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## **Determinants of key facets of job satisfaction in the banking sector: applying SMART PLS and artificial neural networks**

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**Abstract:** Job satisfaction is closely associated with life satisfaction and important workplace behaviours (Judge and Kammeyer-Mueller, 2012). Minnesota satisfaction questionnaire (MSQ) or job description index (JDI) (Castanheira, 2014; Saane et al., 2003) are widely used to measure job satisfaction. However, since these instruments cannot be generalised to all industrial sectors (Khalilzadeh et al., 2013), this two-part study attempted to manifest the facets of job satisfaction of public sector bank employees in India through factor identification using systematic literature review, exploratory factor analysis and statistical mode, followed by partial least squares (PLS) modelling of the problem using SmartPLS and comparing the outcome to artificial neural networks (ANN) output. The study has important implications for policy recommendations to banking sector to promote satisfaction among employees. Secondly, it is able to demonstrate which of the two techniques is better – PLS or ANN.

**Keywords:** ANNs; artificial neural networks; partial least squares modelling; job satisfaction; banking sector; exploratory factor analysis; SMART PLS; SQL Server 2012.

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## 1 Introduction

The job is an integral component of an individual’s life as he or she spends a sizeable amount of his or her lifetime at the workplace. The identification of an individual with his or her job determines their response to the basic question of “What do they do?” (Judge and Kammeyer-Mueller, 2012), and reflects on an individual’s perceptions, judgements and opinions about their profession and job attitudes per se. Job attitude of an individual, job satisfaction to be precise, is reflective of their life evaluation, which significantly

impacts their life satisfaction (Unanue et al., 2017; Rode, 2004; Ghiselli et al., 2001). Job satisfaction has paramount importance in organisational behaviour studies, as it is predictive of important work-related outcomes, such as organisational commitment, loyalty, morale, employee turnover and so on (David et al., 1989; Hom and Griffeth, 1995; Mathieu and Zajac, 1990). Job attitudes have a hierarchical structure – an individual has a general job attitude (an overall attitude), followed by relatively general job attitude such as job satisfaction, organisational commitment; followed by specific attitudes like facets of job satisfaction and so on. Similarly, overall job satisfaction is composed of multiple specific satisfactions in different domains (Judge and Kammeyer-Mueller, 2012).

Job satisfaction is defined as “how people feel about their jobs and different aspects of their jobs. It is the extent to which people like or dislike their jobs” (Spector, 1997). Social scientists have been interested in gauging job satisfaction levels of professionals in industrial setups. This has happened in part to improve the work experiences of individuals since it is believed that satisfaction with one’s job aids or inhibits an individual’s development of personal potential. Additionally, this has also been linked to the quality of life and health of an individual. Efforts to improve an employee’s job satisfaction can lead to improvement in productivity and organisational effectiveness (Kalleberg, 1977). The importance of employee satisfaction is further exaggerated in the service sector since it is directly linked with customer satisfaction. Higher customer satisfaction can be generated by increasing job satisfaction among service personnel (Rogers et al., 1994; Jeon and Beomjoon, 2012; Homburg and Stock, 2004). It has also been seen that employee identification with the firm, offering bonuses to the employees boosts their job satisfaction and hence can lead to a logical conclusion that there are many facets of job satisfaction (Solnet, 2007; Walkup, 2002).

Multiple perspectives are available on the measurement of job satisfaction – single-item measure, multiple item measures, overall measures or global measures, specific facet measure and so on; and while assessing overall job satisfaction, both professional and personal components need to be weighed differently (Schmidt, 2007; Spector, 1997). The basic premise to measure job satisfaction, in general, has been ‘workplace reaction’, that is how individuals react to and value workplace, its offerings and needs (Brewerton and Millward, 2001). Although, studying and measuring workplace reaction is a diverse phenomenon (Schermerhorn et al., 2002), ‘single global rating’ and ‘summation score’, which is made up of a number of job facets have been the most widely applied approach (Robbins, 1996). Job description index (JDI), Minnesota satisfaction questionnaire (MSQ) and other popular scales available for measuring job satisfaction are time-consuming and have limitations in applications. In a meta-analysis study on JDI, Kinicki and fellow researchers suggested that MSQ measurement is more appropriate for facet satisfaction measurement than JDI, and in ‘overall satisfaction’, JDI acts slightly better than MSQ (Kinicki et al., 2002). Facets of the construct have been seen to have significant importance in the implication towards overall job satisfaction (Khaleque and Wadud, 1984). A specific facet or aspect of job satisfaction may significantly influence the overall job satisfaction and consequently impact job-related outcomes dependent on the variable (Judge et al., 2002; Griffin, 1998). Therefore, a study is required to devise a scale of job satisfaction which – firstly, involves both affective and cognitive aspects of job satisfaction and secondly, applies specifically to the banking sector.

This leads to the present research task, which suggests that managerial cadre workers of the banking sector in India may feel differently about the different factors or constructs

of job satisfaction. A standardised scale of job satisfaction may not yield satisfactory results owing to the fact that the banking sector in India is prone to several challenges which in themselves can impact the satisfaction of employees with the jobs. In Herzberg's two-factor theory of motivation, it is posited that there exist 'hygiene factors' and 'motivation factors', the former corresponding to contextual factors around the job and the latter related to the content of the job or work itself. Further, it is posited that job content is the satisfier while context causes frustration and job dissatisfaction (Chuang et al., 2009; Arvey, 1998; Furnham et al., 2002; Martin et al., 2006). Congruent with these, scholars and researchers alike have recognised the composition of job satisfaction in terms of its various facets (Petrescu and Simmons, 2008; Chuang et al., 2009; Judge et al., 2002). In banks as well, the long working hours, fewer holidays and targets set by bank management create a performance pressure on the employees who may consider shifting. The variation may also be attributed to the individual differences and distinctions in the nature of jobs (Kalleberg, 1977). While the former is beyond the scope of this research, the latter has been considered with the sole focus on the banking sector. For such studies, generally, the scheme of research is to include some characteristics of the work and a measure of job satisfaction which then helps to establish a relation between the two. Several theories have been utilised by researchers in the past to build on the work characteristic, however, for this research it is proposed to identify the components of work which impact the job satisfaction through systematic literature review and existing multiple facet measures of job satisfaction. This, in turn, can lead to scale development for job satisfaction in the banking sector through better identification of components of job satisfaction specific to the Indian banking sector. Such a perspective has immense practical implications since it may aid in suggesting different ways in which a bank can increase its employees' job satisfaction.

### *1.1 Problem statement*

The present research work in this context attempts to manifest the specific facets of job satisfaction as applied to the banking sector. It seeks to investigate and examine both theoretically and empirically, those facets which are significant components of job satisfaction and therefore, have the highest impact on job satisfaction levels of bank employees. The study posits that differences in levels of job satisfaction arise from differences in perceptions towards the identified facets of job satisfaction. The findings of the work can be used as a basis for summated scale development for the measurement of job satisfaction of bank employees in India working at managerial positions.

## **2 Systematic literature review**

This part of the study attempts to identify the factors of job satisfaction which are generally utilised by researchers for the measurement of multiple facets of job satisfaction. The purpose of this exercise is to build an exhaustive list of factors of job satisfaction (See Table 1), which can be utilised by bank employees to identify which factors do they believe to be the most important for gauging their job satisfaction.

**Table 1** Identification of factors of job satisfaction using a systematic literature review

<i>S. No.</i>	<i>Year</i>	<i>Authors</i>	<i>Factors of job satisfaction</i>
1	1996	Shapiro, Burkey, Dorman and Welker	Self-actualisation, achievement/support, avoidance, job-related affect, working conditions, professional self-esteem
2	2001	Schwepker	Promotion, advancement, pay, supervision, company policy and support, customers, co-workers
3	1997	Koustelios and Bagiatis	Working conditions, supervisor, pay, work itself, advancement
4	1997	Spector	Pay, promotion, supervision, fringe benefits, rewards, rules and policy, co-workers, work itself, communication
5	2002	Cowin	Professional status, pay, company image, stress
6	2001	Fang	Stress, supervision, professional commitment
7	2001	Fletcher	Intrinsic work values, job security, salary, fringe benefits, work schedule, leadership
8	2003	Larrabee, Ostrow, Withrow, Hobbs and Burant	Leadership, group cohesion, psychological empowerment, teamwork or collaboration
9	2002	Lu, Lin, Hsich and Chang	Education, professional commitment
10	2003	Rambur, McIntosh and Mongeon	Career advancement, education, gender, working hours, work role, task
11	2001	Shader, Broome, Broome, West and Nash	Age, stress, work schedule, teamwork
12	2002	Tzeng	Work environment, salary, promotion, self-growth, leadership, working conditions, family support, religion
13	2002	Yin, Yang	Promotion, stress, education, salary, supervision, schedule, administration policy, fringe benefits, recognition, achievement, work environment, professionalism
14	2015	Alegre, Mas-Machucha, Berbegal-Mirabent	Teamwork, work-family balance, supervision, autonomy, interpersonal relation

### 3 Research methodology

The current research work was ‘Descriptive’ in nature, a survey was conducted to identify and describe the factors that determine job satisfaction of bank employees (Creswell and Poth, 2015; Lambert and Lambert, 2012), and exploratory in nature due to hypothesis testing (Cooper and Schindler, 2011). For this study, a questionnaire was used as the research instrument, distributed both electronically and in person to more than 200 bank employees working in the managerial cadre, in public sector banks of India, and a total of 139 completed questionnaires were received. This sample constitutes roughly 1% of the entire managerial cadre population of the banks. This sample size is optimal for the application of SMART PLS for analysis, since SmartPLS is especially useful when sample size is small, and little theoretical backup is available for the application, and

predictive accuracy is highly required (Bacon, 1999; Hwang et al., 2010; Wong, 2010). Samples were collected using convenience and snowball sampling techniques, while all the data items were measured on a five-point Likert scale.

**Table 2** Factor analysis communalities (see online version for colours)

Statements	1	2	3	4	5	6	7	8	9	10
My immediate supervisor is an effective manager.	.749									
My immediate superior talks to me giving clear direction and suggestions.	.593									
My supervisor respects my views and ideas related to the job.	.694									
I have freedom to discuss my personal problems with my immediate supervisor.	.551									
My work is being regularly supervised.	.659									
My manager always makes sure that I am informed about decisions or changes that will affect me.	.627									
I feel that there is no threat to my job till my superannuation.		.513								
Given an opportunity to do some other job at the same remuneration, I would stay in my present job.		.666								
Considering my skills and efforts I put into the job, I am satisfied with the compensation I receive.		.534								
My pay package is competitive compared to other organizations in the same line of work.		.572								
Superannuation benefits are adequate to secure my future needs.		.598								
Non-financial benefits given by the bank are good enough.		.603								
All Financial and Non-financial benefits are provided to employees without any discrimination.		.777								
I know how my goals are linked to that of organization's goals.			.555							
I am satisfied with the empowerment I have, to influence the quality of my work.			.539							
I am satisfied with my status in the society?			.677							
I am satisfied with recognition I receive for my contributions.			.628							
I am satisfied with value being accorded to my views and participation.			.531							
I am responsible for my work.			.702							
I like the kind of work I do in my organization				.569						
My work here helps me to learn more about my profession or occupation?				.601						
My work is meaningful and has an impact on the success of the organization.				.534						
I feel free to plan my own work.				.727						
I feel I am doing useful work here.				.579						
My work gives me feelings of accomplishment and pride.				.732						
I am given adequate training to do my job well?					.692					
Training schedule in this bank is well designed.					.797					
Training helps me to do my job more efficiently.					.867					
My Job-related training needs are adequately being taken care off.					.655					
I have confidence and trust in the superiors and juniors with whom I work.						.515				
Leaders in my work environment are positive role models.						.518				
General behavior towards one another among employees and officers is courteous.						.750				
All jobs are looked upon by employees as collective goals.						.767				
I am satisfied with ambience of my branch and other physical facilities?							.697			
I am satisfied with the working hours per day?							.720			
I am satisfied with my present placement?							.523			
The amount of work I am asked to do is reasonable.								.627		
My job does not cause stress or anxiety in my life.								.667		
I will not leave this bank even under adverse circumstances.									.562	
If my job demands, I am always ready to do work overtime without consideration of any compensation.									.773	
I would recommend employment here to a friend.									.707	
My job description clearly spells out my responsibilities.										.634
Adequate promotional avenues for career growth are there in this bank.										.614

### 3.1 Measures

*Job satisfaction:* Overall job satisfaction has been measured using a five-item scale given by Brayfield-Rothe (Judge et al., 2004; Erdogan and Mauer, 2005).

For data regarding other components, a job satisfaction scale was developed through systematic literature review, application of statistical mode and factor analysis carried out

in the study. First, a pre-study was conducted to identify the factors for 'job satisfaction', which in essence determined those intrinsic and extrinsic variables, which are perceived as satisfying by the bank employees to conduct their job smoothly. A pilot survey was then carried out on 30 bank employees, who were asked to check any 10 factors from the collected factors, which they perceived to be the most relevant as a job satisfying factor. Then, the statistical mode was applied to the data collected from this survey, which reduced the number of factors to 10, which were used as the final scale. Next, for scale development, for each of these 10 finalised factors, a list of statements was gathered from an extensive systematic literature review, expert interviews and pre-test surveys. A sample data was collected using five-point Likert scale on each of these statements, from the 30 respondents of the pilot survey. Intercorrelations among these items were subjected to factor analysis to remove the redundant statements and club similar statements (Table 2). The number of components extracted was 10, confirming the factor composition of job satisfaction. The final data from 139 respondents of the sample, was gathered again on this reduced number of statements corresponding to 10 factors, on a five-point Likert scale.

These 10 dimensions or components are:

- *supervision* – this factor assesses the overall health of the relationship of the individual with the supervisor
- *compensation, benefits and security* – this factor deals with the pay component, fringe benefits perceived as a bonus and job security by the individual
- *achievement, recognition and responsibility* – this factor assesses how many opportunities for advancement, timely recognition and how much responsibility for the performance of a task is provided by the job and organisations
- *work itself* – this factor assesses whether an individual perceives his tasks to be challenging enough to motivate him to work and stay in the job
- *training and induction* – this factor assesses how much opportunity is provided by the job to advance one's skills and abilities
- *interpersonal relations* – this factor estimates how encouraging and helping one's colleagues are on the job
- *working conditions* – this factor measures the resource adequacy or conduciveness of the work environment for the employee
- *stress and workload* – this factor assesses the amount of stress perceived by an individual arising from the performance of the job
- *loyalty* – this factor measures the faithfulness of the individual towards the organisation
- *company and admin policy* – this factor gauges the perception of the employees towards policies of the organisation, whether they are favourable for one's working or not.

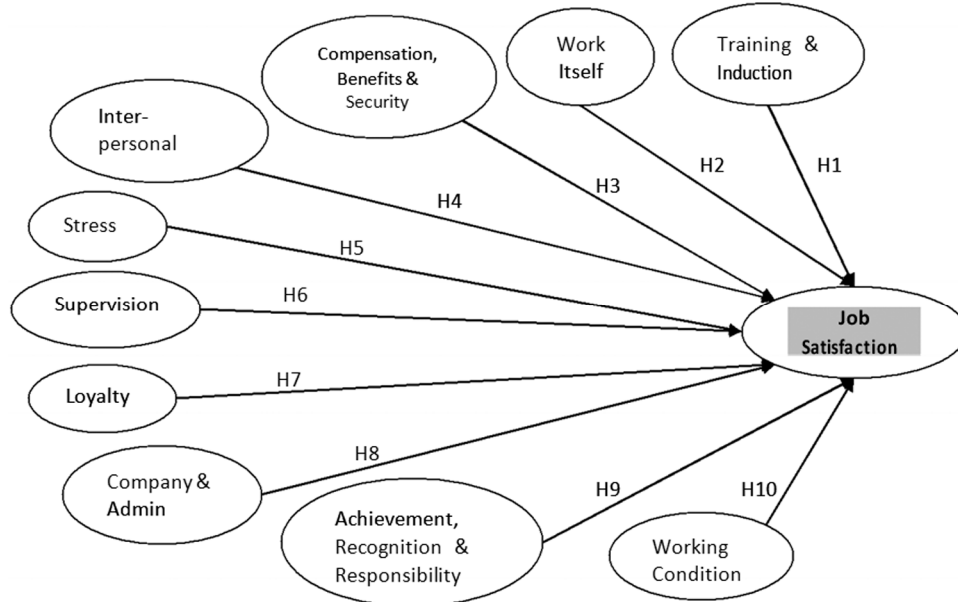
3.2 SMART PLS

A measurement model deployed for PLS application can be formative or reflective. For this purpose, confirmatory tetrad analysis (CTA) is designed, which tests the null hypothesis of vanishing tetrads for all latent variables, implying that the model is reflective (Gudergan et al., 2008). In this study, application of CTA confirms that all scales follow a reflective model of measurement. The analysis here presents testing of the relationship (Figure 1) between endogenous latent variable (Job Satisfaction) and exogenous variables (10 factors under study), applying PLS (Sosik et al., 2009).

3.3 Artificial neural networks (ANNs)

Artificial neural networks (ANNs) mimic biological neural networks and are used to model any type of complex functional relationships. These networks do not require pre-specifying the relation between covariates and response variables. An ANN has multiple layers – one layer is the input layer, the second layer is composed of one or more hidden layers and the third layer is that of output or response variables. The process for output computation in neural nets is called supervised learning. The following steps are utilised in a neural network for weight training or supervised learning – set all weights to random values, neural network algorithm computes the output from the given set of inputs and these weights, network computes an error function *E*, and finally the weights are adjusted until minimisation of the error function.

Figure 1 Conceptual framework



Many models have been defined to compute the weighted average and ANN in SQL Server 2012 uses multilayer perceptron to model functional relationships. The multilayer perceptron is like a directed graph (Gunther and Fritsch, 2010; Zurada, 1994) which has nodes and directed edges. The data passes as signals through the networks and the



weights are adjusted, using learning rate  $\eta$ , and gradient or partial derivative of weights is used for the adjustment, until the desired minimum error is reached. These basically form the principle of conjugate gradient algorithm, applied in SQL SERVER 2012, implying moving in a direction opposite to the direction of the gradient (Xuming et al., 2016).

## **4 Conceptual framework for hypothesis testing**

### *4.1 Definitions of constructs used in the study*

Job training has been defined (Schmidt, 2007) as “a set of planned activities on the part of an organisation to increase the job knowledge and skills or to modify the attitudes and social behaviour of its members in ways consistent with the goals of the organisation and requirements of the job” (p.483).

The working condition or work environment refers to the conditions under which the employee operates. These may refer to the characteristics arising out of performing the task itself. For example, working hours, travel, physical surroundings etc. refer to working conditions (Kalleberg, 1977).

Achievement, recognition and responsibility refer to the desire of an employee to progress or advance his career in the organisation and his need for recognition. This has been observed as a motivator for the employees to stay with the same firm and also appreciate working in it (Cartwright, 1965).

According to (Coomber and Barriball, 2007), job satisfaction is defined as “An attitude of an individual towards how well his expectations at work correspond to the outcomes”. This can arise a state of satisfaction or dissatisfaction. It is one of the major predictors for turnover intention.

Loyalty refers to demonstrating pride in an organisation and being willing to defend the firm against criticism. It implies faithfulness towards the firm and not complaining about the same (Costen and Salazar, 2011).

Supervision refers to the extent a supervisor delegates and gives autonomy to the employees which in turn influences their satisfaction with the job (Alegre et al., 2015). Many studies have cited this as a strong predictor of turnover intention.

Teamwork or cooperative work is a reflection of the relationship shared among colleagues and with employers. When interpersonal relations are such that they create synergy, the outcomes are bound to benefit both the individual and the organisation (Alegre et al., 2015).

The characteristics associated with the work itself that makes it interesting and allowing the employee to propel his potential towards the accomplishment of that work is referred to as ‘Work Itself’ dimension (Kalleberg, 1977). It is also cited as a major need and a major motivator in earlier studies on motivation.

Occupational stress has been considered to evolve from two primary sources – quantity of work demanded from the job and degree of control one has over the tasks he performs. Stress and well-being have been extensively researched and closely correlated (Lu, 1999).

Company policy establishes the rules of conduct within a firm, which in turn clearly indicated the roles and responsibilities of both employees and employers. This aids in the protection of rights of the employees as well as satisfy the business needs of the

employers. The organisations need to revise their policies timely to adjust to the changing business environment (Scott, 2019).

All the above-identified factors are consistent with the constructs of job satisfaction established by Saane et al. (2003), in their systematic review of instruments of job satisfaction.

#### *4.2 Development of research framework*

Based on these, the following conceptual framework (Figure 1) or structural model has been proposed for analysis using SMART PLS.

Globalisation calls for a competitive necessity to evolve through leveraging an environment for learning in organisations (Sharma et al., 2005). The influence of globalisation in financial markets has urged the banks to be a knowledge-intensive sector (Hafizi et al., 2006), and training programs offered by the banks allow individuals to learn through participation (Shipton et al., 2002). Training, in addition to the achievement of organisational goals, enables achievement of individual goals such as for development, recognition and financial benefits, consequently leading to psychological benefits (Rowden and Conine, 2005). Therefore, learning fosters positive appraisal of one's job through its positive impact on individual's emotional health (Locke, 1976; Weiss, 2002), improves employee morale (Keltner and Finegold, 1996) and prior studies suggest that a significant relationship exists between satisfaction with job training and overall satisfaction (Schmidt, 2007; Violino, 2001; Blum and Kaplan, 2000). Employees who receive training from the organisation have significantly higher levels of job satisfaction than those who do not (Chiang et al., 2005; Bartlett, 2001). Therefore, it can be sufficiently hypothesised that:

*H1: Employer-provided job training is positively linked with overall job satisfaction.*

Herzberg's two-factor theory for motivation suggests two different set of factors (intrinsic and extrinsic) which motivate an individual to perform a job (Herzberg et al., 1959; Pollack, 2008). An important motivational factor that emerged in the theory was 'Work Itself', since it is seen that workers are challenged or stimulated to the greatest extent by characteristics of work itself, because it satisfies their innate needs for curiosity, challenge, competence and autonomy (Shrivastava and Purang, 2009; Singh et al., 2010). Many studies in the past have linked satisfaction with work as the primary influencer of satisfaction with a job on the whole (Bond and Bunce, 2003; Ewen, 1964; Seo et al., 2004). Failure of an individual to perform the task at hand eventually leads to job dissatisfaction (Crossman and Abou-Zaki, 2003). In this context, organisations also tend to enrich or add to jobs so that individuals derive satisfaction from their jobs (Kalleberg, 1977). Therefore, it can be hypothesised that:

*H2: Work Itself is positively linked with overall job satisfaction.*

A key purpose of attaining job is financial security, which makes an important influence on the level of job satisfaction (Shrivastava and Purang, 2009; Kalleberg, 1977). Perception of financial security and satisfaction of individual's basic needs fulfilled through monetary transactions, has an effect on his overall job satisfaction (Coomber and Barriball, 2007). Differences in perception of satisfaction from compensation, benefits and security may arise when individuals feel that they are not being rewarded adequately

compared to their peers in the same or other competing organisations (Green and Heywood, 2008) (Heneman et al., 1988). This can lead to the following hypothesis:

*H3: Compensation, benefits and security are positively linked with overall job satisfaction.*

Interpersonal relationships play an important role in the work setting of an individual. A social structure composed of one's peers, supervisors and subordinates have found a positive link with job satisfaction (Schyns and Croon, 2006). An individual has an innate social need for belongingness (Maslow, 1943). Even at the job, individual desires to make friends, help others in their tasks and receive help from others when needed (Sargent and Terry, 2000). Perception of healthy interpersonal relations satisfy an individual's social needs at work, and hence result in job satisfaction (Baldoni, 2017; Schirmer and Lopez, 2001). Therefore, although interpersonal relationships may not be a primary influencer, they definitely play a role in increasing worker satisfaction with job.

*H4: Interpersonal relationships are positively linked with overall job satisfaction.*

Stress has been consistently cited as a predictor of turnover in almost all organisations (Hwang et al., 2014; Kim and Stoner, 2008). Stress in banks is often attributed to longer working hours, tight schedules, huge rush in the days of salary distribution and hours becoming unstable in adverse circumstances following government moves such as demonetisation (Giorgi et al., 2017; Michailidis and Georgiou, 2005; Katyal et al., 2011). A diverse and challenging job such as that of managers in banks is often accompanied by stress, technology-intensive jobs are also prone to create stress for employees (Coomber and Barriball, 2007). These stressful circumstances have an adverse effect on an individual's psychological and physical well-being, leading to job dissatisfaction and job burnout (Giorgi et al., 2017; Michailidis and Georgiou, 2005; Travers and Cooper, 1993). Therefore, it can be hypothesised that

*H5: Stress is negatively linked to job satisfaction.*

The cadre of managers taken as respondents in the study make low-level decisions daily, which necessitates the need for employee empowerment (Coomber and Barriball, 2007). However, when supervision is not open and empowering, it causes dissonance among employees since they are unable to perform routine tasks smoothly (Schirmer and Lopez, 2001). It has also been seen that supervision style has an impact on organisational commitment of employees and their job satisfaction (Kang et al., 2014). When an employee receives encouragement from his supervisor to perform the job, his attitude towards the job improves (Schyns and Croon, 2006). This implies that supervisor support positively influences the perception of the job of an individual and work-related attitudes (Alegre et al., 2015). This leads to the hypothesis that:

*H6: Supervision is positively linked with overall job satisfaction.*

When an employee is loyal towards the organisation, his likelihood of staying with the organisation increase (Costen and Salazar, 2011). Loyal employees reflect the values of the organisation, and act as a shield against any sort of criticism towards the firm (Chen et al., 2010). When an individual is loyal, he is not scared of assuming the responsibility which in turn reduces chances of job switches (Eskildsen and Nussler, 2000), and, therefore, loyalty has been used a component of measuring organisational commitment.

This perception of value congruence, assuming responsibility in loyal employees imply higher job satisfaction (Meyer and Allen, 1991). On this basis, the following hypothesis has been framed:

*H7: Loyalty positively influences overall job satisfaction.*

The function of HR (human resources) in any organisation is responsibility for framing policies which employees abide by and use as a rulebook. The policies need to be perceived favourably by employees as it may lead to dissatisfaction among employees (Ghosh et al., 2015). For example, companies have introduced the policy of flexible hours, or the option to work from home to accommodate working mothers who need to manage both family and work (Eaton, 2003; Mitchell et al., 2001). Since policies link the employee to the firm, the way in which they are perceived has important implication towards employee satisfaction. When policies are directed towards making the environment conducive for employees, it also boosts their level of job satisfaction (Schyns and Croon, 2006). Based on this premise, the following hypothesis has been proposed:

*H8: Company and administration policy positively influence job satisfaction.*

All employees crave for recognition for their contribution towards organisational goals and wish to be assigned work which gives them responsibility as it makes them feel important (Wright and Davis, 2003). The tasks at work providing autonomy and variety and responsibilities such that they provide an opportunity for recognition and achievement in one's job has a massive influence on one's satisfaction with the job (Dodd and Ganster, 1996; Ting, 1997; Zaffane, 1994). From all of the above discussions, it is quite evident that when an employee perceives that opportunity for advancement exists in the organisation and that he is being recognised for his contribution towards organisational work, that is positively linked with job satisfaction (Blau, 1999; Martins et al., 2002). Therefore, it can be hypothesised that

*H9: Achievement, recognition and responsibility are positively linked with job satisfaction.*

An individual requires the presence of adequate resources to perform his work (Wanous, 1974; Schaufeli and Taris, 2014). For example, equipment, authority, working hours etc. are some of the basic necessities without which it would be impossible to work. Irrespective of the support from supervision, or the cohesion among colleagues, the necessity of resources required to perform a task is irreplaceable (Bokemeier and Lacy, 1987; Raziq and Maulabakhsh, 2015). Thus a worker may be concerned with the lack of appropriate working conditions which in turn may lead to dissatisfaction among workers. Therefore it can be said that

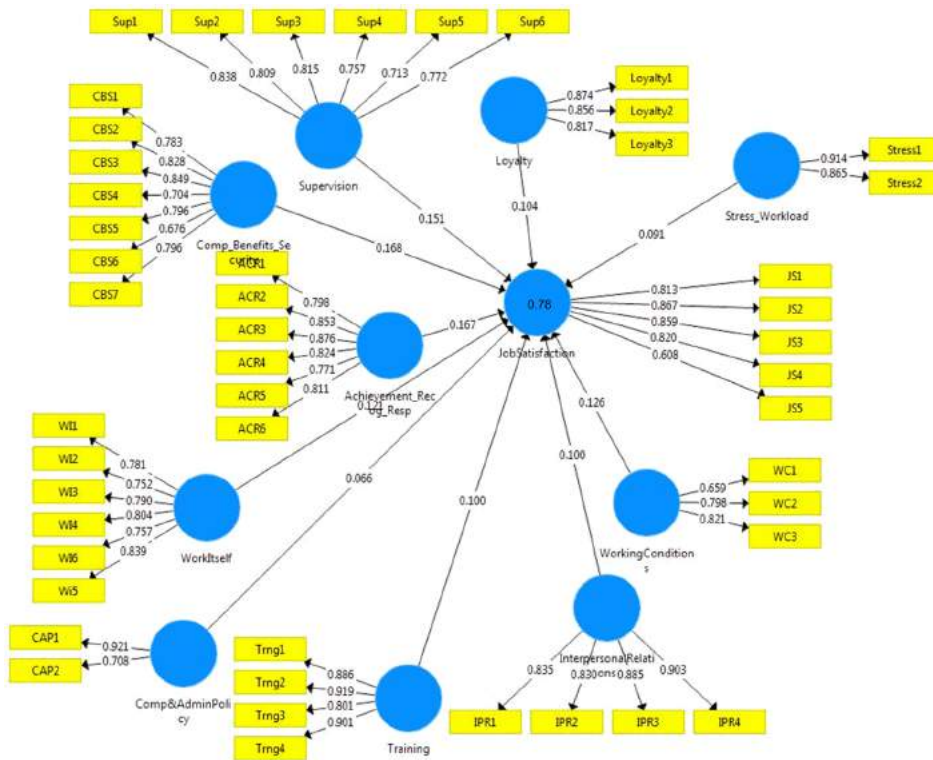
*H10: Working conditions are positively linked with overall job satisfaction.*

## **5 Results and discussions – SMART PLS output**

Before we look into the output generated from application of SMART PLS for analysis of data, it is worth recalling that this study aims to develop a scale for measurement of job satisfaction of employees working in the managerial cadre, in the banking sector in India.

To measure job satisfaction, a multi-item measurement approach is applied in this work. In this approach, items to measure the level of satisfaction with specific facets of one’s job are used, which then represent overall job satisfaction of an individual. Firstly, through systematic literature review, expert interviews and pilot studies, facets of job satisfaction were collected. A total of 10 factors (facets of job satisfaction) and the items to measure each of these was finalised after application of statistical mode and factor analysis to sample data collected for a pilot study. The final data for scale development was taken from 139 bank managers in public sector bank of India. The analysis was carried out through hypothesis testing through the application of SMART PLS and then a comparison was done through the application of ANN. Both the techniques revealed similar results – which facets were primarily important for the measurement of job satisfaction of bank managers in India. The results depicted in the figure have been discussed as in Figure 2.

Figure 2 SMART PLS output (see online version for colours)



### 5.1 Explanation of target endogenous variable variance

The coefficient of determination,  $R^2$ , is 0.786 for the variable ‘job satisfaction’, implying that the 10 latent variables considered in the research explain 78.6% variance in the outcome variable.

### 5.2 *Inner path model coefficient sizes and significance*

- The path coefficients determine the relative importance of each variable or measures their effect on the outcome variable. When the values of path coefficients are less than 0.1, it indicates that the relationships are not statistically significant.
- The inner model suggests that ‘compensation, benefits and security’, ‘achievement, recognition and responsibility’ and ‘supervision’ have the strongest effect on job satisfaction, with standardised path coefficients equal to 0.168, 0.167 and 0.151 respectively, implying that the relationships are statistically significant.
- These latent variables are followed by ‘work itself’ and ‘working conditions’ with path coefficients value at 0.121 and 0.126, in their effect on ‘job satisfaction’.
- The path coefficients value for ‘training’, ‘interpersonal relations’ and ‘loyalty’ is around 0.1 only, implying that their effect on the outcome variable is relatively weak.
- For this research model, the latent variables – ‘company and administration policy’ and ‘stress and workload’, do not form a statistically significant relationship with the outcome variable ‘job satisfaction’.
- The moderately strong predictors for job satisfaction as indicated through data analysis:
  - ‘compensation, benefits and security’, ‘supervision’
  - ‘achievement, recognition and responsibility’

### 5.3 *Reliability and validity*

The reliability has been assessed using internal consistency approach, by analysing the composite reliability values. All variables demonstrate composite reliability (values higher than 0.7) (Wong, 2010), as depicted in Table 3. Wherever, reliability of indicators (squaring of outer loadings) is found to be less than 0.7, but composite reliability and AVE for the variable is acceptable, then the indicators were retained since they imply additional information (Becker, 2017). Convergent validity was assessed by analysing AVE (Average variance explained) values, which should be greater than ‘0.5’ (Table 3), while discriminant validity was assessed using Fornell-Larcker criterion (Table 4). The criteria for discriminant validity is that the square root of AVE for each latent variable should be greater than the correlation among latent variables. As can be seen from Table 4, the variables satisfy the criteria for discriminant validity.

### 5.4 *Checking structural path significance*

SMART-PLS allows significance testing for both inner and outer model by computing *T*-statistics through bootstrapping. As a rule of thumb, at 5% level of significance, the path coefficients are assumed to be significant, if *T*-statistics have a value greater than 1.96 for each latent variable. The findings (See Table 5) are consistent with earlier analysis.

**Table 3** Results summary for reflective outer model

<i>Latent variable</i>	<i>Indicators</i>	<i>Loadings</i>	<i>Indicator reliability</i>	<i>Composite reliability</i>	<i>AVE</i>
ACR	ACR1	0.798	0.637	0.926	0.677
	ACR2	0.853	0.728		
	ACR3	0.876	0.767		
	ACR4	0.824	0.679		
	ACR5	0.771	0.594		
	ACR6	0.811	0.658		
CAP	CAP1	0.921	0.848	0.803	0.675
	CAP2	0.708	0.501		
CBS	CBS1	0.783	0.613	0.914	0.606
	CBS2	0.828	0.686		
	CBS3	0.849	0.721		
	CBS4	0.704	0.496		
	CBS5	0.796	0.634		
	CBS6	0.676	0.457		
	CBS7	0.796	0.634		
IPR	IPR1	0.835	0.697	0.922	0.746
	IPR2	0.830	0.689		
	IPR3	0.885	0.783		
	IPR4	0.903	0.815		
JS	JS1	0.813	0.661	0.897	0.639
	JS2	0.867	0.752		
	JS3	0.859	0.738		
	JS4	0.820	0.672		
	JS5	0.608	0.370		
LOYALTY	LOYALTY1	0.874	0.764	0.886	0.721
	LOYALTY2	0.856	0.733		
	LOYALTY3	0.817	0.667		
STRESS	STRESS1	0.914	0.835	0.884	0.792
	STRESS2	0.865	0.748		
SUPERVISION	SUP1	0.838	0.702	0.906	0.616
	SUP2	0.809	0.654		
	SUP3	0.815	0.664		
	SUP4	0.757	0.573		
	SUP5	0.713	0.508		
	SUP6	0.772	0.596		

**Table 3** Results summary for reflective outer model (continued)

<i>Latent variable</i>	<i>Indicators</i>	<i>Loadings</i>	<i>Indicator reliability</i>	<i>Composite reliability</i>	<i>AVE</i>
TRAINING	TRNG1	0.886	0.785	0.931	0.771
	TRNG2	0.919	0.845		
	TRNG3	0.801	0.642		
	TRNG4	0.901	0.812		
WC	WC1	0.659	0.434	0.805	0.582
	WC1	0.798	0.637		
	WC3	0.821	0.674		
WI	WI1	0.781	0.610	0.907	0.620
	WI2	0.752	0.566		
	WI3	0.790	0.624		
	WI4	0.804	0.646		
	WI5	0.757	0.573		
	WI6	0.839	0.704		

## 6 Results and discussions: ANN output

For the purpose of implementing ANN mining technique on the data, the average of items belonging to each component was computed and a new column average was created for the same. The mining model implemented in SQL is as follows (Figure 3).

To facilitate easier interpretation of the ANN output, these average values were assigned to classes where values less than 2.8 were coded as '1', greater than 3.2 were coded as '3', while remaining were coded as '2'. This was necessary as ANN is a supervised learning method of classification and therefore requires the target variable (job satisfaction in this case which is to be predicted) to be defined clearly.

As per the output of the mining model implemented in SQL Server 2012, the key influencers have been selected based on the scores assigned by the MS neural network algorithm. Those components which had scores greater than 50 are considered to be of importance in influencing job satisfaction. In decreasing order of their importance, the key influencers of job satisfaction are (score mentioned inside parenthesis) – interpersonal relations (100), loyalty (84.4), supervision (65.21), work itself (60.68), working conditions (59.01), achievement and recognition and responsibility (51.79) and training (50.02).

The model's accuracy has been assessed using a lift chart which shows a predict probability of 98.06% implying a very high accuracy level. The classification matrix of the model for test data (29 data points) has also been shown in Table 6.



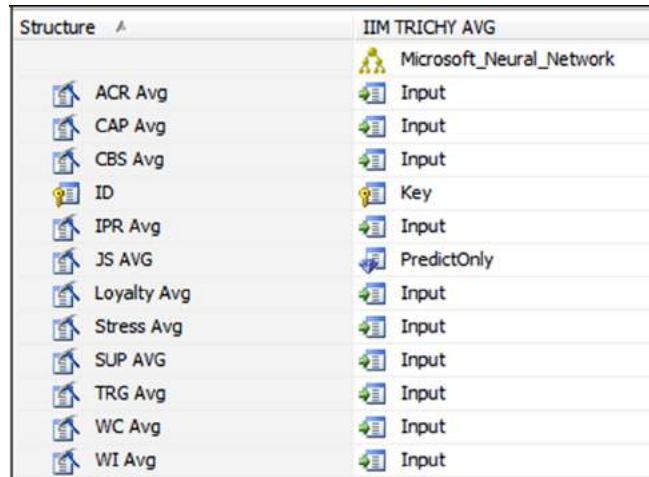
**Table 4** Fornell-Larcker criterion analysis to check discriminant validity

	ACR	CAP	CBS	IPR	JS	Loyalty	Stress	Supervision	Training	WI	WC
ACR	<b>0.823</b>										
CAP	0.715	<b>0.822</b>									
CBS	0.739	0.723	<b>0.778</b>								
IPR	0.736	0.624	0.717	<b>0.864</b>							
JS	0.804	0.792	0.773	0.832	<b>0.799</b>						
Loyalty	0.679	0.631	0.703	0.652	0.713	<b>0.849</b>					
Stress	0.475	0.358	0.584	0.494	0.634	0.560	<b>0.890</b>				
Supervision	0.789	0.710	0.730	0.769	0.779	0.724	0.412	<b>0.785</b>			
Training	0.713	0.626	0.661	0.558	0.775	0.641	0.575	0.536	<b>0.878</b>		
WI	0.788	0.625	0.620	0.686	0.719	0.610	0.455	0.765	0.593	<b>0.763</b>	
WC	0.735	0.630	0.673	0.632	0.709	0.576	0.467	0.724	0.604	0.580	<b>0.787</b>

**Table 5** T-statistics of path coefficients (inner model)

	<i>T-statistics</i>
ACR → Job satisfaction	5.866
CAP → Job satisfaction	0.837
CBS → Job satisfaction	5.267
IPR → Job satisfaction	4.171
Loyalty → Job satisfaction	3.560
Stress → Job satisfaction	0.629
Supervision → Job satisfaction	4.348
Training → Job satisfaction	4.117
WI → Job satisfaction	5.277
WC → Job satisfaction	5.618

**Figure 3** ANN mining model (see online version for colours)



**Table 6** Classification matrix for ANN output

<i>Predicted</i>	<i>Low (actual)</i>	<i>Medium (actual)</i>	<i>High (actual)</i>
Low	1	0	0
Medium	0	0	0
High	0	0	28

## 7 Practical implications

Job satisfaction has been conceptualised and operationalised as both a global construct and a multifaceted construct (Hirschfeld, 2000). The study demonstrates the importance of the use of a multidimensional multifaceted measure. This would be highly useful in situations where the impact of job satisfaction on work-related outcomes is to be studied as the different facets may relate differently to these outcomes and aid in providing a

broader understanding of the relationship. Abridged versions of shorter forms of MSQ or other similar scales have been seen to possess lower construct validity, although they distinguish and measure between the intrinsic and extrinsic measure of job satisfaction (Buitendach and Rothmann, 2009). In this context also, the present findings of facets of job satisfaction would enable to overcome this limitation.

The hypotheses generated for testing have all been accepted through the PLS technique, except H6 and H8 which posit the linkage between stress and company policy on job satisfaction. This implies that clearly a multifaceted approach can be adopted for measurement of job satisfaction since employees do perceive these components differently which ultimately impacts their job satisfaction levels.

Compensation, benefits and job security have the highest impact on the job satisfaction of bank managers followed by achievement, recognition and responsibility, after supervision. Therefore policy design and bank's efforts aimed at increasing the job satisfaction of the managers should inculcate these aspects. The banks in India (especially the one under study) do offer job security after employees complete their period of probation. Besides this, the job in SBI is also lucrative being a government job which has higher job security than private ones. The bank also offers career advancement internally, which in turn leads to higher pays and perks for the employees. Work itself at the bank is quite monotonous as for a particular post, the same set of tasks need to be carried out. Therefore, the work is not as enticing, however, the responsibility that accompanies the tasks makes work lucrative. A job of a bank manager is considered quite respectful in India. Working conditions at the bank are highly conducive since almost all branches are now completely air-conditioned and computerised.

Training, interpersonal relations and loyalty have a weak relation with job satisfaction. Training at the bank is quite intensive and the SBI bank has also opened global centres now with centres of excellence for people with disabilities (SBI, 2017). This might be the reason that the perception of training doesn't have much impact on the measurement of job satisfaction. The bank has work roles which do not require much of interpersonal relations to operate on.

In a nutshell, the maximum impact on job satisfaction can be achieved by offering lucrative compensation and benefits to the bank employees. Achievement, recognition and responsibility shape employee's commitment and makes their workplace attitudes favourable. So sufficient opportunities for achievement and recognition should be provided by the bank. The supervisor needs to delegate and provide autonomy to the employees at the bank. Paying close attention to these factors will increase the job satisfaction of the bank managers. Training also leads to an increase in employee loyalty, which leads to better job satisfaction and reduced turnover intention.

Comparative analysis of the ANN output and output from SMART PLS reveal that both the techniques fetched similar components for the measurement of job satisfaction. However, PLS has fetched an additional component 'compensation, benefits and security'. Both the techniques seem to be equally good for measurement in this case, PLS supplies the researcher with multiple other parameters which add robustness to one's research such as measures of validity and reliability.

## **8 Future scope and limitations of the study**

There has been considerable debate on single item measures of job satisfaction vs. multiple facet multiple-item measures. In this study, multiple facets – multiple-item measure has been utilised. The benefit of using this approach was that it could be clearly demonstrated through empirical testing, about the facets of job satisfaction that have a higher contribution to the level of job satisfaction of bank managers in India. While it is possible for employees to be satisfied with one component and dissatisfied with another, on the whole, an aggregate level of job satisfaction can be reached by balancing the satisfactions against dissatisfactions (Kalleberg, 1977). In addition, it has been argued that single item measures that determine overall job satisfaction levels, are easier to interpret, take less time to complete, and have higher face validity and maybe better at measuring changes in job satisfaction (Nagy, 2002; Wanous et al., 1997). Therefore, a study can be based on comparing the effectiveness of the two approaches in measuring the job satisfaction levels of bank managers.

Prior studies have accounted for the variations in the level of job satisfaction through a number of different approaches. For example, individual differences in personality have been related to job satisfaction. A few other studies have totally relied on variations in characteristics of the job to account for varying job satisfaction levels. Both of these approaches have limitations, such as the former completely ignores to inculcate the nature of jobs to account for job satisfaction, the latter ignores how individual differences make one perceive job characteristics differently and hence lead to varying job satisfaction level (Kalleberg, 1977; Shephard, 1970; Massie, 1964). The authors have cited that the best approach for measurement of work satisfaction is the one that inculcates how individuals impart meaning to various aspects of their job (Russell, 1975; Wanous, 1974; Vroom, 1964). This view is based on the premise that the satisfaction an individual derives from his work is neither a function of individual differences nor that of the job characteristics, rather it inculcates both of these, in addition to the motives of the individual. In this study, it should be understood that the scale incorporates work characteristics for the measurement of job satisfaction, whereas job satisfaction is not a one-way process as mentioned before. Individuals contribute to their job differently owing to individual differences, which may result in evaluating job satisfaction components different. People attach emotional components to their work which shapes their work experiences and hence changes in job satisfaction (Russell, 1975). This aspect research, but explored in this research but may pave way for future research.

A major limitation of the study is the data source. The study is based on a small sample collected from a single public sector in India. Although this is the largest bank in India, the sample restricts the generalisability of the study. Besides this, it is also limited to one designation. This can be expanded to other designations, compared with private sector banks and sample size could be increased.

Although, a questionnaire was administered electronically and was not targeted to a specific location, it cannot be said with confidence that all locations of the bank in India were completely covered by the survey. Also, the bank has offices outside India in other countries as well. These cross-cultural factors too impact these components of job satisfaction. These were not incorporated into this study.

Sample size also posed a limitation on the efficiency of ANNs. The efficiency of these techniques is directly proportional to sample size, that is, the larger the sample, more efficient the technique is. The study was conducted using survey where data were

collected based on self-report on a five-point Likert scale. However, self-reporting is often distorted owing to bias, prejudices, and incomplete responses. This has chances of introducing measurement errors and hence constraining some relationships between variables.

In a nutshell, the study was able to demonstrate that bank managers weigh different facets of their job differently and hence this accounts for variations in their level of job satisfaction. The study, therefore, not only allows for the development of a scale for measurement of job satisfaction specifically designed for the banking sector in India; it also suggests which facets are the most important satisfier for bank managers. The banks can use these findings to improve the areas which emerge as dissatisfiers and at the same time, the revelations can aid in the policy design in banks such as retention policy which incorporates all the satisfiers, thereby increasing bank's productivity. This research work is a small attempt with many limitations, yet it poses several future research possibilities for research and important implications for the banking sector.

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