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## Designing a model for the acceptance of electronic stock exchange by individual investors

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### Abstract

Acculturation in the field of familiarity of stockholders and individuals with modern methods of electronic stock exchange has a special position. Applying and paying attention to these methods is an inevitable and considerable issue. So, developing electronic stock exchange culture is considered one of the research priorities in our country. One of the fields for this subject is innovation and technology acceptance model [1]. In this study we have tried to identify necessary strategies for developing the culture of electronic stock exchange in order to access productivity in capital market as well as productivity of service section and at last increasing productivity in the whole economy. In this study, attempts are made to recognize effective factors in enhancing intension to use electronic stock exchange application by real investors through combining models of innovation diffusion and technology acceptance and merging it with dimensions of online trading. Period of data collection for this research has been from July to September 2009. Structural equations modeling has been used by means of LISREL software in order to test this model. Results reveal that there is a relationship between normal tendencies, perceived ease of use, perceived risk and market effectiveness with intension to use electronic stock exchange.

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*Key words:* capital market, electronic stock exchange, technology acceptance model.

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### 1. Introduction

The term “productivity” has been applied in many parts of the world especially in industrialized countries as one of the main dimensions of economic development. With due attention to the role of productivity in economy, it is necessary to manage resources so that it can lead to productivity enhancement in different economic sectors [2]. One of the problems for development in Iran is the subject of productivity, too. National productivity in Iran is very low because of lack of effective demand and main incentives of productivity and for many other reasons that should be enhanced. Empowering and capacity building in the society by relying upon modern sciences and technologies and also general development and growth in the new national and international space is one of the most important purposes of the future vision of the Islamic Republic of Iran in the horizon of the next two decades [3]. This is while

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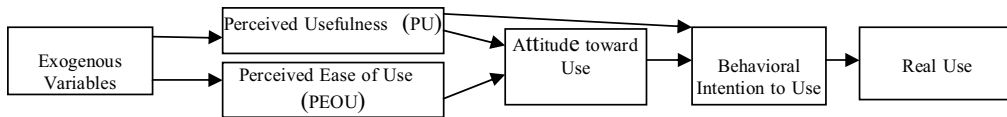
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Iran has the nineteenth rank among twenty Asian countries in terms of productivity rate [4]. Therefore necessity performing of applied researches for increasing the productivity level in various parts of manufacturing, service and agriculture is obvious for all. One of the economic fields for developing and improving in service section is financial services activities. Thus, productivity of capital market (as one of the critical institutions with financial services) has a main role in enhancing service productivity. The clear-sighted believe that information technology (IT) has a positive effect on enhancing efficiency, and increasing and growing productivity [5]. One of the phenomena of information and communications technology index which is considered as the axis of economic development in various countries at present is electronic commerce (i.e. executing buying and selling processes electronically). Easy access to agents and brokerages of stock exchange will be provided by developing electronic stock exchange applications [6]. So, it is essential for the stock exchange processes to go out of their traditional form become more productive. One of the applications of electronic commerce is electronic stock exchange which is very important with due attention to the increasing performance of capital market in the country (with more than 104,202 billion Rials of capital value and more than 422 member companies) [7]. Primarily acculturation is the most essential and fundamental substructure in developing information and communications technology and electronic commerce. It is impossible to gain unpredicted purposes in order to access general development until culture of applying and using information technology isn't institutionalized in the society. This is not possible without extending e-business culture and making sure of investors in relation with security of information and their properties.

## 2. Literature Review

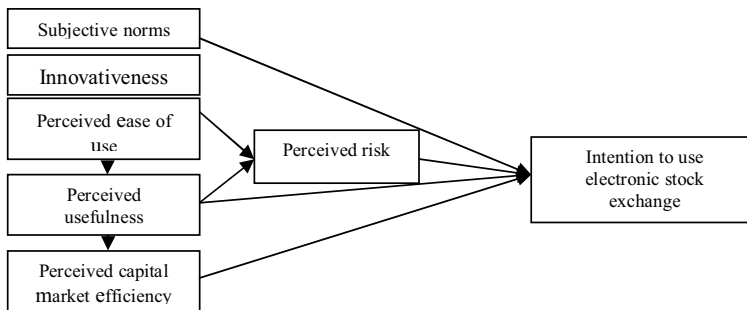
Electronic commerce (Using Internet and other information technologies to run commercial processes) in the present form was constituted based on "electronic data interchange" (EDI) in the 1960's. Emergence of internet provides possibility of performing new commercial activities through computer networks. This phenomenon leads to new forms of electronic business like electronic services [5]. Stock exchange market is considered an organized institution among the main institutions in the capital market and undertakes many duties along other institutions. History of foundation of the first stock exchange dates back to the end of the fourteenth century and the beginning of the fifteenth century in the Netherlands. But stock exchange in codified form has started its activity since two centuries ago and now most exchanges are done electronically by developing of information technology and applying of electronic tools [6]. Accordingly, the number of these listed companies in Tehran Stock Exchange (TSE) has increased from 422 companies at the end of year the 2005 to 435 companies at the end of the year 2007 [8]. In the process of developing electronic commerce, the field for electronic stock exchange has been grown too. Many researches have been performed in relation with this subject both inside and outside of the country. Ha and Stoll [9] concluded that customers are not only the web users with informational and security needs but also they are purchasers with experimental and service needs. Hang et al [10] have classified factors that affect agents' decision on intension to use electronic stock exchange into six groups: characteristics of innovation, organizational factors, environmental factors, suppliers, technology of network, policy of the government and legal regulations. Venkatesh and Brown [11] have divided the process of acceptance into four prominent theories: theory of behavioral intention, theory of planned behavior, innovation diffusion theory and theory of technology acceptance. Lucas [12] argues that companies which had more tendency towards information technology and had started investment in it enjoyed a better situation in the crisis of stock market downfall after 1973. Bauman and Bluner (1998) have emphasized the importance of electronic exchange in stock market in their research and merging of stocks has been considered too. Therefore, stock exchange processes should proceed towards enjoyment from electronic methods and substitute traditional methods of trading in the long run. Struab and Keel [13] have tested a conceptual model of information technology acceptance in three countries including the United States of America, Switzerland and Japan comparatively and have concluded that the model has been confirmed in America and Switzerland; while it has not been confirmed in Japan. Naturally these researchers have related this difference to cultural differences of such countries. Davis [14] has explained the effect of perceived ease of use and perceived usefulness on attitude toward use, and behavioral intention to use of information technology (Figure 1).

Figure 1- Primary model of Davis or technology acceptance model (TAM)



According to the report released by the institution of scientific information (ISI), 424 articles have been referred to Davis's article until January 2000. Some of these studies have been mentioned as below: Moslemi [15], Ansari [16], Barouti [5], Zidon [6], Movahedi [17], and Seyed Javadin and Yazdani [18]. We used these the above theories, studies and other literature evidences such as Davis TAM2 model, Wang et al [19], Pikkarainen et al [20], Vijayarati [21], Sanzblas et al [22], and Ha and Stoll [9] to design our conceptual model shown in figure 2.

Figure 2- Recommended model for the acceptance of electronic stock exchange



### 3. Methodology

This research is descriptive-metrical. We have used historical study in order to gather research literature. Ascertained questionnaire has been used in order to gather field study data. Statistical population of the research consists of all individual investors who are investing in TSE and live in Isfahan province. The special characteristic of this population is that they should have done stock trading a month before filling the questionnaire. Sampling in this research is available in the form of simple random since there is no special classification in the population that affects the results of hypotheses. Three sources are used to access the sample: 1) publishing the questionnaire in brokerages sties 2) agents' consumers' database 3) people in stock exchange hall in Isfahan branch of TSE. One of the most powerful and suitable methods of analysis in researches related to behavioral and social sciences is multi-variable analysis. One of the most basic methods of analysis of complex data structures is analysis of covariance structures or causal modeling or structural equations modeling. LISREL software has been used to test the recommended model. Our research conceptual model has been estimated by the software and the results are presented in next section.

### 4. Results

We have used t statistic in order to show the significance of each parameter of the model. This statistic is obtained from ratio of coefficients between model variables and their standard deviation error which should be higher than 2, so that these estimations would be significant statistically. The amount of the calculated t in all relations of the model is significant except in normal tendencies' relation with the intention to use electronic stock exchange. Thus all of the represented estimations are significant except one case. Results related to confirmation or rejection of these relations are shown in table 1. The major proposed question is whether this model is suitable or not. Circumstantial evidence df and other standards oof the model's goodness should be studied in order to respond to this question. The amount of the calculated df equals to 2.2 with due attention to LISREL output. Existence of low df shows acceptable goodness of the model. Since, the lower the amount of df, the more suitable the represented

model. With due attention to the following results that are obtained from LISREL output:  $df=2.2$ ,  $p\text{-value}=0.12$ , and  $RMSEA=0.19$ . The amount of  $p\text{-value}$  is more than that of standard significance level ( $\alpha=5\%$ ), so the represented model is suitable. Table 1 briefly shows significant and insignificant relations between model variables.

Table 1- evaluating of significance of the model's relations

Independent Variable	Dependent Variable	Path coefficient	t-value	Result (rejection or confirmation of hypothesis)
Normative tendencies	Intention to Use Electronic stock exchange	0.010	0.8	Rejected
Innovativeness	Perceived risk	0.47	12.7	Confirmed
Perceived ease of use	Perceived risk	0.21	11.35	Confirmed
Perceived Risk	Intention to use electronic stock exchange	0.61	10.28	Confirmed
Perceived ease of use	Perceived usefulness	0.38	2.78	Confirmed
Perceived usefulness	Intention to use electronic stock exchange	0.61	4.28	Confirmed
Perceived capital market efficiency	Intention to use electronic stock exchange	0.76	8.9	Confirmed
Perceived usefulness	Perceived capital market efficiency	0.47	10.85	Confirmed

There are several goodness indices for evaluating models of confirmatory factorial analysis. Applied cases in this research are roots of average error of squares' approximation, goodness of fit index and adjusted goodness of fit index. Results of these indices are demonstrated in table 2. If GFI and AGF are closer to 1, the better goodness the model has with data. These two indices are 0.92 and 0.91 respectively in this model which shows proper goodness of the model. Therefore, the model has accepted goodness.

Table 2- Goodness of fit indices of the model

Name of index	standard amount of index	amount of index in the desired model	Conclusion
$\chi^2/df$	About 2	2/2	Fitness is good
P_Value	More than 0/05	0/12	Fitness is good
GFI	More than 0/9	0/92	Fitness is good
AGFI	More than 0/9	0/91	Fitness is good
RMSEA	Less than 0/1	0/019	Fitness is good
CFI	More than 0/9	0/93	Fitness is good
NFI	More than 0/9	0/98	Fitness is good

## 5. Conclusion

Finally, we concluded that if we try to enhance the level of innovativeness, perceived ease of use, perceived usefulness, and perceived capital market efficiency, we can control the perception of investors about risk of electronic stock exchange and enhance their intention to use this application. Success in this approach will lead to better management of the application development and based on the literature to better impact on securities market productivity. This can enhance productivity in service sector and finally in the whole of economy. The basic

difference of our work with the past empirical studies is our attention to perceived risk. Risk is one of the basic criteria of investment decisions according to the whole investment literature. Marquitz, CAPM, Sharpe, and many other theories also emphasize the importance of risk in investment portfolio construction. Based on these theories, each innovation in security market will be accepted by investors if it can decrease investment risk or increase its return. In our model, return is measured by usefulness, and risk is our new variable added to the body of the TAM literature.

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