

Examining the Impact of Technology Readiness on the Internet Based Investment Services

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Abstract: Internet has changed the way information gets delivered to investors. It has a tremendous impact on the way in which the investors can act on the information for the process of making their investments. The paper focuses on the empirical investigation of the casual relationship between technology readiness and internet based investment services among the investors. The two major variables considered for the study are the technology readiness and internet based investment services. The technology readiness scale developed by Charles Colby and Parasuraman (2014) was adopted in the present study. The technology readiness of the investors is operationalized by four dimensions namely optimism, innovativeness, discomfort and insecurity. The internet based investment services scale contains 11 subscales namely, cost and convenience, product integration, Self Directed Decision Making, Investing skill, customization, innovative features, error free execution, scope for fraud, reduced litigation, instant alerts and documentation. The psychometric properties of the scale were tested and found to be valid in Indian context. Specific hypotheses were formulated for the study. The study was conducted among investors listed in the Coimbatore Capital Limited. The major finding of the study was that the investors adopt the internet enabled investment services due to their discomfort and insecurity in adopting themselves to technology than optimism and innovation. The findings of the study were analysed and the discussions are made.

Keywords: Technology Readiness, Internet Based Investment Services, Structural Equation Modelling, Investors, Model Fitness

I. Introduction

Usage of Internet have immensely integrated into the every aspect of business during the past two decades. Using Internet and technology has grown in a big way in business as we continue to see the impact of technology in the success and failure of every business. The e-commerce firms are now transforming the way the traditional investment related services are delivered and offering a vast variety of new services. The paper throws light on some of the major services like error free execution, reduced litigation, instant alerts and documentation. Further, the vast amount of investment related data and information availed in the internet will enable the investors to confirm their prior beliefs in the market. Therefore, the investors will become overconfident in their ability to pick stocks and in deciding their investment strategies. Moreover, investors in recent years have put themselves at greater risk by concentrating in trading rather than investing for a long term basis. Therefore, the critical and largely unexplored area is how the technological adoption/ development associated with Internet are likely to affect investors and financial markets.

II. Research Design and Methodology

1. Objective of the study:

To explore the relationship between Technology Readiness (TR) and the Internet Based Investment Services (IBIS).

2. Research Question

Whether TR impacts IBIS?

3. Hypotheses

H₀1: There is no significant relationship between TR and IBIS.

Further, there were two main factors in technology readiness scale as motivators and inhibitors to the investors towards their Technology Readiness (TR). Therefore, the hypothesis was further simplified as follow:

H₀1.a. There is no significant relationship between motivating factors of TR on IBIS.

H₀1.b. There is no significant relationship between inhibiting factors of TR on IBIS.

4. Measures

4.1. Technology Readiness Scale (TRS)

It is a type of measurement used to assess the maturity level of a particular technology. Parasuraman, A. and Charles L. Colby (2014), TR scale was adopted. The construct is operationalized by four subscales namely, optimism (4 items), innovation (4 items), discomfort (4 items) and insecurity (4 items). The scale consists of 16 Likert type items measured on a four point scale. The first two dimensions namely optimism and innovation acts as contributors increasing an individual's TR which are to be responded on a four point Likert type scale items starting from '1- Strongly Disagree', '2- Disagree', '3- Agree' and '4- Strongly Agree'. The last two dimension discomfort and insecurity act as inhibiting factors of TR. Reliability is the consistency of measurement (Bollen, 1989). To establish reliability among Indian context and to make it fit for the present study, the reliability of the scale was calculated using the Split-Half method. It examines the inter-item correlations within the instrument (Nunnally & Bernstein 1994; Haladyna 1999; DeVon et al. 2007). The reliability scores were, Optimism: 0.945; Innovation: 0.749; Discomfort: 0.981; Insecurity: 0.973. Validation of the scale was performed through Confirmatory Factor Analysis using AMOS Software Version 21. The results showed that the scale is reliable and valid in Indian context. The maximum possible score is 64 and the minimum possible score is 16. Cumulative scores of the responses of all items yield scores on the technology readiness. Higher scores represent that the investors are more ready towards technology and the lower scores indicate that people are less influenced through technology.

4.2. Internet Based Investment Scale (IBIS)

The internet based investment is operationalized by 11 dimensions namely, cost and convenience (7 items), product integration (7 items), self-directed decision making (7 items), investing skill (5 items), customization (5 items), innovative features (5 items), error free execution (5 items), scope for fraud (8 items), reduced litigation (6 items), instant alerts (5 items), documentation (5 items). The instrument contains 65 Likert type items measured on four point scale. The items were spread equally across eleven dimensions to be responded on a four point Likert type scale items starting from '1- Strongly Disagree', '2- Disagree', '3- Agree' and '4- Strongly Agree'. The reliability of the scale was assessed using Split-Half method. The reliability scores of the subscales were, Cost and convenience (0.957); Product Integration (0.976); Self-directed decision making (0.967); Investing Skill (0.982); Customization (0.983); Innovative Features (0.981); Error Free Execution (0.982); Scope for fraud (0.979); Reduced Litigation (0.979); Instant Alerts (0.968) and Documentation (0.935). Confirmatory factor analysis was conducted using AMOS version 20 software to test the validity of the instrument. Thus, the results showed that the scale is reliable in Indian context. The maximum possible score is 260 and the minimum possible score is 65. Cumulative scores of the responses of all items yield scores on IBIS. Higher scores represent that people are more prone towards Internet Based Investment and the lower scores indicate that people are less prone towards Internet Based Investment.

5. Sampling Technique

Purposive sampling technique was adopted to collect responses from the internet based investors. The leading stock trading firm, Coimbatore Capital limited was selected. They were major players of stock trading in TamilNadu. There are 100 branches all over South India. They are the early adopters offering internet based trading and investment services. Adequate care was taken to collect sufficient data for the present study. People using internet enabled investment services were chosen as the major respondents. The purpose of the research and the requirements of the investigator were explained to the participants. Considering the rule of thumb for problem solving research, a minimum sample size of 200 and it usually varies from 300 to 500 samples (Malhotra and Dash, 2009). Another rule of thumb by Mitchell 1994, suggests that the minimum number of observations should be 4 to 5 times higher than the total number of statements measuring the constructs in the study. Thus, the minimum sample size was estimated to be $81 * 4 = 324$ respondents. Therefore, with all the above presumptions, 370 questionnaires were distributed among internet based investors. On repeated reminders from the researcher, 334 questionnaires were returned back reporting 87% response rate. On perusal it was found that few response sheets were incomplete and few were not marked properly in spite of repeated reminders. Hence, those respondents were removed from the sampling unit. Totally, the final sample consisted of 320 responses.

6. Data Editing

Prior to the data analysis, the collected data were inspected for data entry errors. It deals with two steps namely, dealing with missing data and removal of outliers. Seventeen missing values were found and substituted for the mean values of the variables calculated from the valid responses. Outliers are scores very different from the rest of the scores (Field, 2005). These extreme scores may occur on a single variable (univariate) or more than two variables (multivariate) (Kline, 2005). Univariate outliers detect the cases that fall outside the

minimum and maximum ranges. A standard score value which is exceeding 2.5 is detected as univariate outliers for sample size less than 80 and 4 in case of larger samples (Hair et al., 2010). According to Tabachnick and Fidell (2006), cases with standardized values exceeding ± 3.29 are considered as outliers. Thirteen univariate outliers are removed from the collected data and 307 responses were taken for further analysis. There were no multivariate outliers in the data.

III. Results

Structural Equation modelling was adopted in order to study the causal relationship between technology readiness and internet based investment services. Each hypothesis formulated was tested by using AMOS version 21. SEM is an advanced multivariate technique used to estimate a series of inter-related dependence relationships simultaneously.

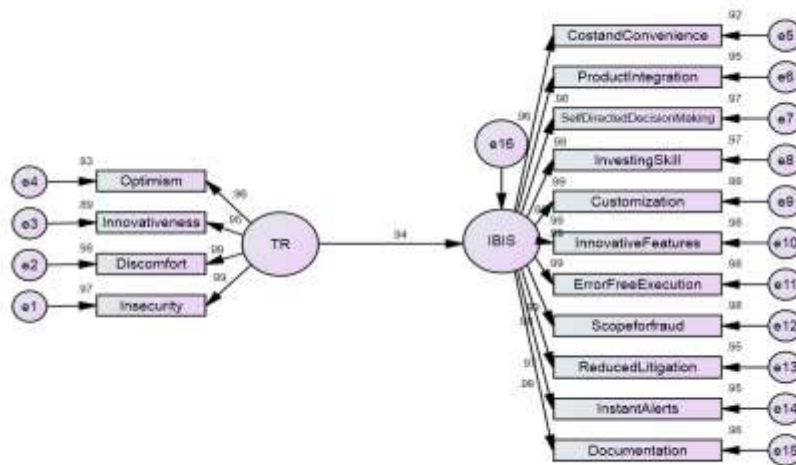


Figure 1: Structural Equation Modelling of TR and IBIS

The following table shows the correlation values among the study variables.

Table 1: Showing correlation values between the study variables

Dependent Variable	<---	Independent Variable	Estimates (r)
Internet Based Investment Services	<---	Technology Readiness	0.94*

P ≤ 0.05, *Significant, #Not Significant

This shows the high positive relationship between technology readiness and internet based investment services.

Table 2: Showing Unstandardized Regression Weights of study variables

Independent Variables		Dependent Variables	Estimate	S.E.	C.R.
IBIS	<---	TR	.994	.029	34.655***
Discomfort	<---	TR	.966	.012	79.983***
Innovativeness	<---	TR	.669	.015	45.455***
Optimism	<---	TR	.739	.014	53.640***
Product Integration	<---	IBIS	1.065	.022	47.863***
Self-Directed Decision Making	<---	IBIS	1.083	.021	51.249***
Investing Skill	<---	IBIS	.759	.015	52.153***
Customization	<---	IBIS	.741	.013	55.404***
Innovative Features	<---	IBIS	.736	.013	55.492***
Error Free Execution	<---	IBIS	.770	.014	55.449***
Scope for fraud	<---	IBIS	1.178	.022	53.427***
Reduced Litigation	<---	IBIS	.885	.018	48.573***
Instant Alerts	<---	IBIS	.779	.016	47.447***
Documentation	<---	IBIS	.724	.015	49.471***

The table shows the covariance value/ unstandardized regression weights (ie.,) beta coefficients, standard error (SE) and the critical ratio (CR) corresponding to the first relationship between TR and IBIS is 0.994, 0.029 and 34.655 respectively. The unstandardized regression weight shows that if technology readiness regression weight goes up by 1, the usage of internet based investment services increases by 0.994 units. This

serves as a proof to accept and support the hypothesis that TR and IBIS are significantly related. The table similarly explains all the other relationships in the model. The same SEM modelling was analysed with two other hypotheses. The technology readiness scale has two factors namely, motivating and inhibiting factors among investors. The structural equation modelling worked out to explore the two other hypotheses is mentioned below:

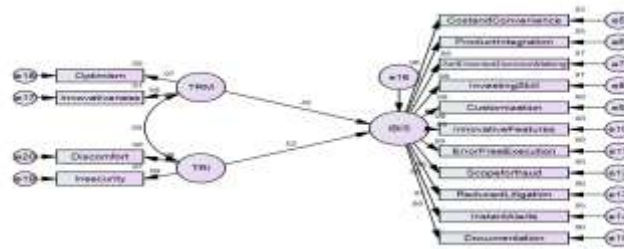


Figure 2: Structural Equation Modelling of TR (TRM and TRI) and IBIS

Table 3: Showing correlation values between the study variables

Dependent Variable	<---	Independent Variable	Estimates (r)
Internet Based Investment Services	<---	Technology Readiness Motivators	0.42*
Internet Based Investment Services	<---	Technology Readiness Inhibitors	0.52*

P ≤ 0.05, *Significant, #Not Significant

The above table shows that both motivating factors and inhibiting factors of technology are have a positive relationship with the internet based investment services. The model fitness of the SEM is given below.

Table 4: Results of Model fitness

Model	Normed Chi-square (χ^2/df)	GFI	AGFI	CFI	NFI	TLI	RMSEA
Investors	3.703	0.949	0.922	0.806	0.856	0.862	0.033
Recommended value	Less than 5	0.8-0.9	0.8-0.9	0.8-0.9	0.8-0.9	0.8-0.9	Less than 0.080

The model is fit. The collected data perfectly fits the proposed hypotheses.

IV. Discussion

The major finding from the structural equation modelling shows that the investors are having a positive approach towards technology adoption. The significant finding is that more that the motivating factor (optimism and innovation), the correlation value is higher for the inhibiting factor (discomfort and insecurity). This shows that the traders have some level of discomfort and insecurity and therefore they are opting for internet based investment services. Technology adoption may be a major threat for people who are above 40 years, due to the insufficient knowledge in technology. Moreover, as age increases, there are higher chances of increase in the volume of investment due to the increase in their income level. However, the work schedules and other priorities motivates investors to adopt internet based investment services.

V. Conclusion

Thus, the study explored the causal relationship between the technology adoption and internet based investment services. The structural equation modelling, an advanced multivariate technique using AMOS version 21 was adopted to study the relationship among study variables. The findings of the study shows that there exists a positive relationship between TR and IBIS. More importantly, the SEM model shows that discomfort and insecurity were the major reason to adopt technology. Therefore, the investors seems to prefer IBIS. Hence, the future studies shows explore the impact of variables like age, knowledge level in technology, education as major variables and test its relationship with subscales of technology readiness.

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