

The Effect of Technology Adoption on Job Insecurity: A Case Study in Turkish Textile Sector ¹

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Abstract

Due to the global changes in trade and economy, firms need to adopt new technologies in their production processes. This brings unending organizational changes and cause resistance and increase the anxiety on losing jobs. Employees think that they can lose their jobs as newer equipment requires less labor. The present study aims to investigate the relationship between technology adoption and job insecurity in a textile manufacturing factory which has adopted a new production infrastructure in Kahramanmaraş.

In order to do so, initially a literature review is conducted and former studies are revised in terms of subject, context, methodology and findings. Later on a

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questionnaire is adopted from literature and applied to 96 participants (whole labor) from the factory. Statistical analyses are conducted via SPSS and AMOS and the results indicate that the labor of the factory are willing to use the new technology and perceive it useful, however they have the anxiety of losing their jobs. In conclusion some proposals for practitioners, researchers and policy makers are presented.

Anahtar Kelimeler: Technology Adoption, Job Insecurity, SEM.

Teknoloji Ediniminin İş Güvensizliği Üzerine Etkisi: Türk Tekstil Sektöründe Bir Alan Çalışması

Öz

Ticaret ve ekonomideki küresel değişiklikler nedeniyle, firmaların üretim süreçlerinde yeni teknolojiler benimsemeleri gerekmektedir. Bu bitmeyen örgütsel değişiklikler, çalışanlarda direnç sebep olmakta ve iş kaybetme endişesini arttırmaktadır. Çalışanlar, daha yeni ekipman daha az emek gerektirdiğinden işlerini kaybedebileceklerini düşünüyorlar. Bu çalışmada, Kahramanmaraş'ta yeni bir üretim altyapısı benimseyen, bir tekstil imalat fabrikasında teknoloji edinimi ile iş güvensizliği arasındaki ilişki araştırılmıştır.

Bunu yapabilmek için öncelikle bir literatür taraması yapılmış olup ve konu, bağlam, metodoloji ve bulgular açısından önceki çalışmalar incelenmiştir. Daha sonra yazından uyarlanan bir anket, fabrikadaki 96 katılımcıya (tüm işgücü) uygulanmıştır. İstatistiksel analizler, SPSS ve AMOS yardımıyla yapıldı. Sonuçlar, fabrika çalışanlarının, yeni teknolojiyi kullanmaya istekli olduklarını ve kullanımda faydalı olduğunu düşündüklerini belirtmektedir. Ancak çalışanların işlerini kaybetme endişesi vardır. Sonuç olarak, uygulayıcılar, araştırmacılar ve politikacılar için bazı öneriler sunulmaktadır.

Keywords: Teknoloji Edinme, İş Güvensizliği, YEM.

INTRODUCTION

The recent changes in business environment urges manufacturing enterprises to adopt more technology on production processes (Agarwal and Prasad, 2000: 295). With the rapid involvement in capitalism due to industry revolution firms need to deploy more technological equipment in order to maximize savings and

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minimize costs (Akkoyun ve Öncül, 2015: 42). Especially by 80s, it is stated that firms started to make use of innovation in order to improve competitiveness. In all sectors, companies began to benefit more from the blessings of technology and also started to look for ways to further integrate manufacturing technologies into production processes (Atiku et al., 2011: 69). Thus they made use of computer-based information and production systems to replace the manual handling (Farooq et al., 2019: 1).

Because of these changes the organizational climate of the firms has changed by focusing on performance and flexibility issues related to the costs and profit (Bacon and Blyton, 2015: 128). Within this period the Turkish manufacturing firms have witnessed this post-modern structure of business world and started to adopt more technology in their production processes (Çetindamar ve Günsel, 2009: 1). Doing so they benefited from information technologies and started to make use of knowledge and became well-versed in management (Güvenli, 2006: 1).

However, the change in organizational structure brought along some concerns on continuity of the current jobs (Ito and Brotheridge, 2007: 40). It is witnessed that economies in higher condition make use of technological change by creating more skilled jobs to the employees whereas the developing ones lose employment (Lissitsa and Chachashvili-Bolotin, 2016: 754). On the other hand, the gap between the latest technology and the utilized ones and this causes loss in rivalry as the developing countries cannot produce their own production systems (Singh and Holmstrom, 2015: 128). The substitution of man with machines the concept of job insecurity emerges as a serious problem as it causes organizational resistance to change (Nam, 2019: 155). Also, it causes more professionals to lose hope and they started to make a decision on whether keeping on with technology or to lose their jobs (Shropshire and Kadlec, 2012: 6). Besides these, firms need to cut their manual operations with the use of technology and employees start to feel more throttled as they are the breadwinners of their families (Smithson and Lewis, 2000: 680). As a result, the whole organization needs to face with the fact that s/he will survive as long as their capability on technology.

Moving from this information the current study tries to depict the relationship between technology adoption and job insecurity in a Turkish textile manufacturing company which adopted new technology recently in Kahramanmaraş. To do so, initially a detailed literature review is conducted and former studies are reviewed in terms of subject, methodology and findings.

This research is approved by the ethical committee of Kahramanmaraş Sütçü İmam University with decision number 05/03/2020 No. 2020-5.

1. LITERATURE REVIEW

The literature is rich in studies seeking for the relationship between technology adoption and job insecurity. Most of the studies found that technology adoption makes unskilled personnel to worry about future of their job, whereas the qualified ones makes themselves assured of their work. For instance, Agarwal and Prasad (2000: 295) discusses the adoption of a new programming language and organizational changes in the firm. Besides this, Akkoyun and Öncül (2015: 42) argues the effects of technology management on corporate structure. Similarly, Öz (2016: 1) and Güvenli (2006: 1) conducted a research on the effects of technology on organizational structure. Moreover, Polat Üzümcü (2012: 1) discusses the concepts of job security and competitiveness in the organizational context. Identically, Plewa et al. (2012: 748) and Hall and Kramarz (1998: 99) searched for the effect of technology on employment, wages and firm performance besides innovation capabilities. Whereas Atiku et al. (2011: 69) focuses on the effects of technology adoption on employees' job insecurity and found that the more the banks adopt technology the less they need labor in Nigerian context. Similarly, Ruvio and Rosenblatt (1999: 139) focused on the job insecurity perceptions of school teachers. Furthermore Bacon and Blyton (2015: 128) studied on the context of iron and steel production and exerted that the higher the technology adoption is deployed the less the firms need unskilled labor. Also Bhaskaran (2013: 425) conducted a research on food processing Small and Medium Sized Enterprises (SMEs) and found that technology reduces the need for employment with the help of production and information opportunities.

On the other hand Chiu et al. (2015: 133) searched for the relationship between employment status and job insecurity and put forth that the type of employment affects the of insecurity perceptions of the employees and diminish organizational citizenship. Similarly Çetindamar and Günsel (2009: 1) discusses the technological capabilities in Turkey as a developing country. Contrary to this research Dill and Jirjahn (2016: 1286) focused on a developed economy in the context of Germany and found that foreign owned companies deploy technology adoption in a more efficient way than the residents do. As a result they need less labor and become more competitive respectively. Identically Farooq et al. (2019: 1) searched for the role of human in computer based information technologies and found that skilled human capital is substantial for enterprises. Similarly, Greenwood and Reinardy (2011: 155) examines the effects of technological challenges in journalism and concludes that employees are more bound to the organization when they are provided freedom and technological opportunities. Nevertheless they are more prone to conduct most of their jobs manually.

For job insecurity many research have been done and one example of these is Ito and Brotheridge (2007: 40)'s work focusing on the antecedents and consequences of job insecurity. They have concluded that there is a relationship between job loss strain and job insecurity which directly supports the idea that technology can affect the employment. Similarly Seppala and Klemola (2004: 157) searched for the organizational impacts of leaner production and job insecurity. Moreover, Keim et al. (2014: 269) examines the facts under the perception of employees on losing their jobs and they have revealed the fact that the adoption of technology is affective on job insecurity. Interestingly, Lissitsa and Chachashvili-Bolotin (2016: 754) have discussed that the job insecurity is something that the skilled labor can imagine and the less the employee knows, the easier s/he can sleep. Menon and Thingujam (2012: 269) approaches the subject in a more macro level and discusses the effects of economic recession on employment of information technology professionals in the Indian context. Similarly Nam (2019: 155) seeks for the relationship between technology usage, job sustainability and perceived job insecurity. The paper concludes that if the firms deploys higher technology it kills the jobs of unskilled labor but in the long-term it creates more jobs for qualified ones. It is also stated that job insecurity changes the psychological contract of the enterprise in a study done by Smithson and Lewis (2000: 680). Besides these Tiryakioğlu (2016: 1) mentions the importance of organizational learning in technology adoption processes. Parallel to these findings Walczuch et al. (2007: 206) discussed that the readiness of the organization to a new technology eases the adoption process. Also they give information of such studies are based on Technology Acceptance Model (TAM). Moreover, the paper uttered by Shropshire and Kadlec (2012: 6) focuses on IT professionals and their perceptions on stress, burnout and job insecurity. Similarly Singh and Holmstrom (2015: 128) points out that the needs of the professionals differ with the adoption of new technology.

According to the findings of the former literature it is obvious that the adoption of a new technology makes some changes in the organizational structure of the firm. Thus the present study will deploy TAM in order to measure the technology adoption. By doing so, the literature review is completed and the theory of the research will be presented in the following part.

1.1. Technology Adoption

Technology is generally defined as the sum of solutions that human kind has developed for the obstacles that are faced in life and Akkoyun and Öncül (2015: 42) state that firms need to adopt new technology in order to survive in rivalry. They also conclude that the adoption of new technology has some strategical benefits besides some change in the organizational structure. The process of adoption is defined as the novel ways of constructing new processes by the

acquisition of new technology (Agarwal and Prasad, 2000: 295). Due to the challenges of global economy enterprises need to deploy new technologies in their production processes (Atiku et al., 2011: 69). These adoptions provide some advantages such as shorter processing times and lower costs besides larger production volumes.

The process of technology adoption is not just the acquisition of a new technology. It brings some organizational changes rather than a pure technical orientation (Bhaskaran, 2013: 425). Plewa et al. (2012: 748) insist that the adoption of a technology can only be achieved by making the organization to adopt new technologies. So, it is obvious that the adoption can cause some resistance and concerns about the continuance of the present status of employment. They also focuses on the TAM and the constructs related to this model are perceived usefulness, perceived ease of use and attitude towards technology.

1.1.1. Perceived Usefulness

The employee is more prone to use items that they consider as useful. If the person is convinced of the usefulness of an item or a new process, they become more predisposed to deploy new technology. Agarwal and Prasad (2000: 295) summarizes this concept as if the new equipment increases the performance, productivity, effectiveness, efficiency and provides greater control of the work or do their jobs easier by making them more advantageous, they use it more willingly. Also Bhaskaran (2013: 425) adds that the functionality of the new process is effective on the preference of new processes. Besides these, Güvenli (2006: 1) states that the handling of goods is no longer to be done by humans and machine interaction improves the job satisfaction, motivation, performance and efficiency of the employee while diminishing the workload.

The concept is defined as the degree to which the employee perceives that using a spectacular system to enhance his/her job performance (Plewa et al., 2012: 748). The compatibility of the new system is the foci of the adoption process. Parallel to these arguments Walczuch et al. (2007: 206) defines the concept as the increased control, efficiency with flexibility to meet customer demands. To sum all up, perceived usefulness of a new system is decisive in adoption of a new technology.

1.1.2. Perceived Ease of Use

The adoption of a new technology is bound to many dimensions. Initially the firm needs to deploy a new way of production and this causes some resistance if the employees are not convinced on the ease of use. The final results of adoption should be comparably more efficient than the previous systems and the subsidiary

effects of the adoption should be confronted (Çetindamar and Günsel, 2009: 1). Farooq et al. (2019: 1) states that if the new methodology is not perceived as easier compared to the former ones, it causes some motivational problems besides increasing the anxiety of job insecurity. Also Greenwood and Reinardy (2011: 155) argue that if the employee finds it harder to operate in the new system, they are more willing to use the older one. Besides these, Güvenli (2006: 1) denotes that ease of use in the new system will make some contribution on the organizational performance and boost effectiveness. Thus, the ease of use enhances the quality of the working climate.

However, Lissitsa and Chachashvili-Bolotin (2016: 754) state that if the employee is unskilled, they are happier with usage of lower technology. The more they learn about the new processing methods, the more they become anxious about their job security. The concept is defined as the degree to which an employee to be free of effort by using a spectacular system (Plewa et al., 2012: 748). As one part of trivet of TAM the concept is highly effective on attitudes on technology and innovation (Walczuch et al., 2007: 206). To sum all up, the perceived ease of use of a new technology can boost innovativeness and encourages employees to try new things.

1.1.3. Attitude Towards Technology

The theory of reasoned action assert that the individual can perform a specific behavior if they have positive attitudes on the particular concept. Adoption of new technologies urges the organization to use new tools, paradigms and methods. Thus they need to be ready for adoption before disposing to change (Agarwal and Prasad, 2000: 295). If the employees are ready to adopt a new process they should have the perception of the benefits of developing new applications and find this change desirable for rivals. Therefore the adoption of new technology effects the organizational climate and also the attitudes towards technology (Farooq et al., 2019: 1). Similar to these discussions, Güvenli (2006: 1) states that the employee is more prone to use new technology if they have positive attitudes. Also Hall and Kramarz (1998: 99) argue that the attitude towards technology will be decisive on productivity of the whole economy.

The present study deploys TAM as the foci of technology adoption and the subtitles of this model is revised above. The literature assert that the adoption of new technologies makes some effects on the organization and the current study knuckles down the effect on job insecurity. Thus the following part will be explaining the job security concept.

1.2. Job Insecurity

Due to the rapid change in the world of business, firms need to adopt technology in their production processes and this new situation demands new way of thinking and decision making. As a result enterprises make use of machinery and technology instead of bulks of labor and this causes some concerns on losing jobs (Agarwal and Prasad, 2000: 295). Then the labor should make themselves more desirable as being ready to operate in new processes and render some adaptive skills or carry about the future of their jobs (Atiku et al., 2011: 69). According to Bacon and Blyton (2015: 128) the new way of production requires the involvement of new technologies while diminishing the need for labor and increase the perceived job insecurity. More over firms need their labor to operate in the least mobility because of the costs and this also enhances the use of technology but this also increase the threat of losing their jobs or voluntarily quitting the job (Chiu et al., 2015: 133; Farooq et al., 2019: 1).

Job insecurity is defined as the perception of being threatened in terms of issues related to job loss (Lissitsa and Chachashvili-Bolotin, 2016: 754). It is also defined as the expectation about continuity of the job, or concerns about the future of the present position, continuity of the present jobs, perceived powerlessness about continuity of the job (Shropshire and Kadlec, 2012: 6; Nam, 2019: 155). It is shown that the concept is gaining more importance as the need for technology increase in manufacturing transplants (Ruvio and Rosenblatt, 1999: 139). The concept of job insecurity can be effected from various conditions. For instance, Dill and Jirjahn (2016: 1286) discuss that low qualification, lower employment protection and deregulations or unemployment experience may affect the degree of job insecurity perception. Also Keim et al. (2014: 269) state that the general economic conditions or a recession can cause job insecurity.

Moreover, the technology intensiveness in the production systems is considered as a factor that have effect on this perception. Also because of profit maximization firms can apply downsizing or rightsizing in terms of employment and this can boost the anxiety on job insecurity (Farooq et al., 2019: 1). Moreover, Walczuch et al. (2007: 206) state that the technology imperils the job security, as it prohibits idle times fiercely. Greenwood and Reinardy (2011: 155) argue that the higher the tension, anxiety and fatigue in the organization, the probable it is to obtain adverse results in issues reated to performance. Also, Güvenli (2006: 1) states that job insecurity can have effects on satisfaction. On the other hand, Hall and Kramarz (1998: 99) argue that technology causes job growth in the long term and creates opportunities for skilled jobs, while increasing the risk for unskilled ones. Besides these, the employee should experience loss of locus of control and employment dependence because of feeling insecured in their jobs (Ito and Brotheridge, 2007: 40). Yet, Plewa et al. (2012: 748) mention the literature is

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basically focused on individual or organizational context but it is something that is to be handled in between organizations. So, the subsidiary effects of job insecurity should be dealt (Plewa et al., 2012: 748).

So far, job security is depicted as an obstacle that the organizational structure of the firm experience with the adoption of new technologies for unskilled labor. The present study aims to search whether this relation is valid in a textile manufacturing firm in Kahramanmaraş. So, the following part of the paper will be on displaying the results.

2. METHODOLOGY

2.1. Sampling

The field study is based on a textile manufacturing firm in Kahramanmaraş. The firm is founded in 2009, just after the global economic crisis. It operates with a total number of 96 employees and registered in Kahramanmaraş Trade and Industry Organization. They have just adopted new technology that permits the use of lower labor. The current paper investigates their perceptions about whether they think they can lose their jobs with this adoption.

2.2. Scale Development

A questionnaire adopted from the literature is applied to a sample of 96 people. Obtained data is analyzed via SPSS and frequency, descriptive statistics, correlations, factor and Structural Equation Modelling (SEM) analyses are deployed. As a result, statistically significant relationships are found among the variables.

To do so, initially a questionnaire form is adopted from literature. The items used for measuring job insecurity are adopted from De Witte (2000: 325) and scale of Plewa et al., (2012: 748) is used for measuring technology adoption. These scales are used because these were based on TAM, which is the locus of the research. Items are translated into Turkish and re-translated into English. Professional opinions from colleagues are considered and some demographic data is also required in the form. The paper didn't use any sampling as the whole working group filled in survey forms. The top management of the firm helped for the data collection and the obtained data is analyzed via SPSS. Frequency tables, reliability analyses, parametric tests, correlation, variance and factor analyses and Structural Equation Modelling (SEM) is used for assessing the aim of the work.

While constructing the research model of the paper former models are revised and it is observed that Agarwal and Prasad (2000: 295) used questionnaire forms in data collection. Also Lissitsa and Chachashvili-Bolotin (2016: 754) utilized

correlation analyses while Plewa et al. (2012: 748) and Nam (2019: 155) used regressions in depicting the relationships between variables. Lastly, Shropshire and Kadlec (2012: 6) used SEM for presenting their model based on a component-based model.

Initially, the demographic features of the sample are scanned via frequency tables and the results are depicted in Table 1.

Table 1. Demographic features of the sample

		<i>f</i>	%
Age	Lowest to 30	50	52.1
	31 to highest	46	47.9
Sex	Male	49	51
	Female	47	49
Seniority	0 to 5	63	65.6
	6 to 10	19	19.8
	11 or more	14	14.6
Income (£)	0-1000	17	17.7
	1001-1500	23	24
	1501-2000	10	10.4
	2001-3000	38	39.6
	3001 or more	8	8.3

The ages of the participants differ from 27 to 45 and this variable is divided into two halves in order to manage the data more appropriately. The genders are nearly equal. Seniority is majorly in 0 to 5 year employees and the monthly incomes vary from 0 to 3001 £ or more. As some of the workers are employed part time the incomes can be comparably low. However, Chiu et al. (2015: 133) state that temporary employment can increase job insecurity. The demography showed that the participants are highly from low income and unskilled labor. T-test and ANOVA are deployed in order to see whether the demographic features cause statistically significant differences on the variables. As a result no significant difference is observed in terms of age. However, gender cause statistically significant difference in perceived usefulness. The perception of the males is comparably lower than the women. However no statistically significant difference is observed for seniority and income.

Secondly, the descriptive statistics besides reliability are observed while making Exploratory Factor Analysis (EFA). These analyses are depicted in Table 2 in order to show the results.

Table 2. EFA, Reliability and Descriptive Statistics Results

	Component			
	1	2	3	4
PerUse1		.778		
PerUse2		.696		
PerUse3		.747		
PerUse4		.768		
PerUse5		.707		
PerEas1				.703
PerEas2				.776
PerEas3				.821
Attitu1	.732			
Attitu2	.784			
Attitu3	.744			
Attitu4	.795			
Attitu5	.724			
JobInse1			-.626	
JobInse2			-.752	
JobInse3			-.800	
JobInse4			-.619	
% of Variance	22.608	21.636	18.867	15.768
Cumulative %	22.608	44.244	63.111	78.880
Mean	4.2063	3.7049	2,1719	3.8281
Std. Deviation	.70693	.99457	.87322	.96198
Cronbach α	,833	,805	,905	,887

The Kaiser-Meyer-Olkin measure for sampling adequacy is observed to be 0,898 which means that the sample is big enough to make EFA. The total variance explained is %78,88 and this result depicts that the EFA has construct validity. The means of the observed variables differ and the highest is the attitudes towards technology. Agarwal and Prasad (2000: 295) also found lower means for job insecurity. Standard deviations are low and this shows that the participants share similar perceptions among the items in the scale. So it is better to assess inter-item relationships with means of the mentioned items. The results of the analysis is shown in Table 3.

Table 3. Results of the correlation analysis

	PerUse	PerEas	Attitude
PerEas	,587**		
Attitude	,695**	,675**	
JobInSEc	-,713**	-,745**	-,702**

PerEas= Perceived Ease of Use; PerUse= Perceived Usefulness; Attitude= Attitude towards technology; JobInSEC= Job Insecurity

** . Correlation is significant at the 0.01 level.

The variables were all found to be correlated. Job insecurity is negatively correlated to other items whereas the others are positively correlated. These results showed that this finding is compatible with the findings of former literature. The more the firm adopts technology, the more the employees become anxious about their future in the job. Data set confirms the findings of the former literature and further analysis should be done as the scale is adopted from other studies. So, Confirmatory Factor Analysis (CFA) is done via SPSS, AMOS and the measurement model is depicted in Figure 1.

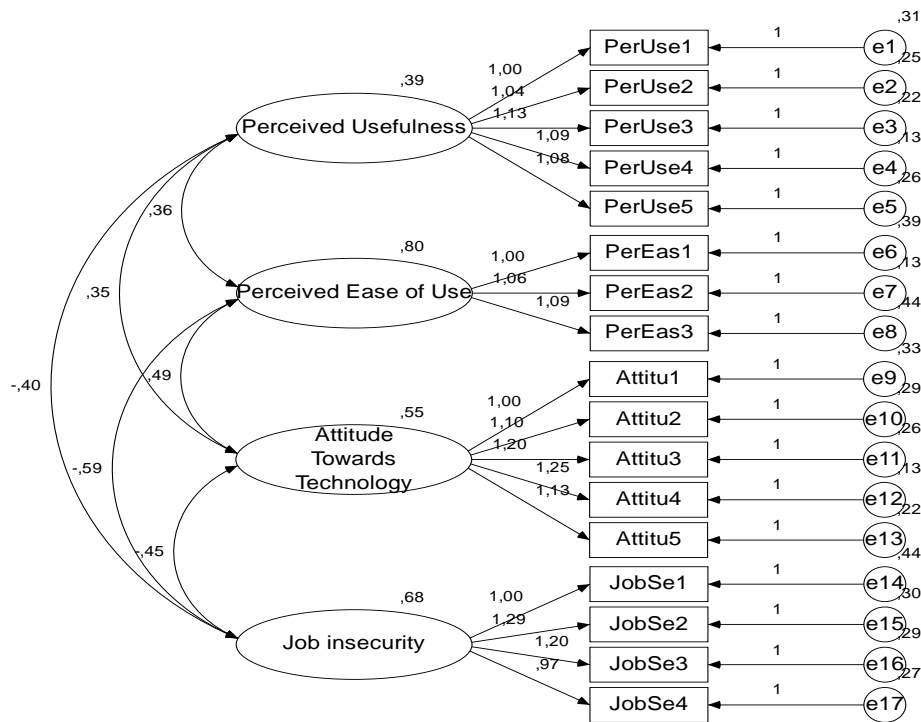


Figure 1. CFA Measurement Model

The model is tested and the results showed that the data fits (NFI=,857; RFI=,827; IFI=923; TLI=,906, CFI=,922, CMIN/DF=1,987 and RMSEA=,102).

This showed that the relationships between the variables can be tested by SEM and it is demonstrated in Figure 2.

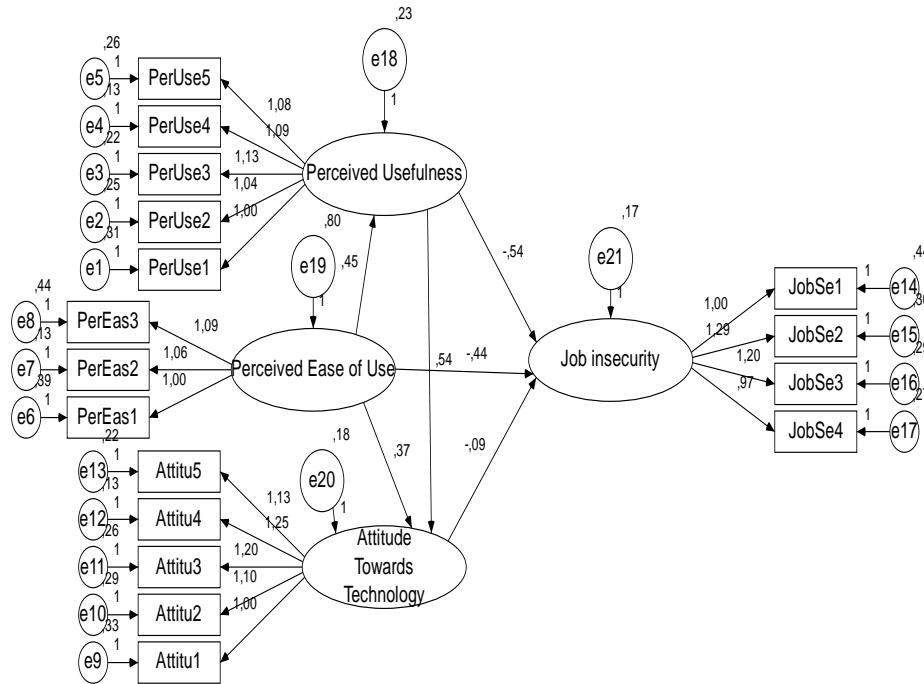


Figure 2. Tested SEM

The model proved that there is a positive relation between the TAM trivet while they effect job insecurity negatively. From these results it can be concluded that the employees of the factory in Kahramanmaraş have positive perceptions on technology but they are anxious about losing their jobs. This finding is similar to those.

3. CONCLUSIONS, LIMITATIONS AND IDEAS FOR FUTURE WORKS

Technology is something that covers the world of production in terms of shorter processing times, diminishing the costs, maximizing the profit and decreasing the need for labor. By the help of technology adoption firms can experience many benefits such as producing more units in shorter times and time to market. On the other hand, if they are disadvantageous in adoption of the technology, they cannot control their labor effectively (Dill and Jirjahn, 2016: 1286; Öz, 2016: 1). So, top management of enterprises should make strategic decisions with technology adoption (Akkoyun and Öncül, 2015: 42). Hall and

Kramarz (1998: 99) supports this conclusion as they consider the subject from a multi-national context.

As technology advances the need for labor is decreasing and it can cause some change in job security of the employees (Atiku et al., 2011: 69). The solution to this problem is discussed in the paper of Bacon and Blyton (2015: 128) as making long-term agreements with labor. Also, Bhaskaran (2013: 425) states that the changing environment of business necessitates this kind of a change. Moreover, Chiu et al. (2015: 133) stressed that temporary employment has a negative effect on job security. Contrary to this finding Farooq et al. (2019: 1) concluded that intensive usage of technology can be considered as an advantage for the skilled labor. Also Ito and Brotheridge (2007: 40) supports this idea as they refer to locus of control by the help of the technology. Besides these Shropshire and Kadlec (2012: 6) and Menon and Thingujam (2012: 269) argued that if the employees are given the chance to improve themselves by intensive training, they can express themselves in work better while feeling lower job insecurity. In addition Seppala and Klemola (2004: 157) conclude that the white-collar employees face more stress on job insecurity as they know much about economy while blue collar ones don't.

Moving here, the present study investigated the effect of technology adoption on job insecurity perceptions of the employees by using TAM just like Plewa et al. (2012: 748). In order to do so, a detailed literature review is conducted and former studies are reviewed in terms of context, subject and findings. Their methodology is revised and a questionnaire is adopted. The survey is applied to 96 workers in a textile manufacturing factory in Kahramanmaraş. The results indicate that there is a negative relationship between technology adoption and job insecurity.

Further research can investigate this relationship in different contexts. Also there is need for research covering innovation capabilities and technology management skills. Practitioners can make use of these findings by providing some training for their labor. Policy makers can also benefit by planning labor education programs that are more convenient to technology adoption. To sum all up, we cannot live without technology nor without earnings. The future of production is mostly based on technology developments due to information age and if the rising generations won't be ready for such a challenge, they will have problems in make a living.

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