

THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGIES ON COMPANY PERFORMANCE: AN APPLICATION ON MANUFACTURING AND CONSTRUCTION SECTORS

BİLGİ VE İLETİŞİM TEKNOLOJİLERİNİN FİRMA PERFORMANSI ÜZERİNDEKİ ETKİSİ: İMALAT VE İNŞAAT SEKTÖRLERİ ÜZERİNE BİR UYGULAMA

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ABSTRACT

This study aims to investigate the impact of Information and Communication Technologies (ICT) on company performance. In this context, the data is obtained from a survey which is conducted to companies that are operating in manufacturing and construction sectors in Bingol province, Turkey. This questionnaire was administered to 190 companies in the October-December 2014. By using the data, it is tried to investigate ICT usage level, the impact of ICT on the productivity of the companies, competitiveness and innovation process. As a result, it is determined that using ICT positively affects the productivity, competitiveness and innovation process of companies

Keywords: ICT; performance of companies; manufacturing and construction sectors

Jel Codes: L1, D83, L25

ÖZ

Bu çalışmada, Bilgi ve İletişim Teknolojilerinin (BİT) firma performansı üzerindeki etkisinin incelenmesi amaçlanmıştır. Bu kapsamda Bingöl il merkezinde imalat ve inşaat sektörlerinde faaliyet gösteren firmalar üzerinde uygulanan bir anketten elde edilen veriler kullanılmıştır. Bu anket, Ekim-Aralık 2014 tarihlerinde 190 firmaya uygulanmıştır. Elde edilen veriler kullanılarak firmaların BİT kullanım düzeyi, BİT'in firmaların verimliliği, rekabet edilebilirliği ve inovasyon süreci üzerindeki etkisi incelenmeye çalışılmıştır. Sonuç olarak, BİT kullanımının firmaların verimliliği, rekabet edilebilirliği ve inovasyon süreci üzerinde olumlu etkileri olduğu tespit edilmiştir.

Anahtar Kelimeler: BİT; firmaların performansı; imalat ve inşaat sektörleri

Jel Kodları: L1, D83, L25

1. INTRODUCTION

The increasing competition emerging with globalization leads both economic and social organizations to have different strategies. Today, the most important strategy used by all business organizations can be expressed as information and communication technologies (ICT). Knowledge-based economy and the use of ICT are among the important factors that increase the efficiency and effectiveness of the companies. Therefore, the use of ICT and knowledge-based economy can be considered as a strategic factor for the business productivity. The improvement of the competition in macro level and the skills in micro level of a country strongly depends on the increased investments of ICT in all sectors (Hagemann, 2008). Therefore, the level of the use of ICT can be considered among the most important determinants of a country's wealth. ICT is a factor used by companies to reach their costumers, stakeholders and suppliers and reduce their costs and save time in order to ensure the competitive advantage

both in macro and micro level. The relationship between companies and suppliers has gained a new dimension by the use of ICT. Large firms began to make direct business with customers through new delivery systems such as the Internet with the effect of the use of ICT (Naudè & Holland, 1996). In this way, they increase the amount of sales and the productivity by reaching more customers. An advanced ICT capacity leads the company to achieve a competitive position by improving the quality management (Jenkins, 2010). In addition, information management mediates ICT competence and firm performance (Tanrıverdi, 2005; Perez-Lo'pez and Alegre, 2012). Companies are able to improve their ability to compete and become successful as long as they increase the use of ICT in their bodies. This success can be achieved by giving importance to both company-wide and country-wide ICT investments. In Turkey, ICT investments have shown rapid increase in general over the last decade (Ministry of Development, 2014). While the total amount of

investments conducted in 2002 was approximately 614 million Turkish Liras, it has exceeded 3 billion 684 million Turkish Liras in 2014, which is 5 times more than the amount of investments made 12 years ago.

In Turkey, the number of studies regarding the impact of the use of ICT on companies is very limited. In this regard, it seems important to investigate this subject at a company level. Therefore, in this study, it has been aimed to investigate the impact of the use of information and communication technologies on the companies operating in the construction and manufacturing sectors.

2. LITERATURE REVIEW

ICT is expressed as a comprehensive concept including the production, processing, access and distribution of information. Information technologies are a common term used for a variety of technologies such as computers, telecommunications and microelectronics in general and also including information transmission and processing (Nyamboga and Kemparaju, 2002). In the literature, the impacts of opportunities offered by ICT on the performance of firms are still discussed. Many studies conducted on the impact of ICT on organization by academicians along with the use of ICT in organizations. In the studies conducted, the impact of ICT on many different sectors such as construction (Duyshart *et al.*, 2003), banking (Mistry, 2006), manufacturing (Beheshti 2004), education (Teo *et al.*, 2012), staff productivity and human resources (Tohidi, 2010), accommodation (Fuchs *et al.*, 2010; Law *et al.*, 2014) and marketing (Loane *et al.*, 2006) has been investigated; because ICT is an important technological process used in all areas.

In the literature, there are conflicting results regarding the impact of ICT use on firm performance (Devaraj and Kohli, 2003; Lee *et al.*, 2008). According to empirical studies conducted over the last decade regarding this subject, the performances of companies improved in an indirect way by improving capabilities in the organizational structures with the use of ICT (Rai *et al.*, 2006; Benitez-Amado *et al.*, 2010). Considering the studies conducted regarding the relationship between the use of ICT and firm performance in the literature, it has been concluded that the use of ICT has increased the company performance in the competitive environments (Martín-Rojas *et al.*, 2011; López and Alegre, 2012). In addition, according to the empirical studies, it has been stated that the use of ICT improves the quality of the performance (Perez-Arostegui *et al.*, 2012), improves the performance of the marketing functions (Noh and Fitzsimmons 1999), increases the efficiency of the purchasing process of suppliers (Baglieri *et al.*, 2007) and improves the performance management (Kagaari *et al.*, 2010). In the study of Johannessen *et*

al. (1999), in which the impact of ICT use on innovation and performance was investigated, it has been concluded that the use of ICT improves innovation and performance. In another study conducted by López and Algre (2012) to investigate the relationship between ICT competence and information processes and company performance, they have stated that ICT competence plays an important role in the information management processes, these management processes are directly related to the company performance which is also related to the financial performance, there is an indirect relationship between company performance and information management and information management processes mediate ICT competence and market performance. In the academic studies conducted, it is stated that the use of ICT has positive impacts on SMEs. In this context, Ongori and Migiro (2010) state that adopting and internalization of ICT by SMEs are important in increasing their competitiveness and the use of ICT also increased their availability to international markets. Beheshti (2004) studied the impact of ICT on SMEs and stated that the use of ICT has positive impacts on SMEs operating in manufacturing and service sectors.

ICT investments made by companies have positive impacts on their performances. According to the study conducted by Chondrakis and Farchi (2014), it has been found that the number of successful patent applications increases significantly in companies that have technological investment initiatives. In the study of Bilgihan *et al.* (2011), in which the impact of ICT on competitive advantages of hotels was investigated, it has been determined that ICT investments lead to lower costs in general, agility, innovation, added value and better customer service for the customers. Similarly, Ayeh (2006) has found that the use of Internet is the main driver for organizational features in the hospitality sector. However, in another study investigated whether the use of ICT has any impact on the productivity of hotel industry, it has been found that despite increasing investments in ICT, it is difficult to express the impact of ICT on productivity (Sigala, 2003).

According to studies investigating the impact of the use of ICT on the company performance in the construction sector, it has been stated that ICT has positive impacts. In addition, it has been also stated that the use of ICT has positive impact on operational efficiency and effectiveness (Betts *et al.*, 1991; Betts and Ofori, 1999). Duyshart *et al.* (2003) have conducted a study in order to investigate the effect of ICT on a construction project and stated that the use of ICT has positive impacts both on efficiency and effectiveness of the construction project. As a result of another study conducted by Peansupap and Walker (2006), in which the limitations of ICT use in construction sector was investigated, they have stated that a limited budget for ICT investments, dependency

on the participants of other projects, ICT standardization problems and security issues are the personal limitations; whereas the basic level of computer experience, time available to learn ICT tools and determination of the benefit of ICT use are the organizational limitations and time available, information sharing and personal communication quality are the limitations at the level of groups, respectively. Cragg *et al.* (2002) have indicated that the use of ICT has positive impacts on the performance of the companies operating in the manufacturing sector.

Lia *et al.* (2006) have investigated the ICT use of companies in China and determined that the use of ICT significantly affected the competitive advantage of the companies operating in the logistics sector. Razali *et al.* (2014) have determined a little impact of the use of ICT on companies operating in the retail sector in Malaysia and they have stated that these companies continue their activities with traditional methods. World Bank (2007) has conducted a study in order to demonstrate the relationship between the use of ICT and innovation and economic growth in Russia, Poland and other Baltic countries. As a result of the study, it has been determined that the use of ICT improves the economic performance and facilitates the modernization of the companies in addition to having positive impacts on facilitating advanced production, organizational change and improved marketing.

3. METHODOLOGY

3.1. Research Goal

This study was conducted to determine the impact of ICT use on the company performance. For this purpose, a field research was conducted using the survey method.

3.2. Sample and Data Collection

In the study, the data was collected by a questionnaire administrated on a total of 190 small and medium sized companies operating in the manufacturing and construction sectors in the city center of Bingöl. The survey developed by World Bank (2007) was adapted to the sample of the study. This survey was conducted between October and December of 2014. The questionnaire administrated consists of questions aiming to determine ICT usage level, the impact of ICT on the productivity of companies, competitiveness and innovation process, and also the government's ICT policy and regulations within the perspectives of companies. The raw data obtained from interviews conducted with the population of the study was controlled by SPSS software in terms of various aspects and the errors detected were corrected. Then, the impact of the use of ICT on the company performance and the views of relevant companies

were presented with the help of percentage and cross tables.

3.3. Measurement of Firms Performance

In the study, company performance was tried to be measured with four indicators (World Bank, 2007). Each indicator has two subscales. In this context, the company performance was tried to be presented by using four concepts; productivity (output and operational cost per staff), growth (revenue derived from sales and profits), innovation (capital allocated for innovation and ICT) and competitiveness (quality competition and price competition). The impact of the use of ICT only, the impact of the use of ICT and other factors together and the impact of other factors only were evaluated in accordance with opinions of the owners of the companies. Other factors were considered to be organizational change, equipment investment, changes in the structure of wages, staff training and new marketing strategies.

4. KEY FINDINGS

In this section, properties of the companies within the scope of the study and their levels of ICT use are presented and the results regarding the impact of ICT use on their company performances are given.

4.1. Sample Properties

In 2013, the average value of purchased goods and services is determined to be 200.000 TL. The rate of companies included in the study using computers in the last three years is 78.4%, while the rate of Internet users is 75.9% and the rate of companies that have a website is found to be 40.2%, respectively. Although the use of computer and internet is very common in companies, the rate of having a website is low. Majority of the sample (63.3%) uses an electronic mail. The rate of intranet users is 20.1%, while 26.1% of them use local area network and 19.1% of them use wide area network, respectively. 47.7% of the companies are connected to the internet with an analog modem, while 34.7% of them are connected via DSL.

4.1.1. The use of ICT and labor productivity

The ratio of those stating that there is no change in the output per employee is 48.7%, while the ratio of those stating that their outputs are increased is 33.7% and 17.6% of them stated that there is a decrease, respectively. According to these results, the ratio of those stating that their outputs are increase is higher than those stating that their outputs are decreased. The distribution of the changes in the output of the employees in accordance with ICT and other factors in the last three years is given in Table 1. According to Table 1, the ratio of those stating that the changes in the output of the employees are mostly caused by the use of ICT only is 11.9%, while 31.3% of them stated that these changes are caused by the use of ICT and

other factors together and 56.7% stated that they are caused by other factors only, respectively. These results show that the use of ICT has positive impacts on labor productivity when used with other factors

together. Other factors were found to be staff training (16.5%) and new marketing strategies (12.5%), respectively.

Table 1: Distribution of the changes in the output of the employees in accordance with ICT and other factors in the last three years

The changes in output per employee		The reason of the changes in output per employee			Total
		Mostly the use of ICT	The use of ICT and other factors	Mostly other factors	
Increased	Number	8	21	38	67
	%	11.9	31.3	56.7	100.0
Decreased	Number	1	9	25	35
	%	2.9	25.7	71.4	100.0
Total	Number	9	30	63	102
	%	8.8	29.4	61.8	100.0

4.1.2. The use of ICT and operational costs

When companies included in the study compared with their last three years, it has been stated that the operational cost per output of 42.7% of the companies didn't change, while the operational cost of 34.7% of the companies increased and the operational cost of 22.6% of the companies reduced, respectively. According to these results, a few companies stated that their costs were dropped down.

The distribution of changes in operation costs per output based on the use of ICT and other factors in the last three years is given in Table 2. Accordingly, the ratio of those stating that reduction in the operational

costs is caused mostly by the use of ICT is 4.4%, while the ratio of those stating that other reasons caused this change is 93.3% and finally 2.2% of the companies state that the reason of reduction in the operational costs are both the use of ICT and other factors, respectively. The use of ICT and other factors have a little impact on the reduction of operational costs per output. More extensive use of ICT in companies can cut the costs over time; because, the use of ICT reduces the processing time and improve the quality of operations. The other factors reducing the operational costs per output were determined as changes in the structure of wages (40.2%), new marketing strategies (23.6%), organizational change (18.1%), staff training (16.6%) and equipment capital investment (13.1%), respectively (Table 2).

Table 2: Distribution of operational cost changes per output based on the use of ICT and other factors in the last three years

The mean operational costs		The reason of changed in the operational costs per output			Total
		Mostly the use of ICT	The use of ICT and other factors	Mostly other factors	
Increased	Number	22	18	29	69
	%	31.9	26.1	42.0	100.0
Decreased	Number	2	1	42	45
	%	4.4	2.2	93.3	100.0
Total	Number	24	19	71	114
	%	21.1	16.7	62.3	100.0

4.1.3. The use of ICT and revenues

34.7% of the companies included in the study stated that their sales revenues have increased in the last three years. On the other hand, 46.2% of these companies stated that their sales revenues remained same in the last three years and 19.1% of them stated that their revenues dropped down, respectively. The distribution of sales revenues of the companies depending on the use of ICT and other factors for the

last three years is given in Table 3. Accordingly, the ratio of those stating that the changes in sales revenues are caused by mostly the use of ICT is 5.8%, while the ratio of those stating both the use of ICT and other factors is 24.6% and the ratio of those stating that the reason is other factor only is found as 69.63%, respectively. It has been seen that the use of ICT and other factors have impact on the increase in sales revenues. In addition, the effect of ICT and other factors along with ICT on the reduction of sales revenues found very little.

Table 3: Total amount of changes in sales revenues of the companies depending on the use of ICT and other factors in the last three years

The changes of sales revenue		The reasons for change of sales revenues			Total
		Mostly the use of ICT	The use of ICT and other factors	Mostly other factors	
Increased	Number	4	17	48	69
	%	5.8	24.6	69.6	100.0
Decreased	Number	1	1	36	38
	%	2.6	2.6	94.7	100.0
Total	Number	5	18	84	107
	%	4.7	16.8	78.5	100.0

4.1.4. The use of ICT and profitability

The ratio of those stating that their sales profit increased in the last three years is 43.7%, while 30.7% stated that their sales profit didn't change and 25.6% of the companies stated that their sales profit dropped down in the last three years, respectively. According to these results, the ratio of those stating that their sales profit increased in the last three years is quite high. Distribution of changes in the sales profit of the companies in the last three years depending on the use of ICT and other factors is given in Table 4.

According to Table 4, the ratio of those stating that the increase in sales profit is mostly led by the use of ICT is 27.6%, while 26.4% of these companies stated that the increase in the sales profit is led by the use of ICT and other factors together and the ratio of those stating other factors is determined as 46%, respectively. These results show that the use of ICT is an important factor in the increase of sales profit of the companies. In addition, considering the impact of the use of ICT and other factors together on the sales profit of the companies, it is more obvious that the impact of the use of ICT on the sales profit of the companies included in the study is higher.

Table 4: Change in the sales profit of the companies depending on the use of ICT and other factors in the last three years

The changes in the sales profit		The reason for the changes in the sales profit			Total
		Mostly the use of ICT	The use of ICT and other factors	Mostly other factors	
Increased	Number	24	23	40	87
	%	27.6	26.4	46.0	100.0
Decreased	Number	5	4	52	61
	%	8.2	6.6	85.2	100.0
Total	Number	29	27	92	148
	%	19.6	18.2	62.	100.0

4.1.5. The use of ICT and innovation capital investment

20.6% of the companies stated that their innovation capital investment increased compared to the last three years. In addition, 58.2% of them stated that their capitals allocated for innovation investments remained the same and 21.1% of them stated that it was reduced in the last three years. The distribution of change of innovation capital investment of the companies in the last three years depending on the use of ICT and other factors are given in Table 5. The ratio of those stating

that the increase in innovation investments mostly led by the use of ICT is 17.1%, while 24.4% of the companies stated that the reason of this increase is both the use of ICT and other factors and 58.5% stated other factors as the reason of this increase in their innovation investments in the last three years, respectively. According to these results, it has been determined that the use of ICT and other factors have impacts on the increase of the capital allocated for innovation investments of the companies. In addition, surprisingly, the effect of the use of ICT is found to be at minimum level on the reduction of capital for innovation investments.

Table 5: The change in the capital allocated for innovation investments of the companies in the last three years

The innovation capital investment		The reason of change in the innovation capital investment			Total
		Mostly the use of ICT	The use of ICT and other factors	Mostly other factors	
Increased	Number	7	10	24	41
	%	17.1	24.4	58.5	100.0
Decreased	Number	0	3	38	41
	%	0.0	7.3	92.7	100.0
Total	Number	7	13	62	82
	%	8.5	15.9	75.6	100.0

4.1.6. The use of ICT and ICT investment capital

11.5% of the companies included in the study stated that their capitals allocated for ICT investments capital are increased in the last three years. In addition, 15.6% of the companies stated that their investments on ICT is reduced in the last three years, while 73.4% stated that it remained same, respectively. Only a few companies stated that their capital allocated for ICT investments were increased. The ratio of those stating that the increase in the ICT capital investment is led

4.1.7. The use of ICT and price competition

55.3% of the companies stated that the price competition is very important for increasing the market share in the last three years, while 18.1% stated that the importance of price competition is little for increasing the market share in the last three years, respectively. These results show than more than half of the companies consider the price competition very important for increasing the market share. The ratio of those stating that the reason why price competition is very important to increase the market share is the impact of mostly ICT use is 10.9%, while this ratio is 30.9% for both the use of ICT and other factors together and 58.2% for those who consider the effect of other factors as the main reason of this importance, respectively. One of the factors contributing to the increase of market share with price competition is considered to be the use of ICT.

4.1.8. The use of ICT and quality competition

75.9% of the companies included in the study stated that quality competition is very important for increasing the market share in the last three years, while 11.1% of them consider the quality competition not very important for increasing the market share in the last three years, respectively. This finding show that a large portion of the companies consider that quality competition is very important for increasing the market share. In addition, according to these results, quality competition seems more important than price competition for companies to increase their market share. The ratio of those stating that the importance of quality competition is resulted by mostly the use of ICT is 6%, while this ratio is 26.5% by the use of ICT and other factor together and 67.5% by mostly the other factors only, respectively. It is

by only the use of ICT is 4.3%, while 52.2% of the companies consider both the use of ICT and other factors as the reason of this increase and 43.5% of them stated that mostly other factors are the reason of the increase in the ICT investments, respectively. It is clear that the use of ICT and other factors are effective on the increase of capital allocated for ICT investments. However, although the ratio of those stating that there is an increase in the capital allocated for ICT investments is very low, the effect of other factors were determined to be quite high.

found be minimal the impact of ICT that quality competition is less important. These results show that the impact of ICT use to increase the market share by quality competition is limited and this increase is mostly depending on other factors. It is found be minimal the impact of ICT that quality competition is less important

5. RESULTS and DISCUSSIONS

In this study, it has been aimed to investigate the impact of the use of ICT, which has become an increasingly important factor for all organizations, on the performance of companies operating in the manufacturing and construction sectors. The rate of companies included in the study using computers in the last three years is 78.4%, while the rate of Internet users is 75.9% and the rate of companies that have a website is found to be 40.2%, respectively. These results indicate that computers and internet, which have become a necessity to use in a company, are not used by some of the companies included in the study. In addition, it has been also found that more than half of the manufacturing and construction companies don't have a website. Website is an important ICT tool to facilitate the company's visibility and marketing activities. Internet holds an important place among the first sources used by consumers to find a product.

The most important indicator related to efficiency of the company is labor productivity showing the output per employee. 11.9% of these companies stating that there is an increase in the output per employee stated that this increase is led by the use of ICT and 31.3% of them stated that this increase is led by the use of ICT and other factors together, respectively. These

data show that the impact of the use of ICT on productivity of the companies is very limited; however, the use of ICT has positive impacts on labor productivity when used with other factors together. In the literature, there are many studies indicating that the use of ICT has positive impacts on productivity of the companies (Betts *et al.*, 1991; Betts and Ofori, 1999).

Costs per output are considered as another indicator showing the productivity of the companies. 22.6% of the companies stated that their operational costs per output have reduced. The majority of the companies stated that the reduction in operational costs is caused by other factors. Operational costs of the companies can be reduced with extensive use of ICT over time. Because the use of ICT reduces the time spent for operations and improves the quality.

The growth of a company depends on its revenues gained from sales and sales profit. According to the results of the study, the ratio of those stating that their revenues obtained from sales has increased in the last three years is 34.7%, while 43.7% of them stated that their sales profit increased, respectively. 5.8% of the companies think that the increase in the revenues is led by the use of ICT only and 24.6% of them think that other factors lead to such an increase, respectively. It has been seen that the use of ICT and other factors have an impact on the sales revenues together. In addition, the impact of ICT use and other factors with the use of ICT on the sales revenues is found to be quite high. In the study, it is also determined that the use of ICT has an important impact on the sales revenues. Because the ratio of companies stating that the use of ICT is the main reason of increased sales profit is 27.6%, while this ratio was determined as 26.4% for the use of ICT and other factors together. These results indicate that the use of ICT is an important factor increasing the sales profit. In addition, considering the impact of the use of ICT and the use of other factors with ICT on the increase of sales profit, the impact of ICT on the sales profit of the companies included in the study becomes more obvious. These results are consistent with the results of another study conducted by World Bank (2007). In the study, the use of ICT and other factors are effective in the increase of capital allocated for innovation investments and capital allocated for ICT investments together. The ratio of those stating that the increase in innovation investments mostly led by the use of ICT is 17.1%, while 24.4% of the companies stated that the reason of this increase is both the use of ICT and other factors, respectively. According to these results, it has been determined that the use of ICT and other factors have impacts on the increase of the capital allocated for innovation investments of the companies. In addition, surprisingly, the effect of the use of ICT is found to be at minimum level on the reduction of capital for innovation investments. The ratio of those stating that

the increase in the ICT capital investment is led by only the use of ICT is found to be 4.3%, while 52.2% of the companies consider both the use of ICT and other factors as the reason of this increase, respectively. It is clear that the use of ICT and other factors are effective on the increase of capital allocated for ICT investments. According to other studies conducted, the use of ICT has positive impacts on the increase of investments done by the companies (World Bank 2007, Chondrakis and Farchi, 2014).

In the study, the impact of ICT use on the competitiveness of the company was considered within the context of price and quality competition. 55.3% of the companies stated that the price competition is very important for increasing the market share in the last three years. These results show that more than half of the companies consider the price competition very important for increasing the market share. The use of ICT is considered to be one of the important factors contributing to the increase of market share by price competition. Because the ratio of those stating that the reason why price competition is very important to increase the market share is the impact of mostly ICT use is found to be 10.9%, while this ratio is 30.9% for both the use of ICT and other factors, respectively. The majority of companies (75.9%) consider the quality competition as an important factor to gain the market share. According to these results, quality competition seems more important than price competition for companies to increase their market share. In the study, the ratio of those stating that the importance of quality competition is resulted by mostly the use of ICT is 6%, while this ratio is 26.5% by the use of ICT and other factor together. In addition, the impact of ICT on the less significance of quality competition is found to be minimal. The results of the study of Perez-Arostegui *et al.* (2012) are consistent with our results. The contribution of the use of ICT to increase the market share becomes higher when it is used with other factors.

6. CONCLUSION

In this study, the effect of the use of ICT on the performance of manufacturing and construction companies was examined. More than half of the manufacturing and construction companies in Bingöl were found not to have websites. In addition, it was determined that the proportion of the companies using computer and internet is high.

As a result, it has been determined that the use of ICT with other factors has positive impacts on the performance of the companies included within the sample of the study. The impact of ICT use on the company performance is limited. However, the use of ICT becomes more effective when used with other factors together. Companies should select their ICT processes by considering their own properties. Governments can establish strategies to promote the

use of ICT and organize ICT training programs for free of charge. This study reveals the impact of ICT use on the company performance at micro level. In

future studies, better results can be achieved by conducting them on a national scale with a broad perspective.

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