University of Economics, Prague

Faculty of Informatics and Statistics

Study program: Quantitative Methods in Economics

Field of study: Quantitative Economic Analysis

LOGISTIC REGRESSION IN R

MASTER THESİS

Author: Alicem Karaca

Supervisor: Mgr. Milan Bašta, PhD

Prague, December 2019

Declaration:

I hereby declare that I am the sole author of the thesis entitled “Logistic Regression in R.” I duly marked out all quotations. The used literature and sources are stated in the attached list of references.

In Prague on……. Signature

Alicem Karaca

Acknowledgment

I would like to thank my supervisor Mgr. Milan Bašta Ph. D. for his patience, kindness and for leading my master thesis.

Contents

Summary

Logistic regression has a wide use of range thanks to its normality free nature. Instead of fitting a straight line or hyperplane, the logistic regression model uses the logistic function to squeeze the output of a linear equation between 0 and 1. This future makes logistic regression one of the best option for working on a classification problem or predicating a binary dependent variable. Statistical compute programs like R studio makes these statistical applications more usable. In this study, logistic regression model created on R studio for explaining intention of job leave. Moreover, created models are tested and their efficiency is illustrated.

Today's economic status, globalization, rapidly increasing competition and technological innovations have caused many businesses to be shut down and many employees are unemployed. The uncertainty created by all these developments has also been reflected in employee and employer relations and has made the issue of job security an even more important issue. The main aim of the research carried out within the scope of the thesis study is to measure the job security satisfaction of the employees in tourism sectors and to reveal the relationship of this satisfaction with organizational commitment, job stress and intention to job leave, and to test the hypotheses of the study in the light of these data.

Data of the study has been gathered with survey method from 459 employees who work in tourism sectors in Istanbul. Analysis results suggest that there is a positive relation between organizational commitment and employee's job security satisfaction. Moreover, there are negative relations between employee's job security satisfaction, job stress and intention to job leave. Also, variances have been detected in terms of socio-demographic variables in job security satisfaction, organizational commitment, job stress and intentions of job leave.

Logistic regression analysis method have applied for testing main hypothesis of thesis. The results of the analyses suggest that female and single employees have much higher intention of job leave while high income employees, who have high level of organizational commitment and high level of job security satisfaction, have much less intention of job leave.

In the light of the findings and evaluations obtained from the research, its contribution was discussed and some suggestions that could shed light on the works to be done afterwards were explained and how the managers could benefit from the research results.

Key words: Job security satisfaction, logistic regression, R studio, model creation in R, intention to job leave.

Introduction

Logistic regression is a statistical model that uses logistic function to model a categorical dependent variable. Since model has no problem working with binary dependent variable, model is used various of fields such as medical, military and social science. R studio offers many futures related with logistic regression. In this paper, intention of job leave is modelled with logistic regression method in R. Furthermore, futures like efficiency measure ROC curve, test method stepwise and likelihood ratio test are introduced.

The years 2010 represent a period of great changes and pressures in all areas. Especially in the last ten years in many countries throughout the world and in parallel with Turkey, the economic crisis with and uncertainties of globalization was reflected in the conditions of competition. This reflection affected employee-employer relation also and caused significant reduction of job security. As a result of the economic crises, the number of workplaces that have closed and shrinking the scale has increased and as a result many workers have been unemployed, and many have faced unemployment and job insecurity.

The basic question of the thesis study can be stated as, “Is there a significant relation between intention of job leave and job security satisfaction, organizational commitment, job stress and demographic variables in accommodation establishments at Istanbul?”. Logistic regression model is created for investigating this question.

In the first two parts of this study, literature scanning has been made for job security, job insecurity, organizational commitment, job stress and intention to job leave. The comments and opinions obtained from the literature review were given in these two parts

In the first part of the study, which is composed of five parts, firstly, the concept of job security, the importance of the concept of job security and the effects on the working life, legal aspect of job security and effects on business life have been examined.

Second part of this study focuses relationship between variables, which are variables of logistic regression on analysis part, have been investigated for better understanding of analysis. Understanding relations between explanatory variables has an important role for reading the results.

Third part of this thesis, logistic regression and its history with mathematical background have been explained. Moreover, explanation of model creation, efficiency measurement and various model tests are introduced in this part.

Methodology, importance of research, data collection and survey preparation have been examined on fourth part of this paper.

Logistic regression model creation and testing those models with various methods can be seen on fifth part of this paper.

Last part of this study contains discussion about findings obtained from survey data regarding to logistic regression method. Moreover, conclusion have been made in this part.

1.1 General Overview of Job Security

Going to work is a social activity that ensures the continuity of human life. From the day humanity has existed, this concept is located to the center of human life. The concept of working with this feature, closely affects human life, the economy of countries and the existing order in society.

Since the birth of the employee class, economic contraction, the decrease in the demand for labor and the necessity of protecting the workforce has revealed the debate and has created the concept of job security.

Although the issues of job security and insecurity are important for both employers and employees, researchers have not shown the necessary experimental and theoretical importance to these issues. Since 2000, the interest in the issue of job security has increased slightly due to the fact that the press has attracted attention to this issue. For more than a decade, it has become more important to examine the relationship between job security and employee behavior.

The concept of job security has been the subject of several studies since the 1980s. This is due to the fact that the issue of job security, in many European countries and in the United States, has become a very comprehensive social concept, with the closure of many businesses, resulting from the main variables such as the restructuring of enterprises and the increase of temporary employment contracts. According to Probstina (2002, p.451), which has contributed greatly to the work security literature, job security is the perception of the employee on the continuity of his/her job in the current form. Job security is the central nervous system of labor law.

According to another definition related to job security in a broad sense, it covers all the measures that allow the employee to lose his/her current job more or to reduce the risk of destruction or risk to work if he/she loses his/her job. In other words, all measures aimed at minimizing the employee's risk of losing his job are in a wide range of job security. All restrictions imposed on the right of termination of the employer by law and contracts, in other words; The necessity of termination reasons, the acceptance of postponement of the employment contract depending on some circumstances, the term of notification of termination and various termination restrictions are considered within the scope of the concept of job security in the broad sense.

Job security means that the continuation of the business relationship. This is the reason for the fact that the right of equal termination granted to both sides in the classical law remains theoretical. If there is an unfair and invalid reason for termination of employment in the business relationship, this causes two situations by the employee. The first of these situations is when the working conditions against the employee. The second is; the employee loses his source of income and consequently his life is endangered.

The main point of attention with the concept of job security is not the employee himself, but the security of his work and the employer does not rely on a valid reason; fully protect employees against arbitrary termination. When the concept of job security is examined in terms of management and organization literature, it is seen that this concept has been used for the first time in the studies that include the business climate inventories in the 1960s and 1970s. In these studies, concept of job security used as measurement of job satisfaction.

In several studies, the concept of job security has been used as a determinant of job satisfaction. To date, most of the work related to job security is related to the new management and organizational structure which emerged with the regulations and economic policies in the legal dimension of job security. Of course, job security should not be addressed from a single point of view. It should be evaluated not only economically but also psychologically and socially.

Sverke, Hellgren and Näswall (2002), made a theoretical distinction between short-term and long-term reactions to job insecurity. According to the authors, reactions like work attitudes, would arise closer in time to the stress experience with respect to some others that are expected to emerge after a longer period, like behaviours and health complaints. There is empirical evidence proving that job insecurity is more strongly related to short-term outcomes (e.g. job satisfaction, organisational commitment) than to long-term reactions affecting the organization (e.g. performance, withdrawal behaviours like turnover intention, absenteeism, lateness and so on) (Sverke et al., 2002).

On the other hand, instead of the concept of job security, especially in the legal field; It is seen that terms such as protection of the right to work, as an employment security and "employee protection against dissolution" are also used.

Job security concept have been born to protect the employee from the social and economic conflicts between the employer and the employee, to protect the social interests, to prevent the abuse of the right of termination. It aims to control this balance.

The purpose of job security is to protect employees against personal and economic reasons and to protect employees against the employer who wants to terminate the individual employment contract.

It is not possible to say that employees in any country are fully protected against termination. There are cases in which the employer cannot control either. For example, production in the enterprise may stop for some reason and the relationship between the employee and the employer can always be broken.

To summarize, between employee and employer, job security cannot be provided in every situation. However, for an employee to be dismissed from the job, one of the reasons stated in the law must be fulfilled. This system will continue even better if the interests of both the employee and the employer are taken into consideration.

1.2 Importance of Job Security and Effects on Business Life

With the rise of globalization, competition between enterprises is increasing rapidly. The relationship between enterprise and employee protection in these competitive conditions has been one of the most debated issues in recent years.

Along with job security, the employer is prevented from unfairly dismissing an employee. The employer must have a justified or valid reason. If the employer has such a reason, it will not be possible to protect the employee. There are some rules of good faith in business relations. For this reason, business relations may become unbearable from time to time. With the job security, now there is a chance for the party who does not want to bear the contract and will be freed from the employment contract.

When considering the interests of the employee and the community in providing job security, the situation of the employer and its relationship with the public interest should not be ignored. In accordance with the principle of social state, there are limitations of the employer's freedom of employment. It is mandatory to evaluate the situation in terms of operational efficiency.

Job security is especially important in developing economies such as Turkey. Regulations on job security in developing economies are not enough. If the employee loses his/her job, he/she also loses his/her income. Protection against dissolution as a human right and workers' rights entails a macro-economic balance. Total employment levels at the macroeconomic level are less volatile in countries with higher job security and less standardized employment. This means that less flexible labor markets react with less force to macro-economic shocks and have less resistance to maintaining the overall balance of the country.

Job security also prevents the unregistered economy and unfair competition, but also ensures the functioning of the Labor Law. Employees who are under the threat of dismissal all the time they work, it cannot be expected to demand the rights under the law or contract in an environment where there is no job security.

It is claimed that job security also has an impact on international competition. Depending on some assumptions, the relationship between this issue and job security may arise as follows: In a country, employers can take cheaper goods to the world markets if they can keep wages low by taking advantage of the labor force. Similarly, employers can dismiss high-paid employees without justified reasons, and if they can work with minimum wages, labor costs fall in total cost and competition opportunities increase (Kutal, 2002, p.204).

Not only individual rights, but also collective rights and freedoms do not have enough functions in a law order where there is no job security. In this context, freedom of union, autonomy of collective bargaining and the right to strike only remain to a large extent written in law.

The fact that the employer has the right to terminate the employment contract arbitrarily causes employees to worry. Moreover, employees are working in an environment of concern affects the productivity of the employees indirectly and the productivity of the business.

Job security has a big impact on foreign capital inflow also. While foreign capital is preferred among countries, it is important that the country to be invested gives confidence to foreign investors.

Current forms of informal employment are replaced by formal forms of formal employment (part-time, temporary or through permanent recruitment, temporary or fixed-term, on-call or independent contracts and employment by subcontracting enterprises, etc.). It is located. The informal labor market is flexible and informal work has been considered a great potential for flexible business understanding. Informalization in the labor market; flexibility and heterogeneity, impotence and insecurity, inequality and polarization are becoming more evident.

On the other hand, with the increase in informal employment, there is a decrease in both the scope of assurance and the number of employees expected to benefit from in the field of job security. With the increase in the number of informal employees, the job insecurity is becoming more widespread in terms of recruitment and dismissal. An unregistered group of employees is deprived of protection for an unreasonable reason because of the volatility of

employment due to invalidity and economic fluctuations. All these reasons are proof of the importance of job security for societies.

As a result, job security has significantly affected business, managers, employees and the judiciary. In all areas of the working life, there is a great deal of responsibility for putting the relevant applications on the right foundation, which are most importance in terms of both the economy of the country and working peace. The correct application of the innovations, that come with job security, is vital for the sustainability of peace in working life. The correct interpretation and proper implementation of the law will depend on the knowledge of the practitioners on this issue as well as closely monitoring the current developments. In summary, job security is the cornerstone of labor law with its importance and benefits. As can be seen, the issue of job security is very important for both employees and employers, and the society.

The studies that contribute to the job security have shown that the issue of job security is one of the most important concepts for the organizations and it has a great importance for the employees to look at their future with confidence.

1.2.1 Positive Effects of Job Security for Employees

Job security means the protection of the rights of the employees, the protection of the employee against dismissal and, on the other hand, the creation of a financial guarantee to him after his dismissal. Job security is a major issue in the world, as well as social partners in Turkey is a major problem that restricts both sides.

On the one hand, the employee, who must continue his life with the money has in exchange for his labor; on the other hand, employer who must maximize profit. There are many challenges for the social state, which seeks to balance the relationship between the employee and employer, who want to ensure the continuity of the enterprise by making production and profit.

The job security provides continuity to the business relationship and thus ensures that the employee looks at the future with confidence and avoids the fear of the deprivation of the wages which are the sole means of livelihood of the people and their families.

Job security benefits the employee, any benefit provided by the law itself allows you to call. In a rule of law where there is job security, not only individual rights but also collective rights and freedoms can see its true function.

Job security is based on the principle of protecting workers who are financially weaker against the employer who is financially stronger. If an employee cannot find a job for a long period of time and cannot have the job he desires, he/she will have to work under all conditions imposed by the employer. In order to prevent such problems, it has a great importance to protect the employee both financially and socially in order to prevent benefiting from the helplessness of an employee.

If there is job security in a legal order, not only individual rights but also collective rights and freedoms, in example freedom of creating a union, collective bargaining autonomy and the right to strike, the institutions can see their true role. If job security cannot be achieved in a legal order, an employee can only be dismissed when he is a trade union member using trade union rights. This situation also discourages other employees working in the workplace and hinders syndicate organization.

Unemployment factors that cause the employer to terminate the employment contract with the employee for valid reasons and the employee wants to find work cannot be realized. The continuation of the employee's employment and the continuity of his/her income is a positive situation for his/her own interests. It is even more important that the employee is protected against dismissal in the legal arrangements where the employee does not have the right to unemployment benefit. Unemployed employees who want to protect their own interests in conditions of unemployment are particularly preferred by unskilled workers. The employment contracts of unqualified employees are terminated after a short period of time. Thus, the cost of labor, which is an important expense item, has been reduced. Some employers do not even insure their employees and exclude them from tax. This kind of applications both push social and economic instability, and hinder their professional development (Ekonomi, 2003, p.247).

With the decisions taken by the International Labor Organization (ILO) in 1982 at the Geneva Congress, arrangements have been completed for the termination of the employment contract with the aim of protecting the work security with the laws. This legal provision has brought certain conditions to the termination of the employment contract of the employee. Termination of employment is deemed invalid if the conditions stated in this regulation are not fulfilled.

The most important asset of a business is the human factor. To be able to work effectively, employer must provide job security for employees. With the globalization, job security is getting even more important from the perspective of employee motivation and job satisfaction.

1.2.2. Positive Effects of Job Security for the Employer

Total productivity in all work fields especially in labor-intensive sectors, one of the most important components is the determination of labor productivity, which is extremely difficult to calculate and associated with many factors as a concept. Factors affecting productivity are related to demographic, economic and social conditions, management and employee characteristics.

One of the main factors that increase labor productivity is job security. If employee feels safe at the work, he/she is working for, this will ensure his/her full embrace job and work much more efficiently. For this reason, it can be said that job security is an important key in ensuring peace of mind with other elements.

If an assessment is made considering the interests of the employer, an employee should be dismissed in the shortest and easiest manner if he cannot adequately meet the labor required for the production of goods and services and does not generate efficiency for the enterprise. If an employer holds efficient staff for the enterprise, he/she can keep the labor costs at the desired level. If an employee wants to put an end to his/her job, a number of legal difficulties and financial obligations increase the costs and the society has to bear the costs.

1.2.3. Positive Effects of Job Security for Society

In terms of social welfare and social peace, in relation to the protection of business relations, depends on trust. What is important is not only the creation of employment but also the protection of this situation and the conditions of social welfare and social peace. However, protecting the work is not enough in the interests of society. Social interest is bi-

directional. This means that both the work and the workplace must be protected. In particular, the concept of protection of the workplace in the process of globalization means that the most appropriate conditions in terms of international competition are created as much as possible. In the face of the rigid system of job security and the cost it creates, employers' investment in countries that provide cheap labor will lead to questioning the rising unemployment job security system in certain respects.

Today, the right to work is seen not only as a right to labor, but as a fundamental human right. In this sense, the protection of the right to work is also important in terms of social peace. If people in a community can be easily dismissed without any valid reason, it will be difficult to ensure order and peace in society. It is accepted that the issue of job security is not only a personal, but also has a political and social dimension and it is seen as a matter of vital importance both for employees and for all contemporary societies.

One of the most important contributions of job security is the positive effect of preventing informal economy. Some employers insure the employees they employ and protect all their rights, while some employers do not give any rights to their employees. Under these circumstances, unfair competition is inevitable. In order to avoid these, all employees must be members of trade unions without fear of dismissal, demand minimum wage and insurance. All these worries experienced by employees can only be eliminated by the job security system.

In addition to these negativities, there are many companies that employ illegal employees without any registration. These businesses are not paying any taxes to the state for the employees they run into the state is damaging. If this situation can be prevented, the revenues of the state will also increase. For all these reasons, job security has a vital importance. If the necessary measures are not taken and the unregistered enterprises do not go over, the unregistered economy will increase.

1.3 The Legal Aspect of Job Security

The concept of job security has an important place in international agreements. Its legal dimension is very important and decisive in terms of its concept.

Job security is one of the most basic and important elements of employee rights. The job security system in the legal order must be effective, otherwise it will stay only on paper.

Labor law provides for the protection of employees in the market and produces solutions for economic and social problems. However, a set of market-recognized rules including social goals and objectives changes with the technology. In Labor Law, protection is provided in the following ways:

- Legal protection,
- Protection with the right to union organization and collective bargaining,
- Protection by Labor Courts and procedures,
- Protection with public systems of social protection.

Even though Business Law is constantly evolving, main aim of the remains unchanged. The subject of labor law is to ensure that both the employer and the employee fulfilled their obligations.

1.4 Job Insecurity

The basic concepts of thesis work, job security and job insecurity loaded meanings can sometimes be mixed with each other. Job insecurity is the low perception of job security. Two concepts are complementing each other, because of that in addition to the concept of job security, the concept of job insecurity was tried to be explained.

Depends on the size of the volume of outputs regarding literature scanning about job insecurity, it is possible to mention many and different definitions about the concept of job insecurity.

According to Hartley (1991, p.39) job security can be defined as, a person's anxiety about the future of his job.

Gount and Benjamin (2007, p.34) stated that job insecurity is a process reflecting a radical change occurring outside the employee's will, depending on the employee's personal perceptions and the attendance of the job.

Cheng and Chan (2008, p.280) stated as perceptions of individuals for the determination of potential hazards on the continuation of work.

Job insecurity was found to have relevant psychosocial consequences for both individuals and organizations. Recently, research is increasingly focusing on those variables that can moderate its negative influences.

Job insecurity is characterized by a discrepancy between the level of security a person experiences and the level he/she might prefer regarding the preservation of his/her employment status (Swaen et all., 2004, p. 443). Experience of job insecurity may be described as a combination of a perceived threat regarding their job, and the sense of powerlessness to do anything about this very threat. Job insecurity has been found to be associated with an increase in job related stress (Storseth, 2006, p.541).

Job insecurity has become a frequently examined stressor in modern working life and scholars have found empirical support for a link between job insecurity and employee reactions. The findings thus so far indicate that job insecurity is negatively related to job and organizational attitudes as well as to employee health and well-being.

Hellgren, Sverke and Isaksson (1999) distinguished between two different forms of job insecurity: a quantitative job insecurity, i.e. worrying about losing the job itself, and a qualitative job insecurity, i.e. worrying about losing important job features. While the quantitative job insecurity is related to the general, comprehensive (and most used) operationalization of the construct, the qualitative job insecurity refers to feelings of potential loss in the quality of organizational position, such as worsening of working conditions, lack of career opportunities, decreasing salary developments (Sverke & Hellgren, 2002).

On the other hand, external resources such as social support, perceptions of process and work control, participations in decision processes, fairness of treatment and organizational justice were shown to affect work attitudes (like satisfaction and commitment) and wellbeing, and thus may moderate the effects of job insecurity (Sverke & Hellgren, 2002).

Sverke, Hellgren and Näswall (2002) made a theoretical distinction between short-term and long-term reactions to job insecurity. According to the authors, some kind of reactions, like work attitudes, would arise closer in time to the stress experience with respect to some

others that are expected to emerge after a longer period of time, like behaviors and health complaints. There is empirical evidence proving that job insecurity is more strongly related to short-term outcomes (e.g. job satisfaction, organizational commitment) than to long-term reactions affecting the organization (e.g. performance, withdrawal behaviors like turnover intention, absenteeism, lateness and so on) (Sverke, 2002).

1.5.1 Job Insecurity and Age

Age is one of the most important demographic variables in determining job insecurity. According to the findings of his research, Mohr (2000) found a strong positive relationship between age and job insecurity perception. Accordingly, older employees feel more job insecurity than young people.

However, the studies conducted that generally the relationship between the two variables is not linear. It was found that subjects aged between 20-59 years were more affected by job loss than those under 20 and above 60 years of age. As a result of Naswall and Witte's research (2003), the positive relationship between variables was not supported. The researchers found that in the findings they obtained from the Netherlands and Sweden; because the middle age group (30-50 years) had children and family responsibilities, they needed an income and they felt more job insecurity.

It is suggested that individuals between the ages of 30 and 50 years of age who are more likely to be able to live up to their families and have the responsibility to raise their children are more likely to perceive a potential job loss as a bad and negative situation than those who are responsible for their own care, younger individuals or older individuals who make retirement plans.

Considering the relationship of age with the working time in the organization, an elderly employee who has been working for many years in the same organization, it would be thought that it would have skills and therefore would be less likely to be employed in another organization. In this context, an older employee may perceive a potential job loss as a much more threatening situation as it will be much more committed to its current job. (Seçer, 2009, p.322).

1.5.2 Job Insecurity and Gender

Rosenblatt, Talmud, and Ruvio (1999) examined the effect of gender on job attitudes to job insecurity and organizational commitment, intention to leave, resistance to change, perceived performance, and perceived organizational support. Researchers concluded that the type of job insecurity and perceived job insecurity vary by gender. According to the results of this study, men's perceived job insecurity level is much higher than women. While men are more concerned about the change or loss of the financial characteristics of the work, women are concerned about the change or loss of content and characteristics of the work. (Rosenblatt., 1999, p.14-15).

However, according to some researchers, job insecurity is equally stressful for men as well as for women. According to the results of the research conducted by Kinnunen, Mauno, Natti and Happonen (2000) women working in the banking sector and in the factory feel more job insecurity than men. According to investigators, women have more job insecurity perception in the areas of dominance of men. According to the results of another study, it was found that

women were affected more than the job loss compared to men and they felt more uncertainty about their jobs.

1.5.3 Job Insecurity and Marital Status

Living with a spouse has a buffer effect against the negative consequences of job insecurity. Employees who share the same house and / or are married can be assumed to be less dependent to their jobs. However, the partner must have an income in order to say this.

The marital status, which is one of the demographic characteristics, is one of the factors determining the perception of job insecurity. Being married imposes an obligation on the individual to provide income to support the house. In this context, the potential job loss that could result in loss of income can be seen as a much greater threat by a married employee. In addition, being married is associated with job insecurity in terms of providing social support to working partners (Seçer, 2009, p.323).

2. Effects of Job Security on Attitude and Behaviors

2.1 Relationship Between Job Security and Absenteeism

First studies on organizational psychology were predominantly practical. As a result of this fundamental, the reasons for being late for work, absenteeism and quitting were some of the first cases investigated by work psychologists. These behaviors called withdrawal behavior have not seen the theoretical interest they deserve until a short time ago, although they have been the subject of many researches since their being become costly and costly.

Absenteeism affects productivity, morale and health of the employees negatively. Therefore, the problem of absenteeism does not only affect the relations between the employer and the employee, but also closely relates to the employment and human resources policies of the enterprises.

The most parsimonious definition of absenteeism is the failure to report to work (Robbins, 2003).

Another definition from Ramsey, Absenteeism; the employee does not come to work without any excuse, without informing the employer or the manager. (Ramsey 2008, p.98).

In a workplace, employees leave their work without any permission considered as the cause of the immediate termination. However, as determined by the French Supreme Court in France, the employee's work a few minutes before the end of the work in order to take a shower to be able to take a valid expiry cannot be made. On the other hand, this behavior of the employee should not gain continuity.

 If the employee does not come to work for three working days in a month, the employee may be removed from the workplace due to absenteeism. However, in order to do so, the attendance minutes must be issued before the dismissal and a letter must be sent to the employee's address via the notary public to demand his defense and question whether there is a valid situation.

2.2 Relationship Between Job Security and Stress

Hans Selye is the first scientist to describe the stress with the known meaning. Hans Selye expresses stress as the changes on emotional state caused by internal and external environment.

Stress is a psychological condition that negatively affects the physiological and psychological structures, behaviors of individuals and their relationships with other individuals.

Stress can cause many different elements. These elements can be material and spiritual. If individuals experience high levels of stress, physical and psychological consequences can be observed (Varlow et al., 2009, p.30).

Job stress can be expressed as an inconsistency and reaction of the employee to his / her work due to his / her work.

Workers under stress start to show some signs of stress over time. These symptoms are grouped under 2 headings, physical and behavioral described in detail below.

Physical Symptoms: A harmful set of components may cause changes in some systems and functions within the organism. Different stages of these changes lead to various symptoms and complaints. Some of these symptoms; increased blood pressure, shortness of breath, digestive disorder, fatigue, allergy, headache and nausea.

Behavioral Symptoms: Stress directly affects the behavior of individuals. Some of these effects; constant sleep, insomnia, lack of appetite, over-eating, speech difficulties, smoking and alcohol use.

Job insecurity is one of the most frequently studied stressors in modern working life. The findings to date show that job insecurity is negatively related to employee health and well-being as well as to business and organizational attitudes (Elder, 2013, p.334).

2.3 Relationship Between Job Security and Employee Performance

Performance is the determination of what is obtained as a result of a purposeful and planned activity in terms of quality or quantity.

There are many definitions related to employee performance. The common point of these definitions is that the performance is the result of the connection between individual expectation and organizational goal. Performance is the quantitative (qualitative) criterion of the effectiveness of an employee, a group or a business to achieve the goal.

Employee's business performance has a great importance in terms of business. Made As a result of the evaluations, the employee should perform the desired performance. Linked the performance evaluation, if all efforts are unsuccessful and if the employee shows no improvement, it will be inevitable to be dismissed.

It has been determined by various studies that some changes in business behaviors have arisen due to job insecurity. It is possible to collect these reactions under two headings: behaviors that are defined as avoidance-withdrawal and individual and collective actions. Avoidance-type reactions appear in the form of a decrease in the willingness to go to work, the decrease in the work and the effort shown in the workplace, not caring about the situation

of the organization they work for, and not commenting on this issue. All these reactions have an overall impact on the employee's performance.

According to Greenhalgh and Roseblatt (1984), efforts to achieve organizational goals will be low in case of job insecurity status. Although this is a very common opinion, the general opinion is that employees who feel job insecurity are less willing to spend time and energy to work.

The survival of an organization depends on the work of the employees. In this way, the organization will be more powerful if their employees are loyal to the organization. Therefore, every organization tries to ensure that its employees continue their work.

2.4 Relationship Between Job Security and Organizational Commitment

The survival of an organization depends on the work of the employees. The more the employees are connected to their organizations, the more the organization will be strengthened. Therefore, every organization tries to ensure that its employees continue their work. For this, organizations identify different strategies. Some of those; promotion prospects presentation, raising salaries, incentives, etc. strategies.

In recent years, organizational behavior has been frequently investigated in the literature because it affects directly to profits of organizations. Individuals connect to their organizations, decrease absenteeism in the workplace and dismissal of employees. While reducing the tendency to leave, it enables employees to do many jobs in the workplace voluntarily.

According to Kim and Chang (2007), organizational commitment can be defined as employees' loyalty to the organization. Employees' loyalty to organizational processes such as business continuity, teamwork, policies and strategies, social relations, organizational citizenship behavior reveals their commitment to the organization.

There are several factors affecting organizational commitment. The main factors that affect employees' loyalty to their organization are as follows according to Çetin (2004 p.98);

* Gender, age, experience,
* Organizational trust, job satisfaction, organizational justice,
* Role conflict and role specificity,
* Support received, the importance of the work,
* Participating in the work and decision-making process,
* Alienation, recognition, occupational safety,
* Rights and marital status, other than wages,
* Working hours, monotony, desperation, prizes,
* Acquisition opportunities, salary, other employees,

* Interest in employees, leadership behaviors, outside job opportunities.

Davy, Kinicki and Scheck have found a strong relation between job security satisfaction and organizational commitment in their research (1997). Lambert (1991) found that job security was positively related to organizational commitment and performance. Iverson (1996) concluded that job security had important effects on organizational commitment (Akpan, 2013, p.85).

Research shows that employees develop an attitude and an emotional commitment to the organization over time. The perception of job insecurity threatens these basic ties to the firm. From this point of view, the perception of job insecurity has been found to adversely affect organizational commitment. In the studies conducted, it has been found that staff working with fixed-term employment contracts have less commitment than staff working indefinitely. According to the research by Probst (2003), there is a negative relationship between organizational commitment and restructuring.

The findings of the research conducted by Burg and Elizur (1992) support the literature on loyalty to the organization; loyalty is decreasing as job insecurity perception increases (Öz, 2008, p.161).

2.5 Relationship Between Job Security and Employee Motivation

Motivation in a broad sense; It can be defined as a process that starts with a physical or psychological need, a deficiency or an urge directed at any goal, which allows the behavior to act. According to another definition, motivation is the process of individuals to behave with their own desires and desires to achieve a specific goal.

The achievements of employees in their workplaces and their real satisfaction are based on their motivation and whether they are run in a certain harmony. This is especially important in labor-intensive enterprises like tourism. Because what is offered for sale; It can be a tangible product that can be held by hand or it can be in a service that is not completely tackled. Even the product that is concrete in the service sector is presented to the customer with the abstract service. Therefore, the person providing the service interacts with the individual (customer) who buys the service directly. The quality of this interaction is also a factor that ensures the continuity of sales. This is where the service offers physical and psychological status of the employee is gaining importance.

Whether the business is successful or not can be entirely dependent on the employee. In other words, the degree of efficiency obtained from the employee will be the key of success in the business.

This feature of the service sector reveals the importance of the management and motivation of employees in service enterprises.

2.6 Relationship Between Job Security and Intention to the Leave Work

The intention to leave work means that an employee is thinking or planning to leave a workplace. The idea of leaving work or the intellectual is the step before leaving the organization. Employees' tendency to leave a workplace is voluntary.

Employees' intention to leave work is a concept that needs to be deducted and understood on both industrial and organizational psychology. The intention to quit is a conscious or cautious decision or intent to leave the work / organization. The problem of leaving employees is still an important problem for organizations. Therefore, the factors that push employees to these behaviors must be investigated.

Employees' leaving the work, both cost-generating and a time losing event for an organization. Social groups established among working groups within the organization damage to relationships and reduces the motivation of employees. Well-trained and the separation of a qualified employee from the work, the costs incurred by the organization for him, wasted the time spent is transformed into damage. For this reason, satisfaction and commitment of qualified individuals are extremely important to prevent the creation of separation intent and to continue in terms of efficiency and competitiveness of the organization.

The tension caused by the perception of job insecurity also has a significant impact on the employee turnover. Like other sources of stress, job insecurity is associated with withdrawal response.

Especially well-educated and well-qualified employees are the first group to engage in new job search behavior if they feel insecurity. King's (2000) research supports this result. In the study conducted on the lecturers working at the university, it was determined that the employees who had high job insecurity perception showed more job search behavior. (Çakır, 2007 p.130-135).

All this information about the literature shows that; Although the issue of job security is discussed in the international literature, it has not seen much interest in Turkey and tourism sector.

3.Logistic Regression

In this research, to support descriptive statistical results, as predictive analysis Logistic regression method has been applied. Logistic regression is the appropriate regression analysis to conduct when the dependent variable is binary (dichotomous).

Logistic regression competes with discriminant analysis as a method for analyzing categorical-response variables. Many statisticians feel that logistic regression is more versatile and better suited for modelling most situations than discriminant analysis. This is because logistic regression does not assume that the independent variables are normally distributed, as discriminant analysis does.

There are several methods used to assign known variables to a number of known or subsequently determined groups according to these characteristics. The most common traditional methods used in grouping observations are clustering analysis, discriminant analysis and logistic regression analysis.

In the cluster analysis, the number of groups to which observations will be assigned is not known in advance. In this analysis technique, observations or variables are grouped according to distance criteria. The purpose here is only implement several observations to understand the structure of the groups it creates. In the logistic regression analysis, the number of groups is predetermined and developed using available data.

Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables.

3.1 Definition and History of Logistic Regression Analysis

Logistic regression: It is a multivariate classification technique that can calculate the probability of assigning dependent variable to pre-defined groups according to explanatory variables. (Powers and Yu, 2000).

1. While the dependent variable is metric in regression analysis, it is a nominal scale variable in logistic regression analysis.

2. In the regression analysis, the unit value of the dependent variable and the logistic regression analysis are estimated the probability of realization of one of the values that the dependent variable can take.

3. In the regression analysis, it is necessary to have multiple normal distributions of the independent variables however the assumption of independent variables is not applied for a theoretical distribution in logistic regression analysis.

The use of the logistic model dates back to the 1845s. Logistic analysis, at first mainly used in the study of socio-economic issues. The use of the logistic model for the analysis of biological experiments was first proposed by Berkson (1944). Cox (1970) reviewed the analysis of biological experiments and made various applications.

Truett (1967) and Halpering (1971) suggested that logistic regression was an alternative to discriminant analysis when normal distribution variance could not be achieved. Since than logistic regression models are widely used in many fields.

In a study from Cornfield (1962), development of coefficient estimation methods and logistic regression models have been investigated and for the first time using the discriminant function approach in coefficient estimation in logistic regression has become popular. Lee (1984) focused on linear logistic models for simple cross-over trial plans. Bonney (1987) studied the use and development of logistic regression model.

It has been observed that regression analysis has been increasing in military subjects, meteorology, internal migration movements and education especially in the last 20 years. One of the most important reasons for this increase is the widespread use of statistical package programs.

However, it is observed that one of the most widely used areas is medicine. For example, creating a model to distinguish whether a tumor is cancer or not. Moreover, different purposes, such as determining whether a disease responds to treatment can be an example for medical use of logistic regression modelling.

Logistic regression analysis has been used in the selection of models in these and many similar examples from the 1900s to the present.

3.2 Preferential Reasons of Logistic Regression Analysis

Multivariate statistical analysis of categorical data concerns almost all areas. Logistic regression analysis has an important place in categorical data analysis because of the

advantage it provides by its regression type logic and its usefulness compared to other analyzes.

Simple and multiple linear regression analyzes are used to analyze the relationship between the dependent variable and the independent variable or variables.

In the data sets where the linear regression methods can be applied, the dependent variable must come from normal distribution, the independent variables are composed of variables or variables with normal distribution and the variance of the error terms should be normal. In the absence of these and similar conditions, simple or multiple linear regression analysis cannot be used.

As it is known, the normal distribution of the regression analysis when the dependent variable is a categorical variable and the assumptions that the error terms are constant variance are ignored. In logistic regression analysis, as in linear regression analysis, estimation is made based on some variable values. Independency stands in linear regression analysis, on the other hand in the logistic regression analysis, there is no such requirement.

Linear regression models data using a straight line where a random variable, Y (response variable) is modelled as a linear function of another random variable, X (predictor variable). On the other hand, the logistic regression models the probability of the events in bivariate which are essentially occurring as a linear function of a set of dependent variables.

Another issue is for sample size, where there is more than two categories of the dependent variable, there is a need for a group size of at least 50 people in each argument for a valid hypothesis test. In some sources, it is emphasized that this number should be a minimum of 20 for each independent variable and a minimum of 60 for the total. Therefore, logistic regression is more flexible than the other two techniques.

3.3. Mathematical Background of Logistics Regression

The logistic regression model is a special form of general linear models obtained for dependent variables with binomial distribution. Both theoretical and experimental studies showed that while the dependent variable has two results, the π (1 - π) shape of the response function will be S or inverse S. Initially, with the increase in X values, the values increase slowly, then the increase is gradually accelerated and stabilized. But it never goes above 1. The relationship between independent variables and probability is not linear. (Figure 1)

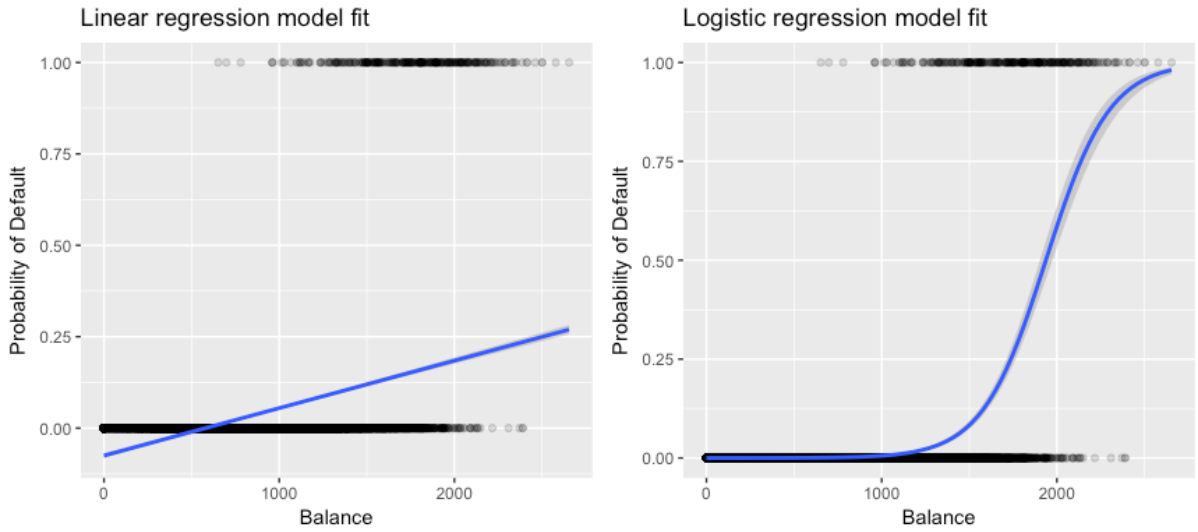


Figure 1. Difference Between Regression and Logistic Regression

The logistics function has a change range between 0 and 1 and this is the most important reason for the logistics function. The logistic model serves to estimate the risk to be any value between 0 and 1. In other words, there is no risk above 1 or below 0. Logistic regression model Equation 1.2. is indicated by. When X = x according to this relation, Y is the probability of being 1 π.

3.3.1 Logistic Regression Analysis with Two Categories

It is a logistic regression method where the dependent variable has two categories. When coding, it is often used for 0 when there is no risk and 1 for the risk. The type of arguments can be of continuous, discrete or sequential data type without any restriction.

The estimation of the *β* coefficients should also evaluate the fitness of the obtained logistic regression model. Moreover, significance and interpretation of the *β* coefficients which are obtained from model, also important stages of the analysis. The likelihood ratios (Odds ratios) can be used for the interpretation of the coefficients.

Odd value indicates how many times more the dependent variable is likely to be observed with the effect of the explanatory variable or how many percent more likely to be observed.

When the data matrix for the argument is X = x, the probability of the event or the probability that Y = 1 is represented by π when the value of X is known. The model in Equation 1. can be created using the standard linear model to define π.

When k is independent variable and there is N observations, expected value for i^{th} observation:

$$E(y_i) = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_k x_{ki} + \epsilon_i \quad (1)$$

Since the result of this linear function is not between 0 and 1, it cannot be used to model the probability. The reason why the least squares method used for coefficient estimation in linear regression assumption cannot be used is the equality of the variances. It would be more proper to use model that gives curvilinear relationship between dependent variable and argument. Also ensure that the dependent variable has a value between 0 and 1.

$$\pi_i = \frac{\exp\left(\beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_k x_{ki} + \epsilon_i\right)}{1 + \exp\left(\beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_k x_{ki} + \epsilon_i\right)} \quad (2)$$

Equation 2 can be called as "Logistic Function" or S-shaped function. S-shaped functions have asymptotes. In this case π can get values only between 0-1 interval.

$$\text{logit}\,\pi(x) = g(x) = \ln\left(\frac{\pi(x)}{1-\pi(x)}\right) \quad (3)$$

The logistic regression model is created by converting the natural logarithm of the equality 3 odds ratio into a linear model. Logistic function can be easily linearized with transformation on equation 4.

$$\eta = \frac{\pi_i}{1 - \pi_i} \quad (4)$$

Equation 4 is called "Odds Ratio". Odds ratio is critical for the model. The effects of the explanatory variables in the logistic model depends on the odds. The ratio of odds estimated at a value of x, to odds estimated at the other value is given as. This gives the result that the number of individuals with x = 1 is how much greater than the number of dependent variables by 1 compared to individuals with x = 0 (Bircan, 2004: 29).

3.4 Model Development Methods

In the development phase of the model, it is tried to determine the variables that should be kept in the model or which need to be removed from the model. The model development strategy varies depending on the purpose of the study. In some studies, it is possible to determine which variable affects the dependent variable by using all the variables in it, but in some studies, the aim of the researcher can be to determine how one or more known variables affect the dependent variable. The point that should be taken into consideration in the development of the model is that these variables that will affect the result should be taken into consideration when creating the model.

The purpose of creating a model is to explain the maximum change in the dependent variable with the help of minimum number of independent variables. If too many variable types are included to the model, standard error estimates will be increased. At the same time, the process of establishing and developing the model with a large number of independent variables will become more complex. There are many different methods for variable selection in the logistic regression model. These are based on two basic separations, one for univariate and the other for multivariate analysis. The multivariate analysis involves two methods. These are the stepwise method and the best subset method. The best subset method is rarely used in logistic regression analysis (Costanza et al., 1992, p. 775). The stepwise method is divided into the forward selection and backward elimination (Lee and Koval, 1997, p. 566).

In other words, multiple regression models can be divided into full or reduced regression models. In the full regression method, all possible variables that may be effective in explaining the dependent variable are included in the model. Reduced regression methods can be

divided into three. These methods are: Forward variable selection method, backward variable selection method and stepwise variable selection method. In the search for an optimal regression model, model estimation with these three reduced models and obtaining the same or similar models is considered as a proof of the appropriateness of the strategically derived regression model.

3.4.1 Likelihood Method

In estimating the coefficients of a logistic regression model with two groups; maximum likelihood method, reweighted least squares method, minimum log chi-square method are widely used methods. The maximum likelihood method gives the values of unknown parameters that maximize the probability of obtaining the observed data set. The maximum likelihood function must be established before applying this method. The maximum likelihood estimates of these parameters are selected to make the function maximum. The values that make this function the largest are the maximum likelihood estimators of unknown parameters. In other words, the maximum likelihood is that the maximum probability of an event is attempted to be made. Thus, the estimates are selected as values closest to the observed values.

In the two-category logistic regression model, the dependent variable takes two values. The Y value can be 0 or 1 with a random value. The calculation of this value is expressed by the likelihood function in Equation 5.

$$\pi(Y = 1) = \pi = \frac{e^{\beta x}}{1 + e^{\beta x}} \quad (5)$$

3.4.2 Stepwise Variable Selection Method

The use of stepwise logistic regression method enables the rapid and efficient examination of many variables and adaptation of the variables to regression models. The stepwise method includes the combined applications of the forward selection and the reverse selection methods. In the stepwise method, the logic works as a forward variable addition method, but the difference can be excluded from the model due to its contribution to the model in the next step as in the backward elimination method.

The drawback of the stepwise method is that the coefficients of all variables that are not in the model should be calculated individually in each step of the maximum likelihood estimates (Kleinbaum et al., 1998).

The basis of this method is the process of first establishing the model together with all independent variables (complete model) and then eliminating the meaningless independent variables respectively. When an independent variable is removed from the model at each stage, the variable which causes the minimum increase in the deviation value is removed from the model and the process continues until the determination of the variable that causes the most change in the final deviation is processed.

3.4.2.1 Forward Variable Selection Method

In the method of forward variable addition, the analysis starts with the model with no independent variable with only constant term. When added to the model, the argument that causes the most change on the log likelihood ratio is included in the model at the first stage. Variable selection process is continued until the model does not remain variable with meaningful contribution to the model. There is no guarantee that the model obtained with this method is the most suitable model.

Forward Selection chooses a subset of the predictor variables for the final model.

We can do forward stepwise in context of linear regression whether n is less than p or n is greater than p.

Forward selection is a very attractive approach, because it's both tractable and it gives a good sequence of models.

- Start with a null model. The null model has no predictors, just one intercept (The mean over Y).
- Fit p simple linear regression models, each with one of the variables in and the intercept. So basically, you just search through all the single-variable models the best one (the one that results in the lowest residual sum of squares). You pick and fix this one in the model.
- Now search through the remaining p minus 1 variable and find out which variable should be added to the current model to best improve the residual sum of squares.
- Continue until some stopping rule is satisfied, for example when all remaining variables have a p-value above some threshold.

3.4.2.2 Backward Variable Selection Method

The basis of this method is the process of first establishing the model together with all independent variables (complete model) and then eliminating the meaningless independent variables respectively. When an independent variable is removed from the model at each stage, the variable which causes the minimum increase in the deviation value is removed from the model and the process continues until the determination of the variable that causes the most change in the final deviation is processed.

Unlike forward stepwise selection, it begins with the full least squares model containing all p predictors, and then iteratively removes the least useful predictor, one-at-a-time.

In order to be able to perform backward selection, we need to be in a situation where we have more observations than variables because we can do least squares regression when n is greater than p. If p is greater than n, we cannot fit a least squares model. It's not even defined.

- Start with all variables in the model.
- Remove the variable with the largest p-value | that is, the variable that is the least statistically significant.

- The new $(p - 1)$-variable model is t, and the variable with the largest p-value is removed.
- Continue until a stopping rule is reached. For instance, we may stop when all remaining variables have a significant p-value defined by some significance threshold.

3.4.3 Complete Regression Method

When the number of variables is low, the model where all possible states are included as a block is called a full regression model. In other words, it is stated that all independent variables are taken to the model at the same time considering that none of the independent variables has any superiority on each other. The number of identifier models will also be large when the number of variables is high. The time to determine the significance of the variables will increase with the increasing number of steps and cause a loss of time. In this case, other methods become more attractive. However, there are some weaknesses in these methods. For example, different models can be obtained from reduced regression methods when the model is developed with variable selection methods. Therefore, it can be said that the stepwise regression method is more preferred than the complete regression method.

3.5 Testing Model

The effectiveness of the model is as important as creating a model. There are several methods for testing model. Score test, likelihood-ratio test, Wald test are the most frequently used in statistics literature for logistic regression models.

Variable selection procedures in regression and discriminant analysis also apply to logistic regression analysis. In statistical terms, none of the algorithms can guarantee the best model. It is considered as the best approach to choose different models and choose from these models according to the criteria of interpretability, significance and theory.

3.5.1 Score Test

The score test is another test for the significance of a coefficient. The most important advantage of this test is to reduce computational effort to the other test. The score test is based on the conditional distribution theory of the derivatives of the likelihood equations. The test statistic for the score test (ST) is calculated as follows:

Another method to be used is the score test (ST). The advantage of this test is that maximum likelihood estimation is not required. Equality is calculated as in 6. In some statistics programs, likelihood testing and the calculation of the Wald test cause the absence of a score test.

$$ST = \frac{\sum_{i=1}^{n} x_i (y_i - \bar{y})}{\sqrt{y_i(1-\bar{y})} \sum_{i=1}^{n} x_i (x_i - \bar{x})^{\,2}} \qquad (6)$$

Under the hypothesis that β_1 is equal to zero, the two tailed p-value is evaluated by $P(|Z| > ST) < \infty$ -level and this test statistic has a standard normal distribution.

The general form of the Score Test is given by:

Score: $S^T(\beta_{0)}\, I^{-1}(\beta_0) s(\beta_0)$

Where,

S= the score vector

I=the information matrix

S and I are evaluated at the null hypothesized values of the parameters.

3.5.2 The Likelihood-ratio Test

A logistic regression is said to provide a better fit to the data if it demonstrates an improvement over a model with fewer predictors. This is performed using the likelihood ratio test, which compares the likelihood of the data under the full model against the likelihood of the data under a model with fewer predictors. Removing predictor variables from a model will almost always make the model fit less well (i.e. a model will have a lower log likelihood), but it is necessary to test whether the observed difference in model fit is statistically significant.

The likelihood-ratio test to assess the contribution of individual "predictors" to a given model. In the case of a single predictor model, one simply compares the deviance of the predictor model with that of the null model on a chi-square distribution with a single degree of freedom. If the predictor model has a significantly smaller deviance (c.f chi-square using the difference in degrees of freedom of the two models), then one can conclude that there is a significant association between the "predictor" and the outcome. Although some common statistical packages (e.g. SPSS) do provide likelihood ratio test statistics, without this computationally intensive test, it would be more difficult to assess the contribution of individual predictors in the multiple logistic regression case. To assess the contribution of individual predictors one can enter the predictors hierarchically, comparing each new model with the previous to determine the contribution of each predictor (Cohen al., 2002).

3.5.3 Wald Test

Wald test statistic is one of the most used tests for the significant of the coefficients for each predictive variable in logistic regression model. Wald statistic can be defined as ratio between non-standardized logistic coefficient and its standard error rate. Furthermore, this is a test that tests the null hypothesis that any logit coefficient is equal to zero. One of the assumptions for the Wald test is maximum likelihood estimations are asymptotically normal, moreover it shows a one-degree-of-freedom chi-square distribution. However, Menard (1995) concluded that the value of the Wald statistic decreased due to the growth of standard error in large coefficients. In addition to that, according to Field (2005), likelihood ratio statistic is better variable elimination criterion that Wald in terms of Wald statistic may produce unreliable results time to time.

3.5.4 Confusion Matrix

A confusion matrix is a table that is often used to describe the performance of a classification model (or "classifier") on a set of test data for which the true values are known. The confusion matrix itself is relatively simple to understand, but the related terminology can be confusing.

Given a classifier (it is the prediction model in this case) and an instance, there are four possible outcomes. If the instance is positive and it is classified as positive, it is counted as a

true positive; if it is classified as negative, it is counted as a false negative. If the instance is negative and it is classified as negative, it is counted as a true negative; if it is classified as positive, it is counted as a false positive. Given a classifier and a set of instances (the test set), a two-by-two confusion matrix (also called a contingency table) can be constructed representing the dispositions of the set of instances. This matrix forms the basis for many common metrics (Fawcett, 2005).

3.5.5 ROC Curve

To be able to visualize the performance of the multi - class classification problem, we may use AUC (Area Under The Curve) ROC (Receiver Operating Characteristics) curve. ROC curve is a performance measurement for classification problem. It shows, how much model is capable of separating classes correctly.

The trade-off at totally different thresholds between getting additional true positives at the expense of extra false positives is visualized in a ROC curve by plotting the trade-off for each possible threshold. As once estimating accuracy, this plot is obtained by building a model from a group of training data so evaluating the model against a group of test data, typically among a cross-validation process. “The output of the model for each case in the test data is then compared against each possible threshold, producing a point for each threshold in the plot. These points are plotted in a unit square, with the vertical location of the point for each threshold corresponding to the percentage of positive cases in the test data that are correctly labelled as positive when using the model at that threshold. The horizontal location of the point for each threshold is the percentage of negative cases in the test data that are incorrectly labelled as positive when using the model at that threshold. Note that this means neither axis represents possible thresholds, given this initial description, there are several characteristics of ROC curves worth nothing. All curves start in the bottom left corner, representing a threshold at which all cases are classified as negative, and end in the upper right corner, representing a threshold at which all cases are classified as positive. Curves should also always be above the diagonal, as a curve below the diagonal indicates that a model is generating more false positives than true positives.” (Fogarty et al., 2005, p. 2)

“While the information presented in a ROC curve can help a researcher choose an appropriate threshold, ROC curves are especially appealing because they allow models to be compared independently of what threshold will be used in an application. When the curve of one model is completely above the curve of another model, it is clear that the model will perform better regardless of what threshold is used. But if two curves cross, the determination of which model is better again depends on what threshold will be used. While there is no single solution to this problem in the general case, many researchers have obtained good results using the area under the ROC curve as a single measure of the quality of a model.” (Fogarty et al., 2005, p. 2)

4. Importance of Research and Methodology

4.1. Importance of Research

Main point of this study, investigating relations between job security, organizational commitment, work stress, wage, and their effects on intention of job leave. Moreover, not only these measurements, also demographic variables have been considered on modelling stage. Logistic regression have chosen as a modelling method for this research.

Employees behaviors at work are closely related to their satisfaction about job securities. Because of that job security has a crucial importance for business organizations. If the employee feels safe about future, this will increase organizational commitment and connected more to business which he/she works. As a result, intention of job leave will decrease.

There are significant changes, both economic and political problems in last 10 years in Turkey. Two major economic crisis, one coup attempt are the biggest happenings in last decade. As a result, all these negativities have an impact of business life and employee's life itself as well. Many people lost their job without consequences, many small businesses had to declare bankruptcy or at least had to decrease their production volume. Furthermore, Job security satisfaction has more importance than ever before for both employees and employers' side.

According to Jahoda who has important studies about job security, job is a source of creativity, identity and superiority. Because of that, job causes opportunities for social interactions, make people active and of course feeling of have purpose in their life.

There are several studies about intention of Job leave and relations between organizational commitment, Job stress and job security. However, most of these studies, does not include all the variables above. For example, Poyraz and Kama (2008), they examine regression between job security, job satisfaction, organizational commitment. They were not use stress as a variable. Another example, Dığın (2010) examined job security and how it can measurable regarding the variable's organizational commitment and job stress in his master thesis. Apart from these examples in this study, job security has been examined with organizational commitment, job stress, demographic variables and intention of job leave. Moreover, logistic regression method has been used for explaining depended variable. There aren't many studies, combining logistic regression method with job security topic especially when the data is taken from Turkey. In this perspective, using a different analysis method makes this study different from others.

4.2 Scope and Limitations of Research

At the stage of preparation of this study, literature from different academicians and scientists had been reviewed. Furthermore, concepts related to topic such as organizational commitment, job stress, demographic elements, intention of job leave and their relationship with job security satisfaction have been examined.

Based on this preparation, employees who has no intention of job leave also have high level of organizational commitment, job satisfaction and job security satisfaction and low level of job stress.

The scope of the study which is the relation between job security satisfaction, organizational commitment, job stress and their effect on intention of job leave. Data has taken from employees who work in Istanbul at tourism sector.

The reason why the study was carried out in hotel enterprises, one of the service sector actors; The importance of service sector in international trade is increasing day by day.

The indicator of developed economies is measured by the share of service sectors in the whole economy. Therefore, on the evaluation of the problems of the service sectors studies are rapidly increasing. (Kılıç ve Eleren, 2009, p.91). Especially in countries like Turkey.

Tourism, which is a service sector, is developing rapidly all over the world. Today, about 30% of all world trade had been accumulated by this sector alone. (Bahar, 2016, p.137).

Achieve competitive advantage in a large extent for tourism enterprises can only be possible with high quality services. Service quality concept is gaining importance every day for almost all over the world. The importance of the concept of service quality in the success of enterprises is related to the desire to create loyalty in customers for sustainable business.

Tourism sector is also a labor-intensive sector and it offers an employment-friendly structure. Therefore, it has a major role in increasing the employment of the country and solving the unemployment problem.

The reason why is this thesis scoping Istanbul as a study field, Istanbul with 15 million people is one of the biggest cities in Turkey. Tourism on Istanbul is free from seasonality and It has a mixed population structure.

As a restriction, study does not cover all tourism businesses in Turkey. Because many tourism enterprises operating in the tourism sector (accommodation, travel, transportation, leisure and catering establishments). It is not possible in terms of both money and time to reach every enterprise. Therefore, Istanbul as a non-official capital had been chosen.

In order to generalize the results obtained, increasing number of enterprises would be providing more trustable results. The same research may give different results in different regions and different businesses where the sample group is different.

4.3 Methodology

Reliability analysis have been applied to Variables have been use for study such as organizational commitment, job security satisfaction, job stress and intention of job leave. Main hypothesis tested with logistic regression analysis. Also, for the relation between variables Pearson's correlation coefficient statistic have been applied.

Main Hypothesis:

H0: Job security satisfaction, organizational commitment, job stress, gender, age, education level, marital status, job position variables cannot explain significantly intention of job leave.

H1: Job security satisfaction, organizational commitment, job stress, gender, age, education level, marital status, job position variables can explain significantly intention of job leave.

Research universe have been chosen as five-star tourism enterprises in Anatolian side of Istanbul. The reason why the research universe was chosen as the town Anatolian side of Istanbul; that the region has a more homogenous structure compared to other regions in Istanbul. There are 16 five-star hotels in chosen area. In these hotels, there are approximately 10.000 employees have been working.

Sample size has been decided according to Table 1. According to table, when the space 10.000, sample should be at least 370 for α=0,05. For better understanding for the researchers, required sample sizes according the confidence level have been given in Table 1.

Space		Confidence level 0,97			Confidence level 0,95			Confidence level 0,90	
Size	p=0,5	p=0,8	p=0,3	p=0,5	p=0,8	p=0,3	p=0,5	p=0,8	p=0,3
100	92	87	90	80	71	77	49	38	45
500	341	289	321	217	165	196	81	55	70
750	441	358	409	254	185	226	85	57	73
1000	516	406	473	278	198	244	88	58	75
2500	748	537	660	333	224	286	93	60	78
5000	880	601	760	357	234	303	94	61	79
10000	964	639	823	370	240	313	95	61	80
25000	1023	665	865	378	244	319	96	61	80
50000	1045	674	881	381	245	321	96	61	81
100000	1056	678	888	383	245	322	96	61	81
1000000	1066	682	896	384	246	323	96	61	81
100000000	1067	683	896	384	245	323	96	61	81

Table 1: Sample size according to confidence level

Source: Yazıcıoğlu ve Erdoğan, 2004, p.50

4.3.1 Data Collection

In this study, surveys have been used for data collection. Necessary information for examining relations between Job security satisfaction level, organizational commitment, job stress and intention of job leave have been gathered with online surveys. Surveys had been sent via e-mails and social media. Approximately 600-700 have been reached, however 459 answers have been received. There are no missing values or invalid responses because of the structure of survey.

In the process of preparing the questionnaire, the satisfaction of the employees' job security, to measure their organizational commitment, job stress and intention of job leave, the scales that are thought to be suitable were determined to be used in the questionnaire in order to examine the various scales developed previously.

First part of the survey related with demographic questions such as gender, age, marital status, wage, position.

Second part of the survey, model have been used crated by Probst for measuring job security satisfaction.

Third part of the survey aims to measure organizational commitment with model designed improvised by Huselid and Day (1991) with 9 questions.

Fourth part of the survey, job stress level has been measured with using House and Rizzo (1972) model.

Last part of the survey focuses on intention of job leave with model designed by Cammann (1993).

Original survey and its translation to English can be found on Index.

Answering method is important for social studies. Especially when variables have high correlation. To be able to get healthier results, in this study instead of using three points answer method, 5 points Likert scale had been chosen. Scale has fallowing rules. 1 “strongly disagree” and 5 “strongly agree”.

4.3.2 Demographic Characteristics of Participants

Table 2 shows, socio-demographic characteristics of participants.

Variables	Options	Frequency	Percentage
Gender	Man	241	52,51%
	Woman	218	47,49%
	Sum	459	100,00%
Marital status	Married	196	42,70%
	Single	258	56,21%
	Sum	459	100,00%
Age	18-25	76	16,56%
	26-30	135	29,41%
	31-35	94	20,48%
	36-40	69	15,03%
	41-45	40	8,71%
	46-50	26	5,66%
	51-55	8	1,74%
	55 and Higher	11	2,40%
	Sum	459	100,00%
Education Level	High School	64	13,94%
	Bachelor	256	55,77%
	Master	114	24,84%
	PhD	25	5,45%
	Sum	459	100,00%
Position	Manager	129	28,10%
	Normal employee	330	71,90%
	Sum	459	100,00%
Working period	Less than a year	69	15,03%
	1-3 year	138	30,07%
	4-6 year	147	32,03%
	7-9 year	76	16,56%
	10 and above	29	6,32%
	Sum	459	100,00%
Wage	1000-2000	31	6,75%
	2000-3000	59	12,85%
	3000-4000	79	17,21%
	4000-5000	111	24,18%
	5000-6000	98	21,35%
	6000-7000	40	8,71%
	7000-8000	21	4,58%
	8000 and above	20	4,36%
	Sum	459	100,00%

Table 2: Socio-demographic characteristics

Participants in this study; 52,51% (241) of them are male and 47,49% (218) of them are woman. 42,70% (196) of them are married and 56,21% (258) of them are single.

Participants in this study; 16,56% (76) of them are in age between 18-25, 29,41% (135) in age between 26-30, 20,48% (94) of them in age between 31-35, 15,03% (69) of them in age between 36-40, 8,71% (40) of them in age between 41-45, 5,66% (26) of them in age between 46-50, 1,74% (8) of them in age between 51-55 and 2,40% (11) of them in age 55 or above.

Participants in this study; 13,94% (64) of them have high school degree, 55,77% (256) of them have bachelor's degree, 24,84% (114) of them have master's degree and, 5,45% (25) of them have PhD.

Participants in this study; 28,10% (129) of them working as a manager and 71,90% (330) of them working as normal employee.

Participants in this study; 15,03% (69) of them working for same compony less than a year, 30,07% (138) of them working for same compony between 1-3 year, 32,03% (147) of them working for same compony between 4-6 year, 16,56% (76) of them working for a same compony between 8-10 year and 6,32% (29) of them working for same compony more than 10 year.

Participants in this study; 6,75% (31) of them are earning 1000-2000, 12,85% (59) of them are earning 2000-3000, 17,21% (79) of them are earning 3000-4000, 24,18% (111) of them are earning 5000-6000, 21,35% (98) of them earning 6000-7000, 4,58% (21) of them are earning 7000-8000 and 4,36% (20) of them are earning more than 8000 Turkish Liras.

4.3.3 Cronbach's Alpha Method

Internal consistency of the survey can be determined with scaling answers homogeneity. Most common way to measure it is Cronbach's alpha method.

When we measure a quantity, which is a sum of K components: $X = Y_1 + Y_2 + \ldots + Y_K$

Cronbach α can be defined as;

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K} \sigma_{Y_i}^2}{\sigma_X^2}\right) \quad (7)$$

According to Chelsea Goforth (2015) Cronbach's alpha is a measure used to assess the reliability, or internal consistency, of a set of scale or test items. In other words, the reliability of any given measurement refers to the extent to which it is a consistent measure of a concept, and Cronbach's alpha is one way of measuring the strength of that consistency.

Cronbach's alpha is computed by correlating the score for each scale item with the total score for each observation (usually individual survey respondents or test takers), and then comparing that to the variance for all individual item scores.

4.3.4 Job Security Satisfaction Scale

Scaling concepts like job security satisfaction is not easy because of the reasons mentioned at very start of this study. To be able to measure job security satisfaction scale (JSS), instead of Probst (1998) model Onder and Wasti (2002) version have been chosen. Questions in this part of the survey aim to measure job security satisfaction with considering

to employee's emotional responses as well. In that time when Probst (1998) create his model about JSS, job security scale wasn't important as much as today.

Today, Job security significantly reduced, satisfaction with job security is an independent dimension of job satisfaction, that is the opinion which is found to find support and offers in this direction. (Önder and Wasti, 2002, p.8-9).

Responding to job security satisfaction statements, instead of using three-points answer method like Önder and Wasti, five points Likert scale have been chosen.

Cronbach's alpha coefficient value have been found as 0,86 in the study have been done by Onder and Wasti. In this study, Cronbach's alpha coefficient found as 0,876 and it indicates that these answers are reliable.

4.3.5 Organizational Commitment Scale

The model has been used in this part of the survey is developed by Mowday, Steers and Porter (1979) and improved Huselid and Day (1991). Original model includes 15 questions and improved model has 9 questions. This shorter version of original model is largely consistent with original model. (Huselid ve Day, 1991, p.383).

According to previous researches, Cronbach's alpha coefficient is changing between 0,72 and 0,92 (Wahn 1998). In the other hand, if an assessment is made in terms of validity, there is a positive correlation between the level of organizational commitment and, the success of the unit he works with, the perception of the opportunities for progress level, income level and employee satisfaction about the flexibility of the work program according to Mimaroğlu (2008, p.117). Cronbach's alpha coefficient for Mimaroğlu study, found as 0,90. Therefore, Cronbach's alpha coefficient has been found as 0,9117 for this study and it shows organizational commitment scale is reliable.

4.3.6 Job stress Scale

To be able to scale Job stress, House and Rizzo (1972) 7 question model have been chosen. This scale is associated with the psychological and psychosomatic symptoms experienced by the employee at work. Scale aims to measure what are the job stress effects on personal life.

On the other hand, if an evaluation is made in terms of validity, there is a positive correlation between job stress and, role ambiguity, work-family conflict of life, family-related stress, intention to leave and poor physical health conditions.

In this study job stress scale created with five-points Likert answer method like Efeoğlu's master thesis. (Efeoğlu, 2006. p.152). Cronbach's alpha coefficient for Efeoğlu's study has been found as 0,84. For this study, it has been found as 0,82 and it shows answers for job stress scale are reliable.

4.3.7 Intention of Job Leave Scale

In order to determine the intention of job leave, Michigan organizational assessment questionnaire have been selected. Therefore, to be simplified to survey, instead of using original one 3 statements version have been chosen like Şenyüz on his PhD thesis. (Şenyüz 2003. p.51). However, five-points Likert answer method have been chosen instead of seven-point Likert.

Şenyüz have found 0,84 for Cronbach's alpha coefficient, in this study Cronbach's alpha coefficient have been found as 0,889 and this shows, answers for intention of job scale are reliable.

Table 3 shows Cronbach's alpha coefficients for four parts of the survey. All the coefficients for job security satisfaction, organizational commitments, job stress, and intention of job leave are higher than 0,8. This shows survey is reliable.

5. Analysis of Data on R

R is a free, open source software program for statistical analysis, based on the S language. It has over 4800 packages available, in its environment which belong to various repositories with specialization in various topics like econometrics, data mining. All the fallowing analysis for this study have been done in R.

Logistic regression which will gone a apply third part of this analysis, is the appropriate regression analysis to conduct when the dependent variable is dichotomous (binary). Like all regression analyses, the logistic regression is a predictive analysis. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable.

In this research, dependent variable chosen as intention of job leave. As a result, before applying analysis, intention of job leave scale should transformed to binary variable. Data for this research, collected with five-points Likert method. So, if we assign points to answers like fallowing way;

- Strongly Disagree = 1,00-1,80
- Disagree = 1,81-2,60
- Uncertain = 2,61-3,40
- Agree = 3,41-4,20
- Strongly Agree = 4,21- 5,00

Points on scale are distributed between 1,00 and 5,00. When points are reaching 5,00 high intention of job leave occurs. When points reaching 1,00, we can say that there is no intention of job leave. As a result, data set can be modified with fallowing rules. 1,00-2,60 interval indicates “0”, no intention of job leave. 3,41-5,00 interval indicates “1”, there is an intention of job leave. Moreover, interval 2,61-3,40 indicates employees who are not sure at the moment survey have been done.

After calculations, 136 “uncertain” employees have been removed from data set and continued with 391 participants.

5.1 Reliability of Answers

First part of the analyses, reliability of answers which are gathered from survey have tested. There are many ways of calculating Cronbach’s alpha in R using a variety of different packages. In this thesis “psy” package have been used and values in Table 3 were calculated.

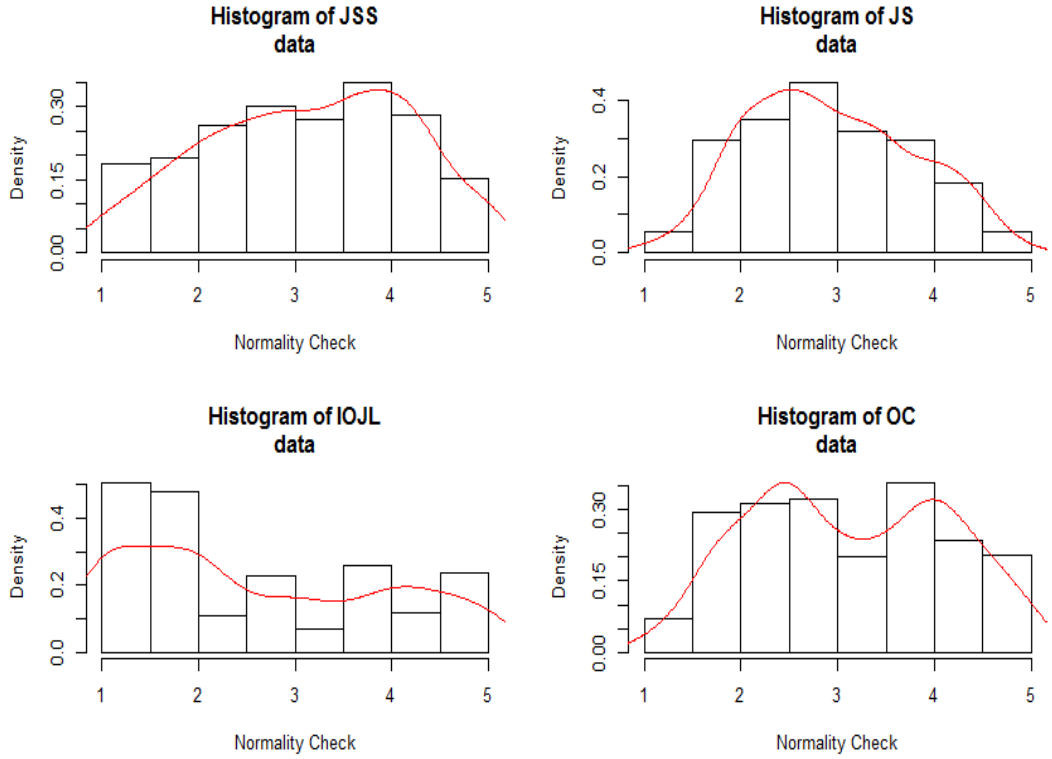
Variables	Components	Cronbach's Alpha
Job Security Satisfaction	6	0,876
Organizational Commitment	9	0,9117
Job Stress	7	0,82
Intention of Job Leave	3	0,889

Table 3: Cronbach's alpha values for variables

5.2 Normality Test and Correlation Between Variables

Second part of the analyses, relation between variables have examined. Even though there is not normality assumption for logistic regression, normality has been checked for applying correct correlation test. Understanding correlation between variables can help us to make comment in future results.

To be able to examine correlation between variables there are many methods. One of the assumptions for most parametric tests to be reliable is that the data is approximately normally distributed. The normal distribution peaks in the middle and is symmetrical about the mean. Data does not need to be perfectly normally distributed for the tests to be reliable.



Graph 1: Histogram for variables

Graph 1 shows histogram plots for interested variables; job security satisfaction, job stress, intention of job leave and organizational commitment.

According to graphs, except job stress scale, it can be easily seeing that data is not normally distributed. However, normality should have tested not only visually, also numerically as well. In R, it can be done with many different methods. For this study "nortest" package have been used and Anderson-Darling Normality Test applied for the all 4 scale.

We use normality tests when we want to understand whether a given sample set of continuous (variable) data could have come from the Gaussian distribution (also called the normal distribution). Normality tests are a form of hypothesis test, which is used to make an inference about the population from which we have collected a sample of data. There are several normality tests available for R. All these tests fundamentally assess the below hypotheses. The first of these is called a null hypothesis – which states that there is no difference between this data set and the normal distribution. Rajesh Sampathkumar (2015).

Null Hypothesis: No observable difference between data and normal distribution

Alternative Hypothesis: Clear observable difference between data and normal distribution.

Variable	P value <
Organizational Commitment Scale	1,59E-07
Job Security satisfaction Scale	7,25E-05
Job Stress Scale	2,20E-16
Intention of Job Leave Scale	1,77E-09

Table 4: p values for variables

Null hypothesis rejected for all 4 variables. There is an observable difference between data and normal distribution.

Due to the fact that the data obtained in the research did not show normal distribution, non-parametric test methods for determining the differences between variables Spearman Correlation Test was used.

Spearman Correlation

The Spearman correlation method derive the correlation between the rank of x and the rank of y variables.

$$\rho = \frac{\sum(x' - m_x)(y' - m_y)}{\sqrt{\sum(x' - m_x)^2}\sqrt{\sum(y' - m_y)^2}} \quad (8)$$

Where $x' = rank(x)$ and $y' = rank(y)$.

In R "ggpubr" package have been used for calculating spearman correlation.

Variables	1	2	3	4
(1) Job Security Satisfaction	1			
(2) Organizational Commitment	0,716**	1		
(3) Job Stress	-0,433**	-0,3281**	1	
(4) Intention of Job Leave	-0,653*	-0,6613**	0,5701*	1

Table 5 :Correlation Coefficients

*p < 0,05 significant level

**p < 0,01 significant level

Correlation is a bivariate analysis that measures the strength of association between two variables and the direction of the relationship. In terms of the strength of relationship, the value of the correlation coefficient varies between +1 and -1. A value of ± 1 indicates a perfect degree of association between the two variables. As the correlation coefficient value goes towards 0, the relationship between the two variables will be weaker. Cheung, M. W. -L., & Chan, W. (2004).

There is a positive and almost strong relation between job security satisfaction and organizational commitment (Table 5). R= 0,716 indicates that positive and because the "R" is higher than 0,7 we may say that "strong" relation between variables. Moreover, p < 0,01 indicates that correlation is meaningful.

According to Ashford, Lee and Bobko (1989), decrease in job security satisfaction causing less organizational commitment from employee perspective. High organizational commitment level, only possible with increasing job security satisfaction (Seçer,2008 p.291).

The findings of the research results support the literature.

Correlation coefficient -0,433 indicates a negative and medium-level relationship between job security scale and job stress scale (Table 5). Also, p- value is lower than 0,01 shows correlation is significantly meaningful.

Job insecurity is considered as a stress creative factor in this literature. According to report from World Health Organization and International Labor Organization, job insecurity is one of the reasons for job stress (Seçer, 2008, p.272). Önder and Wasti (2002) says, in Turkey, there is a statistically meaningful relation between job security job security satisfaction and job stress. Moreover, employees who have low level of job security have higher job stress. The result obtained from this research verifies that job insecurity is a creative factor for job stress.

Correlation coefficient for job security satisfaction and intention of job leave found as a -0,653. P value is significantly meaningful when α value chosen as 0,05 (Table 6). -0653 indicates there is negative and almost strong relation between job security satisfaction and intention of job leave.

According to a Kinnunen (2000, p,456), job security satisfaction has effect on both staying in the same job or searching for different options. There is negative relation between job security satisfaction and staying in same job (Davy, 1997, p.343). In research from Poyraz and Kama (2008, p.158), this relation describes as negative and low-level correlation between job security satisfaction and intention of job leave. In a summary, if employee doesn't happy with his/her job satisfaction level, he/she would search new opportunities, and this would increase

to intention of leave. From this perspective, results obtained from this research verifies the general literature.

Correlation coefficient -0,6613 indicates a negative and strong relationship between organizational commitment scale and intention of job leave scale (Table 5). Also, p- value is lower than 0,01 shows correlation is significantly meaningful.

The results of research's on organizational commitment found a negative relation with absenteeism and intention to quit. According to Stumpf and Hartman (1994), organizational commitment is statistically meaningful as an explanatory variable for intention of job leave (Azaklı, 2011, p.85). Employees who are dedicated to the organization generally have a strong desire to stay in organization and contributes to objectives of organization. There is a consistent and negative relation between organizational commitment and intention of job leave (Balcı, 2003, p.30). Therefore, results obtained from this research verifies the literature.

Correlation coefficient 0,5701 indicates positive and medium-level relationship between job stress scale and intention of job leave scale (Table 5). Also, p- value is lower than 0,05 shows correlation is significantly meaningful.

In the studies on the subject, low-level job stress affects success in a positive direction. Employees who has some specific tasks like requires creativity, can use stress positively. However, increase on stress level especially in management roles may cause psychological destruction and it will affect health also organizational success. In addition, stress is the most important reason for the transfer of labor and absenteeism (Sabuncuoğlu, 2003, p.240.). Results gained from this study verifies the literature.

5.3 Logistic Regression in R

In this part of the thesis, logistic regression model have been created for explaining intention of job leave (binary version) with explanatory variables; job security satisfaction scale, organizational commitment scale, job stress scale, gender, marital status, position, wage and age.

Logistic regression analysis, especially in the field of social sciences is a common method. Thanks to its nature, yes-no, negative-positive, successful-unsuccessful type of variables can be modelled with logistic regression method.

R is great tool for fitting models. Function to be called for fitting process is glm(). Fitting process in background is not so different from linear regression. This function stands for Generalized Linear Model. Moreover, logistic regression itself is part of this larger class of algorithms. Nelder and Wedderburn (1972) proposed this model with an effort to provide a means of using linear regression to the problems which were not directly suited for application of linear regression.

$g(E(y)) = \alpha + \beta x_1 + y_{x2}$	(9)

Equation 9 indicates fundamental of generalized linear model. g() Is the link function where $E(y)$ is the expectation and $\alpha + \beta x_1 + y_{x2}$ is the linear predictor. Link function allows "link" between expectation and linear predictor.

Before starting to analysis these important points should be mentioned;

- Generalized linear model does not assume linear relationship between dependent and explanatory variables, yet, it does assume a linear relation between explanatory variables and link function in logistic model.
- Maximum Likelihood Estimation (MLE) is the method for parameter estimation, instead of Ordinary Least Square (OLS) method.
- Dependent variable doesn't have to be normally distributed.
- Residuals (error terms) need to be independent, however doesn't have to be normally distributed.

Table 6 shows what type of variables have used on logistic regression model.

Variables	Catagory	Value	Variables	Catagory	Value
Gender	Man Woman	Catagorical	Working Time	<1 1-3 year 4-6 year 7-9 year >10	Catagorical
Age	18-25	Catagorical			
	26-30				
	31-35				
	36-40		Wage	1000-2000	Catagorical
	41-45			2000-3000	
	46-50			3000-4000	
	51-55			4000-5000	
	55 and above			5000-6000	
Education Level	High School Bachelor Master PhD	Catagorical		6000-7000	
				7000-8000	
				>8000	
Marital Status	Single	Catagorical	Position	Manager Employee	Catagorical
	Married				
Job Security Sati.	1-5	Scale	Organizational Commitment	1-5	Scale
Job Stress	1-5	Scale	Intention of Job Leave	Binary	Scale

Table 6: Variables have used on logistic regression model

5.3.1 Model creation

Model 1 have created with every variable in survey. There are no missing values because of survey structure. (It is not possible to continue for next question without answering current question).

```
> model1 = glm(Job_Leave_Log ~.,data=Test_data,family=binomial(link='logit'))
> summary(model1)

Call:
glm(formula = Job_Leave_Log ~ ., family = binomial(link = "logit"),
    data = Test_data)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.3344  -0.1996  -0.0255   0.0909   3.6584

Coefficients:
                              Estimate Std. Error z value Pr(>|z|)
(Intercept)                    2.33574    1.81152   1.289 0.197265
GenderWoman                    0.79122    0.50711   1.560 0.118698
Age26-30                      -0.13503    0.87929  -0.154 0.877951
Age31-35                       0.76511    1.03164   0.742 0.458304
Age36-40                      -0.12574    1.19718  -0.105 0.916352
Age41-45                      -0.78600    1.82897  -0.430 0.667377
Age46-50                       0.61755    1.62540   0.380 0.703994
Age51-55                     -11.04877 1963.84366  -0.006 0.995511
Age55 and above              -14.44131 1540.45079  -0.009 0.992520
Educational_LevelHigh School  -0.50512    0.82898  -0.609 0.542308
Educational_LevelMaster        0.05316    0.61101   0.087 0.930667
Educational_LevelPhD          -0.25478    2.17019  -0.117 0.906542
Marital_StatusSingle           0.86215    0.59061   1.460 0.144353
Working_Time10 and above      -2.28539    1.93068  -1.184 0.236524
Working_Time4-6 year          -0.29813    0.64989  -0.459 0.646426
Working_Time7-9 year          -1.68761    1.14031  -1.480 0.138885
Working_TimeLess than a year  -1.32110    0.93761  -1.409 0.158835
Wage2000-3000                 -1.35215    1.12918  -1.197 0.231127
Wage3000-4000                 -3.99194    1.33407  -2.992 0.002769 **
Wage4000-5000                 -4.63892    1.39788  -3.319 0.000905 ***
Wage5000-6000                 -7.03678    1.69064  -4.162 3.15e-05 ***
Wage6000-7000                 -4.84826    1.88087  -2.578 0.009947 **
Wage7000-8000                 -2.76164    1.90747  -1.448 0.147672
Wage8000 and above            -7.46375    3.34416  -2.232 0.025623 *
PositionManager                1.51103    0.73466   2.057 0.039708 *
Job_Security_Satisfaction     -0.69955    0.32527  -2.151 0.031499 *
Organizational_Commitment     -1.98092    0.38644  -5.126 2.96e-07 ***
Job_Stress                     2.71724    0.42073   6.458 1.06e-10 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 510.09  on 390  degrees of freedom
Residual deviance: 139.01  on 363  degrees of freedom
AIC: 195.01

Number of Fisher Scoring iterations: 17
```

Figure 2: Model 1 output from R

Figure 2 shows summary of the logistic regression model with all chosen variables; intention of job leave (binary), organizational commitment, job stress, job security satisfaction, age, gender, working time, educational level and marital status. As it can be seen from the out of model, not all variables are statistically significant for explaining intention of job leave.

Variables wage_4000-5000, wage_5000-6000, organizational commitment and job stress are statistically significant with highest possible level.

Variables wage_3000-4000 and wage_6000-7000 are statistically significant when α = 0,001.

Variables wage_8000_and_above, position_manager and job security satisfaction are statistically significant when α = 0,01.

5.3.2 Testing model

As mentioned in theoretical part of this study, stepwise regression is a common approach for creating a subset of variables from a complex model. Basically, stepwise is a procedure which examines the impact of each variable to model one variable at a time. In next step, both ways stepwise regression have applied to model.

```
> smodel1<-step(model1, direction = "both")
Start:  AIC=195.01
Job_Leave_Log ~ Gender + Age + Educational_Level + Marital_Status +
    Working_Time + Wage + Position + Job_Security_Satisfaction +
    Organizational_Commitment + Job_Stress

                            Df Deviance    AIC
- Age                        7   142.59 184.59
- Educational_Level          3   139.46 189.46
- Working_Time               4   143.72 191.72
<none>                           139.01 195.01
- Marital_Status             1   141.19 195.19
- Gender                     1   141.49 195.49
- Position                   1   143.54 197.54
- Job_Security_Satisfaction  1   143.66 197.66
- Wage                       7   174.66 216.66
- Organizational_Commitment  1   174.55 228.55
- Job_Stress                 1   217.95 271.95

Step:  AIC=184.59
Job_Leave_Log ~ Gender + Educational_Level + Marital_Status +
    Working_Time + Wage + Position + Job_Security_Satisfaction +
    Organizational_Commitment + Job_Stress

                            Df Deviance    AIC
- Educational_Level          3   142.91 178.91
- Working_Time               4   148.49 182.49
<none>                           142.59 184.59
- Marital_Status             1   145.47 185.47
- Gender                     1   145.70 185.70
- Position                   1   147.10 187.10
- Job_Security_Satisfaction  1   147.50 187.50
+ Age                        7   139.01 195.01
- Wage                       7   177.77 205.77
- Organizational_Commitment  1   177.16 217.16
- Job_Stress                 1   221.62 261.62

Step:  AIC=178.91
Job_Leave_Log ~ Gender + Marital_Status + Working_Time + Wage +
    Position + Job_Security_Satisfaction + Organizational_Commitment +
    Job_Stress

                            Df Deviance    AIC
<none>                           142.91 178.91
- Working_Time               4   151.02 179.02
- Marital_Status             1   146.09 180.09
- Gender                     1   146.23 180.23
- Position                   1   147.59 181.59
- Job_Security_Satisfaction  1   147.66 181.66
+ Educational_Level          3   142.59 184.59
+ Age                        7   139.46 189.46
- Wage                       7   181.19 203.19
- Organizational_Commitment  1   178.20 212.20
- Job_Stress                 1   222.92 256.92
```

Figure 3: Stepwise output from R

Figure 3 shows stepwise iterations with both direction results. Model 2 have created according to Akaike Information Criterion (AIC) values. AIC is useful when comparing model options. AIC is basically maximum likelihood estimate which penalizes to prevent overfitting. Lower AIC is better for the model.

```
> summary(model2)

Call:
glm(formula = Job_Leave_Log ~ Gender + Marital_Status + Working_Time +
    Wage + Position + Job_Security_Satisfaction + Organizational_Commitment +
    Job_Stress, family = binomial(link = "logit"), data = Test_data)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.3277  -0.2356  -0.0379   0.0912   3.7243

Coefficients:
                              Estimate Std. Error z value Pr(>|z|)
(Intercept)                     1.7537     1.5300   1.146 0.251712
GenderWoman                     0.8498     0.4717   1.801 0.071647 .
Marital_StatusSingle            0.9179     0.5232   1.754 0.079388 .
Working_Time10 and above       -2.2847     1.3312  -1.716 0.086127 .
Working_Time4-6 year           -0.1959     0.6001  -0.326 0.744102
Working_Time7-9 year           -1.7050     1.0451  -1.631 0.102819
Working_TimeLess than a year   -1.4395     0.7793  -1.847 0.064733 .
Wage2000-3000                  -1.1185     0.9996  -1.119 0.263186
Wage3000-4000                  -3.5859     1.1539  -3.108 0.001885 **
Wage4000-5000                  -4.0616     1.1492  -3.534 0.000409 ***
Wage5000-6000                  -6.3680     1.4455  -4.405 1.06e-05 ***
Wage6000-7000                  -4.3342     1.4795  -2.930 0.003395 **
Wage7000-8000                  -2.6113     1.6521  -1.581 0.113968
Wage8000 and above             -6.6344     3.5788  -1.854 0.063765 .
PositionManager                 1.4769     0.7031   2.101 0.035678 *
Job_Security_Satisfaction      -0.6713     0.3111  -2.158 0.030931 *
Organizational_Commitment      -1.8983     0.3700  -5.131 2.88e-07 ***
Job_Stress                      2.6539     0.4015   6.610 3.85e-11 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 510.09  on 390  degrees of freedom
Residual deviance: 142.91  on 373  degrees of freedom
AIC: 178.91

Number of Fisher Scoring iterations: 8
```

Figure 4: Model 2 output from R

Figure 4 shows summary of logistic regression model with updated variables according to stepwise regression method. After removing variables that cannot contribute to model significantly, model 2 have created.

One of the best performance measures of the model is ROC curve which is explained detailly in part 3. However, to be able to create ROC curve we should split data as “training set” and “test set”. Main reason of this, avoid the effecting results by using same data which have been used create the model as test data. Splitting ratio can be change according to dataset.

For this part of study data set was split into two parts by the ratio 0,7 as the training set and 0,3 as a test set. This means, randomly selected 293 cases goes into a training set and to make prediction of 98 cases goes to the test set.

Figure 5 shows summary of training and test sets.

```
> summary(training_set)
    Gender              Age            Educational_Level  Marital_Status     Working_Time          Wage              Position
 Length:293         Length:293         Length:293         Length:293         Length:293         Length:293         Length:293
 Class :character   Class :character   Class :character   Class :character   Class :character   Class :character   Class :character
 Mode  :character   Mode  :character   Mode  :character   Mode  :character   Mode  :character   Mode  :character   Mode  :character


 Job_Security_Satisfaction Organizational_Commitment   Job_Stress    Job_Leave_Log
 Min.   :1.000             Min.   :1.000             Min.   :1.000   Min.   :0.0000
 1st Qu.:2.333             1st Qu.:2.333             1st Qu.:2.286   1st Qu.:0.0000
 Median :3.167             Median :3.000             Median :2.857   Median :0.0000
 Mean   :3.114             Mean   :3.093             Mean   :2.922   Mean   :0.3584
 3rd Qu.:4.000             3rd Qu.:4.000             3rd Qu.:3.571   3rd Qu.:1.0000
 Max.   :5.000             Max.   :5.000             Max.   :5.000   Max.   :1.0000
> summary(test_set)
    Gender              Age            Educational_Level  Marital_Status     Working_Time          Wage              Position
 Length:98          Length:98          Length:98          Length:98          Length:98          Length:98          Length:98
 Class :character   Class :character   Class :character   Class :character   Class :character   Class :character   Class :character
 Mode  :character   Mode  :character   Mode  :character   Mode  :character   Mode  :character   Mode  :character   Mode  :character


 Job_Security_Satisfaction Organizational_Commitment   Job_Stress    Job_Leave_Log
 Min.   :1.000             Min.   :1.000             Min.   :1.286   Min.   :0.0000
 1st Qu.:2.333             1st Qu.:2.333             1st Qu.:2.286   1st Qu.:0.0000
 Median :3.417             Median :3.389             Median :2.857   Median :0.0000
 Mean   :3.211             Mean   :3.246             Mean   :2.940   Mean   :0.3571
 3rd Qu.:4.167             3rd Qu.:4.111             3rd Qu.:3.571   3rd Qu.:1.0000
 Max.   :5.000             Max.   :5.000             Max.   :4.714   Max.   :1.0000
```

Figure 5: Training and Test set summary

Now we can create our model from training set with glm function. Important point, splitting data set may cause decrease efficiency in the model.

Figure 6 shows summary of logistic regression model created from training set.

```
> summary(Training_model1)

Call:
glm(formula = Job_Leave_Log ~ ., family = binomial(link = "logit"),
    data = training_set)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-2.1826  -0.0884  -0.0019   0.0395   3.3058

Coefficients:
                              Estimate Std. Error z value Pr(>|z|)
(Intercept)                    4.72590    2.66768   1.772 0.076471 .
GenderWoman                    1.34145    0.80152   1.674 0.094206 .
Age26-30                      -0.31979    1.34546  -0.238 0.812129
Age31-35                       0.68334    1.56862   0.436 0.663106
Age36-40                      -0.90358    1.57349  -0.574 0.565795
Age41-45                      -2.91116    2.56068  -1.137 0.255593
Age46-50                      -0.05882    2.22151  -0.026 0.978876
Age51-55                      -6.90024 2671.89154  -0.003 0.997939
Age55 and above              -14.81687 1727.15867  -0.009 0.993155
Educational_LevelHigh School  -1.04058    1.26025  -0.826 0.408977
Educational_LevelMaster       -1.09705    0.97116  -1.130 0.258632
Educational_LevelPhD          -0.09574    3.65189  -0.026 0.979084
Marital_StatusSingle           0.38531    0.81509   0.473 0.636416
Working_Time10 and above      -3.15458    2.34307  -1.346 0.178191
Working_Time4-6 year           0.62998    0.90716   0.694 0.487396
Working_Time7-9 year          -1.06053    1.44269  -0.735 0.462277
Working_TimeLess than a year  -2.33590    1.45821  -1.602 0.109178
Wage2000-3000                 -2.97625    1.67704  -1.775 0.075948 .
Wage3000-4000                 -7.03790    2.12604  -3.310 0.000932 ***
Wage4000-5000                 -6.98369    2.08077  -3.356 0.000790 ***
Wage5000-6000                -13.27132    3.49006  -3.803 0.000143 ***
Wage6000-7000                 -5.84665    2.53600  -2.305 0.021141 *
Wage7000-8000                 -2.63471    2.60982  -1.010 0.312717
Wage8000 and above           -10.57564    5.03767  -2.099 0.035789 *
PositionManager                0.11767    1.37909   0.085 0.932004
Job_Security_Satisfaction     -0.71447    0.46691  -1.530 0.125961
Organizational_Commitment     -3.25391    0.77085  -4.221 2.43e-05 ***
Job_Stress                     4.05813    0.80820   5.021 5.14e-07 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 382.347  on 292  degrees of freedom
Residual deviance:  77.559  on 265  degrees of freedom
AIC: 133.56

Number of Fisher Scoring iterations: 17
```

Figure 6: Summary of Training Model 1

As it can be seen from the Figure 6, there are different significant variables comparing to model 1. For improving model, second step will be stepwise method.

```
Step:  AIC=119.84
Job_Leave_Log ~ Gender + Marital_Status + Working_Time + Wage +
    Position + Job_Security_Satisfaction + Organizational_Commitment +
    Job_Stress

                            Df Deviance    AIC
- Position                   1   83.874 117.87
- Marital_Status             1   84.982 118.98
<none>                           83.838 119.84
- Job_Security_Satisfaction  1   86.668 120.67
- Gender                     1   87.733 121.73
- Working_Time               4   93.857 121.86
+ Educational_Level          3   82.190 124.19
+ Age                        7   79.536 129.54
- Wage                       7  128.715 150.72
- Organizational_Commitment  1  118.567 152.57
- Job_Stress                 1  161.607 195.61

Step:  AIC=117.87
Job_Leave_Log ~ Gender + Marital_Status + Working_Time + Wage +
    Job_Security_Satisfaction + Organizational_Commitment + Job_Stress

                            Df Deviance    AIC
- Marital_Status             1   85.086 117.09
<none>                           83.874 117.87
- Job_Security_Satisfaction  1   86.671 118.67
+ Position                   1   83.838 119.84
- Working_Time               4   93.871 119.87
- Gender                     1   87.940 119.94
+ Educational_Level          3   82.215 122.22
+ Age                        7   79.602 127.60
- Wage                       7  128.778 148.78
- Organizational_Commitment  1  118.593 150.59
- Job_Stress                 1  162.161 194.16

Step:  AIC=117.09
Job_Leave_Log ~ Gender + Working_Time + Wage + Job_Security_Satisfaction +
    Organizational_Commitment + Job_Stress

                            Df Deviance    AIC
<none>                           85.086 117.09
+ Marital_Status             1   83.874 117.87
- Job_Security_Satisfaction  1   88.160 118.16
- Gender                     1   88.432 118.43
+ Position                   1   84.982 118.98
- Working_Time               4   96.440 120.44
+ Educational_Level          3   82.967 120.97
+ Age                        7   80.164 126.16
- Wage                       7  129.091 147.09
- Organizational_Commitment  1  119.968 149.97
- Job_Stress                 1  163.850 193.85
```

Figure 7: Stepwise steps for Training Model 1

According to AIC values, optimum selection can be seen from Figure 7. New model have been created with variables, Gender, Marital Status, Wage, Organizational Commitment and Job Stress.

```
> summary(Training_model2)

Call:
glm(formula = Job_Leave_Log ~ Gender + Marital_Status + Wage +
    Organizational_Commitment + Job_Stress, family = binomial(link = "logit"),
    data = training_set)

Deviance Residuals:
     Min        1Q    Median        3Q       Max
-1.93937  -0.12890  -0.01803   0.07223   2.78380

Coefficients:
                          Estimate Std. Error z value Pr(>|z|)
(Intercept)               -0.3793     1.6349  -0.232  0.81655
GenderWoman                1.1879     0.5593   2.124  0.03368 *
Marital_StatusSingle       1.0487     0.6014   1.744  0.08121 .
Wage2000-3000             -0.6779     1.1368  -0.596  0.55098
Wage3000-4000             -3.0814     1.1986  -2.571  0.01015 *
Wage4000-5000             -3.1879     1.0932  -2.916  0.00354 **
Wage5000-6000             -7.8579     1.9814  -3.966 7.31e-05 ***
Wage6000-7000             -3.3587     1.3430  -2.501  0.01239 *
Wage7000-8000             -1.5257     1.3695  -1.114  0.26527
Wage8000 and above        -5.4599     2.6772  -2.039  0.04141 *
Organizational_Commitment -2.8949     0.4981  -5.812 6.17e-09 ***
Job_Stress                 3.2581     0.5603   5.814 6.08e-09 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 382.347  on 292  degrees of freedom
Residual deviance:  97.853  on 281  degrees of freedom
AIC: 121.85

Number of Fisher Scoring iterations: 8
```

Figure 8: Summary for Training Model 2

Figure 8 shows summary of Training Model 2. After stepwise iterations optimum model for training set have been created. To be able to see its efficiency confusion matrix and according to accuracy ROC curve has been created with test data set.

```
> auc <- performance(pr, measure = "auc")
> auc <- auc@y.values
> auc
[[1]]
[1] 0.9396825

> cm

    FALSE TRUE
  0    58    5
  1     9   26
```

Figure 9: Confusion Matrix and Accuracy

Confusion matrix in Figure 9 shows the result of predictions obtained from Training Model 2 with test set. According to Figure 9, model has prediction accuracy 0,9396. This means 93% of cases in the test set predicted correctly with respective dependent variable intention of job leave.

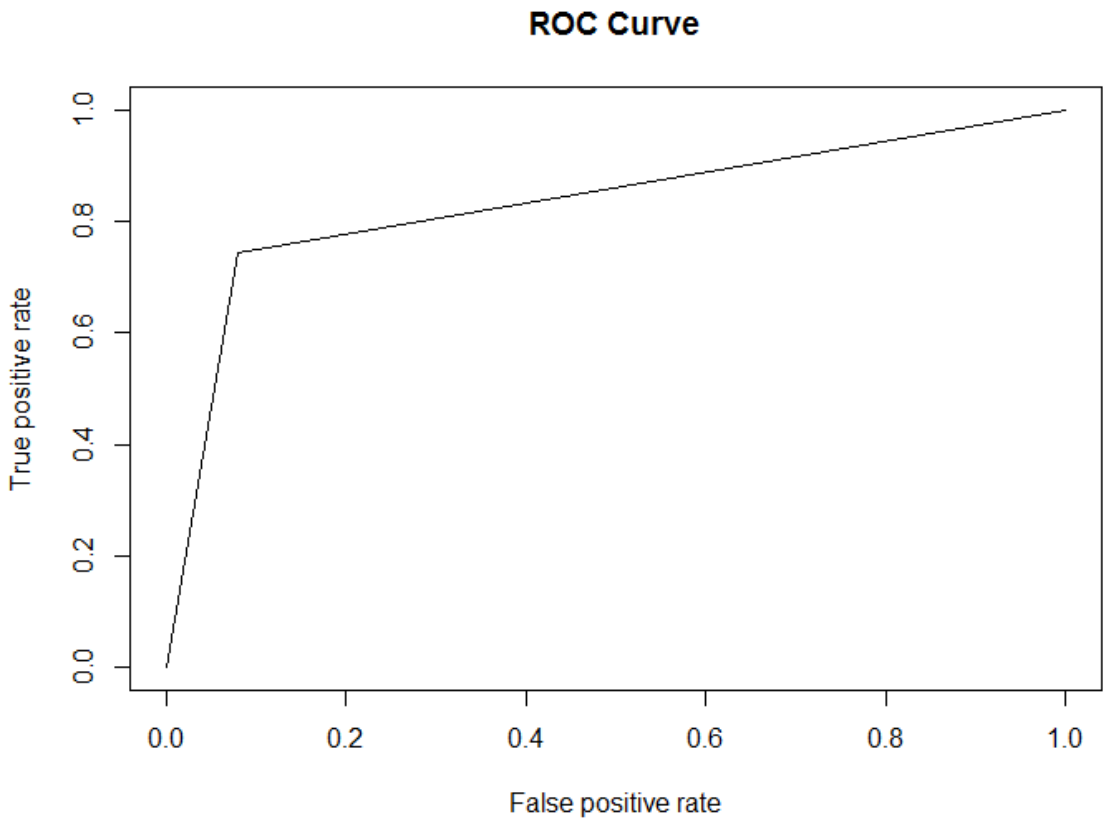


Figure 10: ROC Curve

Figure 10 shows ROC curve for testing model 2. An excellent model has AUC near to the 1 which means it has good measure of separability and a poor model has AUC near to the 0 which means it has worst measure of separability. Thanks to high accuracy testing model 2 is highly efficient.

Even though testing model 2 has a high accuracy some of the information has been sacrificed while splitting the data. If we compare testing model 2 and model 2, it can be seen that coefficients changed significantly and some of the significant variables in model 2 are not included in testing model 2.

```
> summary(model2)

Call:
glm(formula = Job_Leave_Log ~ Gender + Marital_Status + Working_Time +
    Wage + Position + Job_Security_Satisfaction + Organizational_Commitment +
    Job_Stress, family = binomial(link = "logit"), data = Test_data)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.3277  -0.2356  -0.0379   0.0912   3.7243

Coefficients:
                              Estimate Std. Error z value Pr(>|z|)
(Intercept)                    1.7537     1.5300   1.146 0.251712
GenderWoman                    0.8498     0.4717   1.801 0.071647 .
Marital_StatusSingle           0.9179     0.5232   1.754 0.079388 .
Working_Time10 and above      -2.2847     1.3312  -1.716 0.086127 .
Working_Time4-6 year          -0.1959     0.6001  -0.326 0.744102
Working_Time7-9 year          -1.7050     1.0451  -1.631 0.102819
Working_TimeLess than a year  -1.4395     0.7793  -1.847 0.064733 .
Wage2000-3000                 -1.1185     0.9996  -1.119 0.263186
Wage3000-4000                 -3.5859     1.1539  -3.108 0.001885 **
Wage4000-5000                 -4.0616     1.1492  -3.534 0.000409 ***
Wage5000-6000                 -6.3680     1.4455  -4.405 1.06e-05 ***
Wage6000-7000                 -4.3342     1.4795  -2.930 0.003395 **
Wage7000-8000                 -2.6113     1.6521  -1.581 0.113968
Wage8000 and above            -6.6344     3.5788  -1.854 0.063765 .
PositionManager                1.4769     0.7031   2.101 0.035678 *
Job_Security_Satisfaction     -0.6713     0.3111  -2.158 0.030931 *
Organizational_Commitment     -1.8983     0.3700  -5.131 2.88e-07 ***
Job_Stress                     2.6539     0.4015   6.610 3.85e-11 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 510.09  on 390  degrees of freedom
Residual deviance: 142.91  on 373  degrees of freedom
AIC: 178.91

Number of Fisher Scoring iterations: 8
```

```
> summary(Training_model2)

Call:
glm(formula = Job_Leave_Log ~ Gender + Marital_Status + Wage +
    Organizational_Commitment + Job_Stress, family = binomial(link = "logit"),
    data = training_set)

Deviance Residuals:
     Min        1Q    Median        3Q       Max
-1.93937  -0.12890  -0.01803   0.07223   2.78380

Coefficients:
                           Estimate Std. Error z value Pr(>|z|)
(Intercept)                -0.3793     1.6349  -0.232  0.81655
GenderWoman                 1.1879     0.5593   2.124  0.03368 *
Marital_Statussingle        1.0487     0.6014   1.744  0.08121 .
Wage2000-3000              -0.6779     1.1368  -0.596  0.55098
Wage3000-4000              -3.0814     1.1986  -2.571  0.01015 *
Wage4000-5000              -3.1879     1.0932  -2.916  0.00354 **
Wage5000-6000              -7.8579     1.9814  -3.966 7.31e-05 ***
Wage6000-7000              -3.3587     1.3430  -2.501  0.01239 *
Wage7000-8000              -1.5257     1.3695  -1.114  0.26527
Wage8000 and above         -5.4599     2.6772  -2.039  0.04141 *
Organizational_Commitment  -2.8949     0.4981  -5.812 6.17e-09 ***
Job_Stress                  3.2581     0.5603   5.814 6.08e-09 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 382.347  on 292  degrees of freedom
Residual deviance:  97.853  on 281  degrees of freedom
AIC: 121.85

Number of Fisher Scoring iterations: 8
```

Figure 11: Comparison of Model 2 and Training Model 2

Since data is limited with only 391 participants, sacrificing data for testing an efficiency of model is not the best approach. Different test methods rather than ROC Curve are possible for model 2. In this way, without losing information model can be tested. Figure 12 shows likelihood ratio test for model 2.

```
> anova(model2, test = "LRT")
Analysis of Deviance Table

Model: binomial, link: logit

Response: Job_Leave_Log

Terms added sequentially (first to last)


                          Df Deviance Resid. Df Resid. Dev  Pr(>Chi)
NULL                                        390     510.09
Gender                     1   11.118       389     498.97  0.000855 ***
Marital_Status             1   42.245       388     456.73 8.054e-11 ***
Working_Time               4   46.586       384     410.14 1.860e-09 ***
Wage                       7   35.934       377     374.21 7.459e-06 ***
Position                   1    1.112       376     373.10  0.291726
Job_Security_Satisfaction  1  125.106       375     247.99 < 2.2e-16 ***
Organizational_Commitment  1   25.072       374     222.92 5.523e-07 ***
Job_Stress                 1   80.007       373     142.91 < 2.2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
>
```

Figure 12: Likelihood Ratio Test output from R

According to Figure 12, except position variable all variables are statistically significant. Removing insignificant variables increased AIC value significantly. Because of that, model 2 was accepted as final model.

```
> summary(model2)

Call:
glm(formula = Job_Leave_Log ~ Gender + Marital_Status + Working_Time +
    Wage + Position + Job_Security_Satisfaction + Organizational_Commitment +
    Job_Stress, family = binomial(link = "logit"), data = Test_data)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.3277  -0.2356  -0.0379   0.0912   3.7243

Coefficients:
                              Estimate Std. Error z value Pr(>|z|)
(Intercept)                     1.7537     1.5300   1.146 0.251712
GenderWoman                     0.8498     0.4717   1.801 0.071647 .
Marital_StatusSingle            0.9179     0.5232   1.754 0.079388 .
Working_Time10 and above       -2.2847     1.3312  -1.716 0.086127 .
Working_Time4-6 year           -0.1959     0.6001  -0.326 0.744102
Working_Time7-9 year           -1.7050     1.0451  -1.631 0.102819
Working_TimeLess than a year   -1.4395     0.7793  -1.847 0.064733 .
Wage2000-3000                  -1.1185     0.9996  -1.119 0.263186
Wage3000-4000                  -3.5859     1.1539  -3.108 0.001885 **
Wage4000-5000                  -4.0616     1.1492  -3.534 0.000409 ***
Wage5000-6000                  -6.3680     1.4455  -4.405 1.06e-05 ***
Wage6000-7000                  -4.3342     1.4795  -2.930 0.003395 **
Wage7000-8000                  -2.6113     1.6521  -1.581 0.113968
Wage8000 and above             -6.6344     3.5788  -1.854 0.063765 .
PositionManager                 1.4769     0.7031   2.101 0.035678 *
Job_Security_Satisfaction      -0.6713     0.3111  -2.158 0.030931 *
Organizational_Commitment      -1.8983     0.3700  -5.131 2.88e-07 ***
Job_Stress                      2.6539     0.4015   6.610 3.85e-11 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 510.09  on 390  degrees of freedom
Residual deviance: 142.91  on 373  degrees of freedom
AIC: 178.91

Number of Fisher Scoring iterations: 8
```

Figure 13: Summary of Model 2

According to summary output for model 2;

Variables wage_4000-5000, wage_5000-6000, organizational commitment and job stress are statistically significant with highest possible level.

Variables wage_3000-4000 and wage_6000-7000 are statistically significant when $\alpha = 0{,}001$.

Variables position_manager and job security satisfaction are statistically significant when $\alpha = 0{,}01$.

Variables wage_8000_and_above, gender_women, marital_status_single and working_time_10_and_above are statistically significant when $\alpha = 0{,}05$.

In Figure 13, deviance residuals can be seen at top of output. Deviance is a measure goodness fit of the logistic regression model. High numbers on deviance indicates worse fit. On output from R, there are two type of deviance; deviance of residuals and the null deviance. Null deviance indicates how well the dependent variable is predicted with a model with only the grand mean (intercept). According to Figure 13, after including independent variables, deviance decreased significantly with a loss of only 17 degrees of freedom.

Second part of output shows coefficients, their standard errors, Wald z-statistics and the related p-values. Figure 4 shows the model after stepwise iterations; all age categories, man from gender category, married from marital status category, 1-3 year from working time category, 1000-2000 from wage category and employee from position category have eliminated from model.

Wald statistics can be seen on the p-values column. According to Wald statistics, there are statistically insignificant variables such as 4-6 year and 7-9 year from working time category, 2000-3000 and 7000-8000 from wage category.

According to model 2, holding all variables fixed value except gender, the odds of intention of job leave (gender=woman) over the odds of intention of job leave (gender=man) is Exp (0,8498) = 2,3392. For better understanding, in terms of percentage change it can be said that odds for intention of job leave for woman is 133% higher that the odds for intention of job leave for man. The coefficient for working time 10 years and above says that when the all other variables in the model assigned to a fixed value, 982% increase in the odds for stay in the same job.

Variables	Coefficient	Std. Error	z value	P-value	Exp(B)	signif.
Intercept	1,7537				5,775934	
GenderWoman	0,8498	0,4717	1,801	0,07165	2,339179	.
Marital_StatusSingle	0,9179	0,5232	1,754	0,07939	2,504026	.
Working_Time10 and above	-2,2847	1,3312	-1,716	0,08613	0,101805	.
Working_TimeLess than a year	-1,4395	0,7793	-1,847	0,06473	0,237046	.
Wage3000-4000	-3,5859	1,1539	-3,108	0,00189	0,027712	**
Wage4000-5000	-4,0616	1,1492	-3,534	0,00041	0,017221	***
Wage5000-6000	-6,3680	1,4455	-4,405	1,06E-05	0,001716	***
Wage6000-7000	-4,3342	1,4795	-2,930	0,0034	0,013112	**
Wage8000 and above	-6,6344	3,5788	-1,854	0,06377	0,001314	.
PositionManager	1,4769	0,7031	2,101	0,03568	4,379349	*
Job_Security_Satisfaction	-0,6713	0,3111	-2,158	0,03093	0,511044	*
Organizational_Commitment	-1,8983	0,3700	-5,131	2,88E-07	0,149823	***
Job_Stress	2,6539	0,4015	6,610	3,85E-11	14,20935	***

Table 7: Detailed view of Variables

Table 7 shows the results of the independent variables that have an impact on employees' intention to quit. The Exp(β) values in Table 7 indicates to odds ratios. Moreover, it can be said that Exp(β) indicates that specific variable is how much effecting the model when the all other variables have fixed value.

In other words, ODDS ratio; shows how many or more times less likely to be observed in one of the two investigated events can occur. When the obtained results are examined, the β coefficients for the independent variables are both positive and negative. Because of that, according to sign of β interpreted direction may increase or decrease.

According to Exp(β) values in Table 8, variables job stress (14,209), position manager (4,37), marital status single (2,0504) and gender woman (2,3391) have highest positive impact on explaining intention of job leave.

According to Exp(β) values in Table 8, variables wage_5000-6000 (0,0017), wage_8000 and above (0,0013), and working time more than 10 year (0,101) have highest negative impact on explaining intention of job leave.

Considering these results our main hypothesis was rejected. It can be seen that, only a certain portion of the independent variables within the scope of the research explained the intention to leave the job meaningfully.

In order to determine the variables thought to affect the intention to job leave, all variables were included in the analysis and it was determined that there were variables that did not have a significant effect on the intention to quit. For this reason, independent variables that do not have a significant effect on the dependent variable's intention to job leave were excluded from the analysis and the logistic regression analysis was repeated with the following variables.

Dependent variable:

-Intention of Job Leave (Binary)

Independent variables:

-Organizational Commitment

-Job Stress

-Job Security Satisfaction

-Gender

-Working Time

-Wage

-Position

Thus, the variables that contribute to the probability equation in the process of estimating the likelihood of the employees' intention to quit are determined to be those that have a significant effect on the intention to quit the dependent variable.

According to the Exp (β) values on Table 7, in terms of the variable of a new employee (Job Security Satisfaction) 0,511 times more likely to intend to leave, in terms of organizational commitment 0,149 times, in terms of job stress 14,209 times, in terms of position as manager 4,37 times more likely to intend to leave job. From wage perspective, employee, who has wage more than 8000, 0,00013 times more likely quit.

Results show that, women, unmarried and managerial positions have higher intention to quit. On the other hand, employees who are satisfied with job security and have high incomes, have a low intention to leave work.

6. Discussion

Findings obtained from survey data examined in the light of previous researches about job security. Many of these findings are supporting general literature. However, some results obtained from logistic regression model failed to prove statements mentioned in the very beginning of this paper.

Splitting the data allows us to perform ROC curve analysis. Not using same data while calculating accuracy is crucial. Otherwise, predictions would be affected, and results would not be trustable. However, splitting data may cause losing information. Researcher should be aware of this and act according to data set.

Understanding relation between explanatory variables is important for understanding whole model. In second part, these relations are examined. Furthermore, normality tests have been applied for choosing correct method for correlation calculation.

According to survey data, women have higher intention of job leave comparing the rest. It can be explained with cultural effects. Woman and man have different roles in society, the edges of this differences are much clearer in countries with male-dominated societies like Turkey even in 2018. Expectations from woman in the society are staying at home and take care of housework, chores rather than the going for work. Of course, this perspective only valid when you think general structure of Turkey. However, this survey have applied on Istanbul which is a more look like a European city considering the rest of the Turkey. Yet, cultural aspect is not the only reason, natural effects must be considered as well. Giving a birth has a tremendous effect on women life. Most of the women are leaving their job because of this reason.

Some studies examining the relationship between gender and employment with a meta-analysis method, in general, have shown that women tend to leave more jobs than men (Cotton and Tuttle, 1986, p.64).

Belcher and Atchicos (1987, p.438) found in their study that women intend to quit jobs more than men because of their roles in society (such as housewife, childcare) and that they do not want to return to work after having a baby. This part of our findings verifies general literature.

On this paper, single (unmarried) employee's intention of job leave found as higher than the others. This can be explained that people, have no concern of families, can change jobs easier than the people with families.

Iscan and Naktiyok (2004, p.197), in their study, have found that married workers are less likely to leave jobs than single employees.

According to paper that prepared by Koçoğlu (2013, p.14), findings show that he intentions of the single employees to leave were significantly higher than the married people.

Beginning of this paper, have been stated that employees who are not working on managerial positions have higher intention of job leave. However, results obtained from survey data indicating directly opposite.

Clark and Harcout (2000) investigated the binomial logistic regression model and the factors that determine the intention of job leave the personnel working in a bank in New Zealand. In their study, they found that the high income and educated workers were more inclined to resign than the others.

Managing position employees usually have better education and higher income. The reason for leave intention is not based on job insecurity or afraid of losing job. Thus, this can be accepted as searching for better opportunity that afraid of losing job.

Job security satisfaction has a negative relation with intention of job leave as we expected. Reasons for this statement, mentioned detailly in the beginning of thesis.

Poyraz and Kama (2008, p.159) found a negative correlation between job security perception and intention to quit. Findings from survey data supports general literature.

According to survey data and results obtained from model 2, there is negative relation between organizational commitment and intention of job leave as stated from beginning of this study.

Gül et al. (2008, p.7) found a negative and significant relationship between job satisfaction and organizational commitment and intention to quit.

As a result, most of the findings obtained from survey data, verifies the general literature. Moreover, the rest of the findings can be explained with acceptable reasons.

7. Conclusion

Logistic regression allows to measure the relationship between a binary dependent variable and one or more independent variables by plotting the dependent variables probability scores. Therefore, its possible to see which explanatory variable is affecting model the most. It is possible to measure efficiency with confusion matrix and ROC Curve. However, to be able to do so, data should be split before creating the model otherwise results would not be healthy. Two different logistic regression model are created. Training model and test model are created after splitting the data. This allowed us to perform accuracy analysis which measure the efficiency of training model. However, splitting data and creating the model costs loss of information due to decreasing number of observations. Loss of information force us to continue with model which created from full data since participant amount is not efficient for split. Furthermore, Anova test applied to model 2 for significance levels.

The years 2010 represent a period of great changes and pressures in all areas. Especially in the last ten years in many countries throughout the world and in parallel with Turkey, the economic crisis with and uncertainties of globalization was reflected in the conditions of competition. This reflection affected employee-employer relation also and caused significant reduction of job security. As a result of the economic crises, the number of workplaces that have closed and shrinking the scale has increased and as a result many workers have been unemployed, and many have faced unemployment and job insecurity. The high youth unemployment, like in Turkey, triggers the fear of being unemployed among those who has a job. The perception of distrust in relation to the continuation and future of his/her work deeply affects the psychology and organizational attitudes of employees. This situation makes the issue of job security particularly remarkable in terms of the contribution of employees to their organizations and positive attitudes and behaviors.

However, it is a fact that businesses in the 21st century will have to continue their activities in a more competitive environment and in a global world. This depends on the ability to survive in the competitive environment, to take part in the leading markets, to increase their productivity, to improve the quality of business life and to improve their service quality. The basic condition for providing this is the effective use of human resources and their utilization of their knowledge, skills and development. If human resources are strengthened in an enterprise, the organization develops, and its objectives can be achieved easily. For this reason, employees should be motivated, committed to their organization and protected. For any reason, dismissing employees and hiring an employee from the army of the unemployed, who are waiting for them at the door, creates extremely negative consequences for the employer and the employees, increasing the feeling of insecurity of the employees.

The tourism industry is largely based on manpower, which cannot be compared to other industries. Since the business is organized according to the principle of manpower and continuity of the business in the hotel enterprises, which is an important branch of the tourism industry; the workforce is one of the most important problems to be solved in terms of both cost and need. Unemployment is one of the biggest concerns of the employees who are employed in a fragile sector such as tourism. Due to the problem of seasonality in tourism, the issue of job security is extremely important for employees who are concerned about

dismissal at the end of each season. All this is an indication of the importance of job security satisfaction. Therefore, it is very important to measure job security satisfaction in the context of hotel businesses and to reveal the relationships between this satisfaction, organizational commitment, job stress and intention to leave.

Within the scope of the research, the relation between organizational commitment, job stress and intention of job leave have been examined. The population of the study consists of the employees of the five-star hotels in Anatolian side of Istanbul. Research results: These are the answers given to the survey questions by 459 employees in these enterprises. Used in the scope of research

In the reliability tests of the scales, it was found that the reliability values of the four scales were over 0.80 and the scales were of high reliability.

Our main hypothesis, which was established to determine to intention to leave the job with the job security satisfaction, organizational commitment, job stress and demographic variables, was tested with logistic regression analysis. It was found that not all the independent variables within the scope of the study significantly predicted the intention to quit. Therefore, our main hypothesis was rejected. Logistic regression analysis applied again with variables; job security satisfaction, organizational commitment, gender, marital status, working position, job stress and monthly average income.

In the light of results, it has been concluded that the most important source of the human resources, which is the most important source for an enterprise, can be evaluated in terms of the business interests. Employees are very important for every business. However, for the sectors such as tourism, where labor-intensive, human relations are extremely important, is even more critical. Because people, who spent their time in hotels, are expecting have fun, good time and friendly positive atmosphere.

In order to ensure customer loyalty and to create a customer portfolio of its own, the company must satisfy its employees and minimize their intention to leave.

The results of this study provide important insights for scientists and industry managers on issues related to job security and related variables.

List of Figures

List of Tables

References

Akpan, C. P. (2013). Job security and job satisfaction as determinants of organizational commitment among university teachers in cross river state, Nigeria. British Journal of Education, 1(2), 82-93.

R Core Team (2019). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria

Aktuğ, S.S. (2010). İş Güvencesinin Sosyal Ekonomik Hukuki Temelleri ve Türkiye Değerlendirmesi, Başbakanlık Basımevi, Ankara.

Azaklı, Ö. (2011), "Çalışanların Örgüte Bağlılıkları ve İş Güvencesizliği Algısı İle İşten AyrılmaNiyeti Arasındaki İlişkinin İncelenmesineYönelik Bir Uygulama", Yıldız Teknik Üniversitesi Sosyal Bilimler Enstitüsü, Yayınlanmamış Yüksek Lisans Tezi, İstanbul.

Bahar, O. (2006). "Turizm Sektörünün Türkiye'nin Ekonomik Büyümesi Üzerindeki Etkisi: VAR Analizi Yaklaşımı. Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 13(2), 137-150.

Balcı, A. (2003). Örgütsel Sosyalleşme Kuram Strateji ve Taktikler, Pegem A Yayıncılık, Ankara.

Barling, J., & Kelloway, E. K. (1996). Job insecurity and health: The moderating role of workplace control. Stress medicine, 12(4), 253-259.

Bircan, H. (2004). Lojistik Regresyon Analizi: Tıp Verileri Üzerine Bir Uygulama. Kocaeli Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 2, 185-208.

Chang, C. P., & Chang, W. C. (2008). Internal marketing practices and employees' turnover intentions in tourism and leisure hotels. The Journal of Human Resource and Adult Learning, 4(2), 161-172.

Cheng, Y., Chen, C. W., Chen, C. J., & Chiang, T. L. (2005). Job insecurity and its association with health among employees in the Taiwanese general population. Social Science & Medicine, 61(1), 41-52.

Cohen, Jacob; Cohen, Patricia; West, Steven G.; Aiken, Leona S. (2002). Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences (3rd ed.). Routledge.

Cuyper, N. D., Bernhard-Oettel, C., Berntson, E., Witte, H. D., & Alarco, B. (2008). Employability and Employees' Well-Being: Mediation by Job Insecurity 1. Applied Psychology, 57(3), 488-509.

Çakır, Ö. (2007). İşini kaybetme kaygısı: İş güvencesizliği. çalışma ve toplum, 1(12), 117.

Çelik, N. (2003). İş Hukuku Dersleri, Yenilenmiş 16. Basım, Beta Basım, İstanbul.

Çetin, M. Ö. (2004). Örgüt kültürü ve örgütsel bağlılık. Nobel Yayın Dağıtım.

Davy, J. A., Kinicki, A. J., & Scheck, C. L. (1997). A test of job security's direct and mediated effects on withdrawal cognitions. Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 18(4), 323-349.

Dığın, Ö. ve Ünsar, S. (2009). "Çalışanların İş Güvencesi Algısının Belirleyicileri ve İş Güvencesinden Memnuniyetin Organizasyonel Bağlılık, İş Stresi ve İşten Ayrılma Eğilimine

Etkisi Üzerine Yapılan Bir Araştırma", 17. Ulusal Yönetim ve Organizasyon Kongresi Bildiriler Kitabı, 106-112.

Efeoğlu, İ. E. (2006). "İş-Aile Yaşam Çatışmasının İş Stresi, İş Doyumu ve Örgütsel Bağlılık Üzerindeki Etkileri: İlaç Sektöründe Bir Araştırma", Çukurova Üniversitesi Sosyal Bilimler Enstitüsü İşletme Anabilim Dalı, Yayınlanmamış Doktora Tezi, Adana.

Ekonomi, M. (1985). Türkiye'de Feshe Karşı Korunmanın Kanun Yolu İle Düzenlenmesinin Sosyal ve İktisadi Sonuçları. Almanya'da ve Türkiye'de Fesih ve *ş*çinin Feshe Kar*şı* Korunmas*ı*, *İ*stanbul.

Ekonomi, M. (2003). İşsizliğin Önlenmesi ve Telafisinde İş Hukuku Kurumları. İ*ş*sizli*ğ*in *İş* Hukuku ve Sosyal Güvenlik Aç*ı*s*ı*ndan Sorunlar*ı*, Kamu-*İş*, Ankara.

Egemen, E. (2003). Türk Hukukunda ve Karşılaştırmalı Hukukta ş Güvencesi. Yeni *ş* Yasas*ı* Sempozyumu, *ş* Hukuku ve Sosyal Güvenlik Hukukuna lişkin Sorunlar ve Çözüm Önerileri.

Field, Andy (2005). Discovering Statistics Using SPSS 2nd Edition. Sage Publications.

Gaunt, R., & Benjamin, O. (2007). Job insecurity, stress and gender: The moderating role of gender ideology. Community, Work and Family, 10(3), 341-355.

Geary, J. F. (1992). Employment flexibility and human resource management: The case of three American electronics plants. Work, Employment and Society, 6(2), 251-270.

Greenhalgh, L., & Rosenblatt, Z. (1984). Job insecurity: Toward conceptual clarity. Academy of Management review, 9(3), 438-448.

Hartley, J., Jacobson, D., Klandermans, B., & Van Vuuren, T. (1990). Job insecurity: Coping with jobs at risk. Sage Publications Ltd.

Hellgren, J., Sverke, M., & Isaksson, K. (1999). A two-dimensional approach to job insecurity: Consequences for employee attitudes and well-being. European Journal of Work and Organizational Psychology, 8(2), 179-195.

Hellgren, J., & Sverke, M. (2003). Does job insecurity lead to impaired well-being or vice versa? Estimation of cross-lagged effects using latent variable modelling. Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 24(2), 215-236.

Huselid, M.A. ve Day, N.E. (1991). "Organizational Commitment, Job Involvement, and Turnover: A Substantive and Methodological Analysis," Journal of Applied Psychology, 76(3): 380- 391.

Iverson, R. D. (1996). Employee acceptance of organizational change: the role of organizational commitment. International Journal of Human Resource Management, 7(1), 122-149.

Jonge, D. J., Bosma, H., Peter, R., & Siegrist, J. (2000). Job strain, effort-reward imbalance and employee well-being: a large-scale cross-sectional study. Social science & medicine, 50(9), 1317-1327.

Jordan, P. J., Ashkanasy, N. M., & Hartel, C. E. (2002). Emotional intelligence as a moderator of emotional and behavioral reactions to job insecurity. Academy of Management review, 27(3), 361-372.

Kaya, P. A. (2002). Türkiye'de İş Güvencesi Sorunsalı Ve Bilim Komisyonunun Hazırladığı Yasa Tasarısı Üzerine Düşünceler. ISGUC The Journal of Industrial Relations and Human Resources, 4(2).

Kıdak, L. B. (2011). Örgüt İçi Stres Kaynakları ve İşten Ayrılma Niyetine Etkisi: Eğitim Diş Hastanesinde Çalışan Diş Hekimleri Üzerine Bir Uygulama. *Eğ*itim, Finans Politik & Ekonomik Yorumlar Dergisi, 48(555), 35-48.

Kılıç, Y. (2014). "Turizm Sektörü İstihdamının Eğitim Durumu ve İnsangücü Planlaması", Eğitim Bilimleri Araştırmaları Dergisi, 4(1): 419- 436.

Kim, T. H., & Chang, K. R. (2007). Interactional Effects of Occupational Commitment and Organizational Commitment of Employees in Sport Organizations on Turnover Intentions and Organizational Citizenship Behaviors. International Journal of Applied Sports Sciences, 19(2).

Klandermans, B., & van Vuuren, T. (1999). Job insecurity: introduction. European Journal of Work and Organizational Psychology, 8(2), 145-153.

Kılıç, B. ve Eleren, A. (2009). "Turizm Sektöründe Hizmet Kalitesi Ölçümü Üzerine Bir Literatür Araştırması", Alanya İşletme Fakültesi Dergisi, 1(1): 91-118.

Kinnunen, U., Mauno, S., Nätti, J., & Happonen, M. (2000). Organizational antecedents and outcomes of job insecurity: A longitudinal study in three organizations in Finland. Journal of Organizational Behavior, 21(4), 443-459.

Kutal, M. (2002). İşçinin Feshe Karşı Korunması Kavramı, ktisadi ve Sosyal Boyutları. İktisadi, Sosyal ve Uluslararas*ı* Hukuki Boyutu ile *ş*çinin Feshe Karş*ı* Korunmas*ı*, *İ*stanbul Barosu, *İ*stanbul.

Lambert, S. J. (1991). The combined effects of job and family characteristics on the job satisfaction, job involvement, and intrinsic motivation of men and women workers. Journal of Organizational Behavior, 12(4), 341-363.

Lau, B., & Knardahl, S. (2008). Perceived job insecurity, job predictability, personality, and health. Journal of Occupational and Environmental Medicine, 50(2), 172-181.

Lazarus, R. S., & Folkman, S. (1984). Coping and adaptation. The handbook of behavioral medicine, 282325.

Lee K. and Koval J.J., (1997). Determination of The Best Significance Level in Forward Stepwise Logistic Regression. Communication in Statistics, 26(B), 566.

Lim, V. K. (1996). Job insecurity and its outcomes: Moderating effects of work-based and nonwork-based social support. Human relations, 49(2), 171-194.

Loseby, P. H. (1992). Employment security: balancing human and economic considerations. Quorum Books.

Mak, A. S., & Mueller, J. (2000). Job insecurity, coping resources and personality dispositions in occupational strain. Work & Stress, 14(4), 312-328.

Mäkikangas, A., & Kinnunen, U. (2003). Psychosocial work stressors and well-being: Self-esteem and optimism as moderators in a one-year longitudinal sample. Personality and individual differences, 35(3), 537-557.

Menard, Scott (1995). Applied Logistic Regression Analysis (Sage University Papers Series on Quantitative Applications in the Social Sciences, series no. 07-106). Thousand Oaks, CA:Sage.

Mimaroğlu, H. (2008). Psikolojik sözleşmenin personelin tutum ve davranışlarına etkileri: Tıbbi satış temsilcileri üzerinde bir araştırma. Basılmamış Doktora Tezi, Çukurova Üniversitesi Sosyal Bilimler Enstitüsü.

Nelder, J. A., & Wedderburn, R. W. M (1972) Generalized linear models J Rev. Stat. Soc, 135, 370-383.

Nooney, J. G. (2005). Religion, stress, and mental health in adolescence: Findings from add health. Review of Religious Research, 341-354.

Onay, M., & Kılcı, S. (2011). İş stresi ve tükenmişlik duygusunun işten ayrılma niyeti üzerine etkileri: Garsonlar ve aşçıbaşılar. Organizasyon ve Yönetim Bilimleri Dergisi, 3(2).

Öz, G.İ. (2008). "Özel Sektör Çalışanlarında İş Güvencesizliğinin Öz Yeterlik ve İş Performansı İle İlişkisi", İş ve Özel Yaşama Psikolojik Bakışlar, Editör: Tarık Solmuş, İstanbul: Epsilon Yayıncılık, 1. Baskı, 149-176.

Parker, S. K., Chmiel, N., & Wall, T. D. (1997). Work characteristics and employee well-being within a context of strategic downsizing. Journal of occupational health psychology, 2(4), 289.

Pearce, J. L. (1998). Job insecurity is important, but not for the reasons you might think: The example of contingent workers. Journal of Organizational Behavior (1986-1998), 31.

Poyraz, K. ve Kama, B. (2008). "Algılanan İş Güvencesinin, İş Tatmini, Örgütsel Bağlılık ve İşten A yrılma Niyeti Üzerindeki Etkilerinin İncelenmesi", Süleyman Demirel Üniversitesi, İ.İ.B.F. Dergisi, 13(2): 143-164.

Preis, U. Almanya'da İşçinin Feshe Karşı Korunması. Almanya ve Türkiye'de İşçinin Feshe Karşı Korunması Semineri.

Probst, T. M. (2002). The impact of job insecurity on employee work attitudes, job adaptation, and organizational withdrawal behaviors. The psychology of work: Theoretically based empirical research, 141-168.

Probst, T. M. (2003). Development and validation of the job security index and the job security satisfaction scale: A classical test theory and IRT approach. Journal of Occupational and Organizational Psychology, 76(4), 451-467.

Ramsey, J., Punnett, B. J., & Greenidge, D. (2008). A social psychological account of absenteeism in Barbados. Human Resource Management Journal, 18(2), 97-117.

Rizvi, L., Javed, O. D., & Siddiqui, K. A. (2012). Examining the impact of job security, organizational climate and engagement on motivation level of employees at IMC PVT LTD. European Journal of Business and Management, 4(9), 27-35.

Rosenblatt, Z., & Ruvio, A. (1996). A test of a multidimensional model of job insecurity: The case of Israeli teachers. Journal of organizational behavior, 17(S1), 587-605.

Rosenblatt, Z., Talmud, I., & Ruvio, A. (1999). A gender-based framework of the experience of job insecurity and its effects on work attitudes. European Journal of work and organizational psychology, 8(2), 197-217.

Roskies, E., & Louis-Guerin, C. (1990). Job insecurity in managers: Antecedents and consequences. Journal of organizational behavior, 11(5), 345-359.

Seçer, B. (2009). İş Güvencesizliği: Türleri, Başa Çıkma Süreci, Belirleyicileri ve Sonuçları. Editörler: Aşkın Keser, Gözde Yılmaz ve Şenay Yürür, Çalışma Yaşamında Davranış Güncel Yaklaşımlar, 1.