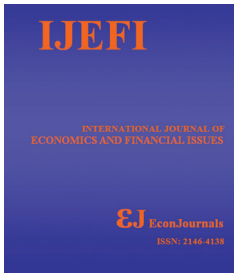


International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2017, 7(3), 371-376.

The Feasibility of Productivity Improvement Using the Approach of Virtual Economy

Samira Ranjbar[1]*, Ali Esmailzadeh Maghari[2]

[1]Islamic Azad University, Islam Shahr Branch, Iran, [2]Islamic Azad University, Islam Shahr Branch, Iran.
*Email: samiraranjbar1363@yahoo.com

ABSTRACT

Given the crucial role of e-commerce to create knowledge-based economy, it can be called the most important context to enter the virtual economy. Increasing growth of e-commerce in developed countries and its competitive advantages as well as its important role in employment and production growth in the countries indicate that those countries have revised their current trade policies. The primary goal of this study is to investigate the relationship between productivity improvement and virtual economy. For hypotheses test, Pearson correlation coefficient and SPSS software were used. Summary and conclusion of research hypotheses suggest that there is a significant relationship between improving productivity and virtual economy, so all research hypothesis are confirmed.

Keywords: Productivity Improvement, Virtual Economy, E-commerce, Pearson Correlation Coefficient
JEL Classifications: L81, O4

1. INTRODUCTION

Given the crucial role of e-commerce to create knowledge-based economy, it can be called the most important context to enter the virtual economy. Increasing growth of e-commerce in developed countries and its competitive advantages as well as its important role in employment and production growth in the countries indicate that those countries have revised their current trade policies (Goldman, 2010). The development of virtual economy causes more people attracted to the virtual market. Institutions, organizations and private and public agencies all around the world intend to introduce their products and services on the internet (Brousseau and Chaves, 2004). Hence, the first requirement they face is referring to people with adequate knowledge and skills to carry out such activities. It is clear that no institution can be found free from virtual economy experts in the future (Sanayei, 2007). Virtual economy, as the intersection of information technology and business market, has provided a sustainable market for activity and employment of many people. Productivity is efficient and effective use of resources (labor - capital - land - material - energy - time and information, etc.) to produce goods and services that satisfy the needs and demands of users (Choi, 2001).

Productivity, as the performance measure, means to use production inputs perfectly and minimize losses. Productivity has very effective factors by which the countries can achieve high positions in this field (Freund and Weinhold, 2000). On the other hand, prices of goods supplied on the Internet are lower than conventional stores. E-commerce is most likely to reduce the prices of goods and services that can be provided by digitalization or making the supply chain on-line (Freund and Weinhold, 2002). Also, the prices can be reduced in businesses with the possibility of increasing efficiency through reduced costs of production, reduced warehousing costs, and better supply chain management (Freund and Weinhold, 2004). Given that there has been no research on the relationship between virtual economy and its impact on the virtual economy indicators, the present study aims to examine it (Sakaran, 2007).

The present study is an applied research; because it seeks to achieve a scientific objective and focuses on solving a problem. It also includes a set of methods that aim to describe the situation or phenomenon under study. In terms of methodology, it can be considered a descriptive survey.

2. RESEARCH METHODOLOGY

The relationship between productivity improvement and virtual economy in the present study is examined using library studies and literature review.

The data of this study were collected from library and field study. Also, library method has been used for the collection and compilation of the literature and reviewing research background. For this reason, the books and articles in libraries and the Internet have been used. In the field study, the questionnaire is also used.

The population of this research consists of all PhD and graduate students of management, economics, and accounting in University of Tehran, Allameh Tabatabaei, and Shahid Beheshti that is over 1,400 students. The sample size was determined 302 students based on Kurgisi and Morgan Table. 330 questionnaires were distributed and 302 of them were collected.

Statistical techniques used in this research are descriptive and inferential. In the field of descriptive statistics, statistical techniques such as frequency distribution table and bar; mean, mode, median, standard deviation and variance are used. Also in the field of inference statistics, Kolmogorov-Smirnov (KS) and Pearson methods are used. SPSS software was also used to perform calculations. For hypotheses test, Pearson correlation parametric test has been used.

3. RESULTS

In this section of data analysis, the data normality is first evaluated using inferential statistical techniques and then research hypotheses will be examined.

3.1. KS Test Results

To determine the appropriate statistical methods for data analysis and hypotheses test, the distribution of research variables in the sample must be studied at the first step. For this purpose, KS test has been used. Table 1 summarizes the test results. As the test results show, all variables of the samples follow a normal distribution (the significance level should be more than 0.05 for normal distribution of data). So parametric tests can be used to test the hypotheses. In the present study, Pearson correlation parametric test has been used for the hypothesis.

3.2. Confirmatory Factor Analysis

Before examining relationships between variables, we must ensure the structural validity of each variable. Thus, the research variables measurement models are studied in this section.

3.3. Research Variables Measurement Model

Figures 1 and 2 show the confirmatory factor analysis results of components and the indicators of research variables using LISREL software.

3.3.1. Chi-square index (χ^2)

It shows χ^2 statistic for the model. In fact, this index shows the difference between model and data that is considered as a standard for bad model. The less values of χ^2 show the less difference between variance-covariance matrix of the sample and variance-covariance matrix of the model. It should be noted that the index depends on the number of samples taken. In fact, if the sample size is more than 200, the index tends to rise. The model fitness

Figure 1: Correlation model of the research variables and their indicators in standard mode

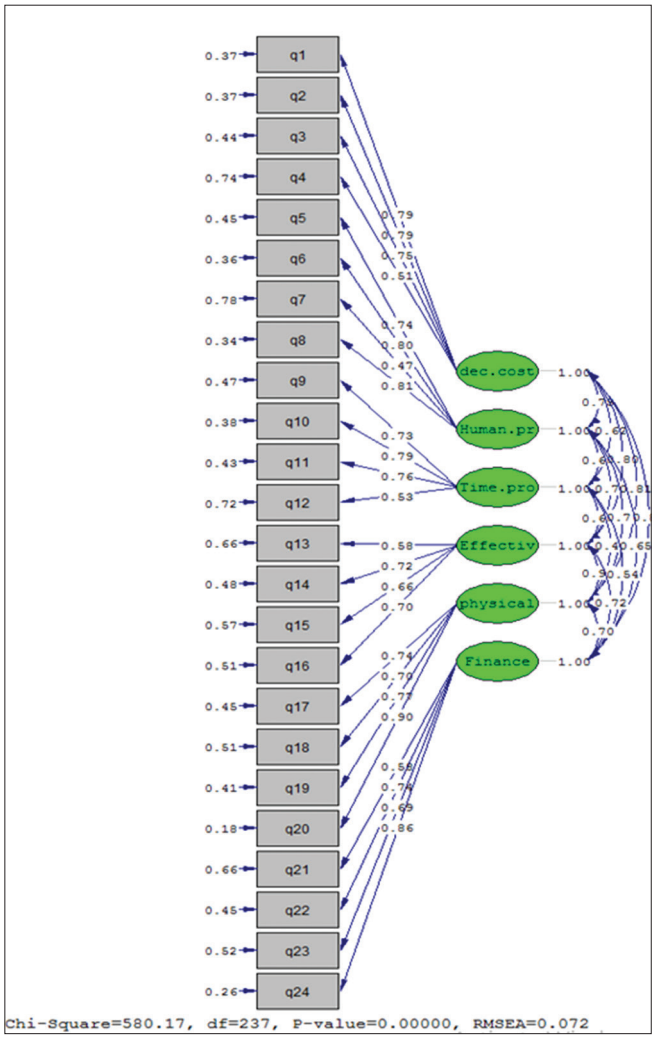
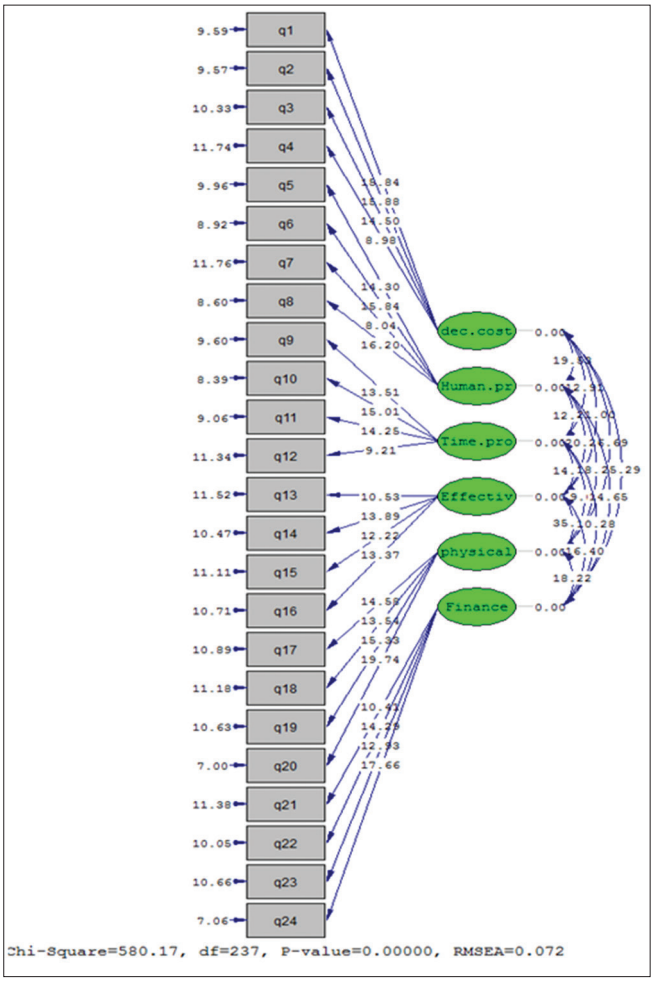


Table 1: Kolmogorov-Smirnov test results

Variable	The most positive difference	The most negative difference	Kolmogorov-Smirnov test statistic	Significance level
Costs reduction	0.298	−0.139	3.359	0.126
Labor productivity	0.311	−0.201	3.500	0.097
Time efficiency	0.282	−0.166	3.183	0.245
Organizational effectiveness	0.335	−0.154	3.771	0.153
Improved physical resources and equipment	0.412	−0.112	3.665	0.096
Improved financial resources (capital)	0.362	−0.165	3.354	0.106

Figure 2: Correlation model of the research variables and their indicators in significance mode



analysis using this index is usually reliable for 100 to 200 samples. It is also preferable to interpret this index taking into account the degree of freedom (df).

3.3.2. df

This index shows the df and should not be <0. The ratio of χ^2/df: One of the best indicators to evaluate the model fitness is the ratio of χ^2/df. However, there is no standard for goodness of the index. But many scholars believe that this index should be <3. Finally, the goodness extreme must be determined by the researcher based on research type.

3.3.3. P value index

This index is another criterion for assessing the goodness of fit. But there is no consensus about the acceptability of the index. Some statistics scholars believe that this rate should be <0.05, while others insist on the more.

3.3.4. Root mean square error of approximation (RMSEA)

This index is built based on the model errors made and considered as a measure for the badness of model, the same as χ^2. Some scholars believe that this index should be <0.05, while others consider <0.08.

3.3.5. Goodness of fit index (GFI)

This index is a measure for goodness of fit. Values higher than 0.9 indicate the suitability of extracted model according to the data.

3.3.6. Adjusted goodness of fit index

This index is adapted mode of GFI taking into account the df. It also another criterion for being a good model. If the index is higher than 0.9. The model is good according to the data.

3.3.7. Normed fit index

It also another criterion for being a good model according to the data. If the index is higher than 9.0, the model is good according to the data.

According to Figure 1, factor loading of all questions is >0.3. Hence, all questions have favorable validity.

Factor loadings of the model in standard estimation mode indicate the effect of each variable and item in order to explain the variance scores of the main variable. In other words, the factor loading shows the correlation of each observer variable (questionnaire) with latent variable (factors). According to Figure 1, the factor loadings of each of the survey questions can be observed. For example, the first question factor loading in the variable cost reduction is 0.79. In other words, this question explains about 79% of the variance of cost reduction. 37% is the error value (the variance that cannot be explained by the first question; it is clear that as the error rate is less, the coefficients of determination are greater and there is more correlation between the question and the corresponding factor). The coefficient of determination is a number between 0 and 1. The closer to 1 increases the amount of variance.

The next output (the model in significance mode) shows the significance of coefficients and parameters obtained from the variables measurement model. It shows that all the coefficients obtained are significant. The significance test values are >1.96 or <−1.96; indicating a significant relationship. Two outputs of LISREL software (top: The model in standard estimation mode; down: The model in significant coefficients mode) are shown.

Figure 2 shows the correlation model between research variables and their indicators in significance mode. All the indicators of research variables have acceptable T values (>1.96) and factor loading. The model fitness indicators indicate that the model is good in terms of fitness; because the ratio of χ^2/df is equal to 2.45 which is less than the maximum allowed 3. And the RMSEA index is equal to 0.072 that is less than the allowed value 0.08. The P < 0.05 that is appropriate for measuring the variables.

3.4. Hypotheses Test

The goal of data collection in any research is data analysis and hypotheses test. In fact, the relationship between productivity improvement and virtual economy can be studied in this section using inference statistical techniques. In the next chapter, some recommendations are provided based on the hypotheses results. In this section, the hypotheses are tested at first and thenthe results are

interpreted. It should be noted that the test used for the hypotheses is Pearson correlation test.

3.4.1. The first sub-hypothesis test

There is a significant positive relationship between cost reduction and virtual economy.

The Pearson correlation test results for the first hypothesis are presented in Table 2.

According to the results of the correlation matrix (4-7), it can be said that there is a relationship between cost reduction and virtual economy at the confidence level of 0.99 and error of 0.01. On the other hand, the correlation coefficient is equal to 0.871 indicating a positive relationship between cost reduction and virtual economy. Also, since the significance level of test is <0.05 (0.000), the relationship between cost reduction and virtual economy is significant. This means that the virtual economy is significantly improved with cost reduction. So the first hypothesis is confirmed with confidence level of 0.99.

3.4.2. The second sub-hypothesis test

There is a significant positive relationship between labor productivity and virtual economy.

The Pearson correlation test results for the second hypothesis are presented in Table 3.

According to the results of the correlation matrix, it can be said that there is a relationship between labor productivity and virtual economy at the confidence level of 0.99 and error of 0.01. On the other hand, the correlation coefficient is equal to 0.779 indicating a positive relationship between labor productivity and virtual economy. Also, since the significance level of test is <0.05 (0.000), the relationship between labor productivity and virtual economy is significant. This means that the virtual economy is significantly improved with labor productivity. So the second hypothesis is confirmed with confidence level of 0.99.

3.4.3. The third sub-hypothesis test

There is a significant positive relationship between time efficiency and virtual economy.

The Pearson correlation test results for the third hypothesis are presented in Table 4.

According to the results of the correlation matrix (4-9), it can be said that there is a relationship between time efficiency and virtual economy at the confidence level of 0.99 and error of 0.01. On the other hand, the correlation coefficient is equal to 0.743 indicating a positive relationship between time efficiency and virtual economy. Also, since the significance level of test is <0.05 (0.000), the relationship between time efficiency and virtual economy is significant. This means that the virtual economy is significantly improved with time efficiency. So the third hypothesis is confirmed with confidence level of 0.99.

Table 2: Correlation test between cost reduction and virtual economy

Variable	Correlation coefficient	Significance level
Cost reduction	0.871**	0.000

**Correlation is significance at 0.01

Table 3: Correlation test between labor productivity and virtual economy

Variable	Correlation coefficient	Significance level
Labor productivity	0.779**	0.000

**Correlation is significance at 0.01

Table 4: Correlation test between labor productivity and virtual economy

Variable	Correlation coefficient	Significance level
Time efficiency	0.743**	0.000

**Correlation is significance at 0.01

3.4.4. The fourth sub-hypothesis test

There is a significant positive relationship between organizational effectiveness and virtual economy.

The Pearson correlation test results for the fourth hypothesis are presented in Table 5.

According to the results of the correlation matrix, it can be said that there is a relationship between organizational effectiveness and virtual economy at the confidence level of 0.99 and error of 0.01. On the other hand, the correlation coefficient is equal to 0.864 indicating a positive relationship between organizational effectiveness and virtual economy. Also, since the significance level of test is <0.05 (0.000), the relationship between organizational effectiveness and virtual economy is significant. This means that the virtual economy is significantly improved with organizational effectiveness. So the fourth hypothesis is confirmed with confidence level of 0.99.

3.4.5. The fifth sub-hypothesis test

There is a significant positive relationship between improved equipment and physical resources and virtual economy.

The Pearson correlation test results for the fifth hypothesis are presented in Table 6.

According to the results of the correlation matrix, it can be said that there is a relationship between improved equipment and physical resources and virtual economy at the confidence level of 0.99 and error of 0.01. On the other hand, the correlation coefficient is equal to 0.829 indicating a positive relationship between improved equipment and physical resources and virtual economy. Also, since the significance level of test is <0.05 (0.000), the relationship between improved equipment and physical resources and virtual economy is significant. This means that the virtual economy is significantly improved with improved equipment and physical resources. So the fifth hypothesis is confirmed with confidence level of 0.99.

3.4.6. The sixth sub-hypothesis test

There is a significant positive relationship between improved financial resources and virtual economy.

The Pearson correlation test results for the sixth hypothesis are presented in Table 7.

According to the results of the correlation matrix, it can be said that there is a relationship between improved financial resources and virtual economy at the confidence level of 0.99 and error of 0.01. On the other hand, the correlation coefficient is equal to 0.811 indicating a positive relationship between improved financial resources and virtual economy. Also, since the significance level of test is <0.05 (0.000), the relationship between improved financial resources and virtual economy is significant. This means that the virtual economy is significantly improved with improved financial resources. So the sixth hypothesis is confirmed with confidence level of 0.99.

3.4.7. The main hypothesis test

There is a significant positive relationship between productivity improvement and virtual economy.

The Pearson correlation test results for the main hypothesis are presented in Table 8.

According to the results of the correlation matrix, it can be said that there is a relationship between productivity improvement and virtual economy at the confidence level of 0.99 and error of 0.01. On the other hand, the correlation coefficient is equal to 0.732 indicating a positive relationship between productivity improvement and virtual economy. Also, since the significance level of test is <0.05 (0.000), the relationship between productivity improvement and virtual economy is significant. This means that the virtual economy is significantly improved with productivity. So the main hypothesis is confirmed with confidence level of 0.99.

4. DISCUSSION AND CONCLUSION

According to the analysis presented in the fourth quarter for each hypothesis, the results of each hypothesis are pointed out separately. Then, the general conclusion about the findings of this study will be made.

4.1. Hypotheses Results

The results of Pearson correlation test for the first hypothesis are presented in the following Table 9.

There is a significant positive relationship between cost reduction and virtual economy.

According to the results, since the significance level of test is <0.05 (0.000), the relationship between cost reduction and virtual economy is significant. This means that the virtual economy is significantly improved with cost reduction. So the first hypothesis is confirmed with confidence level of 0.99.

Table 5: Correlation test between organizational effectiveness and virtual economy

Variable	Correlation coefficient	Significance level
Organizational effectiveness	0.864**	0.000

**Correlation is significance at 0.01

Table 6: Correlation test between improved equipment and physical resources and virtual economy

Variable	Correlation coefficient	Significance level
Improved equipment and physical resources	0.829**	0.000

**Correlation is significance at 0.01

Table 7: Correlation test between improved financial resources and virtual economy

Variable	Correlation coefficient	Significance level
Improved financial resources	0.811**	0.000

**Correlation is significance at 0.01

Table 8: Correlation test between productivity improvement and virtual economy

Variable	Correlation coefficient	Significance level
Productivity improvement	0.732**	0.000

**Correlation is significance at 0.01

Table 9: Pearson correlation test results

Variable	Correlation coefficient	Significance level
Costs reduction	0.871**	0.000
Labor productivity	0.779**	0.000
Time efficiency	0.743**	0.000
Organizational effectiveness	0.864**	0.000
Improved physical resources and equipment	0.829**	0.000
Improved financial resources (capital)	0.811**	0.000

**Correlation is significance at 0.01

There is a significant positive relationship between labor productivity and virtual economy.

According to the results, since the significance level of test is <0.05 (0.000), the relationship between labor productivity and virtual economy is significant. This means that the virtual economy is significantly improved with labor productivity. So the second hypothesis is confirmed with confidence level of 0.99.

There is a significant positive relationship between time efficiency and virtual economy.

According to the results, since the significance level of test is <0.05 (0.000), the relationship between time efficiency and virtual economy is significant. This means that the virtual economy is

significantly improved with time efficiency. So the third hypothesis is confirmed with confidence level of 0.99.

There is a significant positive relationship between organizational effectiveness and virtual economy.

According to the results, since the significance level of test is <0.05 (0.000), the relationship between organizational effectiveness and virtual economy is significant. This means that the virtual economy is significantly improved with organizational effectiveness. So the fourth hypothesis is confirmed with confidence level of 0.99.

There is a significant positive relationship between improved equipment and physical resources and virtual economy.

According to the results, since the significance level of test is <0.05 (0.000), the relationship between improved equipment and physical resources and virtual economy is significant. This means that the virtual economy is significantly improved with improved equipment and physical resources. So the fifth hypothesis is confirmed with confidence level of 0.99.

There is a significant positive relationship between improved financial resources and virtual economy.

According to the results, since the significance level of test is <0.05 (0.000), the relationship between improved financial resources and virtual economy is significant. This means that the virtual economy is significantly improved with improved financial resources. So the sixth hypothesis is confirmed with confidence level of 0.99.

There is a significant positive relationship between productivity improvement and virtual economy.

According to the results, since the significance level of test is <0.05(0.000), the relationship between productivity improvement and virtual economy is significant. This means that the virtual economy is significantly improved with productivity. So the main hypothesis is confirmed with confidence level of 0.99.

REFERENCES

Brousseau, E., Chaves, B. (2004), Diffusion and Impact of E-commerce: The French. Working Paper. Center for Research on Information Technology and Organization (CRITO). Irvin, CA: University of California.

Choi, Y.J. (2001), Essays on the Economics of E-Commerce, Integration and Infrastructure. A Dissertation for the Degree of Doctor of Philosophy. New York, Buffalo: State University of New York At Buffalo.

Freund, C., Weinhold, D. (2000), An Empirical Investigation of the Internet and International Trade: The Case of Bolivia. IT Workshop.

Freund, C., Weinhold, D. (2002), The Internet and International Trade. Working Paper. Federal Reserve Board of Governors International Finance.

Freund, C., Weinhold, D. (2004), The effect of the internet on international trade. Journal of International Economics, 62, 169-171.

Goldman, J. (2010), E-Commerce: Impacts and Policy Challenges OECD-Economics Department Working Papers No. 252.

Sakaran, U. (2007), Research Methods in Management. Translated by Mohammad Saebi and Mahmoud Shirazi. Tehran: Higher Education and Research Institute of Planning and Management.

Sanayei, A. (2007), E-Commerce in the Third Millennium. 4th ed. Isfahan: Jihad University.