africa (IBSA) provision of energy and other resources. The Indian Navy holds a strategic location for the fight against piracy off the Gulf of Aden, and the Indian Navy can monitor the sea lines of communication (SLOCs) of Hormuz and Aden & combat terrorism across the Indian Ocean. India has signed an MOU to provide piracy patrols to Mozambique. In 2007 India has set up its naval base in Strait of Hormuz & Strait of Malacca & has negotiated with Mauritius to construct surveillance aircraft. India's expansion of its maritime control with its navy has transferred offshore naval patrol vessels, provides staff training, naval hydrographic support to the island nations. To ensure the safety of navigation & support all marine activities, environmental protection, it is strengthening its naval bases in the Indian Ocean & the development of ports with loans from the Asian Development Bank & World Bank.

c) Trends in Trade in Both the Countries

Trade between these countries consists of agricultural products, engineering goods, textile products etc. Both India & China want to strengthen economic co-operation, technology development, industrial cooperation, promote regional economic integration in Asia. India's exports to China include copper alloys, copper, cotton yarn, granite, iron-ore, vegetable oils, wool, food products & marine products. India's imports from China include telephone sets, apparatus for a wireless network, machines for processing data, chemical fertilizers, spare parts, television sets, packaging materials and silver.

From table 1, it is evident that there is continuous growth in trade with China for the

Table 1: India's Trade with China During 1995-2012 (US \$ in Millions)

Year (Apr-Mar)	Exports	Imports	Balance of Trade	Total Trade Turnover	Annual Growth of Turnover
1995-96	334	807	-463	1141	-
1996-97	615	757	-142	1372	20.2
1997-98	718	1,112	-394	1830	33.4
1998-99	427	1,097	-670	1524	-16.4
1999-00	539	1,283	-744	1822	19.5
2000-01	831	1,502	-671	2333	28.1
2001-02	952	2,036	-1084	2988	28.1
2002-03	1,975	2,792	-817	4767	59.5
2003-04	2,955	4,053	-1098	7008	47
2004-05	5,616	7,098	-1482	12714	81.4
2005-06	6,759	10,868	-4109	17627	38.6
2006-07	8,321	17,475	-9154	25796	46.3
2007-08	10871	27146	-16275	38017	47.3
2008-09	9353	32497	-23144	41850	10.1
2009-10	11618	30824	-19206	42442	1.4
2010-11	15,483	43,480	-27997	58963	38.9
2011-12	18,077	57,518	-39441	75595	28.2
Total (1995-2012)	95444	242345	-146891	337789	511.6
Average (1995-2012)	5614	14256	-8641	19870	30.1

Source: Government of India (2012), Export and Import Data Bank (DGCI&S), Ministry of Commerce

past 17 years. Exports data has increased 53 times whereas import data has increased 70 times from 1995-96 to 2011-12. The gap between exports & imports is increasing which results in increasing negative balance of trade with China. In 1995-96 import figures are 2.41 times of export figures whereas in 2011-12 import figures are 3.18 times of export figures.

Except in 1998-99 for all other years the annual growth rate of turnover is increasing, in 2004-05 the increase in annual growth rate turnover is at its peak i.e. at 81.4 % while in 2009-10, the lowest percentage growth is 1.4% & in 1998-99 there is a negative growth of 16.4%.

Table 2 shows the trade balance between India & China from 2009 till 2011. There was a

Table 2: China India Trade Balance 2009 to 2011 (US \$ in billions)

	2009	2010	2011
India Exports to China	13.70	20.86	23.41
Growth %	-32.63	52.19	12.26
China Exports to India	29.57	40.88	50.49
Growth %	-6.17	38.25	23.50
Total India-China Trade	43.28	61.74	73.90
Growth %	-16.55	42.66	19.71
Trade Balance for India	-15.87	-20.02	-27.08

Source: Government of India (2012), Export and Import Data Bank (DGCI&S), Ministry of Commerce

recession during this time. In 2009 trade declined to 16.55% whereas in 2010 trade increased to 43%. India exported goods to China worth the US \$ 20.86 billion & China imported goods worth the US \$ 40.88 billion. In 2011 India's exports to China was US \$ 23.41 billion (23%) & China's exports to India was the US \$ 50.49 billion (24%).

Findings

China is driven by the production and export of manufactured goods and India is by services, led by Information Technology (IT). Goldman Sachs claims that China & India could overtake the USA as the world's biggest economy in 2020. China ranks as the second largest economy in terms of GDP in PPP dollars. Both the countries account for 19.2 % of world GDP- China 11.5% and India 7.7%. One of China's most ambitious economic and foreign policy projects is the so-called 'One Belt, One Road' (OBOR) initiative, also referred to as the Silk Road Economic Belt and the 21st Century Maritime Silk Road. It aims to connect China's near and distant neighborhood through a massive program of infrastructure building. In 2013 China under its President Xi Jinping spent 900 US \$ to improve its interconnectivity with more than 60 countries in Asia, Europe & East Africa, by increasing trade it can increase economic growth & wealth.

Limitations & Scope for Further Study

The study does not focus on space development between the two countries. The scope for further study will be to understand the regional economic integration amongst the BRICS countries & its impact on the development of these two countries.

Conclusions

India and China are competing for markets, resources, and influence on land and sea, in Asia, Africa, and the Indian Ocean. This competition is spilling over into outer space. The competition is likely to increase between these countries. Although India's focus on the military applications & transfer of technology is certain to grow in the coming years, much will depend on its collaboration with the U.S. This could prompt China to accelerate its own military program further. India has maintained its territorial integrity. As India & China are the largest importers of oil & it arrives by sea from the Middle East, both the countries should ensure that there is no disruption of the sea lanes of communication.

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Sustainable Sericulture and Allied Farming : A Study of Rural Agripreneur in Kalaburagi District of Karnataka State in India

Panduranga V*

Abstract

India is an agrarian economy; farmers are the backbone of the country. Majority of the rural people depend on agriculture directly and indirectly. Agro-based industries are also providing employment opportunities. The agriculture sector is making a considerable contribution to the GDP. A lot of diversity prevails in the agricultural sector in India due to different varieties of soil, landscape, climatic conditions, size of land holding etc. There are many small and marginal farmers in India. These small and marginal farmers are finding a lot of difficulties and farming is not economically feasible for many farmers. However, some of the farmers are doing wonders in their small lands. An attempt is being made in this study to describe and analyze the sustainable and allied farming of a rural agripreneur by name Gunderaya Dhoolgond of Pattan Village of Kalaburagi District of Karnataka State in India.

Introduction

The agricultural sector is contributing significantly to the Indian economy in terms of providing livelihood, employment, food for consumption, inputs to agro-based industries, etc. Majority of the rural population depend directly and indirectly on agriculture. Indian farmers are facing several challenges such as low productivity, fluctuating prices, the shortfall of rain, crop loss due to pests and insects, etc. Sustainable farming is the need of the hour. However, some of the farmers have proved that farming is commercially feasible with small land holdings. Crop diversification, allied farming activities, conservation of water, organic farming, etc. are the best practices of sustainable farmers. Karnataka is one of the states known for sericulture. In the Kalaburagi

district of the state 627.73 hectares of land is under sericulture as of March 2018 in 156 villages and there are 834 farmers. The present study deals with the sustainable and allied farming practices of a rural agripreneur Mr. Gunderaya Dhoolgond of Pattan Village in Kalaburagi District of Karnataka State in India.

Review of Literature

M.Raju and B.Sannappa (2018) analyzed costs involved and returns generated in mulberry and cocoon production among the farmers of rainfed and irrigated conditions in Chamarajanagar district of Karnataka state. It was observed that the cost and return structure of mulberry and cocoon production varied between rainfed and irrigated conditions of small, medium and big farmers.

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Subrata Trivedi (2015) compared the income of sericulture with traditional agriculture crops by conducting a survey of 200 farmers from Nabagram Block of Murshidabad District. Sericulture is capable of generating more income than other cash crops such as paddy, wheat etc. Most of the crops can be grown once or twice in a year but sericulture can take place four to five times in a year.

A.N. Borkar et al (2011) conducted a survey of sixty sericulture farmers of Nagpur District. Sericulture has a great employment potential of 689.62 human labor days. One male and one female labor can get full employment throughout the year through on small scale sericulture. It was observed that silk cocoon above 200 DFLs and area more than 0.40 hectare is more profitable with a high scope for employment.

Ruchira Shukla (2012) studied the economics of rainfed sericulture with an empirical analysis of 70 rainfed sericulture farmers in the Udaipur district of Rajasthan state. Sericulture has good potential to generate an attractive income of farmers. It is labor intensive and very good for small farmers to gain employment and income throughout the year.

S. Purushotham and P. Rama MohanaRao (2009) analyzed the economics of mulberry sericulture farmers of cross-breed silkworm farmers selected from six villages with the highest area under mulberry cultivation of Ananthapur District of Andhra Pradesh. Based on the survey of 120 farmers it was found that net returns of two acres of mulberry worked out to Rs. 52,206 per annum. The benefit-cost ratio of sericulture is about two.

Objectives

The study aims to describe the sustainable farming activities of a rural farmer and analyses the financial feasibility of sericulture farming on small scale.

Methodology

The study is descriptive and analytical in nature. It is completely based on primary data. Data has been collected from the farmer who is cultivating sericulture and some allied crops through a sustainable approach. In-depth interview of the farmer has been conducted in the month of October 2018.

Personal and Entrepreneurial Profile

Mr. Gunderaya, S/o Smt. Shankamma and Shri. Siddanna Dhoolgond was born in the year 1969 in a farming family of Pattan Village of Kalaburagi Taluk in Kalaburagi (erstwhile Gulbarga) District of Karnataka State in India. He studied up to 7th standard in Pattan Village, High school in Kadaganchi village which is 12 kilometers from Pattan village. During schooling, he used to work in farming activities along with his parents. After passing SSLC in the year 1986, he was admitted to Internship teacher training course (now it is known as TCH/D.Ed.), he quit the course within one month, and then he was admitted to ITI (Diesel Mechanic). He did not continue even in that course. He was put to work in a shop but he was not interested, then he worked in a transport undertaking for some days. He was very much interested in agriculture, that's why started cultivating in his farm from 1986. After four years he started digging a well to source water for irrigation. In a span, six months 56 feet depth 27 feet width and 27 feet length well were dug. The manpower employed in digging the well

consisted of himself, his spouse, one hired labor and few labors hired occasionally employed. Since 1991, the water of this well is being used for cultivation. He is involved in agriculture since his childhood. He took several initiatives in farming over a period of 32 years, since 1986. He has sought the guidance, assistance, and training from Central Silk Board as well as Dept. of Sericulture, Government of Karnataka. He has adopted organic farming practices. He is not using any chemical fertilizers and pesticides. He was honored with Krishi Pandit awarded in the year 2014 by Department of Agriculture, Government of Karnataka and Sangashree Award given by reputed Kannada Daily Vijayavani in the year 2014. Few other regional level awards are the feathers for Mr. Gunderaya.

His elder son has completed the Diploma and now he is perusing D.Ed. course but still he is assisting in farming activities. His daughter has completed a Diploma in Nursing course and working as a Staff Nurse in a private hospital in Kalaburagi. Younger son is going to school. Entire family leaves in a small house

constructed in their field and all the family members are assisting in farming activities on a need basis. His practices and preaching are as follows:

- a) Don't expect and accept any illegal source of money
- b) Non-violence.
- c) Honesty is the best policy.
- d) Down to earth and work hard.
- e) Don't waste time.
- f) Famer shall be a giving hand and stretching hand.
- g) The land is like gold.

Sericulture and Other Allied Farming Activities

Mr. Gunderaya has 3 Acre and 27 Gunta (Approximately 3.675 acre) inherited the land. He has used the land for sericulture and allied farming. Details of land usage are given in Table 1, and revenue details in Table 2.

It can be inferred from the land utilization

Table 1: Land Utilisation for Cultivating Commercial Crops as well as for Domestic Consumption

Sl. No.	Size of the Land	Land Utilisation	Purpose
1.	Two Acres	Mulberry growing	Commercial
2.	One Acre	Chikoo (Sapodilla) plants	Commercial
3.	Between the Chikoo plants in the one-acre land mentioned in Sl. No.2	Cultivation of cereals pulses, oilseeds as well as rice. Two to three crops per year.	Domestic consumption
4.	0.27 Gunta (Approximately 0.675 Acre)	Rearing House of 50 X 20 feet for sericulture and Chawki Shed of 20 x 30	Commercial
		Sheep, Hen, and chickens	Commercial
		Three Cows	Commercial as well as domestic consumption
		Lime tree, banana tree, growing vegetables, ginger, garlic, turmeric, etc.	Domestic consumption

details given in Table 1 that the land is utilized optimally. Apart from commercial crops, a part of the land is used for cultivating the crops and vegetables required for domestic consumption.

He is self-sufficient in food grains and vegetables required for consumption at home.

Table 2: Crop-wise Average Revenue per Year (Based on the Last Three Colander Years)

Sl. No.	Crop	Average Revenue (Rs.)
1	Sericulture	4,80,000
2	Chikoo	50,000
3.	Cow milk and sale of the calf	30,000
4.	Sale of rooster and hen	20,000
5.	Sheep	20,000
Total		6,00,000

Gunderaya has started sericulture in the year 2006. He has got a subsidy of Rs. 75,000 from Government of Karnataka for construction of Rearing House. Every year he is growing seven crops with an average of 150 Kgs. of cocoon per crop. For every crop 250 silk, warm eggs are required. These 250 eggs will yield 1,60,000 - 1,70,000 silk warms. The eggs are procured from Silk Board at Rs. 500 for 100 eggs. Mulberry plants are grown in two acres of land. Average yield is 150 Kgs. cocoon per crop. Hence, annual production will be 1000 to 1050 Kgs. of the cocoon. He fetched an average price of 450 to 600 per kg in the last three years (the calendar year 2016, 2017, and 2018). Apart from sericulture, he is also getting revenue from the sale of Chikoo fruits, roaster, hen, sheep, calf, and milk. As shown in Table 2 he is generating a revenue of Rs. 6,00,000 per annum. His out of pocket cost is hardly Rs. 35,000 per annum. However, there is an opportunity cost of using own land, two full-time labors (Himself and his spouse) and two labors (son and daughter) working occasionally.

Cost analysis revealed that the major cost for him is an opportunity cost. The opportunity cost of his land is about Rs. 50,000 per annum based on ongoing lease rates. Mr. Gunderaya and his wife are working throughout the year and their son, as well as a daughter, works with them on a need basis. The opportunity cost of labor will be Rs. 1,86,000 per annum (Rs. 200 per day x 720 man days + Rs. 200 per day x 210 man days). Apart from this the opportunity cost of manure estimated at Rs. 30,000. The total cost opportunity will be Rs. 2, 66,000. He is also spending out of pocket cost of Rs. 35,000 on various miscellaneous expenses. Hence, his total cost is about Rs. 3,01,000, of which about 89 percent of the cost is an opportunity cost. The net earnings is Rs. 2,99,000 p. a. (i.e., Revenue Rs. 6,00,000 – cost Rs.2,01,000)

SWOT Analysis

Based on the interaction with Mr. Gunderaya Dhoolgond, the author has inferred the

following strengths, weaknesses, opportunities, and threats:

<p style="text-align: center;">Strengths</p> <ul style="list-style-type: none"> a) Honest and dedicated. b) Owns fertile land. c) Always ready to take up new initiatives and experiments. d) Capable of farming with limited resources. e) Living in a house with a family in his farming land. f) Cooperation and assistance from family members. g) Entire family members are engaged in farming activities on a need basis. 	<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> a) Complacent. b) Not focusing much on marketing. c) Not interested in scaling up.
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> a) Increasing demand for silk. b) Scaling up of farming activities. c) Alternative crops such as palm tree plantation and red sandal plantation. 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> a) Fluctuating prices of the cocoon. b) Not able to buy land due to the high price of agriculture land.

Being the owner of small fertile land Mr. Gunderaya Dhoolgond is an honest and dedicated farmer. He has become a role model for other farmers in and around Pattan Village. He is capable of increasing the revenue from his farming activities; he can also scale up farming activities by purchasing additional land. But he is not interested in scaling up. The threat of fluctuating prices of the cocoon is a temporary phenomenon. The first-grade cocoon fetches a good price. He is he is able to cultivate good quality cocoons by working and monitoring regularly and punctually.

Social Service

Mr. Gunderaya Dhoolgond has a lot of concern for society. Always he is helping people in and around Pattan village. Two years ago he has started a trust by name Shree Guru Beeralinga and Shishya Mahalingaraya Education and Rural Development Trust for undertaking

various social service activities. Under this trust, a school is started for benefit of rural children. At present, the school is running in his own house located in the village. At present 40 children are studying in school. A very nominal fee is collected from the students and he is spending yearly Rs. 30,000 from his pocket to meet the operating expenses of the school. He has purchased one acre land near Pattan village and earmarked it for the trust to undertake other socially responsible activities. He has become a role model in and around Pattan Village. He has encouraged and other farmers in saturating sericulture.

He has organized eleven mass marriages were in June 2018 along with his son's marriage. Cloths and gold were gifted to all the brides and bridegrooms. He instructed the family members of pairs getting married to invite any number of friends and relatives for the marriage. About

6,500 people gathered to witness the occasion. Majority of the food grains used such as rice, pulses, oilseeds, vegetables etc. were cultivated in his field. He has incurred the entire expenditure of eleven marriages.

Allied Farming Activities for Small Farmers

Mr. Gunderaya is motivating other farmers in and around Pattan village to focus on allied farming activities along with the main crops. Out of his own experience, he is suggesting the following activities to make farming commercially feasible.

Table 3: Allied Farming Activities Suggested for Small Farmers

Activity	Cost (Rs.)	Revenue within the first two years
One pair of sheep	10,000	Gives birth to 10 sheep in two years which can be sold at Rs.3000 (Rs. 3,000 x 10 = Rs. 30,000). Manure can be used for farming.
One hen and one rooster	1,000	Minimum 100 chicks which can be sold for at least Rs.100 each. (Rs. 100 X 100 = Rs. 10,000). Manure can be used for farming.
Two cows and one ox	60,000	4calf can be sold for Rs. 40,000 and milk of Rs. 40,000 per year (Rs. 10,000 x 4 calf + Rs. 40,000 x 2 years = Rs. 1,20,000). Manure can be used for farming.

The allied models suggested by Mr. Gunderaya are feasible for small farmers to increase their revenue easily. These activities will also lead to the accumulation of organic manure. Otherwise, the farmers need to spend a part of their revenue on the purchase of milk, manure for field etc. Hence, there is a dual benefit of increasing revenue and reducing expenditure.

source of inspiration for small farmers. Many farmers are getting his advice and he is always ready to help others. Sericulture, few crops, and other allied activities make farming economically viable. Small farmers can lead a very happy, healthy and wealthy life by adopting the farming strategies of Gunderaya Dhoolgond.

Conclusion

Small farmers can do wonders in their two to three acres of land. Sustainable farming is the need of the hour. Optimum use of resources, crop diversification, organic farming are the main principles for sustainable farming. Along with main crops allied activities such as two to three cattle, two to three sheep, few rooster, and chicken, are grown to add revenue and gives full-time employment. Mr. Gunderaya of Pattan Village is having thirty-two years of framing experience is self-sufficient and capable of getting a good return. He is the role model and

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Is Privatisation Solution for PSBs to get Rid of NPAs?

Prakash Basanna *

Abstract

A strong banking sector is essential for the growth of the economy of any country. The failure of the banking sector may have an adverse impact on other sectors. The Indian banking system, which was operating in a closed economy, now faces the challenges of an open economy. Granting of credit for economic activities is the prime duty of banking. Apart from raising resources through fresh deposits, borrowings and recycling of funds received back from borrowers constitute a major part of funding credit dispensation activity. NPAs have not been a problem only for the banks but has been a problem for the economy too. The money locked up in NPAs has a direct impact on the profitability of the banks as many Indian banks are highly dependent on interest income. This paper has made an attempt to explore the causes of NPA and measures undertaken to curtail NPA, especially of PSBs. Though many steps have been taken by RBI and the government to reduce NPAs they are not enough to curb it. Only PSBs and cooperative banks have the largest NPAs compared to privately owned banks. The root cause for the problem is government ownership of the banks. In spite of being tried various schemes of improvement none of the PSBs has succeeded. It is only through structural changes rather than functional changes, the problem of NPAs can be cured. Unless the ownership of PSBs is changed there is no hope of achieving robust in the Indian banking system. In addition, a proper monitoring system and effective business models need to be developed in order to resolve the gigantic problem of NPAs.

Introduction

A strong banking sector is essential for the growth of the economy of any country. The failure of the banking sector may have an adverse impact on other sectors. The Indian banking system, which was operating in a closed economy, now faces the challenges of an open economy.

Granting of credit for economic activities is the prime duty of banking. Apart from raising

resources through fresh deposits, borrowings and recycling of funds received back from borrowers constitute a major part of funding credit dispensation activity. Lending is generally encouraged because it has the effect of funds being transferred from the system to productive purposes, which results in economic growth. However, lending also carries a risk called credit risk, which arises from the failure of the borrower. Non-recovery of loans along with interest forms a major hurdle in the process of the credit cycle. Thus, these loan losses affect

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the banks' profitability on a large scale. Though complete elimination of such losses is not possible, banks can always aim to keep the losses at a low level.

Non-performing Asset (NPA) has emerged since over a decade as an alarming threat to the banking industry particularly Public Sector Banks (PSBs). In spite of many corrective measures undertaken by the RBI and government to solve and end this problem, the problem is not completely solved. It is a sweeping and all-pervasive virus confronted universally on banking institutions. It is observed that four sectors like textile, aviation, mining, and infrastructure contributes to a huge amount of NPA. According to sources of RBI Gross NPA (GNPA) of Indian public sector banks stood at `7,33,974 crores while that of private sector banks stood at `1,02,808 crores as on 30th September 2017. Nirav Modi and Mehul Choksi cheated Punjab National Bank by defaulting the loan to the tune of Rs.11,400 crores.

According to the CARE rating analysis of 38 banks during the first quarter of June 2017, 18 PSBs were among the top 20 banks with the highest GNPA ratios. SBI, Punjab National Bank, Bank of India and Bank of Baroda accounted for Rs.3,93,154 crore which is 47.4% in the total NPAs. Out of which SBI accounted for the largest share of about Rs.1,88,068 crore which is 22.7% in the total NPAs. Nearly eight public sector banks such as IDBI Bank, Indian Overseas Bank, UCO Bank, Bank of Maharashtra, Central Bank of India, Dena Bank, United Bank of India and Corporation Bank had a GNPA ratio of over 15 percent. YES Bank is the only bank in the sample of 38 banks with a GNPA ratio of less than one. Thus the recent

default scams of many Indian PSBs really make everyone to seriously think about it and implement necessary actions. The total NPA of the Indian banking sector is recorded at `9.62 lakh crore at the end of March 2018 and out of which 4387 large borrowers alone accounted for `8.6 lakh crore which constitutes 90% of total NPAs of the banking sector.

Review of Literature

Ramu, N (2009) analyzed the asset quality of selected urban cooperative banks in Tamil Nadu and suggested that by adopting international prudential norms and accounting practices and by tightening the prudential norms the banking sector can be relieved from the problem of NPAs. Bhavani Prasad and Veera D (2011) studied NPAs of the Indian banking sector and pointed out that PSBs accounted for 78% of total NPAs and this is due to falling revenues from traditional sources. Jaynal Ud-din Ahmed (2011) in his study concluded that both the earning capacity and profitability of Indian banks have been adversely affected by the NPAs and reduction of which has been the biggest challenge for the Indian economy. Siraj K.K. and P.Sudarsanan Pillai (2013) in their paper state that NPA affects liquidity and profitability and poses a serious threat to the quality of assets and survival of banks. The study also concluded that NPA poses a great question mark on the efficiency of credit risk management of Indian banks. Sonia Narula and Monika Singla (2014) in their paper stated that there is a positive relation between total advances, net Profits, and NPA of the bank. The NPA arises due to mismanagement of bank and such problem results in dry-up of the funds required for the new borrowers.

Need for the Study

NPA has emerged, since over a long period, as an alarming threat to the Indian banking industry particularly PSBs. Several banking reforms introduced by the GOI and RBI have been neutralized by the ill effects of this surging threat. In spite of various correctional measures administered to solve this problem, almost all the PSBs are severely suffered by the problem. This is an area which requires urgent consideration and hence, the researcher felt the need of taking up a study on NPAs of Indian PSBs.

Objectives of the Study

- To present a conceptual framework of NPA.
- To identify the causes for NPAs in Indian public sector banks.
- To discuss the measures taken by the government to curb the NPAs of PSBs.
- To suggest the precautionary and remedial measures for controlling NPAs.

Research Methodology

The current research paper identifies various causes for NPAs and suggests the measures for controlling it; hence the study is described as descriptive analytical research. It considers the secondary data collected from research papers published in various journals, magazines, and other sources.

Limitations of the Study

The current study is limited to the NPAs of PSBs and does not consider private sector banks. Since the study is based on secondary data the accuracy of data cannot be guaranteed.

Conceptual Framework and Data Analysis

In India, the definition of NPA has been changed from time to time. According to the Narasimhan Committee report of 1991, the assets (such as advances, discounted bills, overdrafts, cash credit etc.) on which interest remains due for a period of 180 days were treated as NPAs. Subsequently, this period was reduced to 90 days from March 1995 onwards. Thus according to RBI, NPA is term loan on which interest or installment of principal remains overdue for a period of more than 90 days from the end of a particular quarter. However, in the case of agriculture loans if it is overdue for more than two crop seasons it is categorized as NPA. The term loans sanctioned by the banks constitute the major assets for the bankers. These assets are classified into four categories viz. standard assets, sub-standard assets, doubtful asset and loss assets. The term loans which are not expected to be default are called as standard assets. The terms loans which are overdue for more than 90 days but less than 12 months are treated as sub-standard assets. The terms loans which are overdue for more than 12 months are default assets. The terms loans which are doubtful and cannot be recovered are loss assets. Out of these sub-standard, doubtful and loss assets are treated as NPAs. The sum total of all loan assets that are classified as NPA as per the RBI guidelines as on closing of accounting year is called Gross NPA (GNPA).

Table-1 exhibits composition of NPAs (Priority, non-priority and public sector wise) of public sector banks from 2005 to 2018. It is inferred from the table that the NPA was very low before 2012; it started increasing only after 2012. In terms of composition, the non-priority sector has lions share in the NPA of public sector banks followed by the priority sector. Public sector constitutes a very negligible amount.

Table-1: Composition of NPAs of Public Sector Banks (in Billion)

Years	Priority Sector		Non-Priority Sector		Public Sector		Total
	Amount	(%)	Amount	(%)	Amount	(%)	Amount
2018	1875.11	20.94	7080.90	79.06	173.88	1.94	8956.01
2017	1609.42	23.50	5237.91	76.50	154.66	2.26	6847.32
2016	1258.09	23.30	4141.48	76.70	34.82	0.64	5399.57
2015	966.11	34.69	1815.98	65.21	2.59	0.09	2784.68
2014	798.99	35.16	1472.35	64.79	1.30	0.06	2272.64
2013	672.76	40.91	960.31	58.39	11.55	0.70	1644.61
2012	557.80	47.57	588.26	50.17	26.56	2.27	1172.62
2011	401.86	53.82	342.35	45.85	2.43	0.32	746.64
2010	304.96	50.89	291.14	48.58	3.14	0.52	599.24
2009	242.01	53.75	205.28	45.59	2.97	0.66	450.26
2008	248.74	61.48	150.07	37.10	5.74	1.42	404.56
2007	225.19	57.96	156.03	40.16	7.32	1.88	388.54
2006	222.36	53.75	182.79	44.18	8.55	2.07	413.70
2005	215.36	45.22	254.94	53.53	5.92	1.24	476.22

Table 2: Composition of NPAs of Nationalised Banks (in Billion)

Years	Priority Sector		Non-Priority Sector		Public Sector		Total
	Amount	(%)	Amount	(%)	Amount	(%)	Amount
2017	1257.29	24.80	3811.93	75.20	147.20	2.90	5069.22
2016	969.03	23.18	3210.85	76.82	17.63	0.42	4179.88
2015	709.34	34.61	1337.67	65.26	2.59	0.13	2049.59
2014	537.50	36.45	935.67	63.46	1.30	0.09	1474.48
2013	408.34	40.16	599.01	58.91	9.48	0.93	1016.83
2012	324.24	46.96	355.55	51.49	10.68	1.55	690.48
2011	246.20	55.61	194.10	43.84	2.42	0.55	442.72
2010	195.67	53.76	165.23	45.40	3.05	0.84	363.95
2009	157.54	59.35	106.68	40.19	1.21	0.46	265.43
2008	159.72	63.96	85.63	34.29	4.38	1.76	249.74
2007	153.44	58.63	103.40	39.51	4.87	1.86	261.72
2006	149.22	51.78	132.27	45.90	6.68	2.32	288.17
2005	153.36	46.75	170.62	52.01	4.06	1.24	328.04

Table-2 exhibits composition of NPAs (Priority, non-priority and public sector) of nationalized banks from 2005 to 2017. It is inferred from the table that the NPA was very low before 2011-12; it started increasing only after 2012. In terms of composition, the non-priority sector has a

substantial share in the NPA of nationalized banks followed by the priority sector. Public sector constitutes a very negligible amount. However, before 2011 the priority sector has a significant share in the NPA of nationalized banks.

Table 4 explains the Gross NPAs of cooperative banks during the 2005-17. The NPA of rural cooperative banks is greater than urban cooperative banks. Amongst the rural cooperative banks, PCARDBs has a substantial portion followed by SCARDBs in the long term structure. In the case of the short term structure, PACs has a substantial portion of NPAs which is followed by DCCBs. However, there is no much difference between the NPA of the short term and long term structures.

Causes for NPAs

Though global slowdown, economic crisis, and fall in domestic demand caused for NPAs to some extent the other reasons such as wilful defaulters, fraud, mismanagement and misappropriation of funds, lack of proper pre-appraisal and follow up, delay in completing the project, business failures etc. causing the huge amount of NPAs. This section discusses various causes of NPAs.

- One of the main causes of NPAs is the government insisting upon the banks to lend a prescribed percentage of their credit to priority sectors which are 40% now. The priority sector includes agriculture, education, Small-Scale Industries (SSIs) and others, with a view to ensuring the flow of credit to these underdeveloped sectors. As per the latest estimates by the SBI, education loans constitute 20% of its NPAs.
- The legal impediments and time-consuming nature of asset disposal proposals also causing a huge amount of NPAs. The banks have the tendency of postponing problem of loan defaults in order to show higher earnings.
- Slow down of GDP during 2000-08 made all the corporates to be active which in turn helped the Indian economy to enter into boom phase. During this period most of the banks particularly PSBs granted the loans extensively. Unfortunately, the corporate sector did not perform well due to some policy changes such as a ban on mining projects, delay in environmental related permits affecting power, iron and steel sector, volatility in prices of raw material and so on. The borrowers could not afford to repay the loan nor pay the interest on the loan which caused mounting of NPAs.
- Another reason for the increase in the NPA is a relaxation of lending norms especially for corporate borrowers and High Net Worth Individuals (HNWs) with a sole objective of selling more loans without analyzing properly the credit rating of borrowers. As per RBI data, the GNPA of PSBs and Private sector banks were 7,33,974 crore and 1,02,808 crore respectively as of second quarter ending Sept 2017. The corporate houses alone accounted for 77% of the total NPAs. Economic Times Dec 2017.
- Majority of the loans provided by most of the PSBs are towards the corporate sector which is around 80%. It is this part of the loan which accounts for lion's share of NPAs of PSBs. Findings of the Standing Committee on Finance says that the corporate sector lending is far higher than the priority sector lending in terms of contributing to NPAs.
- The Lack of Bankruptcy code and the sluggish legal system made it difficult for the banks to recover loans from both corporate and non-corporate borrowers in

India. However, the Insolvency and Bankruptcy code was enacted late in the year 2016.

- The financial crisis and the economic slowdown at national and international level results in the erosion of huge profit margin of corporates which in turn results into non-servicing of interest and loan payments. For instance, the global financial crisis took place in 2008 and the economic slowdown of India in 2011 caused several domestic and multinational companies to suffer huge losses. The slow down in a specific industry also causes such a problem. For instance, the IT recession in India caused nonpayment of interest and loan repayments in 2008.
- Unplanned expansion of corporate houses during boom period and loan taken at low rates later being serviced at high rates, therefore, resulting in NPAs.
- Diversification of funds to unrelated business may also cause NPAs. For instance, Vijay Mallya borrowed a huge loan and invested in unrelated airlines business and burnt his fingers.
- In addition to the above reasons the reasons such as manipulation of debtors using political influence, wilful defaulters, lack of non-transparency, Lack of morale, failure of projects etc. also cause defaults.

Measures Undertaken to Control NPAs

The story of NPA is not new to India. Several restructuring programmes have been undertaken by the Government of India (GOI) and RBI to curb the menace of NPA. Narasimham committee in the year 1991

recommended many reforms; some of them were implemented. Some of the important steps taken by the government are discussed below.

- The very prominent step taken by the GOI is launching 'Mission Indradhanush' in the year 2015 to make the working of PSBs more transparent and professional. According to this plan, the government estimated additional capital of ₹1,80,000 crore to be infused into PSBs till 2019. However, the committees formed for this purpose such as the Narasimhan committee (1998) and Nayak committee (2014) were against such capital infusion as it is the tax money collected from the public. The government also set up Bank Board Bureau under this mission to facilitate the appointment of top bank officials of PSBs which began functioning in April 2016.
- The GOI set up a tribunal known as Debt Recovery Tribunal (DRTs) in 1993 to reduce the time required for settling cases.
- Credit information bureau was started in 2000 which collects information about borrowers and provides to the lenders to prevent bad loans. It also helps the banks by maintaining and sharing data of individual and corporate defaulters.
- Lok Adalats were started by RBI in 2001 whereby the recovery of small defaulters (i.e. loan up to Rs.5 lakh) is tackled with an intention of avoiding to take such cases to the legal system.
- Compromise settlement scheme was introduced in 2001. Under this scheme, the loan defaults up to Rs.10 crores are settled through compromise between the bank and the borrowers. This scheme covers lawsuits with courts and DRTs and excludes wilful defaulters.

- The RBI granted a license to 14 new Asset Reconstruction Companies (ARCs) after the amendment of the SARFAESI Act of 2002 (Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest). ARCs are created to unlock value from stressed loans. SARFAESI Act and the Debt Recovery Tribunals (DRTs) have proved to be most effective in terms of the amount recovered among the various channels of recovery for dealing with bad loans. In one of the studies, it is ascertained that in terms of the recovery, 58 percent of the NPAs was recovered through one-time settlement/compromise schemes, 30.5 percent through DRTs, 5.63 percent through Lok Adalats and 35.71 percent under the SARFAESI Act during the period 2003-2012. The government has increased DRTs from 33 in 2016-17 to 39 in 2017-18. Under the SARFAESI Act, the banks can take possession and auction residential and commercial properties of the defaults. Under this Act, 64,519 properties were seized by the banks in 2015-16.
- Introduction of Corporate Debt Restructuring (CDR) in 2005. CDR is a financial instrument designed by the corporate borrower to bring down the burden of the debt by way of decreasing interest rate and increasing time duration of the loan repayment.
- Setting up of joint lenders forum in 2014. A joint lenders forum consisting of all lending PSBs (of stressed loans) is formed in 2014 to avoid a person or a company borrowing from different banks and/or to prevent instances where a person borrows from a bank to repay a loan of the other bank.

- The GOI enacted Insolvency and Bankruptcy code in the year 2016 (It was asserted by the President of India on 28th May 2016) which provides a one-stop solution for resolving insolvencies without delay in the process.
- RBI started the AQR in 2015 to force banks to recognize their NPAs and provision accordingly.

Suggestions

It is found from the analysis that only PSBs and cooperative banks which have the largest NPAs compared to privately owned banks. In the light of this scenario and looking at the causes for NPAs highlighted above, it is inferred and said by many experts that the root cause for the problem is government ownership of the banks. In spite of being tried various schemes of improvement none of the PSBs has succeeded. NPAs of PSBs is continuously rising from year to year due to misuse of the PSBs funds by unscrupulous businessmen like Nirav Modi, Vijay Mallya etc. For instance, Return on Equity (ROE) of private sector banks was 12% in 2016-17 whereas that of PSBs was 2.8% negative. NPAs of PSBs increased substantially from 5.43% (i.e. Rs.2,78,466 crores) in March 2015 to 13.69% (Rs.7,33,137 crores) in June 2017 and nearly Rs.3,60,000 crores of NPAs has been written-off in the last 10 years. Thus, it is only structural rather than functional that can cure the problem of NPAs. Unless the ownership of PSBs is changed there is no hope of achieving robust in the Indian banking system. Based on the causes of NPAs and measures already taken by the government to curb it, the following additional suggestions have been given.

- While sanctioning loans the banks have to see the existing capital structure of the client firm to understand the debt-equity ratio and also check the sources of the promoter's

investment; whether debt or equity. If a major portion of the promoter's investment is out of debt the loan request has to be denied.

- Corporate governance issues relating to the appointment of top executives such as criteria of appointment and wide search for the candidate should be addressed. Though the government has set up BBB to facilitate the appointment of bank top officials of PSBs, it is not functioning to the expected level. It has to be strengthened by providing autonomy.
- Accountability to loan defaults has to be extended from lower officials to top officials who are actually involved in loan decisions. As of now only lower ring officials are considered to be accountable for the default even though the loaning decisions are taken at a higher level. It is suggested that the top sanction officials should also be held responsible for the default.
- The government is suggested to establish Asset Reconstruction Company (ARC) which takes away bad loans from the banking system and helps the banks to focus mainly on the activity of lending. An ARC acquires bad loans from banks and financial institutions, usually at a discount, and works to recover them through a variety of measures, including the sale of assets or a turnaround steered by professional management.
- The privatization of public sector banks would make the banks more vigilant by tightening the lending norms and thereby ensures efficient credit management. The chief economic adviser to the central government Mr. Arvind Subramanian speaking at the Annual Convention 2018 of Madras Management Association stressed the privatization of PSBs.

- Strengthening the credit monitoring system: Develop an early warning mechanism and comprehensive MIS (Management Information System) can play an important role in it. MIS must enable timely detection of problem accounts, flag early signs of delinquencies and facilitate timely information to management on these aspects.
- Banks are advised to conduct sensitivity analysis and contingency planning while appraising the projects of the clients.

Conclusion

NPAs are not the only problem for the banks but also a problem for the entire economy of the country. The money blocked in NPAs has a direct impact on the profitability of the banks as many banks depend on interest income for their day-to-day operations. Though many steps have been taken by the RBI and the government to control NPAs they are not enough to curb it. Only PSBs and cooperative banks have the largest NPAs compared to privately owned banks. The root cause for the problem is government ownership of the banks. In spite of being tried various schemes of improvement none of the PSBs has succeeded. It is only structural rather than functional can cure the problem of NPAs. Unless the ownership of PSBs is changed there is no hope of achieving robust in the Indian banking system. The government has to stop mandatory lending to the priority sector as it is one of the major contributors to the bank's NPAs and take necessary steps to speed up the recovery process of loans. Stringent fiscal and monetary policies under the strict supervision of RBI need to be implemented to eradicate this problem from its root. In order to resolve the gigantic problem of NPAs, the banks need a well-established credit monitoring system and effective business

models to be developed. A centralized model for sanctioning and recovery of loans should be set up and for this staff with specialized skills in credit risk management must be hired. Constant monitoring of the performance of the borrowers must be kept so that the recovery of installments becomes easy.

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An Empirical Study on Determinants of Profitability of Selected Nationalised Banks in India

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Abstract

In this paper, an attempt has been made to study the determinates of profitability of nine selected nationalized banks. The study period was of seven years from 2011-12 to 2017-18. Researcher has identified ROA as the dependent variable and Interest income to total funds(IIT), Interest expanded to total funds (IET), Credit to deposits(CDR), Operating cost to assets(OCA), Net profit per employees(NPE), Business per employee(BPE), Investment to deposits(IDR), Capital adequacy ratio(CAR) and Net NPAs to net advances(NPANA) as independent variables. Statistical techniques –correlation matrix and the regression model were used in the study. The result of the research study concluded that IIT, CDR, OCA, PPE, CAR, and NANPA are significantly correlated with ROA. The result of regression model indicates that out of seven selected determinates, only two determinants - Capital adequacy ratio(CAR) and Net NPAs to net advances(NPANA) have a significant impact on the profitability of selected nationalized banks.

Introduction

Indian's finance and economic condition are superior to any other countries of the world. The study suggested that the Indian banking sector has been very strong and also withstood the global downturn. Innovation in the banking model for payment is happening. There is also restructuring in the banking sector. There is also a faster digital payment system in the Indian banking sector. Our faster payments innovation index is 5 which are considered very well. There are 56 regional banks, 49 foreign banks, 27 public sector banks, 21 private sector banks, 1562 urban credit cooperative banks, and 94,384 rural cooperative banks. It is also noted that India has the fourth largest retail credit market in emerging countries. In September

2018, the government of Indian started post payment bank and opened branches in 650 districts across India. This step is good for financial inclusion.

There was a biggest financial deal between Indusind bank limited and Bharat Financial Inclusion Limited amounting to 2.4 million dollars. Microfinance sector is also growing very rapidly in India. As per the report in Business Standard 31st July 2018, microcredit has witnessed the growth of 40% year on year. The government of India has also made the Pradhan Mantri Jan Dhan Yojana in which almost thirty crore family have opened the account and account holders have deposited

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65,000 crore rupees in the bank account. Besides this infusion of funds, the government would infuse Rs. 11,336 crores in five public sector banks. The Indian banking sector is also upgrading its existing technology to serve the customer better. Estimated digital lending would be \$ 75 billion in FY2018 to US\$ 1 trillion by Fy2023.

About Profitability and its Determinants

The financial performance of any banks depends on profitability. There is tough competition in the market. Nationalized banks are competing to private sectors and foreign banks. It is said that private banks are very flexible in their approach toward the clients. Private Banks are also offering innovative products to serve the customer better. Thus private banks can earn more profit. But nationalized banks have government restrictions. They are following RBI guidelines very strictly. They cannot be as much flexible as in private banks. Their employees are secured by the permanent status

of the job. Therefore they are least bothered about the quality of service to the clients. They are less innovative and creative in their approach. Their mindset is totally different from the mind of the employees of private banks. So such a situation naturally affects the performance of nationalized banks. Besides these qualitative phenomena, there are quantities of aspects which affect the profitability of the banks. There are two types of factors affecting profitability (1) Internal variables which are also known as banks specific variables and (2) external variables which are known as macroeconomic variables. The researcher has identified some of the most important banks' specific variables which affect profitability. There are various measures of profitability such as return on assets, return on equity and net income margin. The researcher has taken ROA as a measure of profitability. The researcher has also identified nine variables as independent variables. Dependent and Independent variables are given below:

Table 1: Dependent and Independent Variables of Profitability

Variables	Items	Definitions
Dependent Variables	ROA	Return on Average Total Assets
Independent Variable	IIT	Interest Income to Total Funds
	IET	Interest Expanded to Total Funds
	CD ratio	Credit to Deposits
	OCA	Operating Cost to Assets
	NPE	Net Profit Per Employees
	BPE	Business Per Employee
	ID ratio	Investment to Deposits
	CA ratio	Capital Adequacy Ratio
	NPANA	Net NPAs to Net Advances

Review of Literature

Researcher reviewed some of the important researches relevant to the selected problem. The review of literature is given below:

Babalola and Yisau Abiodun (2012) worked on the profitability determinants of the Nigerian bank for the period of 1999 to 2008. The sample size was of 14 banks. The study resulted that capital adequacy ratio has impacted on profitability in the short run but size and tangibility have also impacted on profitability in long run.

Naser Hooshyari & Abdollah Pakdel Monghanloo (2015) worked on the impact of inflation on the profitability of banks for the period of 2010 to 2013. It is concluded that variables like inflation, size, taxation, liquidity, cost of efficiency and capitalization etc have an effect on the profitability of banks.

Fadzlan Sufian & Roayfaizal Razali (2015) did a study on the determinant of profitability banks of the Philippines for the period of 1990 to 2005. The result of the study suggested that credit risk, firm size are expenses have negatively affected the profitability of banks whereas capitalization and non-interest income affected positively to banks' profitability.

Guru Balachanddher K worked on the determinant of profitability of the Malaysian bank for the period of 1985 to 1998. Researchers have determined assets based and capital based measures of profitability. Empirical findings explained that a current account deposit to total deposit has a significant effect on net income before tax to total asset. Loan and advances to total assets ratio have significant also impact on net income before tax to the total asset. Total

expenditure has also impacted significantly in net income before tax to the total asset. Other variables have impacted on in net income before tax to total asset but the impact was not significant.

Houcem Smaoui and Ines Ben Salah (2012) did research on the profitability of the Islamic Bank for the period of 1995 to 2009. The sample size was of 44 Islamic banks. The result of the study explained that better assets quality, large size, and higher capital increase profitability whereas the rising cost to income ratio decreased profitability. Apart from this, it is also concluded that favorable macroeconomic variables have a positive impact on Islamic banks' profitability.

Christian Kalhoefer & Rania Salem (2007) worked on profitability analysis of Egyptian banks for the period of 2003 to 2005. The researcher concluded that a massive amount of non-performing loan and profitability problems.

Hassan Mobeen Alam and Ali Raza et. al. (2011) have done the comparative analysis of the financial performance of Pakistani banks for the period of 2006 to 2009. The researcher has analyzed ratios like bank size, profitability ratio, liquidity ratio, leverage ratio, and assets quality ratio. The study concluded that the profitability of public sector banks is good. Liquidity ratios also suggested the public sectors banks are good. Leverage ratio and assets quality ratio are also good in public sector banks.

Sehrish Gul et al. (2011) worked on factors affecting Pakistani banks for the period of 2005 to 2009. The study shows that internal factors size, capital loan; deposits have a significant impact on profitability. External factors like

GDP and Inflation have also a significant positive impact on Banks' profitability

James W. Scott et al. (2011) have done research on the determinants of profitability of US banks for the period of 2004 to 2006. The research concluded that return on equity, capital to assets ratio and annual percentage changes in external per capita income are significant determinants of Selected five US banks' profitability.

Rasidah Mohd Said et al. (2011) worked on performance and the financial ratio of Malaysia and chine's banks for the period of 2001 to 2007. The result of the research indicated that credit risk has a negative impact on the ROA of both the countries' banks. There is a mixed effect of capital on the performance of banks. Operating expenses has a significant negative impact on the performance of both countries' banks. Size and liquidity banks did not have an impact on the performance of banks of both the countries' banks.

Mohammad Abu Sayeed (2012) wrote a case on the profitability of banks of Bangladesh. The result of the study shows that large commercial banks have better assets management than small banks in Bangladesh whereas small banks have better liability management.

Constantinos Alexiou and Voyazaz Sofoklis (2009) worked on determinants of profitability of Greek banks for the period of 2002 to 2007. Bank specific determinants like credit risk, cost to income, size, loan to deposits, equity to assets and DBN have a significant impact on ROE. Whereas variable like the cost to income, size, productivity, loans to deposits, private consumption and equity to assets have also significant effect on ROA.

W.E.I.Weersainghe and Tissa Ravinda Perera (2013) worked on determinants of profitability of commercial banks of Srilanka for the period of 2001 to 2011. The result of the research study indicated that liquidity and operating cost efficiency have negatively impacted the profitability of the bank. Besides, the interest rate has a negative but significant impact on the profitability of Srilankan banks.

Echenkoba F.N. et al worked on determinants of profitability of banks in Nigeria for the period of 2001 to 2010. It is found that liquidity has a significant effect on the profitability of banks whereas capital adequacy, assets quality, management efficiency and earning have any impact on the profitability of banks.

Angela Romani and Adina Elena Danuletiu (2013) worked on determinants of profitability of banks of Romania for the period of 2003 to 2011. The research found that banks specific factors like assets quality, management quality and liquidity have impacted significantly on profitability. Whereas external factors like economic growth and banking concentration have an impact on banking profitability.

Angela Roman and Loana –Luliana Tomuleasa worked on profitability determinants of NEW EU member state banks for the period of 2003 to 2013. The researcher found that capital adequacy, the ratio of non-performing loans, the cost to income ratio and bank size have a significant impact on profitability while external determinants annual GDP, banking concentration and inflation have a significant impact on profitability.

Nor Hayati Ahmad and Mohammad Akbar Noor (2010) did research on determinants of

efficiency and profitability of world Islamic banks for the period of 1992 to 2009. The researcher found that there is a positive relationship between the profitability of banks and technical efficiency. Thus the authors concluded the study with the observation that a higher amount of operating expenses reduce the profitability.

Ahmed Ariff Almazari and Dr. Mohmmad Abdelkarim Almumani (2014) worked the profitability efficiency of Saudi national banks for the period 2006 to 2010. The researcher has calculated correlation matrix which explains that there is a correlation between ROA and operating expense which is significant at 1%. Whereas there is also a significant relationship between the utility of assets and ROA. There is an insignificant relationship between ROA and total assets.

Samina Riaz (2013) worked on the determinants of profitability of Pakistani banks for the period of 2006 to 2010. Profitability which is expressed in term of two variables like RORE and ROA is significantly affected by assets size, credit risk, total deposit to total assets and interest rate. However total deposit to total assets has not a significant impact on ROA.

Gemechu Abdisa Shremo (2016) did work on determinants of profitability of Ethiopian Banks for the period of 2002 to 2012. The empirical research of the study revealed that profitability (ROA) of banks is significantly affected by capital adequacy, credit risk, expenses management, efficiency and productivity, exchanges rate, loans and advances, and liquidity risk. Whereas profitability measured in term of net interest margin is significantly

affected by exchanges rate, expenses management, interest rate, GDP, loans and advances, marketing concentration and regulation.

Nadica Iloska worked on the analysis of profitability of Macedonian banks for the period of 2008 to 2011. The result of the study explained that the profitability of banks is significantly negatively affected by operating expenses and loan loss provision. Whereas profitability is positively impacted by staff expense, banks size and the portion of loans in total assets. Besides this, the study has also concluded that liquid assets, deposits and noninterest income have a low impact on profitability.

Nesrine Ayadi and Younes Boujelbene (2012) worked on determinants of profitability of banks of Tunisian for the period of 1995 to 2005. The result of the research indicated that the profitability of banks has been positively affected by bank capitalization, size. Whereas variable of a financial structure such assets of bank assets to gross domestic product ratio, the ratio of market capitalization of stock to assets of the bank have a negative but they have a significant impact on profitability. Variable of macroeconomic did not have any impact.

Jana Erin and Natalja Lace (2013) studied profitability indicators of Latvia banks for the period of 2006 to 2011. Researched using an internal variable like assets size, credit risk, deposits, capital, loans to total assets and total loans. Whereas the researcher also examined external indicators like GDP and annual inflation. Credit risk, capital, and deposit have an insignificant negative impact on profitability.

Whereas loans to total assets have an insignificant positive impact on profitability. External factors like GDP and inflation have a positive but insignificant impact on profitability.

Hussein Mohammad Samhani and Mr. Abdullah Yusri Al-Khstib (2015) studied determinant of financial performance of Jordan Islamic bank. The result of the study revealed that there is a significant correlation between inflation, unemployment rate, equity, debt and bank size with ROA. Whereas inflation, unemployment rate, and bank size have a significant relationship with ROE.

Angela M.Kithinji (2010) worked on credit risk management and profitability of the commercial bank of Kenya for the period of 2004 to 2008. The result of the study shows that the profitability of the banks is affected by non-performing loans and loans and advances to total assets.

Ayse Altioek Yimaz (2013) worked on the profitability of banks of emerging markets like Brasil, Czech Republic, Hungary, Malaysia, Mexico, Poland, South Africa, Taiwan, and Turkey for the period of 2005 to 2010. The study revealed that profitability (ROA) has been significantly affected by banks loan to total assets, operating expenses to total asset, equity to total asset, nonperforming loan to total loans, size and inflation. Whereas researcher has also used another measure of profitability like net interest income to total asset which has been affected by operating expenses to total assets, equity to total assets, nonperforming loans to total loans, M & A activities, size, and inflation. Somanadevi Thianarajan et al (2011) worked on

factor profitability determinants of public bank and private sector banks in India for the period 2000 to 2010. The study revealed that nonperforming assets have a negative but significant impact on the profitability of the public sector and private sector banks. NPA to total advances affects negatively on profitability. GDP has a positive impact on NPA but inflation has a negative impact on NPA.

Ongtze San and Teh Boon Heng (2013) worked on factors determining the profitability of Malaysian banks for the period of 2003 to 2009. The result of the research evidenced that ROA is significantly affected by equity to total assets, the cost to income ratio, loan loss reserve to total assets and liquidity assets to deposit & short-term funding. ROE is significantly affected by size. Net interest margin is affected by liquid assets to deposit & short-term funding and loan loss reserve to total assets.

Faisal Khan Melati Ahmad Anuar et al (2011) worked on determinants of profitability of Pakistani banks for the period of 2000 to 2010. Empirical research evidenced that there was a strong association between bank-specific variables and profitability. Variables like a deposit to assets ratio, deposit to loans ratio, loans to assets ratio; loan growth, nonperforming loans, net interest margin, tax, non-interest income and return on assets are the chief determinants of profitability.

Paolo Saona Hoffmann (2011) worked on determinants on the profitability of US banks for the period of 1995 to 2007. The researcher used internal variables (bank specific) and the external variable (macroeconomic variable). The result shows that there is a negative

association between capital ratio and profitability. Research also found that the size of banks matters a lot for economic scale benefits.

- H₈: Capital adequacy ratio has also a positive impact on profitability
- H₉: Net NPAs to Net advances has a negative impact on profitability.

Objectives

1. To study the determinants of profitability in selected nationalized banks in India
2. To examine the correlation between dependent and independent variables.
3. To study the impact of an independent variable(banks specific) on the dependent variable(ROA)through multiple regression model

Hypothesis

- H₁ : Higher the ratio interest income to total assets, higher will be the profitability
- H₂: Interest expanded to total fund ratio has a negative impact on profitability.
- H₃: There is a positive impact of credit to deposit ratio on profitability
- H₄: There is a negative impact of operating cost to assets on profitability
- H₅: There is a positive impact on net profit employee
- H₆: There is a positive effect of business per employee on profitability
- H₇: Investment to deposit ratio has a positive impact on profitability

Research Methodology

Sources of Data: “An empirical study on determinants of profitability of selected nationalized banks in India” has been made by using data from financial statements of all nine selected nationalized banks of India. The period of the study was five years from 2012-13 to 2017-2018. Convenient sampling technique has been used by the researcher and the type of research is analytical. Name of selected sample units (1) State Bank of India (2) Bank of Baroda (3) Bank of India (4) Dena Bank (5) UCO bank (6) Central Bank (7) Punjab National bank (8) Vijaya Bank and (9) Canara bank. The data have been collected from the Capitaline database, moneycontrol.com, monypore.com and from the annual reports of the respective companies. Analysis and interpretation of data have been carried out using the Statistical techniques such as descriptive statistics s, correlation and multiple regressions using SPSS package.

Model-1 Researcher has used Return on Assets as profitability indicators and other independents variables like Interest income to total funds, Interest expanded to total funds, Credit to deposits, Operating cost to assets, Net profit per employees, Business per employee, Investment to deposits, Capital adequacy ratio and Net NPAs to net advances.

Y=	α+	+ β1(IIT)	+β2(,IET)	+β3(CD)	+ β4(OCA)	+ β5(NPE)	β6(BPE)	β7(IDR)	β8(CAR)	β9(NPANA)	μit
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The entire regression model is explained below

Table 2: Dependent and Independent Variables of Profitability (with symbols)

	Dependent Variable	Definition
Y	ROA	Return of Assets
	Independent Variable	
β_1	IIT	Interest Income to Total Funds
β_2	IET	Interest Expanded to Total Funds
β_3	CDR	Credit to Deposits
β_4	OCA	Operating Cost to Assets
β_5	NPE	Net Profit per Employees
β_6	BPE	Business Per Employee
β_7	IDR	Investment to Deposits Ratio
β_8	CAR	Capital Adequacy Ratio
β_9	NPANA	Net NPAs to Net Advances

Result and analysis: Researcher has used calculated correlation matrix and multiple regressions.

Table 3: Correlation Matrix

		ROA	IIT	IET	CDR	OCA	NPE	BPE	IDR	CAR	NPANA
ROA	Pearson Correlation	1									
	Sig. (2-tailed)										
IIT	Pearson Correlation	.285(*)	1								
	Sig. (2-tailed)	.024									
IET	Pearson Correlation	.061	.880(**)	1							
	Sig. (2-tailed)	.635	.000								
CDR	Pearson Correlation	.641(**)	.155	-.164	1						
	Sig. (2-tailed)	.000	.224	.200							
OCA	Pearson Correlation	-.300(*)	.155	-.060	.106	1					
	Sig. (2-tailed)	.017	.224	.641	.410						
NPE	Pearson Correlation	.263(*)	.055	-.186	.312(*)	.085	1				
	Sig. (2-tailed)	.037	.669	.144	.013	.508					
BPE	Pearson Correlation	.089	.021	.057	.118	-.044	-.061	1			
	Sig. (2-tailed)	.490	.868	.657	.359	.731	.632				
IDR	Pearson Correlation	-.234	.468(**)	.437(**)	-.186	.301(*)	-.041	-.100	1		
	Sig. (2-tailed)	.065	.000	.000	.144	.017	.749	.433			
CAR	Pearson Correlation	.537(**)	-.087	-.296(*)	.472(**)	-.079	.104	-.040	-.323(**)	1	
	Sig. (2-tailed)	.000	.496	.019	.000	.537	.415	.758	.010		.000
NPA NA	Pearson Correlation	-.897(**)	-.288(*)	-.110	-.623(**)	.349(**)	-.135	-.145	.255(*)	-.470(**)	1
	Sig. (2-tailed)	.000	.022	.389	.000	.005	.292	.256	.044	.000	

Note: * Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

N=63

Table-3 indicated a correlation matrix of determinants of profitability. ROA is the measure of profitability. IIT has a positive and significant relation (0.285*) with ROA. IET has positive but insignificant relation with ROA but correlation coefficient between IET and IIT (0.880**) which indicates that there is a multicollinearity exists between these two variables. The coefficient of correlation between CDR and ROA is (0.641**) which is also significant at a

1% level of significance. The correlation coefficient between OCR and ROA is (-0.300*) which is significant at a 5% level of significance. There is a positive and significant correlation between PPE and IDR have an insignificant correlation with ROA. CAR has a positive and significant correlation with ROA whereas NPANA has a correlation coefficient (-0.897**) which means that NPANA has a negative but significant relation with ROA.

Table 4: Backward Stepwise Regression Analysis

Variables	Models						
	1	2	3	4	5	6	7
ROA	-1.117 (-1.168)	-1.128 (-1.196)	-1.159 (-1.253)	-0.805 (-1.075)	-0.831 (-1.101)	-0.803 (-1.068)	-0.149 (-0.296)
IIT	0.297 (1.418)	0.301 (1.465)	0.286 (1.485)	0.320 (1.739)	0.079 (1.354)	0.064 (1.167)	X
IET	-0.213 (-1.0610)	-0.217 (-1.103)	-0.209 (-1.089)	-0.2509 (-1.381)	X	X	X
CDR	.006 (0.634)	0.006 (0.628)	0.006 (0.658)	X	X	X	X
OCA	-0.325 (-1.5210)	-0.328 (-1.196)	-0.328 (-1.253)	-0.306 (-1.492)	-0.124 (-0.784)	X	X
NPE	3.000 (1.446)	3.030 (1.462)	3.081 (1.505)	3.160 (1.555)	4.650 (2.683)**	4.470 (2.609)***	4.530 (2.638)**
BPE	-3.820 (-0.129)	X	X	X	X	X	X
IDR	-0.259 (-0.233)	-0.250 (-0.227)	X	X	X	X	X
CAR	.084 (1.863)***	0.085 (1.904)***	0.087 (1.986)***	0.089 (2.050)***	0.111 (2.718)**	0.105 (2.626)**	0.092 (2.396)
NPANA	-0.157 (-7.104)*	-0.156 (-7.209)*	-0.158 (-7.540)*	-0.165 (-9.125)*	-0.175 (-10.593)*	-0.181 (-12.354)*	-0.187 (-13.723)*
R ²	0.85	0.85	0.85	0.85	0.85	0.84	0.84
Adjusted R ²	0.827	0.830	0.833	0.835	0.832	0.834	0.833
F-Statistic	34.00	38.97	45.31	53.33	62.62	78.64	103.76
Durbin-Watson	1.768	1.768	1.768	1.768	1.768	1.768	1.768

Note: *, **, *** significant at 1%, 5% and 10% level of respectively

Table 4 indicates the backward stepwise regression model. There are seven models prepared by eliminating variables which have multicollinearity. model-1 indicate that ROA is positively affected by IIT, CDR, and NPE but the impact is found statistically insignificant. Whereas ROA is negatively impacted by IET, OCA, BPE, and IDR but the impact is not significant. CAR has a positive impact on ROA

which is also significant at a 10% level of significance. NPANA has a negative effect on ROA which is also significant at a 1% level of significance. Model -1 shows R2 0.85 which means that 85% variance is caused by independent variables combine. Whereas the value of Adjusted R2 0.827 which means that 82.70% fluctuations have been caused by independent variables. The calculated value of F

is 34 which is significant at a 1% level of significance. This means that the model is fit for regression. The calculated value of Durbin Durbin-Watson is 1.76 which means that the autocorrelation problem does not exist.

Backward stepwise regression calculation has also given Model 2 by removing one variable. Model 2 exhibits that ROA is positively affected by IIT, CDR, and NPE but the impact was insignificant. IET, OCA, IDR, and NPANA have affected negatively to ROA but the effect of NPANA has been significant at a 1% level of significance. CAR has a significant and positive effect on ROA. The value of R square is 0.85 and value of Adjusted R2 0.830 which indicates that 85% and 83% variations have been created by independent variables such IIT, CDR, NPE, IET, OCA, IDR and NPANA. The calculated value of F is 39.97 which were significant at a 1% level of significant indicating fitness of model. Durbin-Watson indicates the value of 1.768 which meant that it is between the range of 1.5 to 2.5 indicating nonexistence of autocorrelation problem. Table-4 also indicates model -3 where two variables have been removed. In this model, variables like IET, OCA, and NPANA have a negative impact on ROA but the only variable NPANA has a significant impact at a 1% level of significance. IIT, CDR, and CAS have a positive impact on ROA but again the impact of CAR has been significant at a 10% level of significance. The value of R2 and adjusted R2 are 0.85 and 0.833 which indicate that 85% and 83.3% variations have created by independent variables. F test indicates that the model is fit. Durbin Watson was 1.768 explaining of the non-existence of autocorrelation. Model-4 indicated that ROA has been positively affected by IIT, NPE, and CAR. The effect of CAR was significant at 10%

level of significance. The effect of IET and OCA have affected on ROA positively. The effect of NPANA has been significant at a 1% level of significance. The value of R2 was 0.85 and adjusted R2 was 83.5% which indicates 85% and 83.5% variations have been caused by combined effects of the independent variable test as a significant 1% level of significance. As per the Durbin Watson test, there was no autocorrelation problem. Model-5 indicates that ROA has been significantly and positively affected CAR. However, NPANA has a negative but significant effect on ROA. Model -5 indicates that The value of R2 was 0.85 and adjusted R2 was 83.5% which indicates 85% and 83.5% variations have been caused by combined effects of an independent variable. F test is significant 1% level of significance. Model -6 measures the impact of four variables by removing five variables. The effect of IIT, NPE, and CAR has been positive and significant on ROA. Model-7 also indicates that NPE, CAR, and NPANA have been effective and significant. The effect of NPE has been significant at a 5% level of significance and the effect of NPANA has been significant at 1%.

Discussion about Hypothesis

The researcher has framed the H1 hypothesis that Higher the ratio interest income to total assets, higher will be the profitability. The result of the regression shows that Interest income to total assets ratio has an insignificant impact on ROA. Whereas the researcher also constructed the H2 hypothesis that Interest expanded to total fund ratio has a negative impact on profitability. The result of regression indicates that Interest expanded to total fund ratio has a negative but insignificant impact on ROA. H3 Hypothesis is about the there is a positive impact of credit to deposit ratio on profitability. The result of the

regression does not validate this hypothesis because the impact was insignificant positive ROA. Hypothesis H4 is about there is a negative impact of operating cost to assets on profitability. The result of the regression insignificantly matches with this hypothesis. Hypothesis H5 indicates that there is a positive impact on net profit employee. Again the result of regression shows that the impact was positive but insignificant. Hypothesis H6 states that there is a positive effect on business per employee on profitability. The result of the regression went against this hypothesis. Hypothesis H7 was about Investment to deposit ratio has a positive impact on profitability. The result of the regression validates this hypothesis. Hypothesis H8 indicates that the Capital adequacy ratio has also a positive impact on profitability. The result of the regression validates that hypothesis at 10% level of

significance. The last hypothesis H9 is about Net NPAs to net advances has a negative impact on profitability. The result of the regression validates this hypothesis at 1% level of significance. The summary of the result is presented in the below table.

Conclusion

The researcher has identified the dependent variable and independent variables of selected nationalized banks in India. The regression model was built by considering dependent variable (ROA) and independent variables (Interest income to total funds, Interest expanded to total funds, Credit to deposits, Operating cost to assets, Net profit per employees, Business per employee, Investment to deposits, Capital adequacy ratio and Net NPAs to net advances

Table 5 : Summary of the Hypothesis

Predators	Level of significance	Expected Impact on ROA	Actual Impact on ROA
Interest Income to Total Funds	Insignificant	Positive	Positive
Interest Expanded to Total Funds	Insignificant	Negative	Negative
Credit to Deposits	Insignificant	Positive	positive
Operating Cost to Assets	Insignificant	Negative	Negative
Net Profit Per Employees	Insignificant	Positive	Positive
Business Per Employee	Insignificant	Positive	Negative
Investment to Deposits	Insignificant	Positive	Negative
Capital Adequacy Ratio	Significant 10%	Positive	Positive
Net NPAs to Net Advances	Significant 1%	Negative	Negative

Table-5 shows the expected result, actual result, and level of significance. Expected impact and actual impact of Interest income to total funds ROA are the same but insignificant. Both the expected impact and actual impact of interest expanded to total funds, credit to deposits, operating cost to assets, net profit per employees and investment to deposits are the same but statistically insignificant. The expected impact

and actual impact of business per employee are different from an insignificant impact. The expected effect and actual effect of capital adequacy ratio and Net NPA to Net advances ratio are significant and similar. Thus the researcher concludes that there are only two independent variable capital adequacy ratio and Net NPA to Net advances ratio have been major determinants of profitability in the selected nationalized banks.

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