

Assessing Financial Literacy Levels of Banking and IT/ITes Employees

P. Shanmugha Priya R. Vishal Kumar

Abstract: For a country poised to become the world's third-largest economy by 2035 (Goldman Sachs), research studies found that Indians exhibit very poor knowledge of how to manage their personal finances. A study by Max Life-NACER finds that Indians fail to take a long-run perspective personal of their financial security thereby savings for their old age unimportance. Ahuvalias M.S (2006) in a survey said, "Indians are wise savers but poor investors". To achieve financial well being the individual should be financially literate. This research paper results reveals that respondents working in banking exhibit higher levels of financial literacy than the IT/ITes sector employees. The paper also suggests various measures to be taken by the authorities to enhance the financial literacy levels of individuals, which in turn improves their investment decisions.

Keywords: Financial Literacy, Investment Decisions

I. INTRODUCTION

To achieve financial well-being, it is necessary that an individual take decisions that make financial sense. Decisions that are financially sound, however, require the individual to be financially literate. Therefore, financial literacy represents a combination of adequate financial awareness, financial knowledge, decision skills, investment attitude and behaviour. Various research studies show that stooping levels of financial literacy is attributed to problems related to personal finance management such as saving, debt (borrowing), investments and eventually retirement planning. Individuals who are financial literate can effortlessly make use of the myriad of financial products/services which are introduced by the government, by analysing and evaluating the risk and return associated with such financial products. The resultant sound financial decisions of individuals improve the quality of financial markets. Financial literacy ultimately helps in improving the service quality of financial intermediaries, stimulating economic growth thereby leading to the nation's development and progress. The trajectory of financial literacy is an eventual progression from financial knowledge to decision skills to investment attitude and to behaviour. This connection is of paramount importance because financial knowledge influences attitude, which in turn leads to positive financial behaviour. Therefore, in order to improve financial literacy, the same needs to be measured and tracked using both knowledge and action metrics. As the

definition of financial literacy involves three components, namely financial knowledge, financial attitude and financial behaviour researchers opine that the level of financial literacy significantly influences investment decisions and that of an individual's savings behaviour. This study attempts to gauge financial literacy levels of respondents. The variables of the study are financial attitude, financial behaviour and financial knowledge. The researcher employed factor analysis to understand the factors underlining financial literacy viz., financial attitude and financial behaviour. To measure the third component financial knowledge, objective type questions were used. The factors of financial attitude were identified as money-management ability; savings-attitude, financial-planning ability, risk-taking ability, investment management, debt management and personal inclination in finance. The findings of financial behaviour factors are personal financial management, decision-making behaviour, financial learning behaviour and purchasing decision behaviour. The research findings were used to give suggestions for the individuals, regulatory authorities and financial service providers.

II. OBJECTIVES:

To explore the financial literacy level among the employees in Banking and IT/ITes using logistic regression. In India, as the service sector contributes 52% to GDP and expected to reach 62% by 2020, the researcher has determined to conduct the research in the services sector. From the industries of services sector Banking and IT/ITES are considered for the study as they contribute 20.54% to GDP for the Indian economy. As money is an important criterion for the investment decisions the Banking and IT/ITES industry which occupies a 5th and 6th place in the highest paid industry, the study conducted by analytics India (2015) were chosen for the study. The questionnaire has considered financial knowledge, financial attitude and financial behaviour to be representative of financial literacy. The questionnaire has used interval scale for data collection.

III. PREDICTING FINANCIAL LITERACY USING LOGISTIC REGRESSION MODEL SPECIFICATION

Logistic regression is use to establish the level of financial literacy, based on socio-demographic factors. Chen and Volpe (2002) and Worthington (2006) used similar models. Logistic regression is used because of the nature of the dependent variable where the dependent variable is dual categories, then binomial logistic regression is used whereas if the dependent variable exceeds two categories then multinomial logistic regression is used.

Manuscript published on 30 June 2019.

* Correspondence Author (s)

Dr. P. Shanmugha*, Assistant Professor, Happy Valley Business School, Anna University, Chennai. (Tamil Nadu), India.

Dr. R. Vishal Kumar, Associate Professor, Department, Finance, Happy Valley Business School. Chennai. (Tamil Nadu), India.

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

The Dichotomous dependent variable was created and was named as “Level of Financial Literacy”. The respondents whose scores were either at par or below the median score were categorised as ‘Low Financial Literacy’. The respondents whose score exceeded the median values were categorised as ‘High Financial Literacy’. The dichotomous nature of dependent variable necessitated use of the binomial logistic regression model for prediction purposes. In the model $\ln(\text{ODDS}) = \ln(p/(1-p))$, where p is the predicted probability of a respondent being more financially literate, thus, scoring higher on the test, which is coded with 1 and 1-p, is the predicted probability of the respondents being low on financial literacy level, coded with 0. As the literature on financial literacy suggests, the independent or predictor variables used in this study includes gender (Chen and Volpe, 2002; Lusardi and Mitchell, 2006, 2008; Monticone, 2010), age (Worthington, 2004; Lusardi and Mitchell, 2006; Cole et al. 2009), education (Alexander et al. 1998; Worthington 2004; Guiso and Jappeli, 2005; Lusardi and Mitchell, 2006,2008), income (Johnson and Sherraden, 2007)

The Logistics Regression Model takes on the following form: $\ln[p/(1-p)] = \beta_0 + \beta_1(\text{Gender}1) + \beta_2(\text{Age}1) + \beta_3(\text{Age}2) + \beta_4(\text{Age}3) + \beta_5(\text{Age}4) + \beta_6(\text{Marital Status}1) + \beta_7(\text{Marital Status}2) + \beta_8(\text{Marital Status}3) + \beta_9(\text{Educational Qualification}1) + \beta_{10}(\text{Income}1) + \beta_{11}(\text{Income}2) + \beta_{12}(\text{Income}3) + \beta_{13}(\text{Earning Member}1) + \beta_{14}(\text{Earning Member}2) + \beta_{15}(\text{Earning Member}3) + \beta_{16}(\text{Family Type}1) + \beta_{17}(\text{Family Size}1) + \beta_{18}(\text{Family Size}2) + \beta_{19}(\text{Occupation}1) + \beta_{20}(\text{Number of Dependent}1) + \beta_{21}(\text{Number of Dependent}2) + \beta_{22}(\text{Number of Dependent}3)$

Where p = the probability of a respondent being high financially literate:

Gender 1 = 1 if the respondent is male, 0 otherwise

Age 1 = 1 if the respondent is in the age group of < 25 years, 0 otherwise

Age 2 = 1 if the respondent is in the age group of 25 – 35 years, 0 otherwise

Age 3 = 1 if the respondent is in the age group of 36 – 45 years, 0 otherwise

Age 4 = 1 if the respondent is in the age group of 46 – 55 years, 0 otherwise

Marital Status 1 = 1 if the respondent is married, 0 otherwise

Marital Status 2 = 1 if the respondent is unmarried, 0 otherwise

Marital Status 3 = 1 if the respondent is widow, 0 otherwise

Educational Qualification 1 = 1 if the respondent is undergraduate, 0 otherwise

Income 1 = 1 if the respondent’s annual income is <Rs. 2.5 lakhs, 0 otherwise

Income 2 = 1 if the respondent’s annual income is between Rs. 2.5 – 4.9 lakhs, 0 otherwise

Income 3 = 1 if the respondent’s annual income is between Rs. 5 – 8 lakhs, 0 otherwise

Earning Member 1 = 1 if the respondent is having 1 earning member is a family, 0 otherwise

Earning Member 2 = 1 if the respondent is having 2 earning members is a family, 0 otherwise

Earning Member 3 = 1 if the respondent is having 3 earning members in a family, 0 otherwise

Family type 1 = 1 if the respondent is in a joint family, 0 otherwise

Family size 1 = 1 if the respondent is having 2-4 members in a family, 0 otherwise

Family size 2 = 1 if the respondent is having 5-7 members in a family, 0 otherwise

Occupation 1 = 1 if the respondent works in an IT/ITes concern, 0 otherwise

Number of Dependent 1 = 1 if the respondent is having 1 dependent member, 0 otherwise

Number of Dependent 2 = 1 if the respondent is having 2 dependent members, 0 otherwise

Number of Dependent 3 = 1 if the respondent is having 3 dependent members, 0 otherwise

As the independent or predictor variables were also categorical, they have been coded using the concept of dummy variables. The analysis has been carried out with the help of SPSS which converts categorical variables to dummy variables, automatically. The above logistic regression employs a maximum likelihood method(MLM). The MLM which maximizes the probability of obtaining the observed results given in the fitted regression coefficients.

IV. RESULT OF BINARY LOGISTIC REGRESSION MODEL

The logistic regression model gives the following regression equation:

$$\ln[p/(1-p)] = 2.371 + 0.325(\text{Gender}1)^* - 0.186(\text{Age}1) - 0.133(\text{Age}2) - 0.162(\text{Age}3) - 0.103(\text{Age}4) - 1.129(\text{Marital Status}1) - 1.530(\text{Marital Status}2) - 0.720(\text{Marital Status}3) + 0.013(\text{Educational Qualification}1) + 0.605(\text{Income}1) + 0.613(\text{Income}2)^* + 0.331(\text{Income}3) - 0.596(\text{Earning Member}1) - 0.560(\text{Earning Member}2) - 0.097(\text{Earning Member}3) - 0.371(\text{Family Type}1)^* + 0.393(\text{Family Size}1)^* + 0.508(\text{Family Size}2)^* + 0.290(\text{Occupation}1)^* - 1.108(\text{Number of Dependent}1)^* - 1.091(\text{Number of Dependent}2)^* - 0.862(\text{Number of Dependent}3)^*$$

*Statistically significant variable at 5% level.

Where p = the probability of a respondent being high financially literate.

Table 1: Variables in the Logistic Regression Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 ^a	Gender(1)	.325	.141	5.356	1	.021	1.385
	Age			.723	4	.949	
	Age(1)	-.186	.259	.517	1	.472	.830
	Age(2)	-.133	.293	.208	1	.648	.875
	Age(3)	-.162	.216	.563	1	.453	.850

	B	S.E.	Wald	df	Sig.	Exp(B)
Age(4)	-.103	.253	.165	1	.684	.902
Marital Status			5.219	3	.156	
Marital Status(1)	-1.129	1.103	1.048	1	.306	.324
Marital Status(2)	-1.530	1.123	1.857	1	.173	.217
Marital Status(3)	-.720	1.179	.373	1	.542	.487
Educational Qualification(1)	.013	.151	.008	1	.931	1.013
Income			9.524	3	.023	
Income(1)	.605	.216	7.824	1	.005	1.831
Income(2)	.613	.241	6.502	1	.011	1.847
Income(3)	.331	.216	2.344	1	.126	1.392
Earning Members			4.986	3	.173	
Earning Members(1)	-.596	.392	2.310	1	.129	.551
Earning Members(2)	-.560	.397	1.996	1	.158	.571
Earning Members(3)	-.097	.482	.041	1	.840	.907
Family Type(1)	-.371	.150	6.137	1	.013	.690
Family Size			5.256	2	.072	
Family Size(1)	.393	.199	3.920	1	.048	1.482
Family Size(2)	.508	.235	4.674	1	.031	1.662
Occupation(1)	.290	.146	3.956	1	.047	1.336
Number of Dependent			29.843	3	.000	
Number of Dependent (1)	-1.108	.270	16.846	1	.000	.330
Number of Dependent (2)	-1.091	.206	28.039	1	.000	.336
Number of Dependent (3)	-.862	.219	15.416	1	.000	.423
Constant	2.371	1.239	3.662	1	.056	10.709

a. Variable(s) entered on step 1: Gender, Age, Marital Status, Educational Qualification, Income, Earning Members, Family Type, Family size, Occupation, Number of Dependent. The value of coefficients (B) in the above table reveal the independent and dependent variable relationships. With the dependant variable on the logit scale, the estimates indicate the amount of increase or decrease. When the sign of the coefficient is negative, the financial literacy level would be predicted by either a one unit increase/ decrease in the predictor variable, holding all other predictor variables constant. The significance of each predictor variable in the regression equation is identified by an index provided by the Wald statistic. In order to assess Wald statistic, the significance values were checked and if less than 0.05 then null hypothesis gets rejected as the variable does make a significant contribution. According to the output, it can be said that variables Gender 1, Income 1, Income 2, Family Type 1, Family size 1, Family Size 2, Occupation1, Number of Dependent 1, Number of Dependent 2 and Number of Dependent 3 were statistically significant. In addition, the Exp (B) in Table 1 indicates through the natural log to power B (odds ratio is predicted by the model). B is the coefficient of the independent variable. The value of Exp (B) for Gender 1 is 1.385. It means that the odds scoring high on financial literacy were 1.385 times more for male respondents than for female respondents. The value of Exp (B) for Income 1 is 1.831. This means the odds of scoring high on financial literacy are 1.831 time more for annual income less than Rs 2.5 lakhs than for above Rs 8 lakhs and also annual income between Rs 2.5 – 4.9 lakhs respondents financial literacy are someone who is only 1 dependent member in the family. The number of dependents 2 has an Exp (B) of 0.336 which means that respondent having 2 dependent members is 0.336 likely to score higher on financial literacy than a respondent who has 4 dependents in the family. Calculating the inverse of Exp (B) i.e, $1/0.336 = 2.976$, it can be said that, a respondent who have 4 dependent members in a family 2.976 times more likely to score on financial literacy, than someone who is only 2 dependent members in a family. The number of dependents 3 has an Exp (B) of 0.423 which means that respondents having 3 dependent members are 0.423 likely to score higher on financial literacy than respondents who has 4 dependent members in the family. Calculating the inverse of Exp (B) i.e, $1/0.423 = 2.364$, it can be said that a respondent who have 4 dependent members

1.847 times more compare to above Rs 8 lakhs. Family type 1 which contrasts those respondents who were residing in the joint family, with in nuclear family has an Exp (B) of 0.690 times which means that a respondent who is residing in the joint family is only 0.690 likely to score higher on financial literacy, than a respondent who is in the nuclear family. Calculating the inverse of Exp (B) here i.e $1/0.690 = 1.449$, it can be said that, a respondent who is residing in the nuclear family is 1.449 times more likely to score higher on financial literacy than someone who is in the joint family, keeping in all other variables constant. The value of Exp (B) for family size 1 is 1.482. The odds of scoring high on financial literacy are 1.482 times for 2-4 members in a family than for more than 7 members in a family and also family 2 (i.e 5-7 members) financial literacy are 1.662 times high compared to more than 7 members in a family. The value of Exp (B) for occupation 1 is 1.336. The odds of scoring high on financial literacy are 1.336 times for respondents working in private sector more than for the respondents working in public sector. The variables, Number of dependents 1, 2 and 3 contrast with a number of dependents as 4 members of a family. A number of dependent 1 has an Exp (B) of 0.330 which means that a respondent having 1 dependent member is only 0.330 likely to score higher on financial literacy than a respondent who has 4 dependent members in the family. Calculating the inverse of Exp (B) here, i.e $1/0.330 = 3.03$, it can be said that a respondent who have 4 dependent members in a family 3.03 times more likely score on financial literacy than

number of dependents 2 has an Exp (B) of 0.336 which means that respondent having 2 dependent members is 0.336 likely to score higher on financial literacy than a respondent who has 4 dependents in the family. Calculating the inverse of Exp (B) i.e, $1/0.336 = 2.976$, it can be said that, a respondent who have 4 dependent members in a family 2.976 times more likely to score on financial literacy, than someone who is only 2 dependent members in a family. The number of dependents 3 has an Exp (B) of 0.423 which means that respondents having 3 dependent members are 0.423 likely to score higher on financial literacy than respondents who has 4 dependent members in the family. Calculating the inverse of Exp (B) i.e, $1/0.423 = 2.364$, it can be said that a respondent who have 4 dependent members



in the family were 2.364 times more likely to score on financial literacy, than someone who is only 3 dependent members in a family. This model was also able to predict, the probability estimate of a respondent being financial literate, with the given values of different predictor variables. Also, the financial literacy group (high or low) in which the respondent will fall can be predicted. The following table indicates the case summaries of the probability estimate for respondents and their group in which they fall.

Table 2: Case Summaries of Logistic Regression Model

	Financial Literacy Level	Gender	Age	Marital Status	Educational Qualification	Income	Earning Members	Family Type	Family Size	Occupation	Number of dependent Members	Predicted Probability	Predicted Group
1	Low	Male	46-55	Marr ied	UG	<2.5 lakhs	3	Nucl ear	5-7 Mem bers	IT/IT es	4	0.872	High
2	Low	Male	>55 years	Wido w	PG	<2.5 lakhs	1	Nucl ear	>7 Mem bers	Bank ing	4	0.879	High
3	Low	Male	46-55	Marr ied	PG	2.5-4.9 lakhs	2	Nucl ear	5-7 Mem bers	IT/IT es	4	0.910	High
4	Low	Male	46-55	Marr ied	PG	<2.5 lakhs	2	Joint	5-7 Mem bers	Bank ing	4	0.874	high

*Cases with studentized residuals greater than 2.000 are listed.

value remains the same because the analysis did not use stepwise logistic regression. In other words the blocking has not been used. The values indicates poor fit of the model as compared to the model containing only the constant. This indicates that, predictors have a significant effect and therefore are able to create a model different from the given one.

V. MODEL VALIDATION

Omnibus Tests of Model Coefficients (Table 3) gives the chi-square statistics and its significance. In this model, chi-square has 22 degrees of freedom, a value of 76.617 and a probability of $p < 0.000$ for the Step, Model and Block. The

Table 3: Omnibus Tests of Model Coefficients

Step 1		Chi-square	df	Sig.
	Step	76.617	22	.000
	Block	76.617	22	.000
	Model	76.617	22	.000

The overall fit of the model indicated by -2Log Likelihood statistic of 1321.392 (Table 4) is not highly significant because the smaller the statistic, the better is the model.

Table 4: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1321.392 ^a	.067	.094

a. Estimation terminated at iteration number 5, caused by parameter estimates that changed by less than .001.

Cox and Snell's R^2 and Nagalckerke's R^2 are Pseudo R^2 measures the logistic regression based on likelihood. Cox and Snell's R^2 model indicates that only 6.7% of the variation, in the dependent variable, is explained by the logistic model. Nagalckerke's R^2 reports the R^2 estimates and for this model the value is 0.094, indicates that, only 9.4% variability in the dependent variables has been explained by predictor variables of the logistic model.

Table 5: Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	8.037	8	.430

Hosmer and Lemeshow test (Table 5) measures the models overall fit. If the value of H-L goodness of fit test statistic is greater than 0.05, then it indicates a well-fitting model. If this value of H-L statistic is 8.037 and has a significance of 0.430 which is greater than 0.05, then the stated null hypothesis that there is no difference between the observed and model predicted values does not get rejected, thereby implying that, the model's estimates do fit the data at an acceptable level. Thus it can be said that, this model is quite a good fit. According to the classification table (Table 6) 67.5% of the cases were correctly classified.

This is an improvement over 66.8% correct classifications with the constant model (Table 7), so it can be said that the model with predictors is significantly a better model.

Table 6: Step Zero Classification Table

	Observed		Predicted		
			Financial Literacy Level		Percentage Correct
			Low	High	
Step 0	Financial Literacy Level	Low	0	365	.0
		High	0	735	100.0
	Overall Percentage				66.8
a. Constant is included in the model					
b. The cut value is .500					

Table 7: Step 1 Classification Table

	Observed		Predicted		
			Financial Literacy Level		Percentage Correct
			Low	High	
Step 1	Financial Literacy Level	Low	50	315	13.7
		High	42	693	94.3
	Overall Percentage				67.5
a. The cut value is .500					

VI. RESULT OF THE REGRESSION:

The logistic regression model used in this study to predict the level of financial literacy based on socio-demographic factors. It offers support for the theory that, gender, income, family type, family size, occupation and number of dependents influences Financial Literacy Levels. It, however does not support that age, marital status, educational qualification, earning members in a family are predictors of financial literacy. The results of the logistic regression model indicate that wherever the respondents is a male there is a greater likelihood of high-level of financial literacy. Similar observations hold good for annual income of either < Rs.2.5 lakhs or Rs. 2.5 – 4.9 lakhs, residing in a nuclear family, with a family size of either 2-4 or 5-7 members, an employee of a private sector and having 4 dependent members in a family.

VII. CONCLUSION

The acceleration of financial markets has necessitated the importance of customers’ financial literacy. With financial products assuming different features and risks, well-being of an individual can be ensured only when there is an awareness of financial markets and instruments. To avoid gullible public to lose money the authorities like the banking watchdog Reserve bank of India (RBI), Securities Market Overseer - Securities exchange board of India(SEBI), the Insurance Regulatory Development Authority(IRDA), the Pension Fund Regulatory and Development Authority (PFRDA) have to take necessary steps to impart financial literacy to various segments of the population. The objective of this study sought to explore the level of financial literacy among employees in Banking and IT/ITes sectors. While the consequences of not being financially literate have individual, social and economic consequences, this study suggests measures to improve financial literacy that would in turn enhance financial decisions. Today, the Indian consumer faces a wide variety of investment products. To lead a good lifestyle proper financial management and investment decisions are required. To make sound financial decisions besides knowledge it is imperative to understand the

behaviour that guides decision making. By improving financial attitude, behaviour and knowledge financial soundness of an economy can be ensured. To improve personal financial management among individuals the education institutions in association with the government and regulatory bodies may include the following as part of their curriculum and syllabus to enhance personal management skills which may ultimately improve the money management ability of the individual, savings attitude, financial planning attitude, risk taking attitude, investment and debt management skills and their personal inclination towards finance. The following are some of the areas which can be included in teaching learning process.

- Financial and economic market
- Basics of Finance and investment management
- Awareness of investment products
- Individual financial behaviour assessment
- Investment planning and assessment

REFERENCES

1. J.H, B. (n.d.). Economic Growth and Sustainability Rooted in Financial Literacy in practicing Sustainability . *Springer* , 95-99.
2. Mian.T.S. (2014). Examining the level of financial literacy among saudi investors and its impact on financial decisions. *International Journal of Accounting and Financial Reporting* , 4(2), 312.
3. OECD/INFE, R. o. (2013). Financial Literacy survey across countries .
4. Padula.M, J. a. (2013). Investment in financial literacy and saving decisions. *journal of Banking and Finance* , 37(8), 2779-2792.
5. Panos.G.A, K. a. (2011). Financial literacy and retirement planning: the russian case. *Journal of Pension Economics and Finance* , 10(4), 599-618.
6. Santhi.P. (2014). Assessment of Financial Literacy for financial inclusion among low income households.
7. Van Rooji.M, L. a. (n.d.). Financial Literacy and stock market participation . 13565.
8. Zia.B, C. a. (2015). Money or Knowledge? What drives the demand for financial services in developing countries. *Harvard Business School Working paper* 5 (9), 117.



AUTHORS PROFILE



Dr. P. Shanmugha Priya is currently an Assistant Professor in Happy Valley Business School, Coimbatore. She has completed her doctoral programme in Anna University, Chennai. The research area of the author is behavior finance. The author has published several papers on savings behavior, financial literacy and investment decisions.



Dr. R. Vishal Kumar is presently an Associate Professor and Head of the Department, Finance at Happy Valley Business School. His area of interest includes Strategic Finance, Behaviour Accounting and Business models. He has presented papers in National and International Conference and authored cases in the area of finance and Management.