

Determining Factors Affecting Intention to Adopt Banking Recommender System

- Case of Iran

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*I would like to express my foremost
and sincere gratitude to my dear parents
for their Love and Support throughout my life.
To Them I dedicate this Thesis.*

Nima Yahyapour
May - 2008

Abstract

By the rapid growth of information technology, banks in many parts of the world are trying to change their traditional methods and try to adapt in to new technologies. One of the most fundamental changes of banking industry is the movement from traditional banking to more electronic banking. But, beside the new facilities, this brings the problem of information overload. So preparing a proper information filtering and recommender system that could help customers to find appropriate services and facilities based on their needs, has become a crucial issue for banks.

The purpose of this master thesis is to explain and analyze the issues that influence Iranian bank customer's intentions, toward banking recommender system adoption. Based on a detailed literature review, a research model on the basis of an extended Technology Acceptance Model (TAM) with original variables perceived usefulness, perceived ease of use, attitude, intention to use, and external variables personality, personal innovativeness and perceived playfulness was employed.

A quantitative research approach was conducted to get a better understanding of the issues. The empirical data was collected from sixteen Tejarat bank (A famous governmental bank in Iran) branches in seven different cities (classified in to four zones) of Iran by the means of questionnaires. Data analyses were done in accordance with the research questions and research model by SPSS 15 and Lisrel 8.53 softwares, and the hypotheses were analyzed by Structural Equation Modeling (SEM) technique. The results show that only personal innovativeness has no significant effect on personal usefulness of the system. The implications of the findings for theory and practice are discussed further. Finally the overall findings from respondent's data show that they have great level of intention toward using a banking recommender system that could guide them through better choices among several available financial services.

Keywords: *Recommender System, Technology Acceptance Model (TAM), Tejarat Bank, Customer, Structural Equation Modeling (SEM), Intention*

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Table of contents

Chapter One	10
Introduction and Research Problem.....	10
1 Introduction and Research Question	10
1.1 Introduction.....	11
1.2 Background.....	12
1.3 Recommender Systems	12
1.4 IT in Banking Sector	13
1.5 Banking Recommender System.....	14
1.6 Iran banking sector.....	14
1.6.1 Tejarat Bank.....	15
1.7 Research Question	15
1.7.1 Research Contribution	15
1.8 Research Objectives.....	16
1.9 Outline of the Thesis.....	16
Chapter Two.....	19
Literature Review	19
2 Literature Review.....	19
2.1 Recommender System	20
2.1.1 Recommender System Benefits	21
2.1.2 Recommender System Techniques	22
2.1.2.1 Content Based Recommender Systems	23
2.1.2.2 Collaborative Filtering.....	24
2.1.2.3 Hybrid Systems.....	25
2.1.2.4 Nearest Neighbor	26
2.1.2.5 Bayesian Networks	27
2.1.2.6 Clustering Techniques	27
2.1.2.6 Classifiers.....	28
2.1.2.7 Association Rules.....	28

2.1.2.8 Horting	29
2.2 The Behavioral Adoption Theories	29
2.2.1 Theory of Reasoned Action (TRA).....	29
2.2.2 Theory of Planned Behavior (TPB)	31
2.2.3 Innovation Diffusion Theory	35
2.2.4 Technology Acceptance Model (TAM).....	38
2.2.4.1 TAM Extension.....	39
2.2.4.2 TAM Antecedents	42
2.2.5 Differences Between Adoption Models	42
2.2.6 Adopter Categories Based Research.....	43
2.2.6.1 Adopter Categories	43
2.3 Conceptual Framework and Research Model	45
2.3.1 Research Model	46
2.3.2 Hypotheses development	51
Chapter Three	52
Methodology	52
3 Methodology	52
3.1 Research Purpose	52
3.1.1 Exploratory	53
3.1.2 Explanatory	53
3.1.3 Descriptive	53
3.2 Research Approach	54
3.3 Research Strategy.....	55
3.4 Sample Selection.....	56
3.4.1 Probability Sampling	57
3.4.2 Non-Probability Sampling	57
3.4.2.1 Convenience Sampling	58
3.4.2.2 Judgment Sampling.....	58
3.4.2.3 Quota Sampling	58
3.4.2.4 Snowball Sampling	59

3.5 Questionnaire Design.....	59
3.5.1 The Questionnaire.....	60
3.6 Pilot Test.....	63
3.7 Validity and Reliability.....	63
3.7.1 Validity	64
3.7.2 Reliability.....	64
3.8 Data Collection	64
3.9 Chapter Summery	67
Chapter Four.....	68
Data Analysis and Presentation.....	68
4 Data Analysis and Presentation	68
4.1 Descriptive Analysis	68
4.1.1 Reliability of the Questions	76
4.1.2 Factor Analysis	77
4.1.3 Different Group's Perception.....	81
4.2 Statistical Analysis.....	82
4.2.1 One-Sample t-test.....	82
4.2.2 Comparison of Survey Variables	84
4.2.3 Structural Equation Modeling (SEM)	89
4.3 Variable Effects	93
4.3.1 Direct Effects of Variables and Results of Hypothesis Test.....	93
4.3.2 Indirect Effects of Variables	94
4.3.3 Total Effects of Variables	95
4.4 Model's Overall Goodness of Fit.....	96
4.5 Suggested Modifications For Model.....	96
4.6 Additional Statistics and Comparisons	97
Chapter Five.....	103
Conclusions.....	103
5 Conclusions.....	103
5.1 Theoretical Implications	103

5.2 Managerial Implications	104
5.3 Innovative Part of the Research	105
5.4 Limitations and Suggestions for Future Research	106
5.5 Conclusion	106
References:.....	108
Appendix A. Questionnaire (English version).....	113
Appendix B. Final Questionnaire (Farsi version).....	117
Appendix C. Tukey HSD Analysis.....	124

List of Tables

Table 2.1	47
Table 2.2	48
Table 2.3	49
Table 2.4	50
Table 3.1	55
Table 4.1	69
Table 4.2	70
Table 4.3	72
Table 4.4	75
Table 4.5	76
Table 4.6	77
Table 4.7	78
Table 4.8	79
Table 4.9	80
Table 4.10	81
Table 4.11	81
Table 4.12	82
Table 4.13	83
Table 4.14	83
Table 4.15	84
Table 4.16	85
Table 4.17	85
Table 4.18	86
Table 4.19	86
Table 4.20	87
Table 4.21	87
Table 4.22	88
Table 4.23	93
Table 4.24	94
Table 4.25	94
Table 4.26	95
Table 4.27	95
Table 4.28	95
Table 4.29	95
Table 4.30	98
Table 4.31	100
Table 4.32	101

List of Figures

Figure 1.1	18
Figure 2.1	30
Figure 2.2	33
Figure 2.3	38
Figure 2.4	39
Figure 2.5	45
Figure 2.6	47
Figure 3.1	66
Figure 3.2	67
Figure 4.1	70
Figure 4.2	71
Figure 4.2	73
Figure 4.3	73
Figure 4.4	72
Figure 4.5	74
Figure 4.6	75
Figure 4.7	76
Figure 4.8	90
Figure 4.9	91
Figure 4.10	92
Figure 4.11	97

Chapter One

Introduction and Research Problem

1 Introduction and Research Question

This chapter begins with a background of the selected sector, followed by a brief introduction. The background begins with an expanded conceptualization of banking industries new faced problems and then the phenomenon of the technologies infusion and its adoption in the banking service encounter. Later it moves to recommender system technology and continues with its deals in banking sector. Subsequently, it narrows down to the research problem and finally states the outline of this thesis.

1.1 Introduction

As information technology is growing in an exponential rate, banks in many parts of the world are trying to change their traditional methods and try to adapt in to these new technologies. One of the most fundamental changes of banking industry is the movement from traditional banking to more electronic banking. By this fast movement, banks become able to offer more services to their customers. But, beside the new facilities, this brings the problem of information overload. So preparing an appropriate information filtering and delivery system, based on customers preferences that could inform them the new offered services and facilities has become a crucial issue for banks. This information filtering and delivery system can be an automated “Banking Recommender System” that provides a personalized solution for each customer in a brief form, and each recommendation will be unique for every customer. But before banks and financial service providers can benefit from recommender system technologies, the willingness of customers to try out and adopt banking recommender system (BRS) should be questioned since such a service option requires many efforts from customers and changes their behavior and habit to some extend. What’s the factors influence customer to adopt or reject a BRS? Why would customer prefer a BRS? How can banks get BRSe operations into the profitable mainstream?

Therefore the purpose of this research is to identify and describe the factors that affecting the intention to adopt a banking recommender system in Iran banking sector from customer’s prospect, by using an extended model based on Technology Acceptance Model (TAM). The empirical field work was done in Tejarat bank which is one the most important governmental banks in Iran, with almost 2010 branches in the whole country. So, the empirical results can give awareness to the banks by highlighting the issue, and helps to contribute to understanding of BRS from an innovation perspective, for both academic and practical domain.

1.2 Background

Recommender systems are widely used in the online purchasing systems and several approaches have been identified based on them. Total information overload becomes increasingly severe in our modern times of omnipresent mass-media and global communication facilities, exceeding the human perception's ability to dissect relevant information from irrelevant. Consequently, since more than 60 years (Van Rijsbergen, 1975) significant research efforts have been striving to conceive automated filtering systems that provide humans with desirable and relevant information only. Search engines count among these filtering systems and have gained wide-spread acceptance, rendering information search feasible even within chaotic and anarchical environments such as the Web. During the last 10 years, recommender systems (Resnick, 1997) have been gaining momentum as another efficient means of reducing complexity when searching for relevant information. Recommenders intend to provide people with suggestions of products they will appreciate, based upon their past preferences, history of purchase, or demographic information.

1.3 Recommender Systems

Recommender systems are being used by an ever-increasing number of E-commerce sites, retailers and service providers to help consumers find appropriate services and products to purchase. What started as a novelty has turned into a serious business tool, and recommender system is one of these technologies by identifying particular items that are likely to match each user's tastes or preferences (Mooney, 1998).

Recommender systems have recently gained much attention as a new business intelligence tool for e-commerce business. These systems provide users with appropriate information that meet their preferences or interests from enormous amount of information. This system uses product knowledge – either hand-coded knowledge provided by experts or “mined” knowledge learned from the behavior of consumers – to guide consumers through the often-overwhelming task of locating products they will like. Recommender systems differ from web-search engines by taking advantage of the users'

profile. These systems help users determine which items are most suitable according to their tastes or their needs (Resnick, 1994).

Recommender systems have been widely used in the past and several approaches have been applied to the problem of making more accurate and efficient recommender systems. But most of them have two common critical limitations: first almost all of them mostly focused on improvement of recommender system techniques, and more on technical aspects, rather than factors like behavioral factors that may lead to affect the user's acceptance of these systems and also results to adoption of this technology to an industry (Hyoung Yong Lee, 2006).

1.4 IT in Banking Sector

Coupled with innovative business thinking, technology is rapidly changing the way personal and corporate financial services are designed and delivered to customers. Banking is an information intensive business, and information technology (IT) plays an increasingly significant role in it during recent years (Shaoyi Liao, 1999).

Although the IT implementation by the banks was previously directed internally, it has facilitated the introduction of changes in banking, the full effects of which are still being felt. The first of these was the expansion of existing services into new markets and that started the era of mass market banking. Secondly, it opened up alternative distribution channels and the first credit cards started appearing effectively by-passing the branch networks. Thirdly, it permitted early experiments with cash dispensers that evolved into ATMs. These developments thus provide a useful bridge into the new phase of IT in banks (Shaoyi Liao, 1999).

By these fast developments, banks become able to offer more services to their customers. But, beside the new facilities, this brings the problem of information overload. So preparing an appropriate information filtering and delivery system, based on customers preferences that could inform them the new offered services and facilities has become a crucial issue for banks. Studies have shown that customers are looking for ways to meet their banking needs without visiting a bank branch (Paradi, 1998).

1.5 Banking Recommender System

By the rapid growth of financial and banking services with the help of IT and new technologies, Banks and financial service providers are offering new services every day. Mobile banking, Internet banking, Credit card, different type of loans and etc. are the variety of services that may gain many benefits for the customers. But this question rises to mind, how customers will be informed of these new value added services in time? How they will find out which service is suitable for them and what will encourage them to use the new service?

Over the past 30 years, banks have developed many new delivery channels. These include automatic teller machines (ATMs), phone banking, kiosks, and recently PC banking, but none of these information delivery systems can be defined as a specific automated recommender system that could provide a personalized solution based on the account information and past records of a customers.

1.6 Iran banking sector

Iran banking sector consists of two main categories, the governmental banks and private banks. Private Banks are almost newly established, and are managed privately by their own board of directors. Some well known private banks in Iran, are Parsian, Saman, Pasargad and etc. In contrast the governmental banks, has more reputation and are managed by government, besides having more transactions in comparison with the private banks. However, both have variety of services to offer their customers; but lack of a systematic way or elaborated tool for offering suitable services appropriate for each customer is felt, in this sector. But, before implementing such a Recommender System, that be able to offer suitable services to customers, some facts like behavioral factors that may lead to affect the user's acceptance of this system and also results to adoption of this technology to this sector, have to be considered carefully.

1.6.1 Tejarat Bank

Tejarat Bank was established as per the legal bill of the Department of Banks' Affairs approved in September 1979 upon amalgamation of eleven private banks. Later, on 20/12/1979, the Iran-Russia Bank also joined the merger, totaling the paid up capital to 39.1 billion Rials. Twenty six years on, as per economic requirements of different regions of the country, Tejarat Bank is now maintaining 2010 branches throughout the country (Tejarat Bank, 2007). After several discussions with academic and banking experts, finally Tejarat Bank's Research Center has agreed to formally cooperate with us in this research. So this Bank has been chosen as the place for running the survey.

1.7 Research Question

This study focuses on the adoption of banking recommender system(BRS) by customers in Iran and aim to gain a deeper understanding of the factors influencing the adoption of BRS by Iranian customers. The main Research question for this thesis can be formulated as:

What are the main factors, which influence the adoption of a banking recommender system, among Iranian customers?

This area is quiet extensive, and in order to cover all aspects, the related theories are explained in the literature review in the second chapter. A framework based on the technology acceptance model, its extension and antecedents is used to derive the factors as well as, personal and behavioral factors of adopters.

1.7.1 Research Contribution

The study is contributes to both theory and practice. The practical information has been extracted through several meetings, interview and focus groups with Bank and Academic experts plus a questionnaire data collection from Tejarat Bank customers in 7 different cities of Iran located in 16 branches (Yahyapour et al., 2008). Briefly in this survey, the following theory and practical steps have been from the beginning, in order to reach the final results:

- Review of the literature, in order to find out the service based recommender system characteristics.
- Study of Banking services, and search for available banking recommender systems in the world.
- Study of existing adoption theories, as well as studying banking services and recommender system adoption surveys.
- Model selection and modification, based on the context (Iran Banking sector) characteristics. Also, extract questionnaire by considering previous banking and recommender system adoption surveys, as well as considering the academic and banking expert ideas, through interview and focus groups.
- Starting field work and running the questionnaire, in 16 different branches of Tejarat bank, in seven different cities.
- Data entry, analysis and data presentation.

1.8 Research Objectives

The objective of this research can help bank authorities to understand the key factors that influence the adoption of a BRS, and Also by explaining users' intentions from a user's perspective, the findings of this research can not only help banking authorities develop a more user-accepted banking recommender system, but can also provide insight into the best ways to promote new services and systems to potential bank costumers. Also, the findings will help researchers in understanding the theoretical constructs of framework in the adoption of banking recommender system.

1.9 Outline of the Thesis

This thesis is divided in six chapters, as shown in figure 1.1 namely the Introduction and Background, Literature Review, Methodology, Data Collection, Data Presentation and Analysis, and Finally Conclusion and implications.

Chapter one: This chapter gives an introduction and background to the research topic, problem area and research questions are also outlined there.

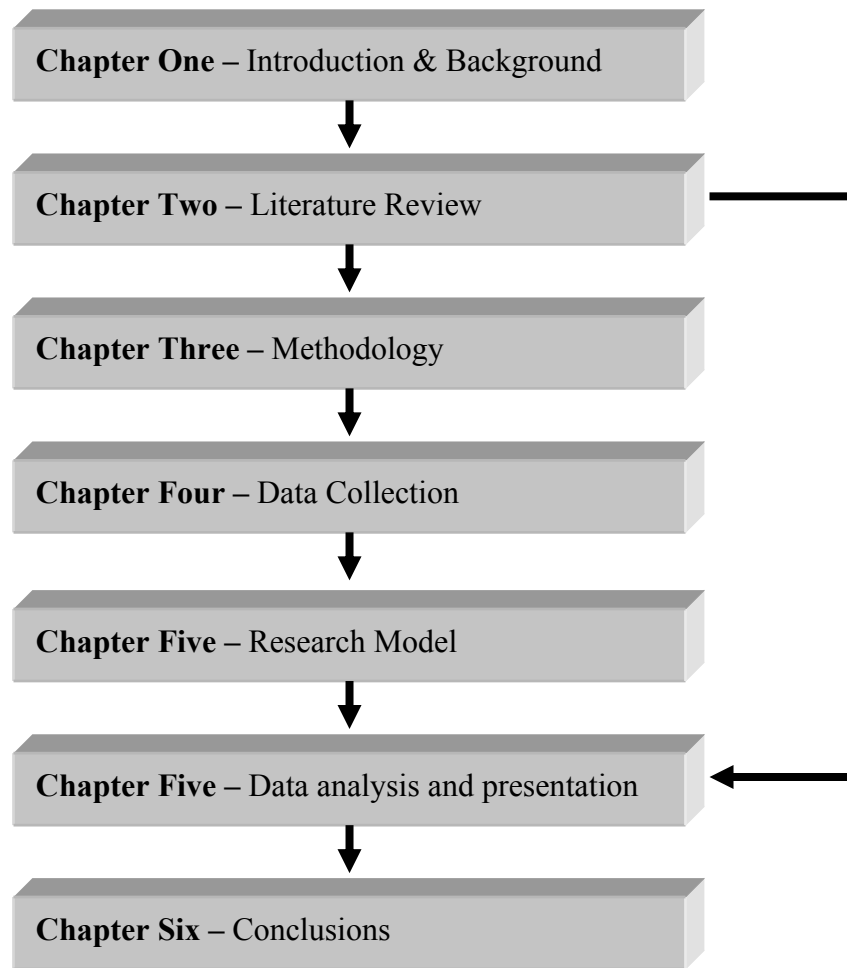
Chapter two: Chapter two presents the theoretical review mainly based on adoption literature as well as the literature review of recommender systems in the same chapter.

Chapter three: Third chapter deals with the methodological choices and describes and explains the motives behind the overall research design from research purpose, research approach, and research strategy to empirical cases. Also method of data collection and data analysis will be discussed in this chapter.

Chapters four: This chapter will present the empirical data gathered by questionnaire, survey, and consult case study.

Chapter five: In chapter five we will analyze the collected data against research model.

Chapter six: Finally the sixth chapter will present the conclusion of the whole study, and further study directions are also suggested by author.



Source: Author's own source, 2007

Figure 1.1: Thesis Outline

Chapter Two

Literature Review

2 Literature Review

The previous chapter provided the background and the problem discussion of this study. In this chapter the literature review will be presented. The aim of this chapter is to provide the relevant literature in the field that is selected for research. The chapter is divided into two sections including detail overview of the recommender systems and prior researches. We will continue by presenting the popular behavioral theories such as TRA, TPB, IDT and TAM .Finally, the purposed research model for the adoption of the a banking recommender system will be presented.

2.1 Recommender System

Total information overload becomes increasingly severe in our modern times of global communication facilities, exceeding the human perception's ability to dissect relevant information from irrelevant. Consequently, since more than 60 years (Van Rijsbergen, 1975), significant research efforts have been striving to conceive automated filtering systems that provide humans with worthwhile and relevant information only. Search engines count among these filtering systems and have gained wide-spread acceptance, rendering information search feasible even within chaotic environments such as the Web.

During the last 10 years, recommender systems (Resnick and Varian, 1997) have been gaining momentum as another efficient means of reducing complexity when searching for relevant information. Recommenders intend to provide people with suggestions of products they will appreciate, based upon their past Preferences and records, history of purchase, or demographic information (Resnick, 1994). Recommender systems use product knowledge – either hand-coded knowledge provided by experts or “mined” knowledge learned from the behavior of consumers – to guide consumers through the often-overwhelming task of locating products they will like [34 seminar]. As mentioned earlier these systems differ from web-search engines by taking advantage of the users' profile.

Recommender systems have gained wide-spread acceptance and attracted increased public interest during the last decade, leveling the ground for new sales opportunities in e-commerce. Therefore, many online retailers and service providers employ an extensive range of different types of recommender systems. Their principal objective is that of complexity reduction for the human being, sifting through very large sets of information and selecting those pieces that are more relevant for the active users. Moreover, recommender systems apply personalization techniques, considering that different users have different information needs (Konstan et al., 1997).

2.1.1 Recommender System Benefits

While E-commerce hasn't necessarily allowed businesses to produce more products, it has allowed them to provide consumers with more choices. Instead of tens of thousands of books in a superstore, consumers may choose among millions of books in an online store. Increasing choice, however has also increased the amount of information that consumers must process before they are able to select which items meet their needs. To address this, e-commerce stores are applying mass customization principles not to the products but to their presentation in the on-line store (Shardanand, 1995). One way to achieve mass customization in e-commerce is the use of recommender systems. Recommender systems are used by E-commerce sites to suggest products to their customers and to provide consumers with information to help them decide which products to purchase. As mentioned before, the products can be recommended based on the top overall sellers on a site, on the demographics of the consumer, or on an analysis of the past buying behavior of the consumer as a prediction for future buying behaviors. In a sense, recommender systems enable the creation of a new store personally designed for each consumer. Of course, in the virtual world, all that changes is the selection of products shown to the consumer, not an underlying physical store.

However, Recommender systems are similar to, but also different from, marketing systems and supply-chain decision-support systems. Marketing systems support the marketer in making decisions about how to market products to consumers, usually by grouping the consumers according to marketing segments and grouping the products in categories that can be aligned with the marketing segments. Marketing campaigns can then be run to encourage consumers in different segments to purchase products from categories selected by the marketer. By contrast, recommender systems directly interact with consumers, helping them find products they will like to purchase. Recommender systems answer questions about individual consumers: which product will this consumer prefer to buy right now? Or which service is the most appropriate service for this customer? Recommender systems include processes that are conducted largely by hand, such as manually creating cross-sell lists, and actions that are performed largely by computer. Accordingly, the algorithms focus more on real-time and just-in-time learning

than on model-building and execution. We study both manual and automatic recommender systems since each offers many interesting ideas about the presentation of recommendations to consumers. Recommender systems enhance E-commerce sales in three ways:

- **Converting Browsers into Buyers:** Visitors to a Web site often look over the site without purchasing anything. Recommender systems can help consumers find products they wish to purchase.
- **Increasing Cross-sell:** Recommender systems improve cross-sell by suggesting additional products for the customer to purchase. If the recommendations are good, the average order size should increase. For instance, a site might recommend additional products in the checkout process, based on those products already in the shopping cart.
- **Building Loyalty:** In a world where a site's competitors are only a click or two away, gaining consumer's loyalty is an essential business strategy. Recommender systems improve loyalty by creating a value-added relationship between the seller or service provider and the customer.

Companies invest in learning about their customers, use recommender systems to operationalize that learning, and present custom interfaces that match consumer needs. Consumers repay these sites by returning to the ones that best match their needs (Terveen L, 1997). The more a customer uses the recommendation system teaching it what he wants, the more loyal he is to the company. "Even if a competitor were to build the exact same capabilities, a customer would have to spend an inordinate amount of time and energy teaching the competitor what the company already knows" (Pine, 1995).

2.1.2 Recommender System Techniques

Two principal patterns for computing recommendations have emerged, namely content-based and collaborative filtering (Goldberg, 1992). Content-based filtering, also called cognitive filtering, computes Product-product similarities are based on features and selected attributes. A system using content based algorithm, recommends items based on

content analysis based on some features extracted from the items. A user profile is created from example data and compared with the content of other items in the database (Malone et al., 1987).

Whereas collaborative filtering, also called social filtering (Resnick, 1994), computes similarities between users based upon their rating profile. Most similar users then serve as “advisers” suggesting the most relevant products or services to the active users. A system using this technique accumulates user ratings of items, identifies users with common ratings, and offers recommendations based on inter user comparison.

Advanced recommender systems tend to combine collaborative and content-based filtering, trying to mitigate the drawbacks of either approach and exploiting synergetic effects. These systems have been coined “hybrid systems” (Balabanovic et al., 1997). Burke (2002) provides an extensive survey of hybridization methods. As a consequence, hybrid recommender systems have been widely used to take advantage of the strengths of each scheme while avoiding their weaknesses.

2.1.2.1 Content Based Recommender Systems

Some systems using content-based information filtering techniques, recommend new items by comparing them with others contained in the user profile. The profile is generally a given set of items that are either directly or indirectly related to the user. For instance, a set of books the user bought at an on-line store and a movie the user explicitly evaluated are both examples of behaviors that produce a direct relation between the user profile and these items. A webcam user who requested detailed specifications at the online store is a procedure that represents the interest of the user for this item. Therefore, the webcam is indirectly related to his/her profile (Belkin, 1992).

It means that, the utility $u(c,s)$ of item s for user c is estimated based on the utilities $u(c,s_i)$ assigned by user c to items $s_i \in S$ that are “similar” to item s . For example, in a movie recommendation application, in order to recommend movies to user c , the content-based recommender system tries to understand the commonalities among the movies user c has rated highly in the past (specific actors, directors, genres, subject

matter, etc.). Then, only the movies that have a high degree of similarity to whatever the user's preferences are would be recommended. The content-based approach to recommendation has its roots in information retrieval, and information filtering research (Baeza R, 1999).

The most popular content-based filtering technique used in these kind of systems is the standard k Nearest Neighbour (kNN) method. This technique, however, presents efficiency problems as the user profile grows, as when the user profile becomes too dense because no compression is adopted to reduce its size. Furthermore, when new items are added to the user profile, the classification speed slows to lower levels (Byron L.D. Bezerra, 2004).

2.1.2.2 Collaborative Filtering

Recommendation systems use this well-known technique called collaborative filtering when trying to predict the rating of a product to a particular user. The general idea behind collaborative filtering is that similar users vote similarly on similar items. Therefore, if similarity is determined between users and items, a potential prediction can be made for the vote of a user for some item. To generate a recommendation list for a particular customer, collaborative filtering algorithm first searches for a group of neighbors by comparing their similarity or correlation values. This is known as the neighborhood-based algorithm. The ratings for new products are predicted by analyzing the neighbor's ratings. Then the final ranked products are presented to the user as the recommendation (Choochart Haruechaiyasak, 2002).

More formally, the utility $u(c,s)$ of item s for user c is estimated based on the utilities $u(c,s)$ assigned to item s by those users $c_j \in C$ who are "similar" to user c . For example, in a movie recommendation application, in order to recommend movies to user c , the collaborative recommender system tries to find the "peers" of user c . Other users that have similar tastes in movies (rate the same movies similarly). Then, only the movies that are most liked by the "peers" of user c would be recommended (Baeza R, 1999). Generally, there are two major flavors of collaborative filtering:

- **Memory-based collaborative filtering:** Also known as user-based collaborative filtering (Pine, 1995), these algorithms try to establish a correlation between users based on their voting pattern. Such correlation is computed dynamically between different pairs of users, every time a prediction is to be made. This puts a big computational and memory load on the system if the prediction is to be delivered in real-time. For that reason, such systems do not scale particularly well for large datasets and are not very popular in real applications.
- **Model-based collaborative filtering:** Also known as item-based collaborative filtering, these algorithms are widely popular today and are used primarily because of their scalability with huge datasets (Pine, 1993). Instead of focusing on similarity between users, such systems compute the similarity between items on which users have voted. The idea behind the algorithm is that if all people who bought item A also bought item B, then items A and B must be “similar” in some context (Tzvetan Horozov, 2006).

Memory-based methods are deployed widely at many commercial websites, because not only they are simple and intuitive on a conceptual level, but also they are deemed sufficiently accurate for many real-world applications. Memory-based methods store historic user ratings in a database and identify users with the similar preferences with an active user for whom a recommendation has to be made. In the predicting phase, they would predict the active user’s ratings based on the corresponding ratings of these similar or like-minded users. In contrast, model-based algorithms build models that can explain the records of historic ratings well and predict the ratings of active users using estimated models. Both types of approaches have been shown to be effective for collaborative filtering (Byeong Man Kim, 2004).

2.1.2.3 Hybrid Systems

As a consequence, hybrid recommender system, is a combination of both collaborative and content based techniques, and has been widely used to take the

strengths of each one while avoiding their weaknesses. Different types of Hybrid recommender systems are as follow:

- **Weighted:** Scores of various recommendation techniques are grouped to produce a single recommendation.
- **Switching:** The recommender system switches between several techniques, depending on the situation, to produce the recommendation.
- **Mixed:** Several different techniques are used at the same time.
- **Feature Combination:** Features from data sources of different techniques are combined and used as an input to one single recommendation technique.
- **Cascade:** The recommender system uses one technique to generate a recommendation, and a second technique to break any ties.
- **Feature Augmentation:** The recommender system uses one technique to generate an output, which in turn is used as an input to a second recommendation technique.
- **Meta-level:** The recommender system uses one technique to generate a model, which in turn is used as an input to a second recommendation technique.

Despite using collaborative, content based or Hybrid methods, there some well-known algorithms that has been used very often in many different recommender systems. Following section are the most popular ones from these approaches.

2.1.2.4 Nearest Neighbor

This kind of Algorithm is based on computing the distance between consumers based on their preference history. Predictions of how much a consumer will like a product are computed by taking the weighted average of the opinions of a set of nearest neighbors for that product. Neighbors who have expressed no opinion on the product in question are ignored. Opinions should be scaled to adjust for differences in ratings tendencies between users (Herlocker et al., 1999). Nearest neighbor algorithms have the advantage of being able to rapidly incorporate the most up-to-date information, but the search for neighbors

is slow in large databases. Practical algorithms use heuristics to search for good neighbors and may use opportunistic sampling when faced with very large populations.

2.1.2.5 Bayesian Networks

System using this method creates a model based on a training set with a decision tree at each node and edges representing consumer information. The model can be built off-line over a matter of hours or days. The resulting model is very small, very fast, and essentially as accurate as nearest neighbor methods (Breese et al., 1998). Bayesian networks may prove practical for environments in which knowledge of consumer preferences changes slowly with respect to the time needed to build the model but are not suitable for environments in which consumer preference models must be updated rapidly or frequently.

2.1.2.6 Clustering Techniques

This technique works by identifying group of consumers who appear to have similar preferences. Once the clusters are created, predictions for an individual can be made by averaging the opinions of the other consumers in that cluster. Some clustering techniques represent each consumer with partial participation in several clusters. The prediction is then an average across the clusters, weighted by degree of participation. Clustering techniques usually produce less-personal recommendations than other methods, and in some cases, the clusters have worse accuracy than nearest neighbor algorithms (Breese et al., 1998). Once the clustering is complete, however, performance can be very good, since the size of the group that must be analyzed is much smaller.

Clustering techniques can also be applied as a “first step” for shrinking the candidate set in a nearest neighbor algorithm or for distributing nearest-neighbor computation across several recommender engines. While dividing the population into clusters may hurt the accuracy or recommendations to users near the fringes of their assigned cluster, pre-clustering may be a worthwhile trade-off between accuracy and throughput.

2.1.2.6 Classifiers

Classifiers are general computational models for assigning a category to an input. The inputs may be vectors of features for the items being classified or data about relationships among the items. The category, is a domain-specific classification such as malignant/benign for tumor classification, approve/reject for credit requests, or intruder/authorized for security checks. One way to build a recommender system using a classifier is to use information about a product and a customer as the input, and to have the output category represent how strongly to recommend the product to the customer. Classifiers may be implemented using many different machine-learning strategies including rule induction, neural networks, and Bayesian networks. In each case, the classifier is trained using a training set in which ground truth classifications are available. It can then be applied to classify new items for which the ground truths are not available. If subsequent ground truths become available, the classifier may be retrained over time (Gediminas, 2005).

Classifiers have been quite successful in a variety of domains ranging from the identification of fraud and credit risks in financial transactions to medical diagnosis to intrusion detection. (Good et al. 1999) implemented induction-learned feature vector classification of movies and compared the classification with nearest-neighbor recommendation; this study found that the classifiers did not perform as well as nearest neighbor, but that combining the two added value over nearest-neighbor alone.

2.1.2.7 Association Rules

Association rules have been used for many years in merchandising, both to analyze patterns of preference across products, and to recommend products to consumers based on other products they have selected. An association rule expresses the relationship that one product is often purchased along with other products. The number of possible association rules grows exponentially with the number of products in a rule, but constraints on confidence and support, combined with algorithms that build association rules with item sets of “n” items from rules with “n-1” item sets, reduce the effective

search space. Association rules can form a very compact representation of preference data that may improve efficiency of storage as well as performance. They are more commonly used for larger populations rather than for individual consumers, and they, like other learning methods that first build and then apply models, are less suitable for applications where knowledge of preferences changes rapidly. Association rules have been particularly successfully in broad applications such as shelf layout in retail stores. By contrast, recommender systems based on nearest neighbor techniques are easier to implement for personal recommendation in a domain where consumer opinions are frequently added, such as on-line retail (Wang, 2004 ; Breese et al., 1998).

2.1.2.8 Horting

Horting is a graph-based technique in which nodes are consumers, and edges between nodes indicate degree of similarity between two consumers (Wolf et al. 1999). Predictions are produced by walking the graph to nearby nodes and combining the opinions of the nearby consumers. Horting differs from nearest neighbor as the graph may be walked through other consumers who have not rated the product in question, thus exploring transitive relationships that nearest neighbor algorithms do not consider. In one study using synthetic data, Horting produced better predictions than a nearest neighbor algorithm (Breese et al., 1998).

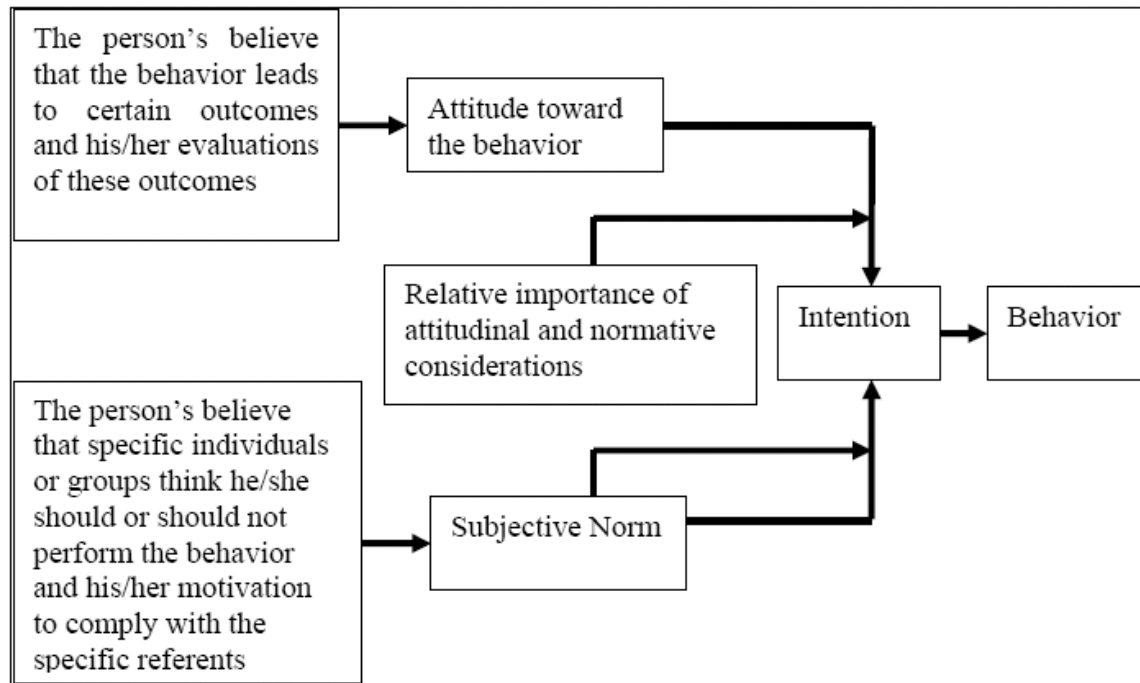
2.2 The Behavioral Adoption Theories

In this section the modification of well-known Technology Adoption theories for describing usage behavior will be presented. At last the main selected model for this survey, plus its theoretical background and definitions will be discussed.

2.2.1 Theory of Reasoned Action (TRA)

This theory has been used widely in many technology adoption researches. According to this theory an individual's intention to adopt an innovation is influenced by attitude toward the behavior and subjective norm and subsequently person's behavior is

determined by his intention to perform the behavior (Ghamatrasa, 2006). Figure 2.1 shows the relationships among constructs in TRA.



Source: (Ajzen and Fisbein, 1975)

Figure 2.1: Theory of reasoned action

The attitude toward performing the behavior is an individual's positive or negative belief about the performing the specific behavior. In fact attitudes are made up of the beliefs that a person accumulates over his lifetime. These beliefs have been created from experiences, outside information or self generated. However, only a few of these beliefs actually work to influence attitude. These beliefs are called salient beliefs and they are said to be the "immediate determinants of a person's attitude" (Ajzen and Fishbein, 1980; Ghamatrasa, 2006).

Subjective Norm is belief about what others will think about the behavior or in the other words the perceived influence of social pressure on an individual to perform or not perform the behavior (Ghamatrasa, 2006). "The person's belief that specific individuals or groups think he should or should not perform the behavior and his motivation to comply with the specific referents." (Ajzen and Fishbein, 1980).

Fishbein (1980), proposed that variables not included in the model can affect intention and, consequently, behavior. Behavior, then, is the transmission of intention into action. It is necessary to say that TRA is related to voluntary behavior. So, using TRA becomes problematic if the behavior under study is not under full volitional control (Ghamatrasa, 2006).

2.2.2 Theory of Planned Behavior (TPB)

Theory of Planned Behavior (TPB) is one of the most widely used models in explaining and predicting individual behavioral intention (BI) and acceptance of IT. TPB is an attitude–intention–behavior model, which posits that an individual's behavior is determined by perceived behavioral control and intention. Intention, in turn, is determined by attitude, subjective norm, and perceived behavioral control (Meng-Hsiang Hsua, 2006).

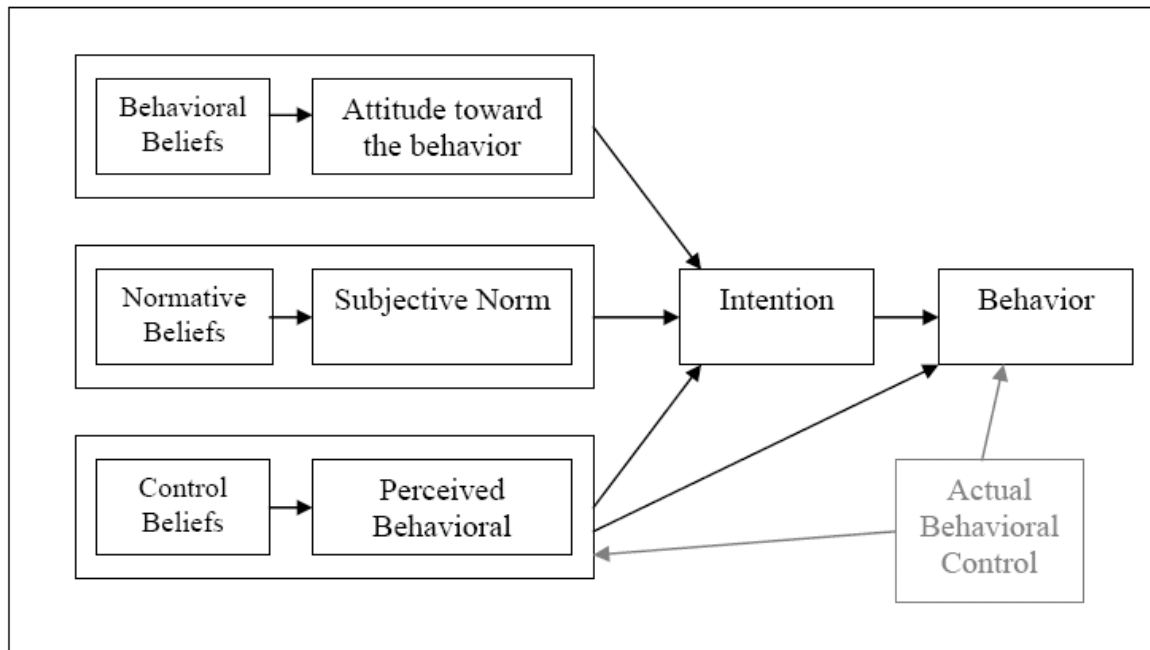
According to TPB, an individual's behavior is determined by BI and perceived behavioral control, and BI is determined by attitude toward behavior (A), subjective norm (SN), and perceived behavioral control (PBC). Attitudes toward behavior reflect one's favorable/unfavorable feelings of performing a behavior. SN reflects one's perception of others' relevant opinions on whether or not he or she should perform a particular behavior. PBC reflects one's perceptions of the availability of resources or opportunities necessary for performing a behavior (Ajzen and Madden, 1986 ; Meng-Hsiang Hsua, 2006).

While previous research has demonstrated the validity of this model across a wide variety of IT acceptance. One obstacle in using TPB has been found in applying it to the research of IT continuance. Recently, some researchers pointed out that a weakness of TPB is its lack of explanatory power of IT continuance (Hartwick and Barki, 1994; Karahanna et al., 1999). This is because TPB constructs do not fully reflect the context of user continuance decisions. For example, drawing upon TRA, Hartwick and Barki (1994) found that attitude and SN exerted different amounts of influence before and after information system development (ISD). Prior to ISD, SN exerted a greater influence on

intention. Following ISD, attitude had a greater effect on intention. Karahanna et al. (1999) endeavored to distinguish the pre-adoption and post-adoption determinants of IT usage. Consistent with Hartwick and Barki's (1994) study, Karahanna et al. (1999) found that SN dominated prediction of BI to adopt a new IT but did not have a significant relationship with intention to continue using Windows technology. Attitude, however, strongly influenced continuance intention. The above findings reported that attitude impacted intention substantively and consistently during both pre-acceptance and post-acceptance stages. Those findings provide support to the notion that attitudes are estimates that a behavior will produce particular outcomes (Oliver and Shapiro, 1993 ; Meng-Hsiang Hsua, 2006).

Attitude in the TPB includes evaluative beliefs regarding certain behavioral outcomes and an estimation of the likelihood that these outcomes will occur. Subjective norms represent normative behavioral beliefs and the motivation to comply with these beliefs. Perceived behavioral control, which is people's confidence in their ability to engage in a certain behavior, together with the perception of the expectations of relevant others (i.e., subjective norms) and with the attitude toward performing a particular act determine people's intention to perform that behavior. Intention, in turn, is the ultimate predictor of behavior. The more a behavior depends on the presence of appropriate circumstances that are external to a person, the less a behavior is intentionally controllable. Thus, in addition to the relationship between perceived control and intention, the TPB also models a direct influence of perceived behavioral control - representing actual control - on behavior (Ajzen & Madden, 1986). Besides these relationships, the TPB is open to further expansion, in principle, provided a supplementary concept captures a unique and significant portion in the explained variance of intention and/or behavior (Ajzen, 1991). In their meta-analytic review regarding efficacy of the TPB, Armitage and Conner (2001) found behavioral control and intention jointly explained 27% of variance in behavior. This is consistent with Ajzen's (1991) estimate of 25–30%. Turning the percentages around, approximately 70–75% of the variance in behavior remains unaccounted for by the theory. One source of this large proportion of unexplained variance is suspected to be unreliable concept measurement, as

the TPB is normally tested specifically, predicting a single action. Such non-aggregated measures are notorious for being unreliable (Manstead, 1996 ; Kaiser, 2006).



Source: (Ajzen, 1991)

Figure 2.2: Theory of Planned behavior

Figure 2.2 illustrates the TPB main model according to Ajzen (Ajzen,1991). This model is consists of 5 constructs. As in the TRA model, it includes behavioral attitudes, subjective norm, intention to use and actual use. The components of behavioral attitude and subjective norm are the same in TPB as in TRA. In addition, the model includes behavioral control as a perceived construct. Intention is an indication of a person's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior. The intention is based on attitude toward the behavior, subjective norm, and perceived behavioral control, with each predictor weighted for its importance in relation to the behavior and population of interest. Behavior is the manifest, observable response in a given situation with respect to a given target (Ghamatrasa, 2006).

Actual behavioral control refers to the extent to which a person has the skills, resources, and other prerequisites needed to perform a given behavior. Successful performance of the behavior depends not only on a favorable intention but also on a sufficient level of behavioral control. To the extent that perceived behavioral control is accurate, it can serve as a proxy of actual control and can be used for the prediction of behavior (Ghamatrasa, 2006).

Perceived behavioral control refers to people's perceptions of their ability to perform a given behavior or in the other words the degree to which an individual feels that the decision to perform or not perform is within his control. It encompasses two components. The first component is "facilitating conditions" representing the resources required to use a specific system. Examples of such resources are time, financial resources or other ICT-related resources. The second component is self-efficacy; that is "an individual's self-confidence in his/her ability to perform a behavior" (Taylor and Todd, 1995; Ghamatrasa, 2006).

TPB and TRA have both been criticized for not suggesting operational components or determinants of behavioral attitudes, subjective norm and to some extent, behavioral control. To meet some of this criticism, many researchers have suggested specific components or determinants of the attitudinal concepts of the TPB-model. For example, Battacherjee (2000) suggests incorporating the TAM (will be discussed next) model in TPB with perceived usefulness and user friendliness as the determinants of attitudes towards use. He also suggests subjective norm may be determined by external and interpersonal influence, and that the two components of perceived behavioral control may also be treated as the determinants of behavioral control (Ghamatrasa, 2006).

Taylor and Todd (1995) suggest what they term a decomposed TPB which also includes the TAM model in the attitudinal part of TBP. However, they also include compatibility as a third determinant of attitude towards use, mainly inspired by the diffusion theory of Rogers (1995). Finally, the decomposed TPB suggests self efficacy, and resource facilitating conditions and technology facilitating conditions are the most relevant determinants of behavioral control (Ghamatrasa, 2006).

2.2.3 Innovation Diffusion Theory

Before describing this theory, describing the innovation word would be helpful. “An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption” (Rogers, 1983). This means that a product that is perceived as new to an individual does not necessarily have to be new on the market. The internet is an example of a significant technological innovation. Diffusion of innovations is a theory frequently applied in information system adoption research based on synthesis of a considerable body of adoption research. Rogers formulated the general theory to explain adoption of various types of innovations (Rogers, 1995). The theory discusses adoption from three aspects: innovation characteristics, adopter characteristics and the adoption process. According to this theory a potential adopter passes through certain stages before decision is made on whether to adopt or reject an innovation (Ghamatrasa, 2006).

Rogers has been one of the researchers who has focused upon the adoption process, which he defines as “the process through which an individual or other decision maker unit passes from first awareness of an innovation, to forming an attitude toward the innovation to a decision or rejection to implementation of the new idea, and to confirmation of this decision” (Saljoughi, 2002 ; Ghamatrasa, 2006) Following stages of innovation decision process according Rogers have been described:

- 1- Awareness:** Socio-economic characteristics, Personality variables and communication behavior all relate to innovativeness. Innovativeness is the degree to which an individual or other adoption unit is relatively early in adopting new ideas compared to other members of a system (Roger, 1995; Ghamatrasa, 2006).
- 2- Persuasion:** The potential adopter’s attitude towards the innovation is formed in this stage. By anticipating and predicting future use satisfaction and risk of adoption, the potential adopter develop positive or negative attitudes to the innovation, which play important role of modifying the final decision. Perceived attitudes of an innovation as its relative advantage, compatibility

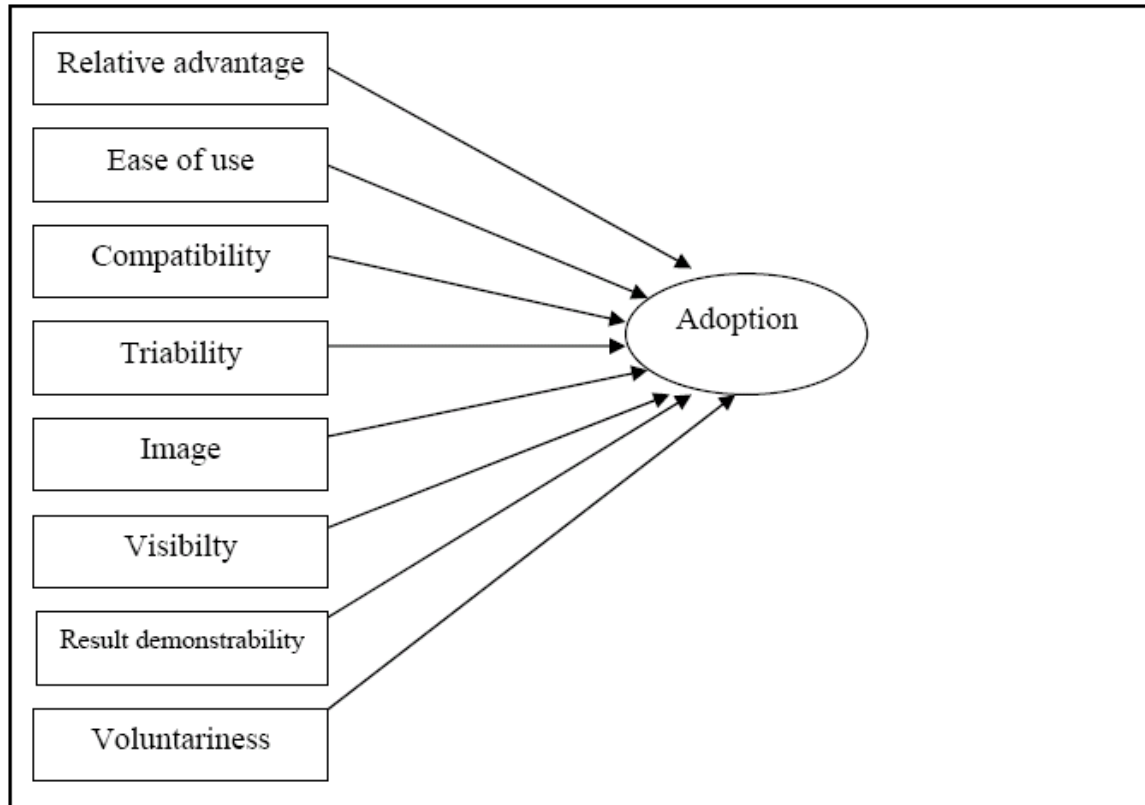
and complexity are especially important here (Roger, 1995;Ghamatrasa, 2006).

- 3- **Decision:** The decision stage occurs when an individual engages in activities that lead to adoption or rejection of the innovation. In this stage the adopter starts to actively seek out information about the innovation that assists the decision making (Ghamatrasa, 2006).
- 4- **Implementation stage:** In this stage, mental information processing and decision making come to an end, but the behavioral change begins (Ghamatrasa, 2006).
- 5- **Confirmation stage:** After the adoption of innovations, the adopter keeps evaluating the results of his decision. If the level of satisfaction is significant enough, the use if innovation will continue; however, it is also possible that the rejection occurs after adoption. In the latter case, the reverse of previous decision is called “discontinuance”. Diffusion of innovations determines five innovation characteristics that affect the adoption. (Rogers, 1995; Ghamatrasa, 2006)
- 6- **Relative Advantage:** The degree to which an innovation is perceived as better than the idea it supersedes. The degree of relative advantage may be measured in economic terms, but social-prestige factors, convenience, and satisfaction are also important components (Ghamatrasa, 2006).
- 7- **Compatibility:** The degree to which an innovation is perceived as being consistent with the existing values, past experience, and needs of potential adopters. An idea that is incompatible with the values and norms of a social system will not be adopted as rapidly as an innovation that is compatible (Ghamatrasa, 2006).
- 8- **Complexity:** The degree to which an innovation is perceived as difficult to understand and use. Some innovations are rapidly understood by most members of a social system; others are more complicated and will be adopted more slowly. New ideas that are simpler to understand will be adopted more rapidly than innovations that require the adopter to develop new skills and understandings (Ghamatrasa, 2006).

9- Trialability: The degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on the installment plan will generally be adopted more quickly than innovations that are not divisible (Ghamatrasa, 2006).

10- Observability: The degree to which the result of an innovation are visible to others. The easier it is for individuals to see the results of an innovation, the more likely they are to adopt it (Ghamatrasa, 2006).

Research has suggested that only the relative advantage, compatibility, and complexity are consistently related to innovation adoption (Agrawal and Prasad, 1998). Based on a research by Moore and Benbasat in 1991, they developed diffusion of innovations theory by adding few constructs. Their final modified model (figure 2.3), included relative advantage, compatibility, ease of use (the reverse phrase of complexity) and triability. They separated image from relative advantage construct of Roger's model. Image was meant as the degree to which use of an innovation is perceived to enhance one's status in one's social system. Also, they divided observability construct of Roger to visibility and demonstrability. Finally, they added voluntariness construct as the degree to which use of the innovation is perceived voluntary (Ghamatrasa, 2006). Innovation diffusion theory (figure 2.3) has been extensively used for relevant IT and IS researches especially for communication adoption purposes (E. Karahanna, 1999 ; Feng-Cheng Tunga, 2007).



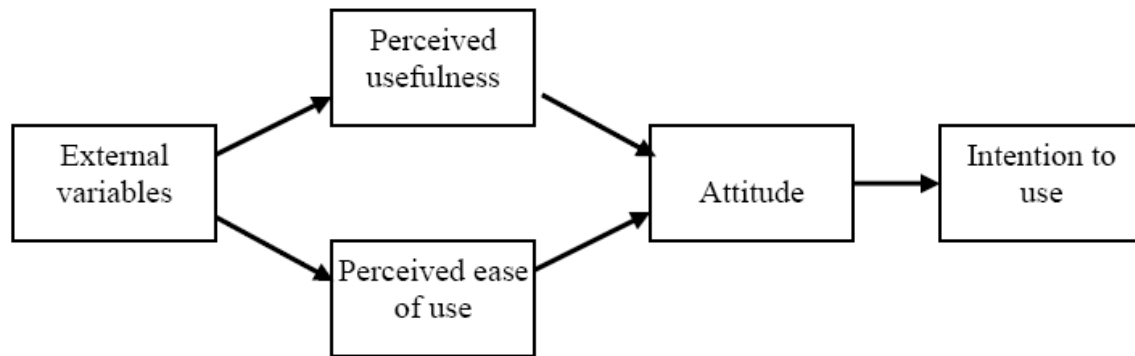
(Moore and Benbasat, 1991; Hsua et al., 2007)

Figure 2.3: Innovation Diffusion Theory

2.2.4 Technology Acceptance Model (TAM)

TAM (figure 2.4), introduced by Davis (Davis, Bagozzi, & Warshaw, 1989), is an adaptation of the TRA (theory of reasoned action) model specifically tailored for modeling user acceptance of information systems (IS). The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified (Davis et al., 1989). TAM adapted the TRA model to the particular domain of user acceptance of information technology (IT), replacing the TRA model's attitudinal determinants with two beliefs: perceived usefulness and perceived ease of use. TAM was found to be a much simpler, easier to use, and more powerful model of the determinants of user acceptance of IT, while both models were found to satisfactorily predict an

individual's attitude (satisfaction) and behavioral intention. In addition, TAM's attitudinal determinants outperformed the TRA model's much larger set of measures (Igbaria, Guimaraes, & Davis, 1995). As such, the satisfaction of an online user should be explained in part by TAM (Hyoung Yong Lee, 2006).



Source: (Davis, 1989)

Figure 2.4: Technology Acceptance Model(TAM)

Perceived usefulness is defined as the prospective user's subjective probability that using a specific IS will increase his/her job performance within an organizational context. Perceived ease of use refers to the degree to which the prospective user expects the target IS to be free of effort (Igbaria et al., 1995). The relationship between perceived usefulness and perceived ease of use and their impact on an individual's intention to use, were studied within the banking recommender system (Hyoung Yong Lee, 2006).

2.2.4.1 TAM Extension

Much of the research into user acceptance of technology makes reference to Davis, who first proposed a technology acceptance model (TAM) applied to predict user acceptance of technology. Since then, researchers have criticized its extrinsic focus. Malone (1981) stated that intrinsic motivation factors might also contribute to user acceptance of technologies, and Moon and Kim (2001) proposed an intrinsic factor—'perceived playfulness' - which can be generally defined as a situational characteristic of the interaction between an individual and the situation - as a new factor to affect a user's attitude (Moon and kim, 2001 ; Hyoung Yong Lee, 2006).

Playfulness, which is based on Lieberman's pioneering works (Lieberman, 1977) and Barnett's study (Barnett, 1990) provides a strong theoretical base for our work. There are two possible approaches: the first, focusing on the trait of playfulness, treats it as a motivational characteristic of individuals; the second, emphasizing the state of playfulness, defines it as a situational characteristic of the interaction between an individual and the situation. General traits refer to comparatively stable characteristics of individuals; these are relatively invariant to situational stimuli. States, however, refer to affective or cognitive episodes that are experienced in the short run and fluctuate over time. Unlike traits, states can be influenced by situational factors and the interactions between the individual and the situation. Playfulness represents a relatively enduring tendency, while being playful represents a temporary state at some specific time. In the trait-based approach, Webster and Martocchio's (1992) Microcomputer Playfulness Scale is a specific adaptation of Barnett's work to the study of computer usage (Webster, 1992; Moon and Kim, 2001).

They conceived playfulness as the characteristic of an individual. Webster (1992), however, found that individuals considered to be high on the playfulness trait demonstrated higher performance and showed higher affective responses to computer training tasks. Also, Atkins and Kydd (Moon, 2001) examined the influence of individual characteristics of playfulness on the use of the WWW. They found that both playfulness and usefulness affect its use in different ways, depending on its use for entertaining or for course work. While the trait-based approach focused on playfulness as the individual's characteristic, state-based research emphasized playfulness as the individual's subjective experience of human-computer interaction. The majority of the research on playfulness as the individual's interaction state are based on the Csikszentimihalyi's flow theory' (Moon, 2001). It emphasizes the role of a context rather than individual differences in explaining human motivated behaviors. He defined the flow as ``the holistic sensation that people feel when they act with total involvement." When in the flow state, a person may have more voluntary interaction with his or her environment. Based on the flow theory, several IS researchers felt that it is useful in understanding playfulness and the individuals' evaluation of IT usage. Webster (Moon, 2001) investigated the effects of flow on the

computer-mediated communication environment. He found that it is influenced by the technology type, ease of use, and computer skill. Also, Webster et al. (2001) examined the state of flow in a specific human-computer interaction. They found that the flow experience is associated with perceived characteristics of the computer software as well as with relevant work related outcomes. But, from the point of technology acceptance research, their studies cannot explain the effects of playfulness on the individual's attitude and actual behaviors. To overcome this problem, we consider playfulness as an intrinsic belief or motive, which is shaped from the individual's experiences with the environment. More specifically, we examine it as an intrinsic salient belief that is formed from the individual's subjective experience with the Banking environment. Therefore, individuals who have more positive playfulness belief in the BRS should view its interactions more positively than those who interact less playfully (Moon, 2000). On the basis of the previous works, we define three dimensions of perceived playfulness; the extent to which the individual:

- Perceives that his or her attention is focused on the interaction with the BRS.
- Is curious during the interaction.
- And finds the interaction intrinsically enjoyable or interesting.

Concentration: In the playfulness state, an individual's attention will be focused on the activity. The focus is narrowed to a limited stimulus field, so that irrelevant thoughts and perceptions are filtered out. In this way, the person loses self-consciousness, becomes absorbed in the activity, and be more intensely aware of mental processes. When people fall into a playful state during their interaction with the BRS, their attention will be focused on the interactions (Moon, 2001).

Curiosity: Malone (Moon, 2001) suggested that, during playfulness, an individual's sensory or cognitive curiosity is aroused. For example, the BRS can encourage sensory curiosity through technological characteristics such as hyper-links and multimedia effects. It can also stimulate cognitive curiosity and the desire to attain competence with the technology by providing options such as bookmarks and hyper-links that encourage exploration and competence attainment.

Enjoyment: When individuals are in the playfulness state, they will find the interaction intrinsically interesting: they are involved in the activity for pleasure and enjoyment rather than for extrinsic rewards (Moon, 2001).

While these three dimensions are linked and interdependent, they do not always occur together in practice. For example, involvement often accompanies feelings of control and enjoyment, but it may also occur during highly stressful activities. Thus one playfulness dimension by itself may not reflect the total experience (Moon, 2001).

2.2.4.2 TAM Antecedents

Although there are a variety of factors which have been proposed as the antecedents of TAM, we used one factor which is known to be important for the usage of IT specially in banking sector personal innovativeness. Personal innovativeness represents the degree to which an individual is willing to try out any new IT. This factors is known to affect perceived ease of use and perceived usefulness in TAM (Agarwal & Prasad, 1998; Lewis, Agarwal, & Sambamurthy, 2003; Hyoung Yong Lee, 2006). As another antecedent for affecting Perceived ease of use, personality of a user is frequently examined.

2.2.5 Differences Between Adoption Models

It's maybe correct to say that evaluation and comparison of the different adoption theories reveals that they are not much different in terms of their differential predictions. But according to the context and situational characteristics a model will be finally selected to measure the intention to adopt. Drawing upon the theoretical foundation of TRA, Davis (1989) proposed that the theory be specially modified for the domain of IT in form of a now widely accepted interpretation of IT acceptance: the technology acceptance model (TAM). In the TAM, as in the TRA, attitude predicts intention, and intentions predict behavior. Unlike TRA, TAM does not include a subjective norm component as a determinant of intention because of its uncertain theoretical ad empirical psychometric status (Davis et al., 1989). Subjective norm can create the direct effects to norm on intentions from indirect effects via attitude (Fishbein and Ajzen 1975).

Comparing with TRA, Technology Acceptance Model (TAM) is more oriented to analyze the human behavior on using information System. TRA and TPB were formulated as generalization of a wide area of individual behaviors, including the use of information technology. In both theories Attitude is influenced by belief about the consequence of execute the behavior weighted by the individual's evaluation of each consequence. Depended variable of interest in both theories is visible and both posit that behavior is influenced of subjective norms. Attitude and intention have the same definition in both TAM and TPB. Both theories predict behavior from intention. Mathieson (1991) also found TAM as a quick and inexpensive in compare to TPB (Karami, 2006).

2.2.6 Adopter Categories Based Research

The individuals in a social system do not adopt an innovation at the same time. Rather, they adopt in an over-time sequence, so that individual can be classified into adopter categories on the basis of when they first begin using a new idea. Three major types of adopters are classified as follow.

2.2.6.1 Adopter Categories

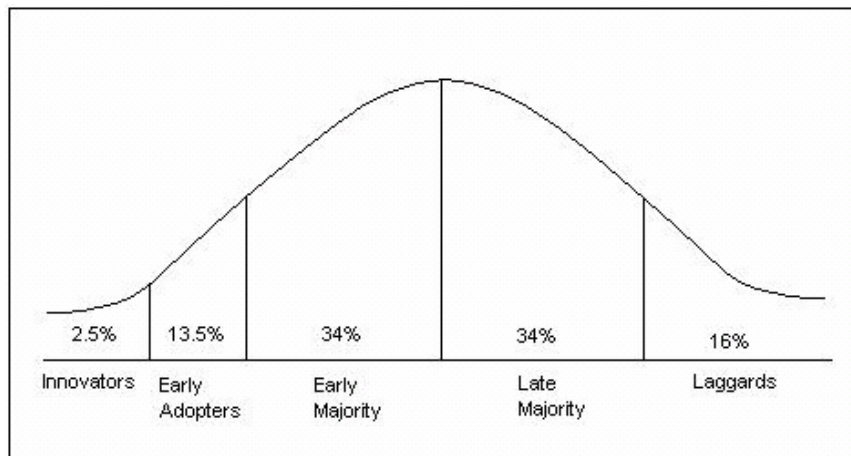
The criterion for adopter categorization is innovativeness. This is defined as the degree to which an individual is relatively early in adopting a new idea then other members of a social system. Innovativeness is considered "relative" in that an individual has either more or less of it than others in a social system (Rogers, 1971).

Adopter distributions closely approach normality. The figure 2.5 shows the normal frequency distributions divided into five categories: innovators, early adopters, early majority, late majority and laggards. Innovators are the first 2.5 percent of a group to adopt a new idea. The next 13.5 percent to adopt an innovation are labeled early adopters. The next 34 percent of the adopters are called the early majority. The 34 percent of the group to the right of the mean are the late majority, and the last 16 percent are considered laggards. (Rogers, 1971). Figure 2.5, shows all these categories.

Innovators are eager to try new ideas, to the point where their venture sameness almost becomes an obsession. Innovators' interest in new ideas leads them out of a local circle of peers and into social relationships more cosmopolite than normal. Usually, innovators have substantial financial resources, and the ability to understand and apply complex technical knowledge. While others may consider the innovator to be rash or daring, it is the hazardous risk-taking that is of salient value to this type of individual. The innovator is also willing to accept the occasional setback when new ideas prove unsuccessful (Rogers, 1971). Below all adaptors category description are defined:

- **Innovators:** Innovators are eager to try new ideas, to the point where their venture sameness almost becomes an obsession. Innovators' interest in new ideas leads them out of a local circle of peers and into social relationships more cosmopolite than normal. Usually, innovators have substantial financial resources, and the ability to understand and apply complex technical knowledge. While others may consider the innovator to be rash or daring, it is the hazardous risk-taking that is of salient value to this type of individual. The innovator is also willing to accept the occasional setback when new ideas prove unsuccessful (Rogers, 1971).
- **Early adopters:** Early adopters are a more integrated part of the local social system than are innovators. This adopter category, more than any other, has the greatest degree of opinion leadership in most system. The early adopter decrease uncertainty about a new idea by adopting it, and then conveying a subjective evaluation of the innovation to near-peers through interpersonal networks. Early adopters drive the development of the early market (Rogers, 1971).
- **Early Majority:** The early majority adopt new ideas just before the average member of a system. The early majority interact frequently with their peers, but are not often found hold positions of opinion leadership in a system. The early majority are the most numerous adopter categories, and it's unique position between the very early and the relatively late to adopt makes them an important link in the diffusion process (Rogers, 1971).

- **Later majority:** The late majorities are skeptical groups and adopt new ideas just after the average member of a system and also count another most numerous adopter categories. They possess relatively scarce resources and need most of the uncertainty about a new idea must be removed before the late majority feel that it is safe to adopt (Rogers, 1971).
- **Laggards:** Laggards are traditionalists and the last to adopt an innovation. Possessing almost no opinion leadership, laggards are localizing to the point of being isolates compared to the other adopter categories. They are fixated on the past, and all decisions must be made in terms of previous generations. Individual laggards mainly interact with other traditionalists. An innovation finally adopted by a laggard may already be rendered obsolete by more recent ideas already in use by innovators. Laggards are likely to be suspicious not only of innovations, but of innovators and change agents as well (Rogers, 1971).



(Source: <http://www.ou.edu/deptcomm/dodjcc/groups/99A2/theories.htm>)

Figure 2.5: Adopter categories

2.3 Conceptual Framework and Research Model

In this part I have formulated my research questions based on the several theories considered within the literature, described in the preceding sections. Then the emerged frame of reference and the main research model as well as the conceptualization and

operationalization will be presented, which will be used to design the questionnaire and conduct empirical study.

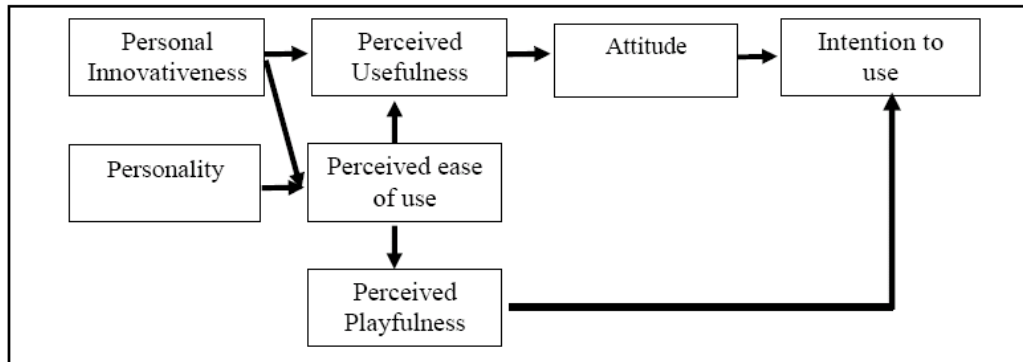
2.3.1 Research Model

Based on the review of literature, the research question and detail study of prior banking adoption researches in the same field in developed countries, various discussions with academic professors and also arranging some meetings with Tejarat Bank experts, the suitable final research model based on original TAM, its extended model and antecedents, as external variables to original TAM, was build to guide our survey's data collection. The purpose of this research model is to build an appropriate conceptual framework for identifying and studying deeply the issues that guides Iranian banks into a recommender system adoption.

As mentioned earlier this final research model (figure 3.1), was selected to best match Iran's banking context characteristics. In brief, the following reasons are the most important reasons, of this model selection:

- TAM has been the most commonly employed model of IT usage and adoption (Taylor and Todd, 1995).
- It has been found that TAM's ability to explain attitude toward using an information system in banking context is better than other model's (TRA and TPB) (Mathieson, 1991).
- TAM has received considerable empirical support (e.g., Davis, 1989; Mathieson, 1991 ; Taylor and Todd, 1995).
- Two belief factors of the TAM model (perceived ease of use and perceived usefulness) are easy to understand and manipulate in information system design and implementation (Hung and Chang, 2004).
- TAM's extended model and antecedents found to be most appropriate in order to measure a recommender system adoption (Hyoung-Yong Lee et al., 2006).

- From Tejarat Bank experts opinion, Personality, Personal innovativeness and Perceived playfulness as the external variables added to the original TAM, can best describe Iranian bank customer's behavior in a BRS adoption.



Source: (Hyoung-Yong Lee et al., 2006, Author's own Source)

Figure 2.6: Overall framework of the main model

In addition to the above, a similar model with some small differences was used by Hyoung Yong Lee et al., (2006) in order to measure the intention to adopt a recommender system in a virtual community as well. Below are the summarized definitions of each construct used in the main model:

Construct	Definition
Perceived usefulness	Refers to the degree to which a person believes that using a particular system would enhance his or her job performance.
Perceived ease of use	Refers to the degree to which a person believes that using a particular system would be free of effort.
Attitude	Refers to one's evaluation about the consequences of performing a behavior.
Personal innovativeness	Represents the degree to which an individual is willing to try out any new IT.
Perceived playfulness	can be generally defined as the situational characteristics of the interaction between an individual and the situation.
Personality	Refers to the personal characteristics of people, that is effective in their interaction with a situation.

(Source: Author's own source)

Table 2.1: Summary of the main model definitions

The above factors have been measured by means of a questionnaire through Tejarat bank customers in 7 different cities of Iran, from 16 branches. The Questionnaire design and data collection process will be explained in detailed in chapter 3. In continuous of Table 3.1; table 3.2, table 3.3 and table 3.4 show the relation of each factor to corresponding statement in the questionnaire.

Construct	Relevant Question
Perceived usefulness	<p>Using a banking recommender system would improve my performance in conducting banking tasks.</p> <p>Using a banking recommender system would help me to have a better selection among different available choices.</p> <p>Using the banking recommender system would enable me to accomplish my banking tasks in a better way.</p> <p>Using this recommender system will have critical role in supporting my banking activities.</p> <p>By Using a banking recommender system, I would not lose opportunities.</p> <p>Using a banking recommender system would help me to have access to updated information regard banking activities and services.</p> <p>Using a banking recommender system would help me to have access to more valuable information, in time.</p> <p>Overall, I find the use banking recommender system useful.</p>

Table 2.2: Summary of the main model's relevant questions

Construct	Relevant Question
Perceived ease of use	<p>I find my interaction with the use of the banking recommender system clear and understandable.</p> <p>I believe learning to use Banking recommender system will be easy for me.</p> <p>I think it will be easy to use Banking recommender system.</p> <p>If needed, I will spend lots of time to learn how to use it.</p> <p>I like to receive recommendations from the system, by the most convenient ways that I prefer.</p> <p>I think this system will be flexible to interact with.</p> <p>Overall, I found using this system free of effort.</p> <p>I think email is the easiest and most convenient way of having recommendations from this system.</p> <p>I think SMS is the easiest and most convenient way of having recommendations from this system.</p> <p>I think Fax message is the easiest and most convenient way of having recommendations from this system.</p> <p>I think direct phone call from the bank is the easiest and most convenient way of having recommendations from this system.</p> <p>I prefer to receive recommendations from this system, when I enter my credit card to and ATM machine and during transaction process.</p> <p>I prefer to receive recommendations from this system, when I entered my account at the bank website.</p>
Attitude	<p>I would feel that using banking recommender system would be pleasant.</p> <p>Using banking recommender system is a good idea.</p> <p>In my opinion, all banks must use a banking recommender system.</p> <p>In my view, using banking recommender system is a wise idea.</p>

Table 2.3: Summary of the main model's relevant questions

Construct	Relevant Question
Intention to use	<p>I would see myself using the banking recommender system for handling my banking transactions.</p> <p>I will frequently use this banking recommender system in the future.</p> <p>I will strongly recommend others to use systems recommendations.</p>
Perceived playfulness	<p>As soon as I receive a suggestion from the system in any situation, I will try using it as soon as possible.</p> <p>I felt happy, when receiving suggestions from the system.</p> <p>I believe the system recommendations are the best, and there is no need to investigate on them.</p> <p>I only prefer to have recommendations from this system, and I will ignore other recommendations from other parties.</p>
Personality	<p>According to my personality, The opinions of my family members regard this system has a great impact on me.</p> <p>According to my personality, the experts' opinion regard this system is very important for me.</p> <p>According to my personality, I will not be the first users of this system. And I will stay until it becomes very popular.</p>
Personal innovativeness	<p>If I heard about a new IT, I would like to experiment with it.</p> <p>Among my peers, I am usually the first to try out new IT.</p> <p>In general, I am hesitant try out new IT.</p> <p>I like to experiment new systems based on IT.</p>

Table 2.4: Summary of the main model's relevant questions

2.3.2 Hypotheses development

Finally, based on the main model and experts and decision maker ideas, we decide to test the following eight Hypotheses. These eight hypotheses are classified as follow:

- H1. Personal innovativeness has a direct and positive effect on Perceived usefulness.
- H2. Personal innovativeness has a direct and positive effect on Perceived ease of use.
- H3. Personality has a direct and positive effect on Perceived ease of use.
- H4. Perceived usefulness has a direct and positive effect on Attitude.
- H5. Perceived ease of use has a direct and positive effect on Perceived usefulness.
- H6. Perceived ease of use has a direct and positive effect on Perceived playfulness.
- H7. Attitude has a direct and positive effect on Intention to use.
- H8. Perceived playfulness has a direct and positive effect on Intention to use.

Chapter Three

Methodology

3 Methodology

In this chapter a brief discussion regarding methodology will be presented. The research purpose, research approach and the research strategy that is used in this research will be discussed and described. And it is also explained why we have chosen these ways of conducting the research. The sample selection, detailed data collection and analysis method will also be explained.

3.1 Research Purpose

There are several techniques which could be used to carry out the research based on research problem area. When dealing with research problem, one can use any of the three classification of research and apply own personal motivation to perform a scientific

study (Yin, 1994). The purpose of an academic research can be exploratory, descriptive, or explanatory. Three different classifications of research are as follow:

- Exploratory
- Explanatory
- Descriptive

3.1.1 Exploratory

Exploratory research is often employed when problem is not well known or it has not been clearly defined as yet, or its real scope is as yet unclear. It allows the researcher to gather the information as much as possible concerning a specific problem. Exploratory research helps determine the best research design, data collection method and selection of subjects, and sometimes it even concludes that the problem does not exist. Exploratory research is quite informal, when it relying on secondary research such as reviewing available literature, data, or qualitative approaches such as informal discussions with consumers, employees, management or competitors, and more formal approaches through in-depth interviews, focus groups, projective methods, case studies or pilot studies (Yin, 1994; Khan, 2007).

3.1.2 Explanatory

In this research the primary goal is to understand the nature or mechanisms of the relationship between the independent and dependent variable. This approach is often used when it's necessary to show that one variable causes or determines the value of other variable. This type of research is good to use when there is no clear apprehension about what model that should be used and what qualities and relations that is important (Zikmund, 1994).

3.1.3 Descriptive

Descriptive research is used to obtain and earn information concerning the current status of the phenomena to describe "what exists" with respect to variables or conditions

in a situation. Descriptive research is used when the objective is to provide a systematic description that is as factual and accurate as possible or when the problem is well structured and there is no intention to investigate cause/effect relation. It provides the number of times something occurs, or frequency, lends itself to statistical calculations such as determining the average number of occurrences or central tendencies (Yin, 1994). One of its major limitations is that it cannot help determine what causes a specific behavior, motivation or occurrence. In other words, it cannot establish a causal research relationship between variables (Khan, 2007).

My research purpose and research question reveal that this study is mainly explanatory. It is explanatory because the data has been collected through questionnaires and conducted a study to find out the relations between the dependent and independent variables of the model. Also to have a better apprehension about the proposed model, and to study factors that influence Iranian bank customer's intentions to adopt Banking recommender system.

3.2 Research Approach

There are two choices of research approach available, namely the qualitative and quantitative research approach. In the quantitative approach, results are based on numbers and statistics that are presented in figures, whereas in the qualitative approach where focus lies on describing an event with the use of words and explanation. Qualitative research also, provides a deeper understanding of the phenomenon under investigation, and the problem can be understood within its context, thus furnishing a holistic view. In contrast, quantitative methods are often used within natural science, and the purpose is regularly explanatory. The objective is to explain causal relationships, to allow generalization, and to enable predictions about the future (Wallstrom, 2002).

In this research, different factors emerged from the literature are empirically tested in order to see their effectiveness in the adoption process of a BRS. Thus, a quantitative approach proves to be suitable for our study, because all the results are presented and supported by digits, and statistical analysis; however as mentioned before,

a qualitative approach is also employed at the beginning, in order to have a holistic understanding on the realistic adoption behavior and refine the questionnaire for later quantitative research. Thus the research approach is suitable to be both quantitative and qualitative.

3.3 Research Strategy

Research strategy is a general plan which shows that how this research will go on, and how researcher will answers the question that has been set by him. It will contain clear objectives, derived from research question specify the source from which researcher intend to collect data and consider the constraints that researchers will inevitably have such as access to data, time, location and money and ethical issues.

According to Yin, the researcher can choose a research strategy among five different types, an experiment, a survey, history, an analysis of archival records and a case study, depending on the character of research questions (Yin, 1994).

Yin suggests that case studies can be used for exploratory (what), descriptive (how) or explanatory (why) purposes. Like the overall aim, the four research questions are mostly descriptive (how) and explanatory (why), but also including exploratory trait (what) at the pilot test as mentioned earlier (Yin, 1994).

Research Strategy	Research Strategy	Required Control Over Behavioral Systems	Focus on Contemporary events
Experiment	How, why	Yes	Yes
Survey	Who, what, where, how many, how much	No	Yes
Archival Analysis	Who, what, where, how many, how much	No	Yes/No
History	How, Why	No	No
Case Study	How, Why	No	No

Source: (Yin, 1994)

Table 3.1: Relevant Situations for Different Research Strategies

Qualitative research can be conducted using different strategies including: case study, experiments, surveys, histories, and analysis of archival information (Yin, 1994). Although experimental or historical strategies are also recommended by Yin if the primary interest is in research problem such as the above, the experimental approach is excluded because the adoption behavior cannot be manipulated easily as we differentiate the adoption behavior as avoiding using, trying and repeat using. Another reason is that we are explicitly interested in proved attitudes and real life experiences rather than behavior in artificial situations. The historical approach is obviously excluded for we are investigating a fairly new phenomenon (Wang, 2004).

But, since this study aims to find out the factors influencing the adoption of banking recommender system form customer's point of view, so the best strategy that best suits this study is survey. Survey is a technique which information will be collected from a number of people through questionnaire (Zikmund, 1994). Beside, as the main question of this research is form of what, so the most relevant and appropriate research strategy for this case is Survey (Yin, 1994).

3.4 Sample Selection

Sampling is a survey-based research where researcher needs to analyze the sample about a population to answer the research questions or meet the research objectives (Saunders, 2000). Once the problem has been carefully defined, the researcher needs to establish the sample that will outline the investigation to be carried out. It is necessary to clearly define the target population from whom sample will be taken. Sampling is important if budget and time constraints prevent research from surveying the entire population. Sample gives higher accuracy and fast result. Sometimes, the entire population will be sufficiently small, and the researcher can include the entire population in the study. This type of research is called a census study because data is gathered on every member of the population (Khan, 2007).

Usually, the population is too large for the researcher to attempt to survey all of its members. A small, but carefully chosen sample can be used to represent the population. The sample reflects the characteristics of the population from which it is drawn. Sampling technique can be classified into two types (Saunders, 2000; Khan, 2007):

- **Probability Sampling**
- **Non-Probability Sampling**

3.4.1 Probability Sampling

In this method of sampling, the sample is selected in such a way that each unit within the population has a known chance of being selected. It is this concept of "known chance" that allows for the statistical projection of characteristics based on the sample to the population (Saunders, 2000). The advantage of probability sampling is that sampling error can be calculated. Sampling error is the degree to which a sample might differ from the population. Probability method includes (Khan, 2007).

- **Random sampling**
- **Systematic sampling**
- **Stratified sampling**

3.4.2 Non-Probability Sampling

In non-probability sampling, the sample is selected in such a way that the chance of being selected of each unit within the population is unknown. Indeed, the selection of the subjects is random or subjective, since the researcher relies on his/her experience and judgment. As a result, there are no statistical techniques that allow for the measurement of sampling error, and the degree to which the sample differs from the population remains

unknown and therefore it is not appropriate to project the sample characteristics to the population (Saunders, 2000; Khan, 2007). Non-probability sampling includes:

- **Convenience sampling**
- **Judgment sampling**
- **Quota sampling**
- **Snowball sampling**

3.4.2.1 Convenience Sampling

This sampling is used in exploratory research where the researcher is interested in getting an inexpensive approximation of the truth. As the name implies, the sample is selected because they are convenient. This non-probability sampling method is often used during preliminary research efforts to get a gross estimate of the results, without incurring the cost or time required to select a random sample (Saunders, 2000; Khan, 2007).

3.4.2.2 Judgment Sampling

Judgment sampling is a common non-probability method. The researcher selects the sample based on judgment. This is usually an extension of convenience sampling. For example, a researcher may decide to draw the entire sample from one "representative" city, even though the population includes all cities. When using this method, the researcher must be confident that the chosen sample is truly representative of the entire population (Saunders, 2000; Khan, 2007).

3.4.2.3 Quota Sampling

Quota sampling is the non-probability equivalent of stratified sampling. Like stratified sampling, the researcher first identifies the strata and their proportions as they are represented in the population. Then convenience or judgment sampling is used to select the required number of subjects from each stratum. This differs from stratified

sampling, where the stratum is filled by random sampling (Saunders, 2000; Khan, 2007).

3.4.2.4 Snowball Sampling

Snowball sampling is a special non-probability method used when the desired sample characteristic is exceptional. It may be extremely difficult or unaffordable to locate respondents in these situations. Snowball sampling relies on referrals from initial subjects to generate additional subjects. While this technique can dramatically lower search costs, it comes at the expense of introducing bias because the technique itself reduces the likelihood that the sample will represent a good cross section from the population (Saunders, 2000; Khan, 2007).

In this survey, we select Tejarat bank customer's, as the representative of banking customers in Iran. Tejarat Bank is a governmental bank and has many branches in different cities of Iran. By, performing interviews with Tejarat bank experts, finally the whole country has been divided into four main different parts. The first part was Tehran city; the capital, which is the heart of financial activities. Based on Tejarat bank experts suggestion the rest of the country has been divided to three classes based on their financial records: Weak, Medium, and Strong. From each of these three classes' two branches has been selected randomly in order to conduct the empirical survey and run the questionnaires. Also, ten other branches were selected from five different geographic parts of Tehran too. So, our sample selection was a non-probable and judgmental.

3.5 Questionnaire Design

The main measure instrument used in this research is the questionnaire. How the questionnaire developed is clearly described in this section. The questionnaire was originally based on research questions and emerged from the main research model. Besides, we adjusted the subsequence based on the kind of questions. There are two kinds of questions included in the questionnaire. One kind of questions is demographic and multiple choice questions and consumers can choose one or more that are applicable for

them. Another kind of question is phrased in descriptive statements. So, a 7-point Likert-scale (strongly agree, agree, somehow agree, neutral, somehow disagree, disagree, strongly disagree) was used. The first part of the questionnaire and the last question (question 42) belongs to demographic and multiple choice questions, and Questions 1-41 belong to 7-point scale questions.

By considering the above mentioned issues, the first version of the questionnaire was extracted. Later, this questionnaire was modified a little, by applying the expert ideas, as well as applying results from the pilot test. Following section shows the first version of the questionnaire. The final English and the final Farsi version of the questionnaire could be find at Appendix A and B.

3.5.1 The Questionnaire

Part 1. Demographic characteristics of the respondent

Gender: Male/Female

Age Group: 18-25 / 26-40 / 41-60 / over 61

Occupation: Working at home/ Manufacturing / Retailing / Private Company / Student / Bank /Financial institution Retired / Student / Other

Education: High school no degree / High school degree / University Degree / Master degree / Doctorate degree

Access to Internet: No / from home / from work

Hours of using Internet per week: less than 5 / Between 5 and 15 / more than 15

Part 2.

1. I use more than one bank to accomplish my banking tasks? Yes / No
2. Which one / ones do you use in use banking activities? ATM / Telephone Bank / Internet

Perceived usefulness

3. Using a banking recommender system would improve my performance in conducting banking tasks.
4. Using a banking recommender system would help me to have a better selection among different available choices.

5. Using the banking recommender system would enable me to accomplish my banking tasks more quickly.
6. Using this recommender system will have critical role in supporting my banking activities.
7. By Using a banking recommender system, I would not lose opportunities.
8. Using a banking recommender system would help me to have access to updated information regard banking activities and services.
9. Using a banking recommender system would help me to have access to more valuable information, in time.
10. Overall, I find the use banking recommender system useful.

Perceived ease of use

11. I find my interaction with the use of the banking recommender system clear and understandable.
12. I believe learning to use Banking recommender system will be easy for me.
13. I think it will be easy to use Banking recommender system.
14. If needed, I will spend lots of time to learn how to use it.
15. I like to receive recommendations from the system, by the most convenient ways that I prefer.
16. I think this system will be flexible to interact with.
17. Overall, I found using this system free of effort.
18. I think email is the easiest and most convenient way of having recommendations from this system.
19. I think SMS is the easiest and most convenient way of having recommendations from this system.
20. I think Fax message is the easiest and most convenient way of having recommendations from this system.
21. I think direct phone call from the bank is the easiest and most convenient way of having recommendations from this system.
22. I prefer to receive recommendations from this system, when I enter my credit card to and ATM machine and during transaction process.

23. I prefer to receive recommendations from this system, when I entered my account at the bank website.

Attitude

24. I would feel that using banking recommender system would be pleasant.

25. Using banking recommender system is a good idea.

26. In my opinion, all banks must use a banking recommender system.

27. I believe using this system is necessary for accomplishing banking tasks.

28. In my view, using banking recommender system is a wise idea.

Intention to use

29. I would see myself using the banking recommender system for handling my banking transactions.

30. I will frequently use this banking recommender system in the future.

31. I am very enthusiast about this systems announcement.

32. I will strongly recommend others to use systems recommendations.

Perceived playfulness

33. As soon as I receive a suggestion from the system in any situation, I will be satisfied and try using it as soon as possible.

34. I believe the system recommendations are the best, and there is no need to investigate on them.

35. I will investigate on the system's recommendations.

36. I only prefer to have recommendations from this system, and I will ignore other recommendations from other parties.

Personal innovativeness

37. If I heard about a new IT, I would like to experiment with it.

38. Among my peers, I am usually the first to try out new IT.

39. In general, I am hesitant try out new IT.

40. I like to experiment new banking systems based on IT.

Personality

41. According to my personality, The opinions of my family members regard this system has a great impact on me.
42. According to my personality, the experts opinion regard this system is very important for me.
43. According to my personality, I will not be the first users of this system. And I will stay until it, becomes very popular.
44. Finally I am eager to receive recommendations from the system, in the following fields?
Loans / investment / saving accounts / current accounts / e- banking / credit cards / debit cards / insurance / retirement facilities / internet banking / all the fields

3.6 Pilot Test

In this section pilot test was conducted in order to assess the questionnaire's comprehension and estimate its average completion time, identify and eliminate potential problems. So, the questionnaire was translated to Farsi language. The preliminary questionnaire was conducted on six decision makers of Iran' banking industry; from Tejarat Bank, Mellat Bank and Academic experts.

The result revealed that some parts of the questionnaire should be revised because of clarity in translation to Farsi. The second round of pilot test was conducted on 17 Tejarat Bank customers. They were asked to check for the wording, coverage, relevancy of the items listed within the questions. Finally, at this stage little modifications were needed and finally, the well-improved questionnaire was developed.

3.7 Validity and Reliability

In order to reduce the possibility of getting incorrect answers, attention needs to be paid to validity and reliability (Saunders et al., 2000).

3.7.1 Validity

Validity is concerned with whether the findings are really about what they appear to be about (Saunders et al., 2000). Validity defined as the extent to which data collection method or methods accurately measure what they were intended to measure (Saunders et al., 2000). Yin (1994) states, “no single source has a complete advantage over all others”. The different sources are highly complementary, and a good case study should use as many sources as possible. The validity of a scientific research or study increases by using various sources of evidence (Yin, 1994). The following steps were done to ensure the validity of this research:

1. The needed data was collected in the format of a structured questionnaire that had been designed based on the the extended TAM model.
2. The questionnaire was translated into Farsi language, in order to make sure that the measurement scales were adapted appropriately.
3. Finally, the questionnaire was reviewed and approved by my supervisors, Tejarat bank experts as well as two other academic experts, and all problems were removed and corrected.

3.7.2 Reliability

According to Saunders et al. (2003), reliability refers to the degree to which data collection method or methods will produce consistent findings. For reliability test the Cronbach alpha value has been calculated for the 17 questionnaires, used in pilot test and it was equal to 0.902, which is greater than recommended value 0.7 and means a very good level of reliability. The Cronbach alpha, for all constructs of the model is presented separately in chapter four.

3.8 Data Collection

The Data collection took place from mid-August to mid-September of year 2007 from 16 branches of Tejarat bank in 7 different cities of Iran. After several discussions with Tejarat bank experts, and because the most important financial organizations and central branches are located in Tehran city, we decided to study this city separately.

Therefore Tehran city was named “Zone 0” and has divided into five different areas (North, South, East, West and center), and two branches were selected randomly from each area. In Tehran the geographical location has a great impact on financial classification of the city. For instance, due to existence of important commercial centers, important organization and offices, as well as central branches of Banks in City center, this part has the most transaction activity in Tehran city and subsequently in the whole country of Iran. The North part of Tehran is settled in the second level, and that is because of the luxury structure of this area, big malls, commercial centers and etc. West part of the city is situated in third level and consequently east and south will obtain fourth and fifth places. At last, in each area two branches again with different levels of financial activity were selected randomly. One branch in each area had high amount of transactions and one had less.

In addition, the whole country was divided in to three different areas (Zone 1, Zone 2 and Zone 3), again based on their transaction records and financial activities. Places with high amount of transaction activities were situated in “Zone 1”, places with average amount of transaction activities were situated in “Zone 2” and places with fewer amounts of transaction activities were situated in “Zone 3”. Then in each three part, two branches were selected randomly for running the survey.

Finally, we had 10 branches in Tehran city and one branch in the following cities: Rasht, Isfahan, Arak, Ilam, Shiraz and Ardabil. After negotiation with each branch’s manager, a person was selected to deliver Questionnaires to the customers. Also, I was to following up the case of each branch by visiting the branch or contacting with the responsible person, once a week. Figure 3.1 shows the provinces and the selected cities in the whole country map. Each city is identified with the beginning letter of it. For example “A” stands for Ardabil and “IS” for Isfahan. Also each zone is highlighted with a different color for better separation. Light blue presents “zone 0”, Green presents “zone 1”, Yellow presents “zone 2” and red presents “zone 3”.

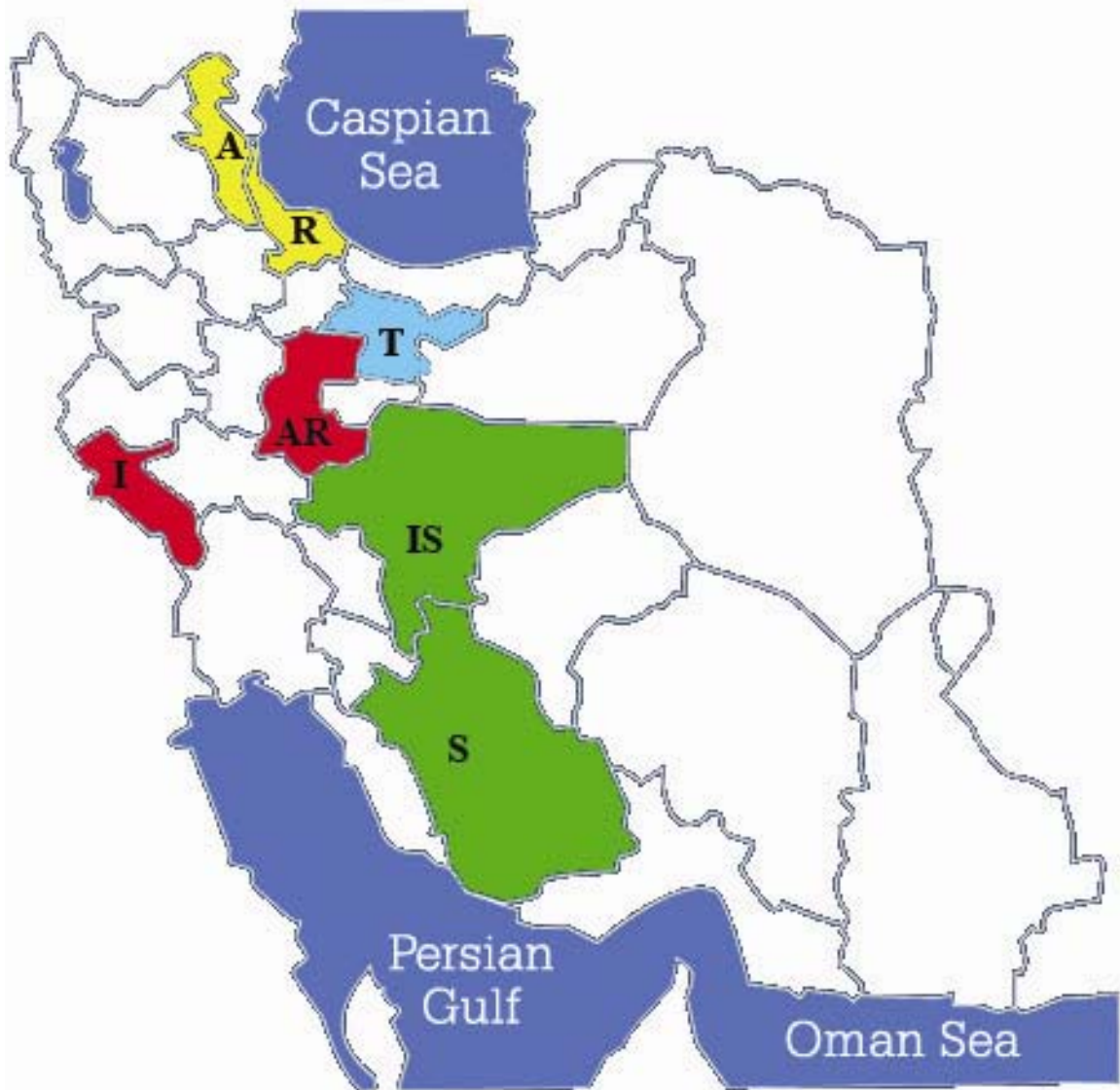


Figure 3.1: Zones, provinces and cities that the survey took place in them

At last, 1100 questionnaires were distributed, 411 questionnaires were returned. 30 out of these 411 were not valid and useful (some were uncompleted or not had appropriate answers. Because we had put 3 negative Questions for canceling the probability of random answers). At last, 381 completed and useful questionnaires were delivered, which leads us to the response rate of 34.63 percent.

3.9 Chapter Summery

So far we have discussed our research purpose, research approach, research strategy, sample selection, data collection and analysis. A research design blueprint below (Figure 3.2) could be defined as chapter summery and help to sort the whole process.

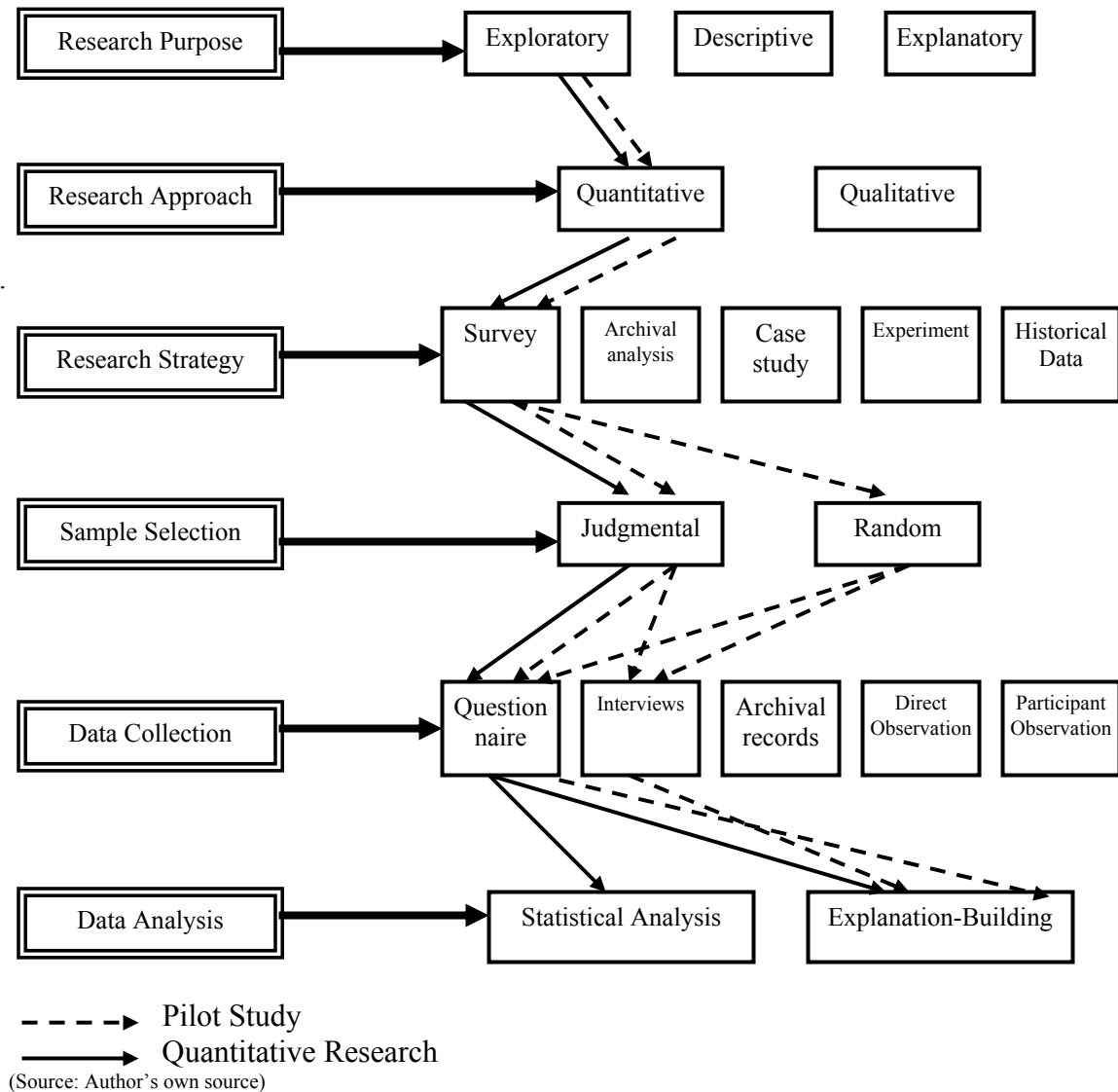


Figure 3.2: Research Design Blueprint

Chapter Four

Data Analysis and Presentation

4 Data Analysis and Presentation

In this chapter data will be analyzed and presented according to the mentioned Methodology. The first part is assigned to the descriptive analysis, and the second part to the other statistical analysis methods, as well as some additional parts at the end of the chapter. All the results in this chapter are obtained from two statistical softwares: SPSS 15 and Lisrel 8.53.

4.1 Descriptive Analysis

As mentioned before, the data collection took place from mid-August to mid-September of year 2007 from 16 branches of Tejarat bank in 7 different cities of Iran. Out of 1100 distributed questionnaires, 381 were completed, valid (response rate = 34.63 %). Table 4.1 lists the response rate of the whole 16 branches, sorted from the highest response rate to the lowest one. In addition figure 4.1 shows the response rate percentage

of the branches, in a pie chart. As, it can be extracted from the table 5.1, no questionnaires were delivered from the Ardabil citie's Jamejam branch, so the response rate of this branch and Ardabil city was equal to zero, and this branch's percentage of response rate is not included in the pie chart. In contrast, the highest response rate is assigned to Isfahan, as it was expected. Because Modares branch of Isfahan city was selected from "zone 1", which is strongest part of the country according to the financial activity records. The Tehran south branch 1 (Moshiriye) has gained the second response rate among whole branches.

But, an amazing finding was being gaining the third place in response rate table by the Ilam enghelab branch which was picked up from "zone 3" the weakest zone in the whole country. According to their experience, the Tejarat bank experts expect that Ilam will be among the branches with lowest response rates, but the statistics shown a huge different between this claim and the real situation we practiced.

City (Branch name)	Frequency	Percent
Isfahan (Modares)	60	15.8
Tehran south 1 (Moshiriye)	55	14.5
Ilam (Enghelab)	47	12.3
Shiraz (Shohada)	33	8.7
Tehran west 2 (Modares)	26	6.8
Tehran north 1 (Emarat)	23	6.0
Tehran north 2 (Park Mellat)	23	6.0
Gilan (Emam Khomeni)	21	5.5
Tehran center1 (Tehran University)	20	5.2
Tehran east 2 (Sakhayi)	16	4.2
Tehran west 1 (Ekbatan)	15	4
Arak (Sepah)	13	3.4
Tehran center 2 (Pole Choubi)	12	3.1
Tehran east 1 (Emam Hossein)	11	2.9
Tehran south 2 (Tohid)	6	1.6
Ardabil (Jamejam)	0	0
Total	381	100

Table 4.1: Response rate of each branch sorted from the highest to the lowest

Also, occupying the lower tiers of the table, by branches located in Tehran, especially north, west and center which people of these areas are in higher financial classes in comparisons with other parts of the city and the country as well, is surprising. You can review other results in table 4.1 and figure 4.1, and as you can see they are very near to what we expect.

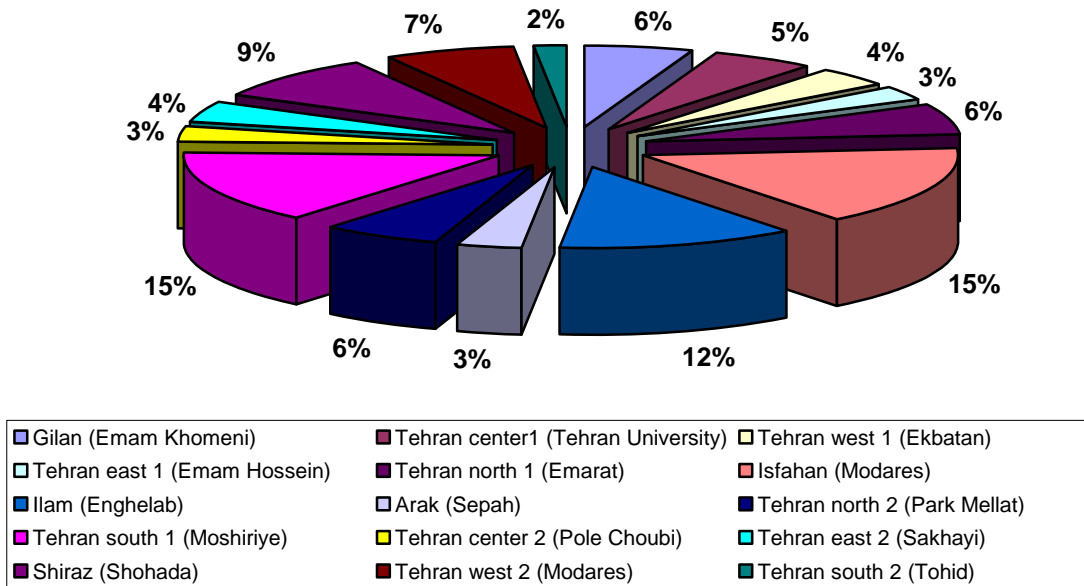


Figure 4.1: Response rate of each branch

Province (City)	Percent
Isfahan (Isfahan)	30.8%
Ilam (Ilam)	24.1%
Fars (Shiraz)	16.9%
Tehran (Tehran)	10.8%
Gilan (Rasht)	10.8%
Markazi (Arak)	6.7%
Ardabil (Ardabil)	0.0%
Total	100

Table 4.2: Response rate of each province and city sorted from highest to the lowest

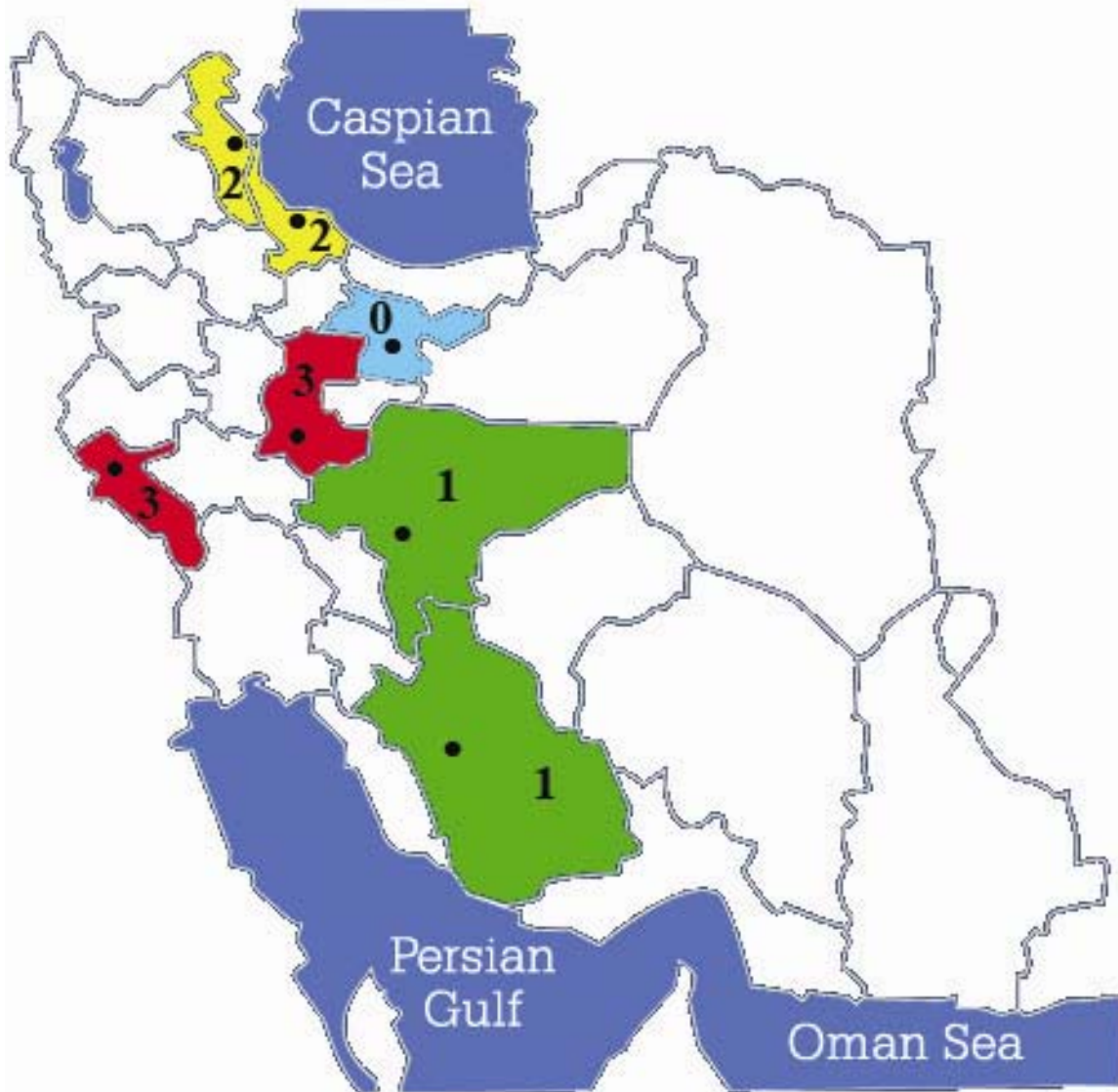


Figure 4.2: Zones, Provinces and cities that the survey took place in them

Continuing from the previous section, table 4.2 shows the response rate of the seven provinces and cities sorted from the highest to the lowest one. Tehran cities' response rate is the average response rate of the whole 10 branches located this city. Again, taking the first and third place by Isfahan and Shiraz, which are in the "zone 1" were expected. But achieving the second place by Ilam from "zone 3" was unexpected. According to the results and by considering zones, "zone 1" has gained the highest response rate with 47.7% of the whole gathered questionnaires, which means approximately half of the total valid questionnaires (50%) were gathered from this zone. "Zone 3" situated at the second

place with 30.8 % of the whole gathered questionnaires. Both, “zone 2” and “zone 0” (Tehran), has been situated in the third place with equal response rate of 10.8 %. This point should be considered that Ardabil city had a zero response rate, so this city has not been taken in to account for measuring the response rate of “zone 2”. Zones and the cities are shown separately in figure 4.2.

Variable	Classification of variable	Frequency	Percent
Gender	Male	285	74.80
	Female	96	25.20
Age	18-25	69	18.11
	26-40	191	50.13
	41-60	100	26.25
	More than 60	21	5.51
Occupation	Housekeeper	30	7.88
	Self-employed	136	35.70
	Governmental	79	20.73
	Student	41	10.76
	Working at Private Companies	42	11.02
	Manufacturing	19	4.99
	No Job	5	1.31
	Bank or Financial Institutes	19	4.99
	Other	10	2.62
Education	High school no degree	60	15.75
	High school degree	181	47.51
	University degree	106	27.82
	Master or Doctorate degree	34	8.92

Table 4.3: Sample Demographics

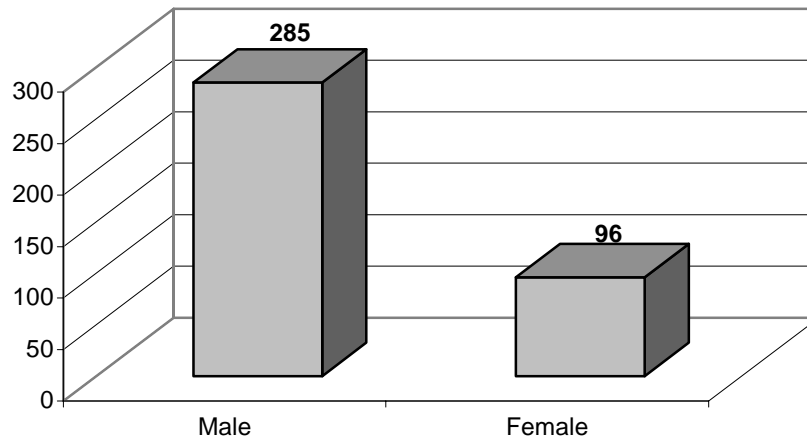


Figure 4.2: Gender of respondents

The demographic results indicate that 74.8% of samples were male and 25.2% were female. The majority of respondents were between 26 and 40 years of age, 26.25% were between 41 and 60 years of age, 18.11% were between 18 and 25 and 5.51% were more than 60. According to the results, 8.92 % of respondents had Mater or above degree, 27.82% had university degree, 47.81% had high school degree and the rest (15.75%) had less than high school degree. Table 4.3 lists the sample demographics. In addition figures 4.1 to 4.5 show this results in the form of bar and pie charts.

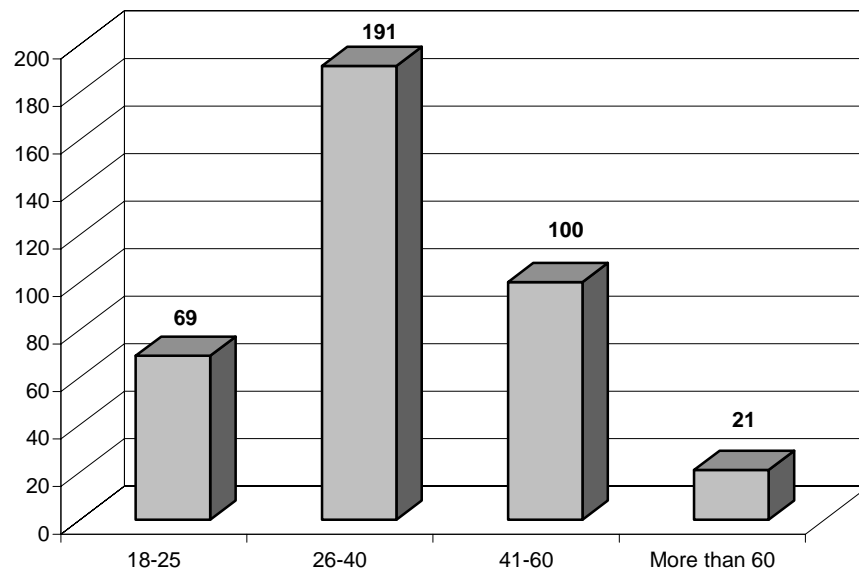


Figure 4.3: Age range of respondents

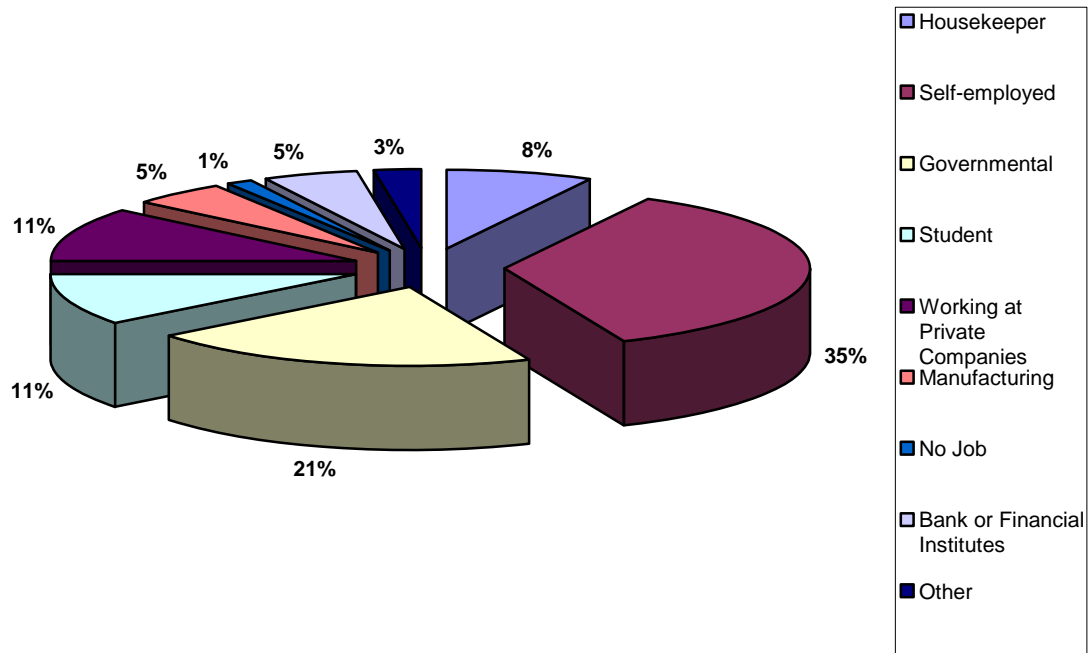


Figure 4.4: Occupation of respondents

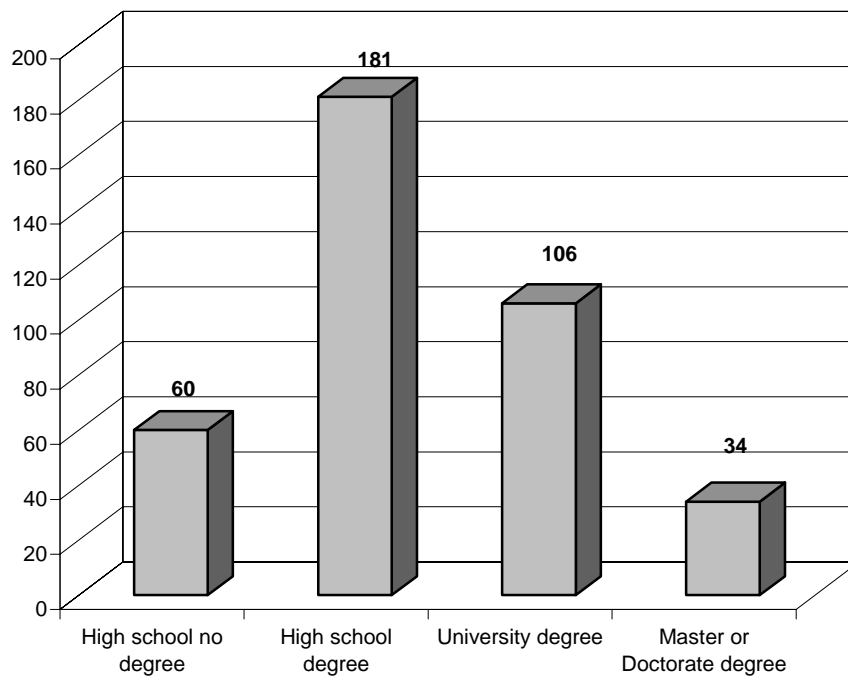


Figure 4.5: Education level of the respondents

According to the below table, 138 respondents (36.22 percent) has no access to internet. Major number of the respondents (170 or 44.62 percent) has access to internet from home and 73 of them (19.16 percent) have access to internet from their work. Also from the number that has access to internet, 27.56 percent of them spend less than three hours per week on internet, 26.77 percent of them spend between three and ten hours per week on internet, and finally 9.45 percent use internet for more than 10 hours per week. The information of internet access and usage of the respondents, are summarized in Table 4.4, figure 4.6 and figure 4.7.

Variable	Classification of variable	Frequency	Percent
Internet Access	No access	138	36.22
	From home	170	44.62
	From work	73	19.16
Hours Spend on Internet per week	Less than 3 hours	105	27.56
	Between 3 and 10 hours	102	26.77
	More than 10 hours	36	9.45

Table 4.4: Internet Usage and average Hours Spent on Internet per Week

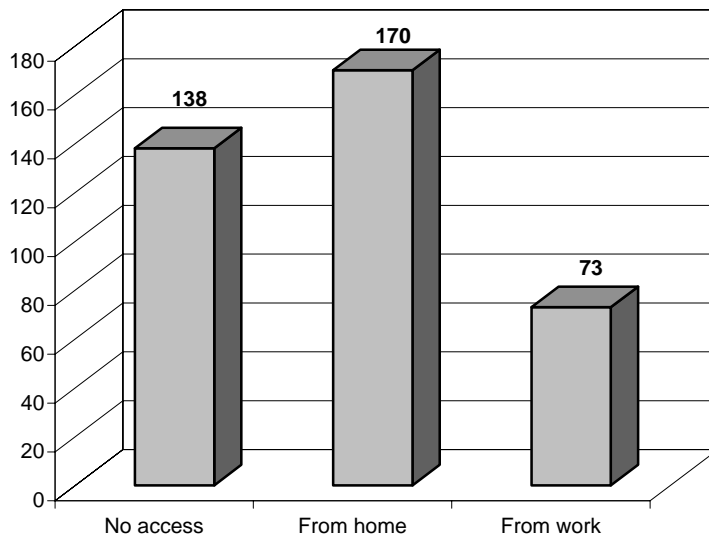


Figure 4.6: Frequency of Internet access among the respondents

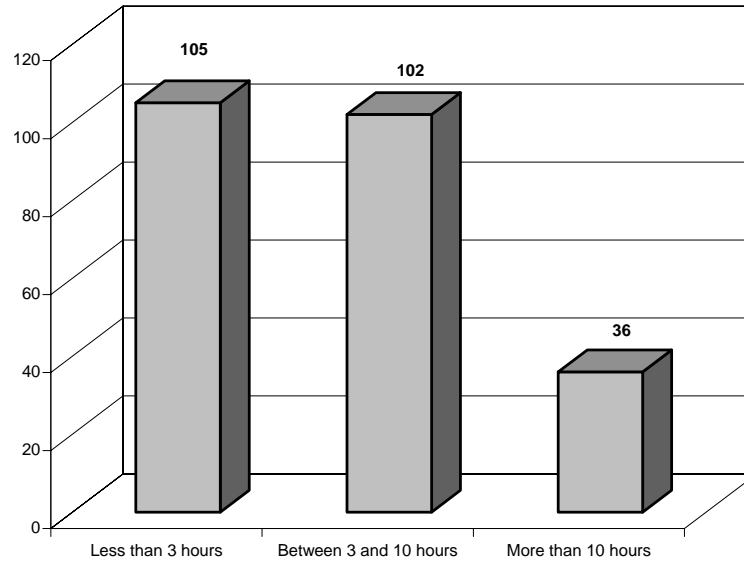


Figure 4.7: Respondent's average hours spend on Internet

4.1.1 Reliability of the Questions

The composite reliability was estimated to evaluate the internal consistency of the measurement model. As it can be seen in table 4.5, the reliability for total questions was 0.943. The composite reliability for all the constructs of this studies model was greater than the level of 0.60 which is recommended by Bagozzi and Yi (1988), as a good level for internal consistency. Measurements reliability for all constructs individually is summarized in Table 4.6. It should be mentioned that, six questions (19 to 24) regard most convenient ways of receiving recommendations from a BRS, are not included in some statistical analysis from now on. Although these questions are related to the system's ease of use, but they are not indicators of, "ease of use" construct.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.943	.949	35

Table 4.5: Reliability of total Questions

Variables	Number of items	Cronbach's alpha (Standardized)	Cronbach's alpha
Perceived usefulness	8	0.883	0.883
Perceived ease of use	7	0.754	0.746
Attitude	5	0.878	0.876
Intention to use	4	0.854	0.854
Perceived playfulness	5	0.750	0.733
Personal innovativeness	3(*)	0.677	0.639
Personality	3	0.743	0.749

(*) A negative question for this construct is not mentioned

Table 4.6: Reliability for each construct individually

4.1.2 Factor Analysis

This part contains the result of factor analysis by SPSS 15.0. The aim of this analysis was to check the validity of the questions after running the questionnaire, and to find out if all indicators (questions) of each variable (construct) are appropriately measuring what they expected to. For this purpose, I run the factor analysis for all questions. The results revealed that, all the questions are appropriately measuring their related construct. From this section to end, in all figures and tables, the abbreviations: PI, P, PU, PEU, PP, AT and IN are stand for Personal innovativeness, Personality, Perceived usefulness, Perceived ease of use, Perceived playfulness, Attitude and Intention to use.

Below, you can find the communality table. Because all communalities are above recommended value 0.5, so all questions could be take part in factor analysis (table 4.7). In continuous table 4.8 indicates the total explained variance results. This table shows that the whole questions are forming seven constructs and these seven constructs explain 61.974 of total variance.

Last table (table 4.9), shows the rotated component matrix, which indicates the loading of each question in all constructs. As, it can be seen from the highlighted items, all questions have a higher loading on their own construct, in comparison with other

constructs and this means questions related to each construct are measuring what they expected to.

Component	Initial	Extraction
PU1	1.000	.660
PU2	1.000	.687
PU3	1.000	.543
PU4	1.000	.614
PU5	1.000	.590
PU6	1.000	.700
PU7	1.000	.639
PU8	1.000	.697
PEU1	1.000	.579
PEU2	1.000	.507
PEU3	1.000	.712
PEU4	1.000	.531
PEU5	1.000	.548
PEU6	1.000	.595
PEU7	1.000	.591
AT1	1.000	.545
AT2	1.000	.642
AT3	1.000	.668
AT4	1.000	.615
AT5	1.000	.626
IN1	1.000	.562
IN2	1.000	.673
IN3	1.000	.612
IN4	1.000	.673
PP1	1.000	.570
PP2	1.000	.510
PP3	1.000	.560
PP4	1.000	.697
PP5	1.000	.724
PI1	1.000	.572
PI2	1.000	.742
PI4	1.000	.608
P1	1.000	.778
P2	1.000	.712
P3	1.000	.501

Extraction Method: Principal Component Analysis.

Table 4.7: Communality of the questions

Item	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.204	37.725	37.725	13.204	37.725	37.725	7.267	20.763	20.763
2	2.555	7.299	45.024	2.555	7.299	45.024	3.760	10.743	31.507
3	1.455	4.156	49.180	1.455	4.156	49.180	2.798	7.996	39.502
4	1.239	3.540	52.720	1.239	3.540	52.720	2.456	7.018	46.520
5	1.128	3.222	55.943	1.128	3.222	55.943	2.085	5.957	52.477
6	1.071	3.059	59.002	1.071	3.059	59.002	1.780	5.087	57.564
7	1.040	2.972	61.974	1.040	2.972	61.974	1.543	4.410	61.974
8	.970	2.770	64.744						
9	.914	2.611	67.355						
10	.859	2.455	69.810						
11	.758	2.166	71.975						
12	.723	2.064	74.040						
13	.703	2.008	76.047						
14	.643	1.836	77.884						
15	.632	1.805	79.689						
16	.555	1.585	81.273						
17	.520	1.487	82.760						
18	.514	1.470	84.230						
19	.479	1.369	85.599						
20	.446	1.274	86.872						
21	.432	1.236	88.108						
22	.425	1.213	89.321						
23	.392	1.121	90.442						
24	.378	1.081	91.522						
25	.340	.971	92.493						
26	.333	.951	93.444						
27	.311	.887	94.332						
28	.298	.852	95.184						
29	.289	.827	96.011						
30	.278	.796	96.807						
31	.257	.734	97.541						
32	.240	.685	98.225						
33	.225	.643	98.868						
34	.209	.596	99.464						
35	.187	.536	100.000						

Extraction Method: Principal Component Analysis

Table 4.8: Total explained variance

Item	Component						
	1	2	3	4	5	6	7
PU1	.294	.737	.134	.010	-.029	.107	-.031
PU2	.456	.670	.107	.022	.105	.009	-.085
PU3	.203	.607	.103	.207	.218	-.014	.179
PU4	.331	.619	.136	.268	.025	.150	.092
PU5	.292	.615	.128	.130	.297	.058	.040
PU6	.315	.487	.094	-.063	.536	.150	.203
PU7	.327	.454	.134	.006	.440	.328	.075
PU8	.340	.447	.061	.013	.585	.183	.048
PEU1	.172	.134	.007	.194	.171	.652	.199
PEU2	.238	.144	.202	.099	.386	.432	-.048
PEU3	.109	.010	.235	.483	-.010	.591	-.247
PEU4	.150	.080	.326	.243	.211	.483	-.240
PEU5	.152	.039	.299	.327	.405	.422	-.058
PEU6	.050	.151	.008	.190	.412	.603	-.057
PEU7	.564	.143	.222	.082	.351	.564	.256
AT1	.597	.346	.131	.193	.099	-.008	.070
AT2	.662	.348	.086	.059	.263	-.040	.036
AT3	.741	.250	.083	.197	.100	.012	-.012
AT4	.668	.266	.087	.141	.211	.069	.145
AT5	.687	.178	.041	.189	.255	.041	.136
IN1	.004	.272	.060	.598	.141	.272	.183
IN2	.028	.266	.113	.706	.094	.280	-.053
IN3	.064	.209	.107	.646	.215	.205	.221
IN4	.185	.242	.058	.683	.092	.303	.105
PP1	.460	.224	.464	.198	-.153	.034	.171
PP2	.416	.248	.573	.118	-.088	.106	-.087
PP3	.418	.155	.528	-.062	.061	.378	.005
PP4	.171	.153	.740	.120	.009	.118	.176
PP5	.127	.130	.793	.114	.022	.066	.191
PI1	.316	.141	.293	.047	-.117	.320	.498
PI2	.171	.071	.169	.262	.089	.043	.775
PI4	.431	.060	.282	-.099	.003	.288	.496
P1	.008	.183	.099	.285	.779	-.014	.217
P2	.195	.122	.185	.098	.783	.042	.001
P3	.091	.047	.229	.281	.495	.184	.178

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 37 iterations.

Table 4.9: Rotated component matrix

4.1.3 Different Group's Perception

The aim of this section is to present judge perception of groups classified by their gender, age and educational level. The results of mean and standard deviation of each group are illustrated in table 4.10, 4.11 and 4.12 respectively. As an example, and according to the statistics we can claim that the average rating in judged perceived usefulness for males and females are approximately the same, and gender has no effect on their perception about this variable.

Scale items	Male (N = 285)	Female (N = 96)
PU	6.1990 (0.69804)	6.1185 (0.86648)
PEU	5.9136 (0.71847)	5.7842 (0.88014)
AT	6.1113 (0.77579)	6.0729 (1.02931)
IN	6.1180 (0.81732)	6.1146 (0.94654)
PP	5.8000 (0.86480)	5.6547 (0.87977)
PI	5.9404 (0.93612)	5.7474 (1.01375)
P	5.6996 (1.00770)	5.5451 (1.25108)

Table 4.10: Gender judge perception Mean (Std deviation), about each model's variable

Scale items	Age (18-25) (N = 69)	Age (26-40) (N = 191)	Age (41-60) (N = 100)	Age (> 60) (N = 21)
PU	6.2355 (0.71375)	6.1955 (0.64075)	6.1800 (0.78623)	5.8333 (1.29502)
PEU	5.9262 (0.77456)	5.9418 (0.65790)	5.8457 (0.79440)	5.3469 (1.20252)
AT	6.1676 (0.88948)	6.1780 (0.70318)	6.0340 (0.90746)	5.5143 (1.29394)
IN	6.2132 (0.78734)	6.1767 (0.74153)	6.0400 (0.92573)	5.6310 (1.35004)
PP	5.8116 (0.89894)	5.7916 (0.81645)	5.7080 (0.94769)	5.6190 (0.88748)
PI	5.9420 (1.03051)	5.9614 (0.89201)	5.7900 (1.05052)	5.5873 (0.78106)
P	5.6078 (1.21207)	5.7140 (0.95186)	5.6567 (1.12960)	5.3651 (1.38205)

Table 4.11: Age judge perception Mean (Std deviation), about each model's variable

	High school no degree (N = 60)	High school degree (N = 181)	University degree (N = 106)	University degree (N = 34)
PU	5.9646 (0.70188)	6.1780 (0.70030)	6.3113 (0.68209)	6.1471 (1.09167)
PEU	5.8651 (0.69413)	5.9418 (0.69655)	5.9097 (0.79339)	5.4958 (1.01091)
AT	5.9333 (0.82229)	6.0851 (0.83190)	6.2476 (0.75065)	6.0353 (1.15309)
IN	5.9333 (0.77551)	6.0760 (0.84251)	6.3095 (0.76627)	6.0662 (1.14863)
PP	5.7533 (0.79691)	5.9000 (0.81590)	5.7283 (0.93123)	5.1706 (0.84442)
PI	5.6667 (0.94081)	5.8796 (0.97566)	5.9623 (0.94205)	6.1373 (0.89937)
P	5.7778 (1.01712)	5.8287 (0.86358)	5.5692 (1.15284)	4.8529 (1.50239)

Table 4.12: Judge Perception Mean (Std deviation), about each model's variable classified by educational level

4.2 Statistical Analysis

I can break this part to four major parts, one sample t-test, comparison of variables by one-way Anova, Path and SEM analysis, and some explanation comments and suggestions for Tejarat bank, according to the findings.

4.2.1 One-Sample t-test

In this section we will try to study the survey's variable conditions with one sample t-test. I am going to test the following two hypotheses by one sample t-test. As, I was used a 7 scale Likert type rating method for my questionnaire, and the respondents were about to answer questions from 1 (mostly disagree) to (7 mostly agree), so the inappropriate situation is H_a , which is the condition that all answers be equal to 4 or less. The appropriate situation (H_b) is when the answers are equal to 5, 6 and 7. Table 4.13 shows each variable total Mean, Standard Deviation and Standard Error Mean.

$H_a : \mu \leq 4$ Inappropriate situation

$H_b : \mu > 4$ Appropriate situation

Variables	N	Mean	Std.Deviation	Std.Error Mean
Personal innovativeness	381	5.8921	.95841	.04917
Personality	381	5.6605	1.07492	.05522
Perceived usefulness	381	6.1787	.74369	.03810
Perceived ease of use	381	5.8810	.76329	.03910
Perceived playfulness	381	5.7637	.86969	.04461
Attitude	381	6.1016	.84572	.04338
Intention to use	381	6.1171	.85052	.04363

Table 4.13: Mean, Std deviation and Std error mean of each variable

Variables	Test Value = 4					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Personal innovativeness	38.484	381	.000	1.89211	1.7954	1.9888
Personality	30.073	381	.000	1.66051	1.5519	1.7691
Perceived usefulness	57.183	381	.000	2.17871	2.1038	2.2536
Perceived ease of use	48.101	381	.000	1.88098	1.8041	1.9579
Perceived playfulness	39.532	381	.000	1.76368	1.6760	1.8514
Attitude	48.441	381	.000	2.10158	2.0163	2.1869
Intention to use	48.523	381	.000	2.11711	2.0313	2.2029

Table 4.14: One sample t-test statistics

As it can be seen in table 4.14, the Sigma number for all variables is equal to zero and less than threshold value 0.05, and by considering the positive sign of the upper and lower limits, by 95% confidence we can claim that H_b is acceptable and the condition is appropriate.

4.2.2 Comparison of Survey Variables

In this section, by the help of one-way Annova test, we will investigate on the differences between the whole 16 branches from the seven variables view. For sure, according to the nature of different surveys, and what somebody is looking for, many more hypotheses could be test by Annova on these data. But here, as a general example we will discuss on probable differences in seven main variables of the survey, between the branches which are located in different parts of the country. So, we are going to test the following hypotheses:

$H_c : \mu_1 = \mu_2 = \dots = \mu_{15}$ There is no difference between the branches

$H_d : \forall \mu_i \neq \mu_j$ There is difference between the branches

Below tables (Table 4.15 to 4.21), shown each variable's Mean and Standard Deviation separately for all of the branches.

Personal innovativeness			
Branch name	N	Mean	Std. Deviation
Gilan	21	6.4603	.73391
Tehran center1	20	5.8833	.91303
Tehran west1	15	5.9333	1.11412
Tehran east1	11	5.5152	.94708
Tehran north1	23	5.8696	1.09054
Isfahan	60	5.0944	.78616
Eilam	46	6.0797	1.00415
Markazi	13	6.1026	.59914
Tehran north2	23	5.6812	.81945
Tehran south1	55	6.2788	.65030
Tehran center2	12	5.2778	1.14445
Tehran east2	16	6.6250	.45338
Fars	33	6.1919	.88987
Tehran west2	26	5.8718	.97103
Tehran south2	6	5.6667	.94281

Table 4.15: Mean and Std Deviation of “Personal innovativeness” variable for each branch

Personality			
Branch name	N	Mean	Std. Deviation
Gilan	21	5.6825	.99709
Tehran center1	20	5.7667	.70171
Tehran west1	15	5.6889	1.46096
Tehran east1	11	5.1515	.80779
Tehran north1	23	5.4203	1.45024
Esfahan	60	5.0778	.69533
Eilam	45	6.1259	.87412
Markazi	13	5.6154	1.06150
Tehran north2	23	5.2754	1.09937
Tehran south1	55	6.3152	.58238
Tehran center2	12	5.3889	.89706
Tehran east2	16	6.5417	.40139
Fars	33	5.9899	1.16811
Tehran west2	26	4.7692	1.31578
Tehran south2	6	5.1667	1.04881

Table 4.16: Mean and Std Deviation of “Personality” variable for each branch

Perceived usefulness			
Branch name	N	Mean	Std. Deviation
Gilan	21	6.3750	.69372
Tehran center1	20	5.8625	.89764
Tehran west1	15	6.5000	.47716
Tehran east1	11	5.9886	1.14490
Tehran north1	23	5.8533	.91286
Esfahan	60	6.1958	.46791
Eilam	47	6.2473	.62200
Markazi	13	6.5288	.59981
Tehran north2	23	6.1669	.53476
Tehran south1	55	6.2114	.70418
Tehran center2	12	5.8646	.55764
Tehran east2	16	6.4219	.61893
Fars	33	6.1402	1.22105
Tehran west2	26	6.1442	.61308
Tehran south2	6	5.9583	.96393

Table 4.17: Mean and Std Deviation of “Perceived usefulness” variable for each branch

Perceived ease of use			
Branch name	N	Mean	Std. Deviation
Gilan	21	5.9184	.58827
Tehran center1	20	5.7786	.70972
Tehran west1	15	5.8000	.83614
Tehran east1	11	5.5325	.95851
Tehran north1	23	5.7205	.85332
Esfahan	60	5.9262	.54382
Eilam	47	6.2381	.57255
Markazi	13	6.1648	.39489
Tehran north2	23	5.4767	.82654
Tehran south1	55	6.0558	.62477
Tehran center2	12	5.4881	.63438
Tehran east2	16	6.4464	.63003
Fars	33	5.9091	1.19460
Tehran west2	26	5.3187	.55152
Tehran south2	6	5.1905	.74870

Table 4.18: Mean and Std Deviation of “Perceived ease of use” variable for each branch

Perceived playfulness			
Branch name	N	Mean	Std. Deviation
Gilan	21	5.7048	.99120
Tehran center1	20	5.4600	.96704
Tehran west1	15	5.8800	.87112
Tehran east1	11	5.5818	.86002
Tehran north1	23	5.3652	1.01740
Esfahan	60	5.6867	.61105
Eilam	46	6.0261	.93961
Markazi	13	5.6462	.80064
Tehran north2	23	5.5565	.72100
Tehran south1	55	6.1927	.54018
Tehran center2	12	5.3000	.50812
Tehran east2	16	6.4875	.57951
Fars	33	6.1515	.91792
Tehran west2	26	4.8308	.70811
Tehran south2	6	5.3333	.87331

Table 4.19: Mean and Std Deviation of “Perceived playfulness” variable for each branch

Attitude			
Branch name	N	Mean	Std. Deviation
Intention to use	21	6.2381	.74731
Tehran center1	20	5.7700	1.04886
Tehran west1	15	6.2400	.92952
Tehran east1	11	5.7091	.96484
Tehran north1	23	5.6435	1.07696
Esfahan	60	5.9900	.54421
Eilam	46	6.1348	.94756
Markazi	13	6.4769	.40446
Tehran north2	23	6.0696	.58031
Tehran south1	55	6.3309	.64085
Tehran center2	12	5.7500	.82297
Tehran east2	16	6.2875	.94930
Fars	33	6.1818	1.23528
Tehran west2	26	6.2846	.61494
Tehran south2	6	5.9000	1.00995

Table 4.20: Mean and Std Deviation of “Attitude” variable for each branch

Intention to use			
Branch name	N	Mean	Std. Deviation
Gilan	21	6.2976	.60528
Tehran center1	20	5.9250	1.11243
Tehran west1	15	6.3167	.88875
Tehran east1	11	5.5909	.89633
Tehran north1	23	5.9239	1.01252
Esfahan	60	6.0625	.47306
Eilam	46	6.0707	1.00231
Markazi	13	6.6731	.41313
Tehran north2	23	6.0000	.89506
Tehran south1	55	6.2545	.69471
Tehran center2	12	5.5417	.80364
Tehran east2	16	6.5938	.52341
Fars	33	6.0530	1.25274
Tehran west2	26	6.2019	.65582
Tehran south2	6	6.0833	1.08012

Table 4.21: Mean and Std Deviation of “Intention to use” variable for each branch

Table 4.22 shows the final results for one-way Annova test. Source of changes between groups, describes differences because of some factors exist in each branch, but in contrast source of changes within groups, describes differences due to some external factors and probably some unknown factors. Finally, it can be assessed from the above table, that the meaningful digit (Sigma) for all variables except “Perceived usefulness”, “Attitude” and “Intention to use” is less than 0.05, so Hypothesis H_d or existing meaningful differences in seven variables, between the 16 branches will be accepted.

Variables	Source of changes	Sum of Squares	df	Mean Square	F	Sig.
Personal innovativeness	Between Groups	74.405	14	5.315	7.087	.000
	Within Groups	273.727	367	.750		
	Total	348.132	381			
Personality	Between Groups	100.562	14	7.183	7.777	.000
	Within Groups	336.202	367	.924		
	Total	436.763	381			
Perceived usefulness	Between Groups	11.587	14	.828	1.525	.099
	Within Groups	198.583	367	.543		
	Total	210.170	381			
Perceived ease of use	Between Groups	32.946	14	2.353	4.571	.000
	Within Groups	188.448	367	.515		
	Total	221.394	381			
Perceived playfulness	Between Groups	60.616	14	4.330	6.991	.000
	Within Groups	226.043	367	.619		
	Total	286.659	381			
Attitude	Between Groups	18.308	14	1.308	1.888	.026
	Within Groups	252.771	367	.693		
	Total	271.079	381			
Intention to use	Between Groups	19.513	14	1.394	1.998	.017
	Within Groups	254.651	367	.698		
	Total	274.164	381			

Table 4.22: One-way Annova Test results

4.2.3 Structural Equation Modeling (SEM)

For this purpose, I used Lisrel 8.53 software for applying Structural Equation Modeling (SEM). Lisrel and Partial Least Squares (PLS) are second generation data techniques that can be used to test the extent to which IS research meets recognized standards for high quality statistical analysis (Gefen, 2000). SEM enables researchers to answer a set of interrelated research questions in a single, systematic and comprehensive analysis by modeling the relationships among multiple and dependent constructs simultaneously. This capability for simultaneous analysis differs greatly from most first generation regression models such as linear regression, ANOVA, and MANOVA, which can analyze only one layer of linkages between independent and independent variable at a time. Unlike First generation regression tools, SEM not only assesses the Structural Model, the assumed causation among a set of dependent and independent constructs, but in the same analysis, also evaluates the measurement model—loadings of observed items (measurements) on their expected latent (constructs). The result is a more rigorous analysis of the proposed research model and, very often, a better methodological assessment tool (Gefen, 2000). Even a glance at the IT literature shows that SEM has become very popular in validating and testing linkages between constructs in IT literature.

As mentioned earlier in section 2.3.2 of chapter two, we had proposed eight hypotheses based on the final model. These eight hypotheses are classified as follow:

- H1. Personal innovativeness has a direct and positive effect on Perceived usefulness.
- H2. Personal innovativeness has a direct and positive effect on Perceived ease of use.
- H3. Personality has a direct and positive effect on Perceived ease of use.
- H4. Perceived usefulness has a direct and positive effect on Attitude.
- H5. Perceived ease of use has a direct and positive effect on Perceived usefulness.
- H6. Perceived ease of use has a direct and positive effect on Perceived playfulness.

H7. Attitude has a direct and positive effect on Intention to use.

H8. Perceived playfulness has a direct and positive effect on Intention to use.

In this section the results of SEM (Structural Equation Modeling), done by Lisrel 8.53 software will be presented. For the first step we had constructed the basic model in the Lisrel software, then all independent and dependent constructs were defined, as well as all indicators of them. Then the model was run by applying the raw data obtained from 381 valid questionnaires (At the SEM analysis process, three negative questions which are removed).

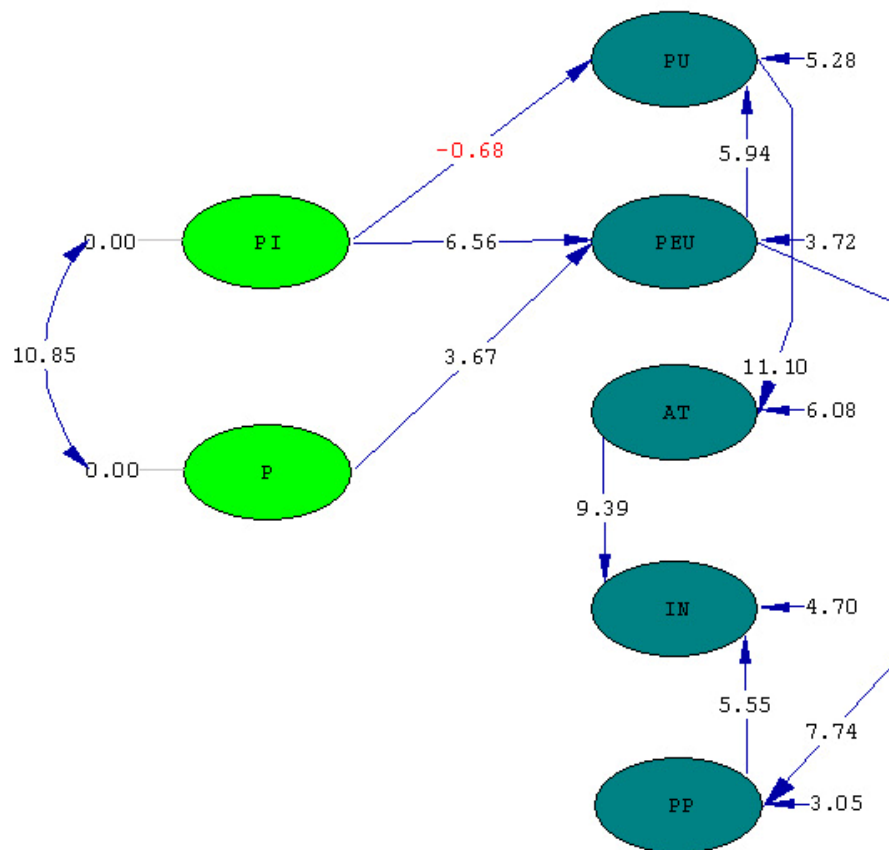


Figure 4.8: Structural model with T-values

The Lisrel software output for T-values is shown in Figure 4.8. It could be seen that all T-values are more than 1.96 (the threshold coefficient value for accepting the relation), except the path between “perceived innovativeness” and “perceived usefulness”. This means that the first hypothesis is rejected and all other seven hypotheses are accepted. Figure 4.9 illustrates the structural model with standardized path

coefficients. In addition the whole hypotheses test results are summarized in table 4.23. And finally figure 4.10 show the whole model includes constructs, indicators and their standardized path coefficients. In all figures and tables below, the abbreviations: PI, P, PU, PEU, PP, AT and IN are stand for Personal innovativeness, Personality, Perceived usefulness, Perceived ease of use, Perceived playfulness, Attitude and Intention to use.

Figure 4.9 shows the structural model with standardized path coefficients. The 0.58 value between “personal innovativeness” and “personality” indicates the correlation between these two constructs, and means a one unit change in each of them will results to 0.58 changes in the other one.

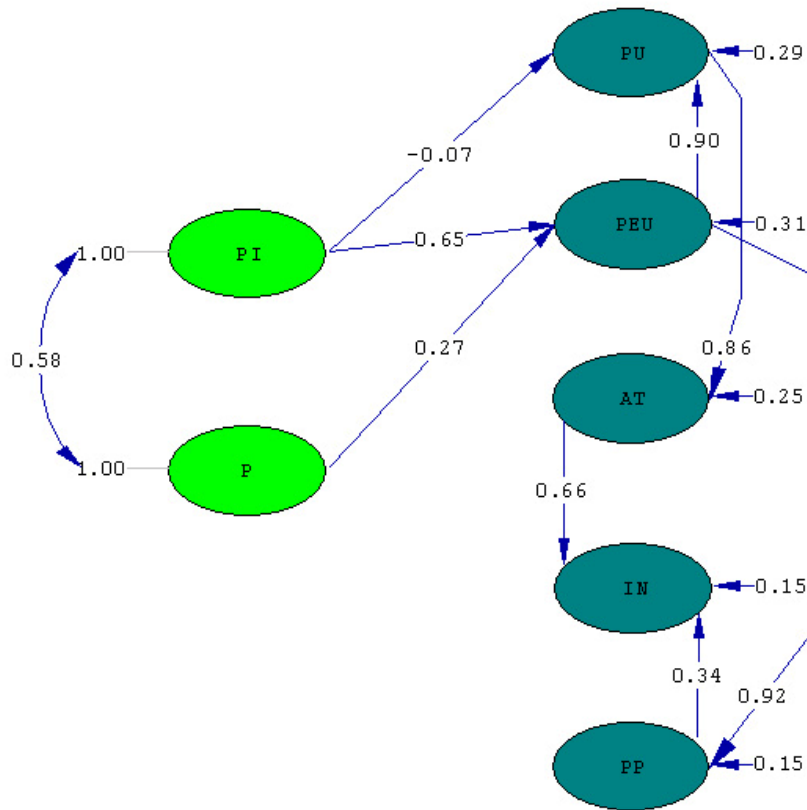
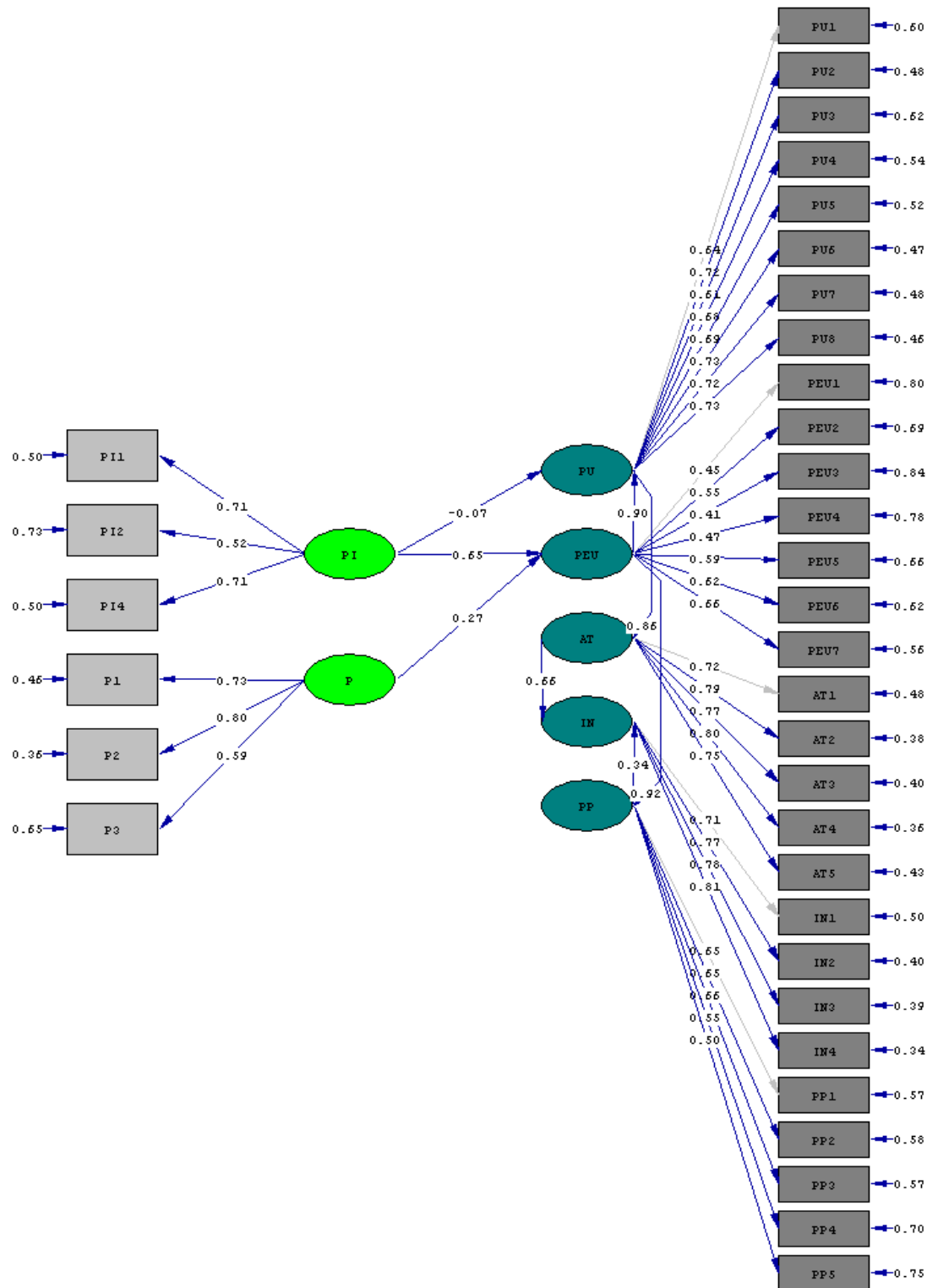


Figure 4.9: model with Standardized path coefficients



Chi-Square=1704.81, df=551, P-value=0.00000, RMSEA=0.074

Figure 4.10: The whole model consist of all constructs, indicators and their related path coefficients

Hypothesis	Effects	Path Coefficient (β)	T- value	Remarks
H1	PI \rightarrow PU	-0.07	-0.68	Not Supported
H2	PI \rightarrow PEU	0.65	6.56	Supported
H3	P \rightarrow PEU	0.27	3.67	Supported
H4	PU \rightarrow AT	0.87	11.10	Supported
H5	PEU \rightarrow PU	0.90	5.94	Supported
H6	PEU \rightarrow PP	0.92	7.74	Supported
H7	AT \rightarrow IN	0.66	9.39	Supported
H8	PP \rightarrow IN	0.34	5.55	Supported

P<0.01

Table 4.23: Hypotheses test results

4.3 Variable Effects

In this part we tried to illustrate direct, indirect and total effect of model variables (constructs) on each other. The results are classified in the sections below:

4.3.1 Direct Effects of Variables and Results of Hypothesis Test

The direct effects of independent variables on dependent variables of the model are illustrated in table 4.24. As, it can be extracted from the table, personal innovativeness has a negative effect on perceived usefulness ($\beta = -0.07$, $p < 0.05$), so as mentioned earlier first hypothesis will be rejected. Also, the results show that perceived innovativeness and personality are significantly positively related to perceived ease of use with amount of ($\beta = 0.65$, $p < 0.01$) and ($\beta = 0.27$, $p < 0.01$), and this means that the second and third hypothesis will be accepted. In addition table 4.25, shows the direct effects of dependent variables on dependent variables, which proves a very strong and meaningful relation between perceived ease of use with perceived usefulness and perceived playfulness with amount ($\beta = 0.90$, $p < 0.01$) and ($\beta = 0.92$, $p < 0.01$). This indicates the importance of perceived ease of use in shaping these two constructs. Also, perceived usefulness has a strong and significant effect on attitude ($\beta = 0.87$, $p < 0.01$), as these are main constructs of the original TAM indicates and it shows the importance of this constructs in shaping attitude. Finally, intention to use a recommender system is

described by Perceived playfulness and attitude by a direct meaningful effect ($\beta = 0.34$ $p < 0.01$) and ($\beta = 0.66$, $p < 0.01$) respectively.

	Personal innovativeness	Personality
Perceived usefulness	-0.07 not meaningful	--
Perceived ease of use	0.65	0.27

Table 4.24: Standardized direct effects of independent variables on dependent variables of model

	Perceived usefulness	Perceived ease of use	Perceived playfulness	Attitude
Perceived usefulness	--	0.90	--	--
Perceived ease of use	--	--	--	--
Perceived playfulness	--	0.92	--	--
Attitude	0.86	--	--	--
Intention to use	--	--	0.34	0.66

Table 4.25: Standardized direct effects of dependent variables on dependent variables of the model

So, the final outcome is the rejection of first hypothesis, and support of all other seven hypotheses. The other relations and effects could be find in tables 4.24 and 4.25.

4.3.2 Indirect Effects of Variables

In continues of the previous section, table 4.26 and 4.27 illustrate the standardized indirect effects of dependent and independent variables on each other. For example, the indirect effect of perceived ease of use has on attitude is $(1.07 * 0.87) = 0.93$.

	Perceived usefulness	Perceived ease of use	Perceived playfulness	Attitude
Perceived usefulness	--	--	--	--
Perceived ease of use	--	--	--	--
Perceived playfulness	--	--	--	--
Attitude	--	0.78	--	--
Intention to use	0.57	0.82	--	--

Table 4.26: Standardized indirect effects of dependent variables on dependent variables

	Personal innovativeness	Personality
Perceived usefulness	0.58	0.24
Perceived ease of use	--	--
Perceived playfulness	0.60	0.25
Attitude	0.44	0.21
Intention to use	0.49	0.22

Table 4.27: Standardized indirect effects of Independent variable on dependent variables

4.3.3 Total Effects of Variables

Finally, tables 4.28 and 4.29 show the standardized total effects of dependent and independent variable on each other.

	Perceived usefulness	Perceived ease of use	Perceived playfulness	Attitude
Perceived usefulness	--	0.91	--	--
Perceived ease of use	--	--	--	--
Perceived playfulness	--	0.93	--	--
Attitude	0.86	0.78	--	--
Intention to use	0.56	0.82	0.33	0.65

Table 4.28: Total effects of independent variables on independent variables

	Personal innovativeness	Personality
Perceived usefulness	0.51	0.24
Perceived ease of use	0.64	0.27
Perceived playfulness	0.60	0.25
Attitude	0.44	0.21
Intention to use	0.49	0.22

Table 4.29: Total effects of independent variables on dependent variables

4.4 Model's Overall Goodness of Fit

In this part we had used two common model-fit measures to assess the model's overall goodness of fit: Ratio of Chi-square to degree of freedom (df) and root mean square error of approximation (RMSEA). According to these tests we can tell that, from the model is totally in a good condition. The results obtained from Lisrel 8.53 are as follow:

- Degrees of Freedom = 551
- Full Information ML Chi-Square = 1704.81 (P = 0.0)
- Root Mean Square Error of Approximation (RMSEA) = 0.074
- 90 Percent Confidence Interval for RMSEA = (0.070 ; 0.078)
- P-Value for Test of Close Fit (RMSEA < 0.05) = 0.00

And the two fit measures obtained from above results are as follow:

1. The value of Chi-square divided to degree of freedom is 3.094 and approximately equal to the recommended value 3.00 ($\frac{\chi^2}{df} = \frac{1704.81}{551} = 3.094$).
2. The RMSEA value of the model is equal to 0.074, which is approximately equal to the recommended value 0.08.

4.5 Suggested Modifications For Model

In addition to the above results the Lisrel 8.53 has suggested some modifications in order to obtain better relations between the dependent and independent variables. These modifications could be considered as some practical guides for future study and researches. For example, the figure presents that making a relation between personality and perceived playfulness may results to 12.68 units decrease in chi-square of the model. The other suggested modifications could be find in figure 4.11.

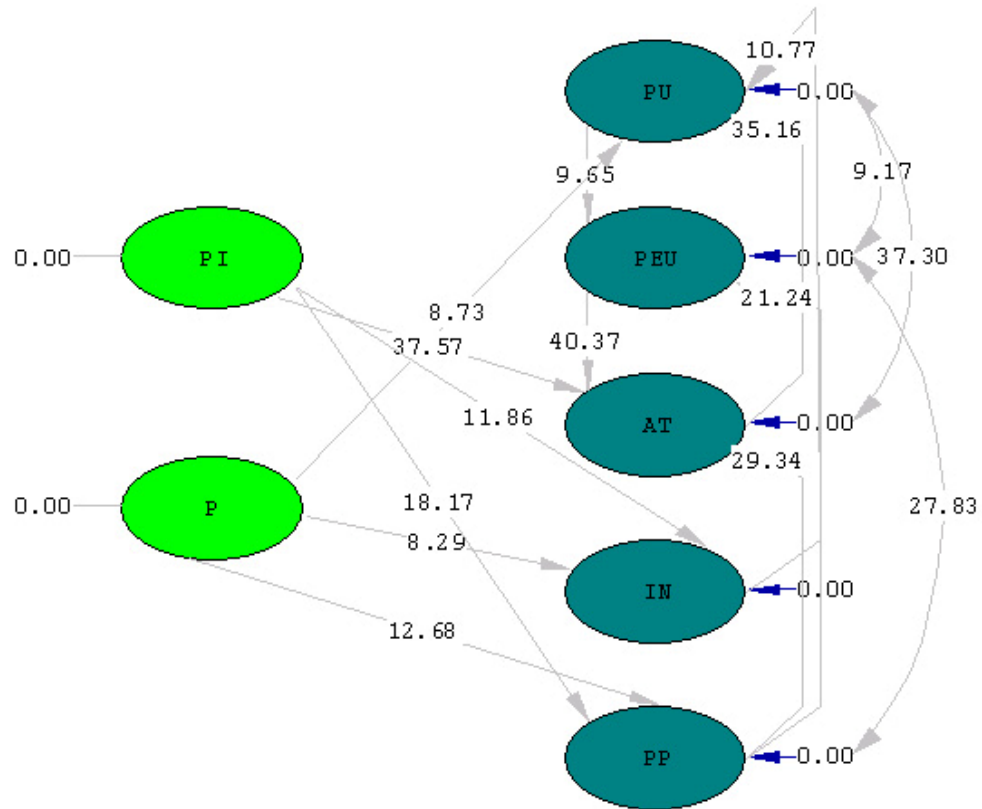


Figure 4.11: Suggested modifications by Lisrel

4.6 Additional Statistics and Comparisons

This section that contains some additional statistics regard branches and the customers, could be break down into two parts. First part contains some statistics regard respondent's banking service usage, preferences in receiving banking recommendations and total idea of the respondents regard a banking recommender system, which could be more useful for Tejarat bank to be aware of its customer's preferences and ideas. The second part has been assigned to Tukey HSD analysis, which compares each branch's customers separately with the other ones from different dimensions. Because, Tukey analysis contains very detailed and extended results and tables, so it has been presented here as an additional part and also some of tables has been moved to Appendix C.

In the survey's questionnaire there were two questions asking about which Tejarat bank services do customers use, and if a recommender system has been developed by Tejarat bank in future, in which fields do they like to receive recommendations from this system? Table 4.30 shows the outcomes of these two questions.

Service	Answer	Frequency	Percent
ATM	Yes	190	49.9
	No	191	50.1
	Total	381	100
Telephone Bank	Yes	165	43.3
	No	216	57.6
	Total	381	100
Internet Banking	Yes	70	18.4
	No	311	81.6
	Total	381	100
Other	Yes	116	30.4
	No	265	69.6
	Total	381	100

Table 4.30: Banking services usage by the respondents

As, it can be extracted from table 4.30, ATM has more users (190 users) in comparison with the other available services offered by Tejarat bank. The second preferred service is Telephone bank (reports the account balance by phone or fax), with 165 users. According to the statistics a very less attention has been paid to the Internet banking and its benefits of usage, by Tejarat bank customers. This could be because of many reasons, such as a premature introduction of internet banking, imperfect internet banking system, lack of enough knowledge by customers and many more reasons that could be discussed in detailed.

The results for the second question, which was asking the respondents: "In which fields you are interested to receive recommendations?" are summarized in table 4.31 in.

In addition to the above question, the Tejarat bank customer's tendency and idea, concerning the most convenient methods of receiving the recommendations are summarized in table 4.32. As well as the previous questions, the results obtained from this question could be also useful for the Tejarat bank's decision makers, in implementation phase of a banking recommender system.

Finally according to the statistics, the respondent's overall opinion to a banking recommender system was very positive, and they thought this system will be useful for guiding them through their banking activities in future. Following results are some proofs for this claim. Almost all of the respondents (98%) believe that using a recommender system will be very useful in improving their performance in conducting their banking activities, also will guide them to have a better selection among several banking services, and will help them to not lose new opportunities (perceived usefulness). About 93% of the respondents believe that using such a system will be easy and free of effort for them (perceived ease of use). According to the answers of almost 90% of the whole respondents, they are very eager to try out new IT services offered by Tejarat bank. This result explains the personality character of the customers toward trying out new innovations (personal innovativeness). Nearly 93.4%, think that using a recommender system by a bank is good and wise idea. Besides, 87.9% were on this opinion, that all banks should use a similar system one day, and 89.7% will strongly recommend other to use this system. At last, for 79.5% their family members opinion regard this system has a great impact on their usage, and for 87.4%, the expert's opinion has this great impact on system's usage.

The second part of this section is assigned to review of differences between each branch customers with the help of Post-hoc comparison (Tukey HSD). The post hoc test (or multiple comparison tests) can be used to determine the significant differences between group means in an analysis of variance setting.

Because 16 branches were exist, and all of them has to be compared one by one in 7 different variables, so the results which are presented in very extended tables are moved to Appendix C. These tables show the results of the Tukey HSD test in details, and totally

Service	Answer	Frequency	Percent
Loans	Yes	148	38.8
	No	233	61.2
	Total	381	100
Investment	Yes	103	27
	No	278	73
	Total	381	100
Revenue Accounts	Yes	114	29.9
	No	267	70.1
	Total	381	100
Saving accounts	Yes	74	19.4
	No	307	80.6
	Total	381	100
Current Accounts	Yes	163	42.8
	No	218	57.2
	Total	381	100
Credit & Debit Cards	Yes	97	25.5
	No	284	74.5
	Total	381	100
E-Banking	Yes	69	18.1
	No	312	81.9
	Total	381	100
Insurance	Yes	36	9.4
	No	345	90.6
	Total	381	100
Retirement Accounts	Yes	29	7.6
	No	352	92.4
	Total	381	100
Internet Banking	Yes	160	42
	No	221	58
	Total	381	100
All fields	Yes	86	22.6
	No	295	77.4
	Total	381	100

Table 4.31: The fields, that the respondents were eager to receive recommendations

if the “Mean different (I-J)” value in these tables be positive, it means branch “I” value in that field is greater than branch “J”, and if this value be negative, it means branch “I” value is less than branch “J”.

Recommendation Method	Answer	Frequency	Percent
Email	Yes	338	88.7
	No	13	3.5
	No idea	30	7.8
	Total	381	100
SMS	Yes	339	89
	No	14	3.7
	No idea	28	7.3
	Total	381	100
Fax	Yes	286	75
	No	37	9.7
	No idea	58	15.3
	Total	381	100
Direct Phone call	Yes	312	81.9
	No	38	10
	No idea	31	8.1
	Total	381	100
ATM display the recommendation after inserting the card	Yes	335	88
	No	15	4
	No idea	31	8
	Total	381	100
An internet account present the recommendation after login to the account	Yes	351	92.2
	No	7	1.8
	No idea	23	6
	Total	381	100

Table 4.32: Recommendation methods, preferred by respondents

Finally, as it can be clearly obtained from table 4.32, most of the respondents (92.2 %) has a strong desire to receive recommendations when they log into their account through banks website, and while they are using their account for regular account checking. Eighty nine percent (89%) of the whole respondents were eager to receive recommendations due to the new offered banking services on their mobile phone and by

SMS (short message service). With a very little different, 88.7 % think that email is the best way of receiving suggestions form bank. In addition, 88 % were interested to be informed of the new offered banking services, by ATM machine and exactly after they have inserted their card into an ATM. At last, 81.9 % and 75 % think that direct phone call by a bank employee and sending a fax could be the best way of offering a new service by Tejarat bank.

Chapter Five

Conclusions

5 Conclusions

In this chapter the findings, theoretical and practical implications of the research will be presented. I will then try to answer the issues posed in the research model, so I could answer my research question. Furthermore, I will also give the conclusions, limitations, the innovative part of the research and some suggestions for future researchers. The finding and conclusions are presented based upon the empirical data, and analysis derived in the previous chapter.

5.1 Theoretical Implications

The aim of this research has been to increase the understanding of factors that will affect the bank customer's intention to adopt a new IT based system (banking recommender system), which could help and guide them step by step through selecting the most suitable and appropriate financial services among variety of available choices.

We tried to explain consumer's opinion and behavior regard this system in Iran, by answering the research question of this study.

The findings of this study provide preliminary evidence suggesting that intention to adopt, adoption and also behavioral intention are determined by different factors. Based on the obtained results from the research, perceived ease of use, attitude and perceived usefulness have the most significant influence on the banking recommender system (BRS) adoption respectively. Among these three factors, attitude has a direct effect on intention, while perceived ease of use and perceived usefulness has indirect effects on intention to use. Actually the indirect effect of external factor, personal innovativeness was weaker than these three factors. The other factor which has positive direct effect, on intention to use, but not very strong is perceived playfulness, and finally personality has a weak positive indirect effect on intention to use a BRS. So, we can claim that based on the findings, attitude plays the most important direct role, while perceived ease of use plays the most important indirect role in modifying a BRS intention to adopt. And finally the findings present a strong support to the existing theoretical links of the proposed extended TAM.

5.2 Managerial Implications

Since this research focused on a single technology and industry context, we have the possibilities to have a deeper insight about customer adoption behavior within the specific context and contribute to this industry problems more accurate. Results from the path analysis of this research show that from Tejarat bank customer's point of view system's ease of use and usefulness are important factors that can affect banking authorities and decision makers to pay more attention to these features of a BRS system. This could results to develop a more user-accepted banking recommender system, and also can provide better insights into the best ways to promote new services to bank's potential costumers.

While, ease of use had shown a great indirect impact on intention to use the system, also its very strong and positive effect on the systems usefulness and playfulness was also considerable. All these facts revealed that, a very specific attention should be paid to this feature of a banking recommender system in Iran context. This has implications for design and implementation of the banking recommender system, and those specialists involved in designing this system should design it with technical features and instructions that allow the novice users to use them without being confused.

Besides, the relationship of perceived usefulness with both attitude and intention was significant, indicating the importance of the system's usefulness in forming the attitude and intention of inexperienced users of a banking recommender system.

Although many of the respondents were eager to try out new IT based banking services, but in overall personal innovativeness did not show a direct positive effect on the system's usefulness. This revealed that, an innovative part of a BRS could not affect on its usefulness from customer's view, and most of the respondents were on this belief that they will try out this new system, only based on expert suggestions and their family members as well. This feature should be very well and carefully considered by the bank decision makers in the implementation phase of a BRS as well.

At last as this research focuses on the phenomenon and situation of banking industry in Iran context, which is culturally different from other countries, so IT adoption behavior and perceptions of the Iranian decision makers may differ from the people in foreign countries. Thus, we hope this study provides a better understanding of bank customer's opinion and intention regard a recommender system, for Iranian banking industry decision makers.

5.3 Innovative Part of the Research

This research is the first study in Iran to investigate and discuss on the factors, which affects a recommender system adoption in general and a banking recommender

system in specific. By considering the context, I tried to choose the most suitable research model and to be innovative in every part of the research, for example selecting the samples among the whole countries population, classified by their financial transaction records on Tejarat bank, and their geographical location as well.

5.4 Limitations and Suggestions for Future Research

There were some limitations during the research, which will be discussed as follow. Although the sample size was chosen among the whole countries population, but it was limited to only Tejarat bank customers, and this may effects on generalization of the findings to the whole population of Iran. So, future researches may be done across different samples from different governmental and private banks. Secondly, although the choices for each question were adopted from the previous studies and by expert's opinion, but all possible alternatives might not have been included. In addition, the validated research framework proposed in this study can then serve as a basis for hypothesis formulation for future research in this area.

5.5 Conclusion

The main purpose of this study was to refine and propose an extended model, based on technology acceptance model (TAM), in order to determine and investigate on factors that influence and motivates banking recommender system adoption. Overall results revealed that the theory of acceptance model (TAM) provides a good understanding of these factors. Also, the findings indicate that, the proposed extended TAM model is a quite good predictor of Iranian bank customer's behavior toward a new information technology based banking service.

The other contribution of this study was to propose and tests a series of hypotheses pertaining to the factors that influence adoption of a recommender system at organizational level in Iran's banking sector. According to the statistical results, perceived innovativeness has no meaningful positive effect on usefulness of the system, and the following factors: perceived ease of use, attitude and perceived usefulness, play the most significant role in banking recommender system adoption in Iran, respectively.

In general, the model was supported by the results, and finally the respondents had shown a very great intention to the implementation of a banking recommender system, which could help and guide them through their banking activities.

References:

- AGRAWAL, R., PRASAD, J. (1998) A conceptual and operational definition of personal innovativeness in the domain of information technology. *Information Systems Research*, 9, 204-301.
- AJZEN, I., AND FISHBEIN, M (1975) Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. *Reading, MA: Addison-Wesley*.
- AJZEN, I., AND FISHBEIN, M (1980) Understanding the attitudes and predicting social behavior. *Englewood Cliffs, New Jersey: Prentice-Hall Inc.*
- AJZEN, I., MADDEN, T.J. (1986) Prediction of goal-directed behavior: attitudes, intention and perceived behavioral control. *Journal of Experimental Social Psychology*, 22, 453-474.
- AJZEN, I. (1991) the theory of planned behavior: Some unresolved issues. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- ARMITAGE, C. J., & CONNER, M (2001) Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, 40, 471-499.
- BAEZA R, Y., AND B. RIBEIRO NETO (1999) Modern Information Retrieval. *Addison-Wesley*.
- BAGOZZI, R. & YI, Y. (1988) On the evaluation of structural equation models. *Journal of academy of marketing science*, Vol. 16, 74-94.
- BALABANOVIĆ, M., AND SHOHAM, Y (1997) Content-based, collaborative recommendation. *Communications of the ACM*, 40, 66-72.
- BARNETT, L. A. (1990) Definition, design, and measurement. *Play and Culture*, 3, 319-336.
- BATTACHERJEE, A. (2000) Acceptance of e-commerce services: the case of electronic brokerages. *IEEE Transactions on Systems, Man and Cybernetics*, 30, 411-420.
- BELKIN N, A. B. C. (1992) Information Filtering and Information Retrieval. *Comm. ACM*, 35, 29-37.
- BREESE, J., HECKERMAN, D., AND KADIE, C (1998) Empirical analysis of predictive algorithms for collaborative filtering. *In Proceedings of the Fourteenth Annual Conference on Uncertainty in Artificial Intelligence. Morgan Kaufmann, Madison, WI, USA*, 43-52.
- BURKE, R. (2002) Hybrid recommender systems: Survey and experiments. *User Modeling and User-Adapted Interaction*, 12, 331-370.
- BYEONG MAN KIM, Q. L. (2004) Probabilistic Model Estimation for Collaborative Filtering Based on Items Attributes. *Proceedings of the IEEE/WIC/ACM International Conference on Web Intelligence, IEEE*.
- BYRON L.D. BEZERRA, F. D. A. T. D. C. (2004) A symbolic approach for content-based information filtering. *Information Processing Letters*, 92, 45-52.
- CHOOCHART HARUECHAIYASAK, C. T., SARAWOOT KONGYOUNG, CHAIANUN DAMRONGRAT, NIRAN ANGKAWATTANAWIT (2002) A Dynamic Framework for Maintaining Customer Profiles in E-Commerce Recommender Systems. *Information Research and Development Division*.
- DAVIS, F. D., BAGOZZI, R. P., & WARSHAW, P. R. (1989) User acceptance of computer technology: a comparison of two theoretical models. *Management*

- Science*, 35, 982-1003.
- E. KARAHANNA, D. W. S., N.L. (1999) Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quart.*, 23, 183-213.
- FENG-CHENG TUNGA, S.-C. C., CHI-MIN CHOUC (2007) An extension of trust and TAM model with IDT in the adoption of the electronic logistics information system in HIS in the medical industry. *International journal of medical informatics*.
- GEDIMINAS ADOMAVICIUS, A. A. T. (2005) Toward the Next Generation of Recommender Systems: A Survey of the State-of-the-Art and Possible Extensions. *IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING*, 17, 734-749.
- GEFEN, D., DETMAR, S. & BOUDREAN, M. (2000) Structural Equation modeling :guidelines for research practice. *communications of AIS*, Vol. 7, 1-78.
- GHAMATRASA, M. (2006) Internet Adoption Decision Model among Iranian Small and Medium Enterprises, Master Thesis, Division of Industrial marketing and e-commerce, Lulea university of technology, 43, pp. 25-29.
- GLORIA YAN, J. C. P. (1998) Internet - The Future Delivery Channel for Banking Services. *Centre for Management of Technology and Entrepreneurship, University of Toronto*.
- GOLDBERG, D., NICHOLS, D., OKI, B., AND TERRY, D (1992) Using collaborative filtering to weave an information tapestry. *Communications of the ACM*, 35, 61-70.
- GOOD, N., SCHAFER, B., KONSTAN, J., BORCHERS, A., SARWAR, B., HERLOCKER, J., AND RIEDL, J (1999) Combining collaborative filtering with personal agents for better recommendations. *In Proceedings of the 16th National Conference on Artificial Intelligence and Innovative Applications of Artificial Intelligence. American Association for Artificial Intelligence, Orlando, FL, USA,*, 439 - 446.
- HARTWICK, J., BARKI, H. (1994) Explaining the role of user participation in information system use. *Management Science*, 40, 440-465.
- HERLOCKER, J., KONSTAN, J., BORCHERS, A., AND RIEDL, J (1999) An algorithmic framework for performing collaborative filtering. *In Proceedings of the 22nd Annual International ACM SIGIR Conference on Research and Development in Information Retrieval. ACM Press, Berkeley, CA, USA*, 230-237.
- HSUA, C.-L., LUB, H.-P. & HSUC, H.-H. (2007) Adoption of the mobile Internet: An empirical study of multimedia message service (MMS). *Omega international journal of manegment and science*, 35, pp. 715 – 726.
- HYOUNG YONG LEE, H. A. B., INGOO HAN (2006) VCR: Virtual community recommender using the technology acceptance model and the user's needs type. *Expert Systems with Applications*.
- IGBARIA, M., GUIMARAES, T., & DAVIS, G. B. (1995) Testing thedeterminants of microcomputer usage via a structural equation model. *Journal of Management Information Systems*, 11, 87-114.
- KAISER, F. G. (2006) A moral extension of the theory of planned behavior: Norms and

- anticipated feelings of regret in conservatism. *Personality and Individual Differences*, 41, 71-81.
- KARAHANNA, E., ET AL. (1999) Information technology adoption across time: a cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, 23, 183-213.
- KARAMI, M. (2006) Factors Influencing Adoption of Online Ticketing, Master Thesis, Division of Industrial marketing and e-commerce, Lulea university of technology, 45, pp. 33
- KHAN, S. (2007) Adoption Issues of Internet Banking in Pakistani' Firms, Department of Business Administration and Social Sciences
Division of Information Systems Sciences, Lulea university of technology, 9, pp.34-35.
- KONSTAN, J., MILLER, B., MALTZ, D., HERLOCKER, J., GORDON, L., AND RIEDL, J. & . 40, 77-87. (1997) GroupLens: Applying collaborative filtering to usenet news. *Communications of the ACM*, 40, 77-87.
- LEWIS, W., AGARWAL, R., & SAMBAMURTHY, V. (2003) Sources of influence on beliefs about information technology use: an empirical study of knowledge workers. *MIS Quarterly*, 27, 657-678.
- LIEBERMAN, J. N. (1977) Playfulness: Its Relationship to Imagination and Creativity. *Academic Press, New York*.
- MALONE, T., GRANT, K., TURBAK, F., BROBST, S., AND COHEN, M (1987) Intelligent information-sharing systems. *Communications of the ACM*, 30, 390-402.
- MALONE, T. W. (1981) Toward a theory of intrinsically motivating instruction. *Cognitive Science*, 5, 333-369.
- MANSTEAD, A. S. R. (1996) Attitudes and behavior. In G. R. Semin & K. Fiedler (Eds.). *Applied social psychology*, Thousand Oaks, CA: Sage, 3-29.
- MATHIESON, K. (1991) Predicting user intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior. *Information Systems Research*, 2, 173-189.
- MENG-HSIANG HSUA, C.-H. Y., CHAO-MIN CHIUC, CHUN-MING CHANG (2006) A longitudinal investigation of continued online shopping behavior: An extension of the theory of planned behavior. *Int. J. Human-Computer Studies*, 64, 889-904.
- MOON, J.-W. & AND KIM, Y.-G. (2001) Extending the TAM for a World-Wide-Web context. *Information and Management*, 38, 217-230.
- MOONEY, R. J., BENNETT, P. N. & ROY, L. (1998) Book Recommending Using Text Categorization with Extracted Information. *Recommender Systems Papers Workshop, Technical Report*
- MOORE, G. A. B., I. (1991) Development of an instrument to measure the perceptions of adoption an information technology innovation. *information systems research*, 2, 192-222.
- OLIVER, T. A., SHAPIRO, F. (1993) Self-efficacy and computers. *Journal of Computer-Based Interactions*, 20, 81-85.
- PINE II, B. J. (1993) Mass Customization. *Harvard Business School Press, Boston, Massachusetts*.
- PINE II, B. J., PEPPERS, D., AND ROGERS, M (1995) Do you want to keep your

- customers forever? *Harvard Business School Review*, 2, 103-114.
- RESNICK, P., N. IAKOVOU, M. SUSHAK, P. BERGSTROM, AND J. RIEDL, GROUPLANS (1994) An Open Architecture for Collaborative Filtering of Netnews. *Conference on Computer-Supported Cooperative Work*. ACM, 175-186.
- RESNICK, P., VARIAN, H. (1997) Communications of the Recommender systems. *ACM*, 40, 56-58.
- RESNICK, P., IACOVOU, N., SUCHAK, M., BERGSTORM, P. & RIEDL, J. (1994) Group-Lens: An open architecture for collaborative filtering of netnews. In *Proceedings of the ACM Conference on Computer-Supported Cooperative Work*. ACM, Chapel Hill, NC, USA, 175-186.
- ROGERS, E. M. (1983) *Diffusion of Innovation* (3rd ed.), New York: The Free Press.
- ROGERS, E. M. (1995) *Diffusion of Innovation* (4th ed.), New York: The Free Press.
- ROGERS, E. M. & SHOEMAKER, F. F. (1971) *Communication of Innovation*. New York: The Free Press.
- SALJOUGHI, F. (2002) *Adoption of M-Commerce* Postgraduate thesis, Agder college.
- SAUNDERS MARK, N. K., LEWIS, P. AND THORNHILL, A. (2000) *Research methods for Business Students*. 2nd ed., Prentice Hall, England.
- SHAOYI LIAO, Y. P. S., HUAQING WANG, ADA CHEN (1999) The adoption of virtual banking: an empirical study. *International Journal of Information Management*, 19, 63-74.
- SHARDANAND U, A. P. M. (1995) Social Information Filtering: Algorithms for Automating Word of Mouth. *Proc. Conf. Human Factors in Computing Systems*.
- TAYLOR.S., A. T., P.A (1995) Understanding information technology usage: A test of competing models. *Inf. Systems Research*, 6, 144-176.
- TEJARAT BANK (2007) <http://www.tejaratbank.ir/en/>.
- TERVEEN L, W. H., B. AMENTO, D. MCDONALD, AND J. CRETER, (1997) PHOAKS: A System for Sharing Recommendations. *Comm. ACM*, 40, 59-62.
- TZVETAN HOROZOV, N. N., VENU VASUDEVAN (2006) Using location for personalized POI recommendations in mobile environments. *Proceedings of the 2005 Symposium on Applications and the Internet*, IEEE.
- VAN RIJSBERGEN, K. (1975) *Information Retrieval*. Butterworths. London, UK.
- WALLSTROM, A. (2002) *Industrial Buying Behaviour of Large Swedish Firms-Case Studies of the Purchase of Educational Services*. Department of Business Administration and Social Sciences, Luleå University of Technology, Luleå, Sweden.
- WANG, J. & NAMEN, J. (2004) Customer Adoption of Technology-Based Self-Service A Case Study on Airport Self Check-in Service, Master thesis, Department of Business Administration and Social Sciences Division of Industrial Marketing and e-Commerce, 85, pp. 28.
- WANG, S.-L. (2004) Adjustable Discovery of Adaptive-Support Association Rules for Collaborative Recommendation Systems. *IEEE International Conference on Systems, Man and Cybernetics*, pp. 3250-3254.
- WEBSTER J, J. J. M. (1992) Microcomputer playfulness: Development of a measure with workplace implications. *MIS Quarterly*, 16, 201-226.
- YAHYAPOUR, NIMA et al., (2008) An extended TAM for "Banking Recommender

- System” adoption, Case of application in Iran, Department of industrial engineering & E-commerce, Tarbiat Modares University, Department of Industrial Marketing & E-Commerce, Lulea University of technology, The 2008 conference of e-commerce, Bangkok, Thailand.
- YIN, R. K. (1994) Case Study research: design and methods, sage Publication,. *Thousands Oak, 2nd edition.*
- ZIKMUND, W. G. & . (1994) Business Research Methods. (4th. Ed.) Orlando. *The Dryden Press.*

Appendix A. Questionnaire (English version)

Part 1. Demographic characteristics of the respondent (Please select your choice of answer)

Gender: Male/Female

Age Group: 18-25 / 26-40 / 41-60 / over 61

Occupation: House keeper / Private / Governmental / Student / Working in Private Company / Manufacturing / No Job / Bank or Financial institution / Other

Education: High school no degree / High school degree / University Degree / Master or Doctorate degree

Access to Internet: No / From home / From work

Hours of using Internet per week: less than 5 / between 5 and 15 / more than 15

Part 2.

1. I use more than one bank to accomplish my banking tasks. Yes / No
2. I prefer to conduct my banking activities through one bank. Yes/No
3. Which one / ones do you use in use banking activities? ATM / Telephone Bank / Internet

Perceived usefulness

4. Using a banking recommender system would improve my performance in conducting banking tasks.
5. Using a banking recommender system would help me to have a better selection among different available choices.
6. Using the banking recommender system would enable me to accomplish my banking tasks more quickly.
7. Using this recommender system will have critical role in supporting my banking activities.
8. By Using a banking recommender system, I would not lose opportunities.
9. Using a banking recommender system would help me to have access to updated information regard banking activities and services.

10. Using a banking recommender system would help me to have access to more valuable information, in time.
11. Overall, I find the use banking recommender system useful.

Perceived ease of use

12. I find my interaction with the use of the banking recommender system clear and understandable.
13. I believe learning to use Banking recommender system will be easy for me.
14. I think it will be easy to use Banking recommender system.
15. If needed, I will spend lots of time to learn how to use it.
16. I like to receive recommendations from the system, by the most convenient ways that I prefer.
17. I prefer this system to be flexible to interact with.
18. Overall, I found using this system free of effort.
19. I think email is the easiest and most convenient way of having recommendations from this system.
20. I think SMS is the easiest and most convenient way of having recommendations from this system.
21. I think Fax message is the easiest and most convenient way of having recommendations from this system.
22. I think direct phone call from the bank is the easiest and most convenient way of having recommendations from this system.
23. I prefer to receive recommendations from this system, when I enter my credit card to and ATM machine and during transaction process.
24. I prefer to receive recommendations from this system, when I entered my account at the bank website.

Attitude

25. I would feel that using banking recommender system would be pleasant.
26. Using banking recommender system is a good idea.
27. I feel it is necessary to use this system.

28. In my opinion, all banks must use a banking recommender system.
29. In my view, using banking recommender system is a wise idea.

Intention to use

30. I would see myself using the banking recommender system for handling my banking transactions.
31. I am always, waiting to receive recommendations from this system.
32. I will frequently use this banking recommender system in the future.
33. I will strongly recommend others to use systems recommendations.

Perceived playfulness

34. As soon as I receive a suggestion from the system in any situation, I will try using it as soon as possible.
35. I feel pleasant receiving suggestions form this system.
36. I will consider this system's recommendations.
37. I believe the system recommendations are the best, and there is no need to investigate on them.
38. I only prefer to have recommendations from this system, and I will ignore other recommendations from other parties.

Personal innovativeness

39. If I heard about a new IT, I would like to experiment with it.
40. Among my peers, I am usually the first to try out new IT.
41. In general, I am hesitant try out new IT.
42. I like to experiment with new IT.

Personality

43. According to my personality, The opinions of my family members regard this system has a great impact on me.
44. According to my personality, the experts opinion regard this system is very important for me.

45. According to my personality, I will not be the first users of this system. And I will stay until it, becomes very popular.

46. Finally I am eager to receive recommendations from the system, in the following fields?

Loans / investment / revenue accounts / saving accounts / current accounts / credit cards / e- banking / insurance / retirement facilities / internet banking / all the fields

Appendix B. Final Questionnaire (Farsi version)



به نام خدا



از آنجا که بانک تجارت همواره در پی یافتن روش هایی برای بهبود هرچه بیشتر خدمات بانکی خود بوده است و کوشش می کند که با مشتریان خود رابطه ای بدون ابهام، مطلوب و رضایت بخش داشته باشد، لذا در نظر دارد روش اطلاع رسانی جدیدی را طراحی و راه اندازی نماید. در این روش هر مشتری بانک به شیوه های متفاوت مطلع می گردد، که با توجه به شرایط حساب او با بانک، می تواند از خدمات مختلفی نظیر وام، سرمایه گذاری، قرض الحسنه، سپرده گذاری، کارت های اعتباری، بیمه، حسابهای جاری، بازنشستگی و غیره استفاده نماید، که در واقع یک سیستم پیشنهاد دهنده هوشمند (Recommender System) نقش آگاهی دهنده و مشاور مشتریان در امور بانکی را ایفا می نماید.

پیشنهادهای این سیستم به مشتریان بانک می تواند از راههای متنوعی نظیر پیام کوتاه، ایمیل، نمابر، دستگاه خودپرداز و حتی تماس تلفنی بانک با مشتریان صورت پذیرد. بعنوان مثال هنگامیکه در حال استفاده از دستگاه خودپرداز هستید، سیستم همزمان با اجرای عملیات، با بررسی مشخصات حساب شما مناسب ترین سرویس بانکی یا جدیدترین خدمات بانکی قابل ارائه به شما، که می تواند در کوتاهترین زمان در اختیاران قرار گیرد را نمایش خواهد داد، و یا بنا بر انتخاب شما این قبیل پیشنهادات می توانند از طریق پیام کوتاه به تلفن همراه شما ارسال گردند. تردیدی نیست که مشارکت شما از طریق اظهار نظر، راهنمایی و ارائه پیشنهاد موجب خواهد شد که شروع برنامه بر اساس نیاز مشتری و خواست او طراحی گردد.

لذا بررسی حاضر، با هدف آگاهی یافتن از تمایل، نگرش، طرز تلقی و ارزیابی شما از سودمندی این روش جدید انجام می پذیرد، و بدیهی است که جوابهای دقیق و از روی تأمل پاسخگویان که بدلیل بی نام بودن پرسشنامه، آنان را نخواهیم شناخت، به هرچه با ارزش و ارزنده تر بودن نتایج این تحقیق کمک خواهد کرد.

"پرسشنامه"

جنسیت:

☐ زن

☐ مرد

محدوده سنی شما:

☐ بالاتر از ۶۰

☐ ۴۱-۶۰

☐ ۲۶-۴۰

☐ ۱۸-۲۵

شغل:

☐ در حال تحصیل

☐ کارمند ادارات دولتی

☐ شغل آزاد

☐ خانه دار

☐ بیکار

☐ کارمند صنایع تولیدی

☐ کارمند مراکز خصوصی

☐ سایر موارد

☐ کارمند بانک و یا ادارات وابسته به آن

میزان تحصیلات:

☐ زیر دیپلم ☐ دیپلم ☐ لیسانس ☐ فوق لیسانس و بالاتر

نحوه دسترسی به اینترنت:

☐ ندارم ☐ از طریق منزل ☐ از طریق محل کار

میزان کار با اینترنت در هفته:

☐ کمتر از ۳ ساعت ☐ بین ۳ تا ۱۰ ساعت ☐ بیش از ۱۰ ساعت

بخش اول:

انجام امور بانکی - لطفاً به سوالات زیر به دقت پاسخ دهید. سوال ۳ می تواند بیش از یک جواب داشته باشد.

۱. از بیش از یک بانک جهت کارهای بانکی و مالی خود استفاده می نمایم.

☐ بلی ☐ خیر

۲. ترجیح می دهم، کلیه سرویسهای دریافتی از بانکها و کلیه امور بانکی خود را از طریق یک بانک انجام دهم.

☐ بلی ☐ خیر

۳. از موارد زیر جهت امور بانکی استفاده می نمایم.

☐ خودپرداز ☐ تلفن بانک ☐ اینترنت ☐ سایر موارد

بخش دوم: (کارآمد بودن و سودمندی)

در این بخش سوالاتی در مورد کارآمد و سودمند بودن این سیستم پیشنهاد دهنده مطرح می شود. لطفاً میزان موافقت یا مخالفت خود با هر کدام از گزاره ها را با انتخاب پاسخ مناسب بیان کنید. (شما تنها مجاز به انتخاب یک جواب برای هر سوال هستید)

کاملاً موافق	موافق	تقریباً موافق	نظری ندارم	تقریباً مخالف	مخالف	کاملاً مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴. استفاده از یک سیستم پیشنهاد دهنده، می تواند باعث افزایش بهره وری (راندمان) کاری من در انجام عملیات بانکی شود.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۵. استفاده از یک سیستم پیشنهاد دهنده، می تواند باعث صرفه جویی در زمان و افزایش سرعت تصمیم گیری من در انتخاب یک سرویس مناسب بانکی گردد.						

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۶. استفاده از یک سیستم پیشنهاد دهنده، انتخاب من میان سرویسهای مختلف بانکی را راحتتر می نماید.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۷. یک سیستم پیشنهاد دهنده، می تواند نقشی مهم و حیاتی، در حمایت و پشتیبانی از عملیات مالی من دارا باشد.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۸. استفاده از چنین سیستمی باعث از دست رفتن فرصتها، و شناخت تمامی امکاناتی است که می توانم از آنها استفاده نمایم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۹. استفاده از یک سیستم پیشنهاد دهنده، باعث دستیابی من به اطلاعات به روز و جدیدی در مورد سرویسهای مختلف بانکی می شود.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۰. استفاده از یک سیستم پیشنهاد دهنده، باعث دستیابی من به اطلاعات با ارزش و به موقع در مورد سرویسهای بانکی جدید می شود.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۱. در مجموع استفاده از سیستمی پیشنهاد دهنده جهت سرویسهای مالی و بانکی را سودمند ارزیابی می کنم.

بخش سوم: (آسان و قابل استفاده بودن)

در این بخش سوالاتی در مورد آسان و قابل استفاده بودن پیشنهادات این سیستم پیشنهاد دهنده مطرح می شود. لطفاً میزان موافقت یا مخالفت خود با هر کدام از گزاره ها را با انتخاب پاسخ مناسب بیان کنید. (شما تنها مجاز به انتخاب یک جواب برای هر سوال هستید)

کاملاً موافق	موافق	تقریباً موافق	نظری ندارم	تقریباً مخالف	مخالف	کاملاً مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۲. نحوه تعامل خود با این سیستم پیشنهاد دهنده بانکی را واضح و بدون ابهام می بینم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۳. تصور می کنم یادگیری نحوه استفاده از این سیستم برایم راحت باشد.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۴. تصور می کنم بکارگیری این سیستم کار ساده ای باشد.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۵. چنانچه نیاز باشد، زمان زیادی را صرف یادگیری نحوه استفاده از آن خواهم کرد.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۶. مایلیم از طرق دلخواهم، پیشنهادات را دریافت نمایم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۷. ترجیح می دهم سیستم طوری طراحی شود، تا در نحوه تعاملاتش با افراد، بسیار انعطاف پذیر عمل کند.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	۱۸. در کل تصور می کنم پیشنهادات چنین سیستمی، برایم قابل استفاده باشد.

کاملا موافق	موافق	تقریبا موافق	نظری ندارم	تقریبا مخالف	مخالف	کاملا مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۱۹. استفاده از نامه الکترونیکی جهت دریافت پیشنهاد را راحت تر می دانم.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۰. استفاده از پیام کوتاه جهت دریافت پیشنهاد را راحت تر می دانم.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۱. استفاده از نمابر جهت دریافت پیشنهاد را راحت تر می دانم.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۲. استفاده از تماس مستقیم تلفنی جهت دریافت پیشنهاد را راحت تر می دانم.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۳. ترجیح می دهم پس از داخل نمودن کارت خود در دستگاه خودپرداز، و در هنگام انجام عملیات توسط این دستگاه، سیستم بصورت خودکار پیشنهادات مناسب را که متناسب با حساب من می باشد، ارائه نماید.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۴. ترجیح می دهم پس از ورود به سایت بانک، و ورود به حساب شخصی، سیستم پیشنهادات مناسب را متناسب با شرایط حساب من ارائه نماید.						

بخش چهارم: (نگرش شما نسبت به سیستم)

در این بخش سوالاتی در مورد نگرش شما نسبت به این سیستم پیشنهاد دهنده مطرح می شود. لطفاً میزان موافقت یا مخالفت خود با هر کدام از گزاره ها را با انتخاب پاسخ مناسب بیان کنید. (شما تنها مجاز به انتخاب یک جواب برای هر سوال هستید)

کاملا موافق	موافق	تقریبا موافق	نظری ندارم	تقریبا مخالف	مخالف	کاملا مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۵. با وجود چنین سیستمی احساس رضایت بیشتری در انجام عملیات بانکی دارم.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۶. استفاده از چنین سیستمی را سودمند می دانم.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۷. استفاده از چنین سیستمی را لازم می دانم.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۸. استفاده از چنین سیستمی ایده و ابتکار جالبی است.						
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۲۹. با توجه به کثرت سرویسها، تصور می کنم در نهایت بانکها و متولیان سیستمهای مالی ناچار به استفاده از چنین سیستمی می باشند.						

بخش پنجم: (تمایل شما نسبت به چنین سیستمی)

در این بخش سوالاتی در مورد تمایل کلی شما نسبت به این سیستم پیشنهاد دهنده مطرح می شود. لطفاً میزان موافقت یا مخالفت خود با هرکدام از گزاره ها را با انتخاب پاسخ مناسب بیان کنید. (شما تنها مجاز به انتخاب یک جواب برای هر سوال هستید)

کاملاً موافق	موافق	تقریباً موافق	نظری ندارم	تقریباً مخالف	مخالف	کاملاً مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۰. از شروع بکار چنین سیستمی استقبال می کنم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۱. همواره در انتظار دریافت پیشنهادات جدید از سیستم هستم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۲. استفاده از پیشنهادات چنین سیستمی را، به دیگران پیشنهاد می کنم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۳. در آینده نیز بصورت مرتب از پیشنهادات آن استفاده خواهم کرد.

بخش ششم: (نحوه تعامل شما با چنین سیستمی)

در این بخش سوالاتی در مورد نحوه تعامل شما با این سیستم پیشنهاد دهنده مطرح می شود. لطفاً میزان موافقت یا مخالفت خود با هرکدام از گزاره ها را با انتخاب پاسخ مناسب بیان کنید. (شما تنها مجاز به انتخاب یک جواب برای هر سوال هستید)

کاملاً موافق	موافق	تقریباً موافق	نظری ندارم	تقریباً مخالف	مخالف	کاملاً مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۴. چنانچه به هر طریق پیشنهادی از طریق این سیستم دریافت کنم، باعث خوشحالی من خواهد شد.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۵. اگر چنانچه پیشنهاد مناسبی دریافت نمایم، به سرعت در جهت آن اقدام می نمایم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۶. پیشنهادات سیستم را همواره مورد بررسی قرار می دهم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۷. پیشنهادات ارائه شده توسط سیستم را بهترین پیشنهاد دانسته، و نیازی به تحقیق بیشتر در این رابطه نمی بینم.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						۳۸. تنها مایل به دریافت پیشنهادات از چنین سیستمی هستم، و سایر پیشنهادات که توسط منابع مختلف ارائه می گردند، را رد می کنم.

بخش هفتم: (تمایل شما نسبت به تکنولوژیهای جدید)

در این بخش سوالاتی در مورد تمایل کلی شما نسبت به استفاده از تکنولوژیهای جدید مطرح می شود. لطفاً میزان موافقت یا مخالفت خود با هرکدام از گزاره ها را با انتخاب پاسخ مناسب بیان کنید. (شما تنها مجاز به انتخاب یک جواب برای هر سوال هستید)

کاملاً موافق	موافق	تقریباً موافق	نظری ندارم	تقریباً مخالف	مخالف	کاملاً مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۳۹. اگر چنانچه هر زمان سرویس جدیدی توسط بانک ارائه گردد، علاقه مند به استفاده از آن هستم.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴۰. مابین خانواده، اولین فردی هستم که همواره یک سیستم، تکنولوژی و یا سرویس جدید را آزمایش می کنم.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴۱. در کل تمایل زیادی به استفاده از سرویسهای جدید بانکی ندارم.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴۲. تمایل به استفاده از سرویسهای جدید بانکی مبنی بر فن آوری اطلاعات را دارم.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

بخش هشتم: (شخصیت)

در این بخش سوالاتی در مورد شخصیت فردی شما مطرح می شود. با توجه به شناختی که از شخصیت فردی خود دارید، لطفاً میزان موافقت یا مخالفت خود با هرکدام از گزاره ها را با انتخاب پاسخ مناسب بیان کنید. (شما تنها مجاز به انتخاب یک جواب برای هر سوال هستید)

با توجه به شناختی که از شخصیت خود دارم، تصور می کنم:

کاملاً موافق	موافق	تقریباً موافق	نظری ندارم	تقریباً مخالف	مخالف	کاملاً مخالف
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴۳. نظر اطرافیان از جمله خانواده در مورد این سیستم در استفاده من از آن بسیار موثر باشد.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴۴. نظر افراد خبره در زمینه امور بانکی در مورد این سیستم، در استفاده من از آن بسیار موثر باشد.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴۵. باتوجه به شخصیت، اولین استفاده کننده	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
۴۶. هیچگاه تمایل ندارم در قبول یک پیشنهاد جدید اولین نفر باشم.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

۴۷. در نهایت مایل به دریافت پیشنهاد توسط سیستم پیشنهاد دهنده در موارد زیر هستیم. (این سوال می تواند بیش از یک جواب داشته باشد)

- | | | | |
|--|--|--|--------------------------------------|
| <input type="checkbox"/> وام | <input type="checkbox"/> سرمایه گذاری | <input type="checkbox"/> قرض الحسنه | <input type="checkbox"/> سپرده گذاری |
| <input type="checkbox"/> حسابهای جاری | <input type="checkbox"/> کارتهای اعتباری | <input type="checkbox"/> بانکداری الکترونیکی | <input type="checkbox"/> بیمه |
| <input type="checkbox"/> حسابهای بازنشستگی | <input type="checkbox"/> بانکداری اینترنتی | <input type="checkbox"/> کلیه موارد | |

در پایان، از شرکت شما در این تحقیق صمیمانه سپاسگذاریم.

Appendix C. Tukey HSD analysis

Multiple Comparisons							
Tukey HSD							
Dependent Variable	(I) Branch	(J) Branch	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Upper Bound	Lower Bound
in	Gilan	Tehran center1	0.57698	0.27057	0.712	-0.3470	1.5009
		Tehran west1	0.52698	0.29276	0.897	-0.4727	1.5267
		Tehran east1	0.94517	0.32232	0.187	-0.1555	2.0458
		Tehran north1	0.59075	0.26138	0.621	-0.3018	1.4833
		Esfahan	1.36587(*)	0.21957	0.000	0.6161	2.1157
		Eilam	0.38061	0.22807	0.941	-0.3982	1.1594
		Markazi	0.35775	0.30561	0.998	-0.6859	1.4014
		Tehran north2	0.77916	0.26138	0.166	-0.1134	1.6717
		Tehran south1	0.18153	0.22214	1.000	-0.5770	0.9401
		Tehran center2	1.18254(*)	0.31338	0.015	0.1124	2.2527
		Tehran east2	-0.16468	0.28737	1.000	-1.1460	0.8166
		Fars	0.26840	0.24174	0.999	-0.5571	1.0939
		Tehran west2	0.58852	0.25408	0.579	-0.2791	1.4562
		Tehran south2	0.79365	0.40088	0.809	-0.5753	2.1626
	Tehran center1	Gilan	-0.57698	0.27057	0.712	-1.5009	0.3470
		Tehran west1	-0.05000	0.29579	1.000	-1.0601	0.9601
		Tehran east1	0.36818	0.32507	0.998	-0.7419	1.4783
		Tehran north1	0.01377	0.26477	1.000	-0.8904	0.9179
		Esfahan	.78889(*)	0.22360	0.035	0.0253	1.5524
		Eilam	-0.19638	0.23195	1.000	-0.9884	0.5957
		Markazi	-0.21923	0.30852	1.000	-1.2728	0.8343
		Tehran north2	0.20217	0.26477	1.000	-0.7020	1.1063
		Tehran south1	-0.39545	0.22612	0.916	-1.1676	0.3767
		Tehran center2	0.60556	0.31621	0.844	-0.4743	1.6854
		Tehran east2	-0.74167	0.29046	0.405	-1.7335	0.2502
		Fars	-0.30859	0.24540	0.995	-1.1466	0.5294
		Tehran west2	0.01154	0.25757	1.000	-0.8680	0.8911
		Tehran south2	0.21667	0.40310	1.000	-1.1598	1.5932
	Tehran west1	Gilan	-0.52698	0.29276	0.897	-1.5267	0.4727
		Tehran center1	0.05000	0.29579	1.000	-0.9601	1.0601
		Tehran east1	0.41818	0.34376	0.997	-0.7557	1.5921
		Tehran north1	0.06377	0.28741	1.000	-0.9177	1.0452
		Esfahan	0.83889	0.24999	0.060	-0.0148	1.6926
		Eilam	-0.14638	0.25749	1.000	-1.0256	0.7329
		Markazi	-0.16923	0.32815	1.000	-1.2898	0.9514
		Tehran north2	0.25217	0.28741	1.000	-0.7293	1.2336
		Tehran south1	-0.34545	0.25225	0.989	-1.2069	0.5159
		Tehran	0.65556	0.33540	0.823	-0.4898	1.8009

		center2					
		Tehran east2	-0.69167	0.31123	0.649	-1.7545	0.3711
		Fars	-0.25859	0.26967	1.000	-1.1795	0.6623
		Tehran west2	0.06154	0.28078	1.000	-0.8973	1.0204
		Tehran south2	0.26667	0.41831	1.000	-1.1618	1.6951
	Tehran east1	Gilan	-0.94517	0.32232	0.187	-2.0458	0.1555
		Tehran center1	-0.36818	0.32507	0.998	-1.4783	0.7419
		Tehran west1	-0.41818	0.34376	0.997	-1.5921	0.7557
		Tehran north1	-0.35441	0.31746	0.999	-1.4385	0.7297
		Esfahan	0.42071	0.28403	0.978	-0.5492	1.3906
		Eilam	-0.56456	0.29065	0.830	-1.5571	0.4280
		Markazi	-0.58741	0.35477	0.945	-1.7989	0.6241
		Tehran north2	-0.16601	0.31746	1.000	-1.2501	0.9181
		Tehran south1	-0.76364	0.28603	0.328	-1.7404	0.2131
		Tehran center2	0.23737	0.36148	1.000	-0.9970	1.4718
		Tehran east2	-1.10985	0.33919	0.076	-2.2681	0.0484
		Fars	-0.67677	0.30150	0.632	-1.7063	0.3528
		Tehran west2	-0.35664	0.31148	0.998	-1.4203	0.7070
		Tehran south2	-0.15152	0.43951	1.000	-1.6524	1.3493
	Tehran north1	Gilan	-0.59075	0.26138	0.621	-1.4833	0.3018
		Tehran center1	-0.01377	0.26477	1.000	-0.9179	0.8904
		Tehran west1	-0.06377	0.28741	1.000	-1.0452	0.9177
		Tehran east1	0.35441	0.31746	0.999	-0.7297	1.4385
		Esfahan	.77512(*)	0.21238	0.023	0.0499	1.5004
		Eilam	-0.21014	0.22115	1.000	-0.9653	0.5451
		Markazi	-0.23300	0.30049	1.000	-1.2591	0.7931
		Tehran north2	0.18841	0.25537	1.000	-0.6836	1.0604
		Tehran south1	-0.40922	0.21504	0.850	-1.1435	0.3251
		Tehran center2	0.59179	0.30838	0.842	-0.4613	1.6449
		Tehran east2	-0.75543	0.28192	0.322	-1.7181	0.2073
		Fars	-0.32235	0.23523	0.989	-1.1256	0.4809
		Tehran west2	-0.00223	0.24789	1.000	-0.8487	0.8443
		Tehran south2	0.20290	0.39698	1.000	-1.1527	1.5585
	Esfahan	Gilan	-1.36587(*)	0.21957	0.000	-2.1157	-0.6161
		Tehran center1	-.78889(*)	0.22360	0.035	-1.5524	-0.0253
		Tehran west1	-0.83889	0.24999	0.060	-1.6926	0.0148
		Tehran east1	-0.42071	0.28403	0.978	-1.3906	0.5492
		Tehran north1	-.77512(*)	0.21238	0.023	-1.5004	-0.0499
		Eilam	-.98527(*)	0.16971	0.000	-1.5648	-0.4057
		Markazi	-1.00812(*)	0.26493	0.014	-1.9128	-0.1034
		Tehran north2	-0.58671	0.21238	0.272	-1.3120	0.1385
		Tehran south1	-1.18434(*)	0.16166	0.000	-1.7364	-0.6323
		Tehran center2	-0.18333	0.27385	1.000	-1.1185	0.7518
		Tehran east2	-1.53056(*)	0.24366	0.000	-2.3626	-0.6985
		Fars	-1.09747(*)	0.18768	0.000	-1.7384	-0.4566

		Tehran west2	-0.77735(*)	0.20333	0.013	-1.4717	-0.0830
		Tehran south2	-0.57222	0.37079	0.969	-1.8384	0.6940
	Eilam	Gilan	-0.38061	0.22807	0.941	-1.1594	0.3982
		Tehran center1	0.19638	0.23195	1.000	-0.5957	0.9884
		Tehran west1	0.14638	0.25749	1.000	-0.7329	1.0256
		Tehran east1	0.56456	0.29065	0.830	-0.4280	1.5571
		Tehran north1	0.21014	0.22115	1.000	-0.5451	0.9653
		Esfahan	.98527(*)	0.16971	0.000	0.4057	1.5648
		Markazi	-0.02285	0.27201	1.000	-0.9517	0.9060
		Tehran north2	0.39855	0.22115	0.896	-0.3567	1.1538
		Tehran south1	-0.19908	0.17303	0.998	-0.7899	0.3918
		Tehran center2	0.80193	0.28071	0.222	-0.1566	1.7605
		Tehran east2	-0.54529	0.25134	0.686	-1.4036	0.3130
		Fars	-0.11221	0.19756	1.000	-0.7868	0.5624
		Tehran west2	0.20792	0.21248	1.000	-0.5177	0.9335
		Tehran south2	0.41304	0.37589	0.999	-0.8706	1.6966
	Markazi	Gilan	-0.35775	0.30561	0.998	-1.4014	0.6859
		Tehran center1	0.21923	0.30852	1.000	-0.8343	1.2728
		Tehran west1	0.16923	0.32815	1.000	-0.9514	1.2898
		Tehran east1	0.58741	0.35477	0.945	-0.6241	1.7989
		Tehran north1	0.23300	0.30049	1.000	-0.7931	1.2591
		Esfahan	1.00812(*)	0.26493	0.014	0.1034	1.9128
		Eilam	0.02285	0.27201	1.000	-0.9060	0.9517
		Tehran north2	0.42140	0.30049	0.987	-0.6047	1.4475
		Tehran south1	-0.17622	0.26706	1.000	-1.0882	0.7358
		Tehran center2	0.82479	0.34667	0.532	-0.3590	2.0086
		Tehran east2	-0.52244	0.32336	0.954	-1.6266	0.5818
		Fars	-0.08936	0.28357	1.000	-1.0577	0.8790
		Tehran west2	0.23077	0.29416	1.000	-0.7737	1.2353
		Tehran south2	0.43590	0.42741	1.000	-1.0236	1.8954
	Tehran north2	Gilan	-0.77916	0.26138	0.166	-1.6717	0.1134
		Tehran center1	-0.20217	0.26477	1.000	-1.1063	0.7020
		Tehran west1	-0.25217	0.28741	1.000	-1.2336	0.7293
		Tehran east1	0.16601	0.31746	1.000	-0.9181	1.2501
		Tehran north1	-0.18841	0.25537	1.000	-1.0604	0.6836
		Esfahan	0.58671	0.21238	0.272	-0.1385	1.3120
		Eilam	-0.39855	0.22115	0.896	-1.1538	0.3567
		Markazi	-0.42140	0.30049	0.987	-1.4475	0.6047
		Tehran south1	-0.59763	0.21504	0.263	-1.3319	0.1367
		Tehran center2	0.40338	0.30838	0.993	-0.6497	1.4565
		Tehran east2	-0.94384	0.28192	0.061	-1.9065	0.0189
		Fars	-0.51076	0.23523	0.685	-1.3140	0.2925
		Tehran west2	-0.19064	0.24789	1.000	-1.0371	0.6559
		Tehran south2	0.01449	0.39698	1.000	-1.3411	1.3701
	Tehran	Gilan	-0.18153	0.22214	1.000	-0.9401	0.5770

	south1	Tehran center1	0.39545	0.22612	0.916	-0.3767	1.1676
		Tehran west1	0.34545	0.25225	0.989	-0.5159	1.2069
		Tehran east1	0.76364	0.28603	0.328	-0.2131	1.7404
		Tehran north1	0.40922	0.21504	0.850	-0.3251	1.1435
		Esfahan	1.18434(*)	0.16166	0.000	0.6323	1.7364
		Eilam	0.19908	0.17303	0.998	-0.3918	0.7899
		Markazi	0.17622	0.26706	1.000	-0.7358	1.0882
		Tehran north2	0.59763	0.21504	0.263	-0.1367	1.3319
		Tehran center2	1.00101(*)	0.27592	0.025	0.0588	1.9432
		Tehran east2	-0.34621	0.24598	0.986	-1.1862	0.4938
		Fars	0.08687	0.19068	1.000	-0.5643	0.7380
		Tehran west2	0.40699	0.20610	0.812	-0.2968	1.1108
		Tehran south2	0.61212	0.37232	0.948	-0.6593	1.8835
	Tehran center2	Gilan	-1.18254(*)	0.31338	0.015	-2.2527	-0.1124
		Tehran center1	-0.60556	0.31621	0.844	-1.6854	0.4743
		Tehran west1	-0.65556	0.33540	0.823	-1.8009	0.4898
		Tehran east1	-0.23737	0.36148	1.000	-1.4718	0.9970
		Tehran north1	-0.59179	0.30838	0.842	-1.6449	0.4613
		Esfahan	0.18333	0.27385	1.000	-0.7518	1.1185
		Eilam	-0.80193	0.28071	0.222	-1.7605	0.1566
		Markazi	-0.82479	0.34667	0.532	-2.0086	0.3590
		Tehran north2	-0.40338	0.30838	0.993	-1.4565	0.6497
		Tehran south1	-1.00101(*)	0.27592	0.025	-1.9432	-0.0588
		Tehran east2	-1.34722(*)	0.33071	0.005	-2.4765	-0.2179
		Fars	-0.91414	0.29192	0.113	-1.9110	0.0827
		Tehran west2	-0.59402	0.30222	0.817	-1.6261	0.4380
		Tehran south2	-0.38889	0.43299	1.000	-1.8675	1.0897
	Tehran east2	Gilan	0.16468	0.28737	1.000	-0.8166	1.1460
		Tehran center1	0.74167	0.29046	0.405	-0.2502	1.7335
		Tehran west1	0.69167	0.31123	0.649	-0.3711	1.7545
		Tehran east1	1.10985	0.33919	0.076	-0.0484	2.2681
		Tehran north1	0.75543	0.28192	0.322	-0.2073	1.7181
		Esfahan	1.53056(*)	0.24366	0.000	0.6985	2.3626
		Eilam	0.54529	0.25134	0.686	-0.3130	1.4036
		Markazi	0.52244	0.32336	0.954	-0.5818	1.6266
		Tehran north2	0.94384	0.28192	0.061	-0.0189	1.9065
		Tehran south1	0.34621	0.24598	0.986	-0.4938	1.1862
		Tehran center2	1.34722(*)	0.33071	0.005	0.2179	2.4765
		Fars	0.43308	0.26381	0.948	-0.4678	1.3340
		Tehran west2	0.75321	0.27516	0.287	-0.1864	1.6928
		Tehran south2	0.95833	0.41456	0.582	-0.4573	2.3740
	Fars	Gilan	-0.26840	0.24174	0.999	-1.0939	0.5571
		Tehran center1	0.30859	0.24540	0.995	-0.5294	1.1466
		Tehran west1	0.25859	0.26967	1.000	-0.6623	1.1795
		Tehran east1	0.67677	0.30150	0.632	-0.3528	1.7063

		Tehran north1	0.32235	0.23523	0.989	-0.4809	1.1256
		Esfahan	1.09747(*)	0.18768	0.000	0.4566	1.7384
		Eilam	0.11221	0.19756	1.000	-0.5624	0.7868
		Markazi	0.08936	0.28357	1.000	-0.8790	1.0577
		Tehran north2	0.51076	0.23523	0.685	-0.2925	1.3140
		Tehran south1	-0.08687	0.19068	1.000	-0.7380	0.5643
		Tehran center2	0.91414	0.29192	0.113	-0.0827	1.9110
		Tehran east2	-0.43308	0.26381	0.948	-1.3340	0.4678
		Tehran west2	0.32012	0.22709	0.986	-0.4553	1.0956
		Tehran south2	0.52525	0.38434	0.990	-0.7872	1.8377
	Tehran west2	Gilan	-0.58852	0.25408	0.579	-1.4562	0.2791
		Tehran center1	-0.01154	0.25757	1.000	-0.8911	0.8680
		Tehran west1	-0.06154	0.28078	1.000	-1.0204	0.8973
		Tehran east1	0.35664	0.31148	0.998	-0.7070	1.4203
		Tehran north1	0.00223	0.24789	1.000	-0.8443	0.8487
		Esfahan	.77735(*)	0.20333	0.013	0.0830	1.4717
		Eilam	-0.20792	0.21248	1.000	-0.9335	0.5177
		Markazi	-0.23077	0.29416	1.000	-1.2353	0.7737
		Tehran north2	0.19064	0.24789	1.000	-0.6559	1.0371
		Tehran south1	-0.40699	0.20610	0.812	-1.1108	0.2968
		Tehran center2	0.59402	0.30222	0.817	-0.4380	1.6261
		Tehran east2	-0.75321	0.27516	0.287	-1.6928	0.1864
		Fars	-0.32012	0.22709	0.986	-1.0956	0.4553
		Tehran south2	0.20513	0.39222	1.000	-1.1342	1.5445
	Tehran south2	Gilan	-0.79365	0.40088	0.809	-2.1626	0.5753
		Tehran center1	-0.21667	0.40310	1.000	-1.5932	1.1598
		Tehran west1	-0.26667	0.41831	1.000	-1.6951	1.1618
		Tehran east1	0.15152	0.43951	1.000	-1.3493	1.6524
		Tehran north1	-0.20290	0.39698	1.000	-1.5585	1.1527
		Esfahan	0.57222	0.37079	0.969	-0.6940	1.8384
		Eilam	-0.41304	0.37589	0.999	-1.6966	0.8706
		Markazi	-0.43590	0.42741	1.000	-1.8954	1.0236
		Tehran north2	-0.01449	0.39698	1.000	-1.3701	1.3411
		Tehran south1	-0.61212	0.37232	0.948	-1.8835	0.6593
		Tehran center2	0.38889	0.43299	1.000	-1.0897	1.8675
		Tehran east2	-0.95833	0.41456	0.582	-2.3740	0.4573
		Fars	-0.52525	0.38434	0.990	-1.8377	0.7872
		Tehran west2	-0.20513	0.39222	1.000	-1.5445	1.1342
person	Gilan	Tehran center1	-0.08413	0.30027	1.000	-1.1095	0.9413
		Tehran west1	-0.00635	0.32490	1.000	-1.1158	1.1031
		Tehran east1	0.53102	0.35770	0.978	-0.6905	1.7525
		Tehran north1	0.26225	0.29007	1.000	-0.7283	1.2528
		Esfahan	0.60476	0.24367	0.456	-0.2274	1.4369
		Eilam	-0.44339	0.25398	0.917	-1.3107	0.4239
		Markazi	0.06716	0.33916	1.000	-1.0911	1.2254

		Tehran north2	0.40718	0.29007	0.987	-0.5834	1.3977
		Tehran south1	-0.63261	0.24653	0.396	-1.4745	0.2093
		Tehran center2	0.29365	0.34778	1.000	-0.8940	1.4813
		Tehran east2	-0.85913	0.31892	0.313	-1.9482	0.2300
		Fars	-0.30736	0.26827	0.998	-1.2235	0.6088
		Tehran west2	0.91331	0.28197	0.084	-0.0496	1.8762
		Tehran south2	0.51587	0.44488	0.998	-1.0034	2.0351
	Tehran center1	Gilan	0.08413	0.30027	1.000	-0.9413	1.1095
		Tehran west1	0.07778	0.32826	1.000	-1.0432	1.1988
		Tehran east1	0.61515	0.36076	0.931	-0.6168	1.8471
		Tehran north1	0.34638	0.29384	0.998	-0.6570	1.3498
		Esfahan	0.68889	0.24814	0.265	-0.1585	1.5363
		Eilam	-0.35926	0.25828	0.988	-1.2412	0.5227
		Markazi	0.15128	0.34239	1.000	-1.0179	1.3205
		Tehran north2	0.49130	0.29384	0.940	-0.5121	1.4947
		Tehran south1	-0.54848	0.25095	0.675	-1.4054	0.3085
		Tehran center2	0.37778	0.35093	0.999	-0.8206	1.5762
		Tehran east2	-0.77500	0.32235	0.513	-1.8758	0.3258
		Fars	-0.22323	0.27234	1.000	-1.1533	0.7068
		Tehran west2	.99744(*)	0.28584	0.040	0.0213	1.9736
		Tehran south2	0.60000	0.44735	0.991	-0.9276	2.1276
	Tehran west1	Gilan	0.00635	0.32490	1.000	-1.1031	1.1158
		Tehran center1	-0.07778	0.32826	1.000	-1.1988	1.0432
		Tehran east1	0.53737	0.38150	0.986	-0.7654	1.8402
		Tehran north1	0.26860	0.31896	1.000	-0.8206	1.3578
		Esfahan	0.61111	0.27743	0.663	-0.3363	1.5585
		Eilam	-0.43704	0.28653	0.972	-1.4155	0.5414
		Markazi	0.07350	0.36418	1.000	-1.1701	1.3171
		Tehran north2	0.41353	0.31896	0.994	-0.6757	1.5027
		Tehran south1	-0.62626	0.27994	0.638	-1.5822	0.3297
		Tehran center2	0.30000	0.37222	1.000	-0.9711	1.5711
		Tehran east2	-0.85278	0.34540	0.466	-2.0323	0.3267
		Fars	-0.30101	0.29927	1.000	-1.3230	0.7210
		Tehran west2	0.91966	0.31161	0.178	-0.1445	1.9838
		Tehran south2	0.52222	0.46423	0.999	-1.0631	2.1075
	Tehran east1	Gilan	-0.53102	0.35770	0.978	-1.7525	0.6905
		Tehran center1	-0.61515	0.36076	0.931	-1.8471	0.6168
		Tehran west1	-0.53737	0.38150	0.986	-1.8402	0.7654
		Tehran north1	-0.26877	0.35231	1.000	-1.4719	0.9343
		Esfahan	0.07374	0.31521	1.000	-1.0027	1.1502
		Eilam	-0.97441	0.32325	0.153	-2.0783	0.1295
		Markazi	-0.46387	0.39372	0.998	-1.8084	0.8806
		Tehran north2	-0.12385	0.35231	1.000	-1.3270	1.0793
		Tehran south1	-1.16364(*)	0.31743	0.022	-2.2476	-0.0797
		Tehran center2	-0.23737	0.40117	1.000	-1.6073	1.1326

		Tehran east2	-1.39015(*)	0.37642	0.020	-2.6756	-0.1047
		Fars	-0.83838	0.33460	0.439	-1.9810	0.3042
		Tehran west2	0.38228	0.34567	0.999	-0.7982	1.5627
		Tehran south2	-0.01515	0.48776	1.000	-1.6808	1.6505
Tehran north1		Gilan	-0.26225	0.29007	1.000	-1.2528	0.7283
		Tehran center1	-0.34638	0.29384	0.998	-1.3498	0.6570
		Tehran west1	-0.26860	0.31896	1.000	-1.3578	0.8206
		Tehran east1	0.26877	0.35231	1.000	-0.9343	1.4719
		Esfahan	0.34251	0.23569	0.982	-0.4624	1.1474
		Eilam	-0.70564	0.24634	0.218	-1.5469	0.1356
		Markazi	-0.19509	0.33348	1.000	-1.3339	0.9437
		Tehran north2	0.14493	0.28340	1.000	-0.8229	1.1127
		Tehran south1	-.89486(*)	0.23864	0.017	-1.7098	-0.0799
		Tehran center2	0.03140	0.34224	1.000	-1.1373	1.2001
		Tehran east2	-1.12138(*)	0.31287	0.029	-2.1898	-0.0530
		Fars	-0.56961	0.26105	0.678	-1.4611	0.3218
		Tehran west2	0.65106	0.27510	0.541	-0.2884	1.5905
		Tehran south2	0.25362	0.44056	1.000	-1.2509	1.7581
Esfahan		Gilan	-0.60476	0.24367	0.456	-1.4369	0.2274
		Tehran center1	-0.68889	0.24814	0.265	-1.5363	0.1585
		Tehran west1	-0.61111	0.27743	0.663	-1.5585	0.3363
		Tehran east1	-0.07374	0.31521	1.000	-1.1502	1.0027
		Tehran north1	-0.34251	0.23569	0.982	-1.1474	0.4624
		Eilam	-1.04815(*)	0.18952	0.000	-1.6954	-0.4009
		Markazi	-0.53761	0.29401	0.885	-1.5416	0.4664
		Tehran north2	-0.19758	0.23569	1.000	-1.0025	0.6073
		Tehran south1	-1.23737(*)	0.17941	0.000	-1.8500	-0.6247
		Tehran center2	-0.31111	0.30391	1.000	-1.3489	0.7267
		Tehran east2	-1.46389(*)	0.27041	0.000	-2.3873	-0.5405
		Fars	-.91212(*)	0.20829	0.001	-1.6234	-0.2008
		Tehran west2	0.30855	0.22565	0.990	-0.4620	1.0791
		Tehran south2	-0.08889	0.41150	1.000	-1.4941	1.3163
Eilam		Gilan	0.44339	0.25398	0.917	-0.4239	1.3107
		Tehran center1	0.35926	0.25828	0.988	-0.5227	1.2412
		Tehran west1	0.43704	0.28653	0.972	-0.5414	1.4155
		Tehran east1	0.97441	0.32325	0.153	-0.1295	2.0783
		Tehran north1	0.70564	0.24634	0.218	-0.1356	1.5469
		Esfahan	1.04815(*)	0.18952	0.000	0.4009	1.6954
		Markazi	0.51054	0.30261	0.936	-0.5228	1.5439
		Tehran north2	.85056(*)	0.24634	0.044	0.0093	1.6918
		Tehran south1	-0.18923	0.19318	1.000	-0.8489	0.4705
		Tehran center2	0.73704	0.31224	0.546	-0.3292	1.8033
		Tehran east2	-0.41574	0.27974	0.978	-1.3710	0.5395
		Fars	0.13603	0.22026	1.000	-0.6161	0.8882
		Tehran west2	1.35670(*)	0.23675	0.000	0.5482	2.1652

	Tehran south2	0.95926	0.41769	0.594	-0.4671	2.3856
Markazi	Gilan	-0.06716	0.33916	1.000	-1.2254	1.0911
	Tehran center1	-0.15128	0.34239	1.000	-1.3205	1.0179
	Tehran west1	-0.07350	0.36418	1.000	-1.3171	1.1701
	Tehran east1	0.46387	0.39372	0.998	-0.8806	1.8084
	Tehran north1	0.19509	0.33348	1.000	-0.9437	1.3339
	Esfahan	0.53761	0.29401	0.885	-0.4664	1.5416
	Eilam	-0.51054	0.30261	0.936	-1.5439	0.5228
	Tehran north2	0.34002	0.33348	1.000	-0.7988	1.4788
	Tehran south1	-0.69977	0.29638	0.546	-1.7119	0.3123
	Tehran center2	0.22650	0.38473	1.000	-1.0873	1.5403
	Tehran east2	-0.92628	0.35885	0.386	-2.1517	0.2992
	Fars	-0.37451	0.31470	0.997	-1.4492	0.7002
	Tehran west2	0.84615	0.32645	0.379	-0.2687	1.9610
	Tehran south2	0.44872	0.47433	1.000	-1.1711	2.0685
Tehran north2	Gilan	-0.40718	0.29007	0.987	-1.3977	0.5834
	Tehran center1	-0.49130	0.29384	0.940	-1.4947	0.5121
	Tehran west1	-0.41353	0.31896	0.994	-1.5027	0.6757
	Tehran east1	0.12385	0.35231	1.000	-1.0793	1.3270
	Tehran north1	-0.14493	0.28340	1.000	-1.1127	0.8229
	Esfahan	0.19758	0.23569	1.000	-0.6073	1.0025
	Eilam	-.85056(*)	0.24634	0.044	-1.6918	-0.0093
	Markazi	-0.34002	0.33348	1.000	-1.4788	0.7988
	Tehran south1	-1.03979(*)	0.23864	0.002	-1.8547	-0.2248
	Tehran center2	-0.11353	0.34224	1.000	-1.2822	1.0552
	Tehran east2	-1.26630(*)	0.31287	0.006	-2.3347	-0.1979
	Fars	-0.71454	0.26105	0.287	-1.6060	0.1769
	Tehran west2	0.50613	0.27510	0.880	-0.4333	1.4456
	Tehran south2	0.10870	0.44056	1.000	-1.3958	1.6132
Tehran south1	Gilan	0.63261	0.24653	0.396	-0.2093	1.4745
	Tehran center1	0.54848	0.25095	0.675	-0.3085	1.4054
	Tehran west1	0.62626	0.27994	0.638	-0.3297	1.5822
	Tehran east1	1.16364(*)	0.31743	0.022	0.0797	2.2476
	Tehran north1	.89486(*)	0.23864	0.017	0.0799	1.7098
	Esfahan	1.23737(*)	0.17941	0.000	0.6247	1.8500
	Eilam	0.18923	0.19318	1.000	-0.4705	0.8489
	Markazi	0.69977	0.29638	0.546	-0.3123	1.7119
	Tehran north2	1.03979(*)	0.23864	0.002	0.2248	1.8547
	Tehran center2	0.92626	0.30621	0.149	-0.1194	1.9719
	Tehran east2	-0.22652	0.27298	1.000	-1.1587	0.7057
	Fars	0.32525	0.21162	0.970	-0.3974	1.0479
	Tehran west2	1.54592(*)	0.22873	0.000	0.7648	2.3270
	Tehran south2	1.14848	0.41320	0.263	-0.2625	2.5595
Tehran center2	Gilan	-0.29365	0.34778	1.000	-1.4813	0.8940
	Tehran	-0.37778	0.35093	0.999	-1.5762	0.8206

		center1					
		Tehran west1	-0.30000	0.37222	1.000	-1.5711	0.9711
		Tehran east1	0.23737	0.40117	1.000	-1.1326	1.6073
		Tehran north1	-0.03140	0.34224	1.000	-1.2001	1.1373
		Esfahan	0.31111	0.30391	1.000	-0.7267	1.3489
		Eilam	-0.73704	0.31224	0.546	-1.8033	0.3292
		Markazi	-0.22650	0.38473	1.000	-1.5403	1.0873
		Tehran north2	0.11353	0.34224	1.000	-1.0552	1.2822
		Tehran south1	-0.92626	0.30621	0.149	-1.9719	0.1194
		Tehran east2	-1.15278	0.36701	0.110	-2.4061	0.1005
		Fars	-0.60101	0.32397	0.873	-1.7073	0.5053
		Tehran west2	0.61966	0.33540	0.877	-0.5257	1.7650
		Tehran south2	0.22222	0.48053	1.000	-1.4187	1.8632
	Tehran east2	Gilan	0.85913	0.31892	0.313	-0.2300	1.9482
		Tehran center1	0.77500	0.32235	0.513	-0.3258	1.8758
		Tehran west1	0.85278	0.34540	0.466	-0.3267	2.0323
		Tehran east1	1.39015(*)	0.37642	0.020	0.1047	2.6756
		Tehran north1	1.12138(*)	0.31287	0.029	0.0530	2.1898
		Esfahan	1.46389(*)	0.27041	0.000	0.5405	2.3873
		Eilam	0.41574	0.27974	0.978	-0.5395	1.3710
		Markazi	0.92628	0.35885	0.386	-0.2992	2.1517
		Tehran north2	1.26630(*)	0.31287	0.006	0.1979	2.3347
		Tehran south1	0.22652	0.27298	1.000	-0.7057	1.1587
		Tehran center2	1.15278	0.36701	0.110	-0.1005	2.4061
		Fars	0.55177	0.29277	0.859	-0.4480	1.5516
		Tehran west2	1.77244(*)	0.30537	0.000	0.7296	2.8152
		Tehran south2	1.37500	0.46007	0.163	-0.1961	2.9461
	Fars	Gilan	0.30736	0.26827	0.998	-0.6088	1.2235
		Tehran center1	0.22323	0.27234	1.000	-0.7068	1.1533
		Tehran west1	0.30101	0.29927	1.000	-0.7210	1.3230
		Tehran east1	0.83838	0.33460	0.439	-0.3042	1.9810
		Tehran north1	0.56961	0.26105	0.678	-0.3218	1.4611
		Esfahan	.91212(*)	0.20829	0.001	0.2008	1.6234
		Eilam	-0.13603	0.22026	1.000	-0.8882	0.6161
		Markazi	0.37451	0.31470	0.997	-0.7002	1.4492
		Tehran north2	0.71454	0.26105	0.287	-0.1769	1.6060
		Tehran south1	-0.32525	0.21162	0.970	-1.0479	0.3974
		Tehran center2	0.60101	0.32397	0.873	-0.5053	1.7073
		Tehran east2	-0.55177	0.29277	0.859	-1.5516	0.4480
		Tehran west2	1.22067(*)	0.25202	0.000	0.3601	2.0813
		Tehran south2	0.82323	0.42653	0.836	-0.6333	2.2798
	Tehran west2	Gilan	-0.91331	0.28197	0.084	-1.8762	0.0496
		Tehran center1	-.99744(*)	0.28584	0.040	-1.9736	-0.0213
		Tehran west1	-0.91966	0.31161	0.178	-1.9838	0.1445
		Tehran east1	-0.38228	0.34567	0.999	-1.5627	0.7982

		Tehran north1	-0.65106	0.27510	0.541	-1.5905	0.2884	
		Esfahan	-0.30855	0.22565	0.990	-1.0791	0.4620	
		Eilam	-1.35670(*)	0.23675	0.000	-2.1652	-0.5482	
		Markazi	-0.84615	0.32645	0.379	-1.9610	0.2687	
		Tehran north2	-0.50613	0.27510	0.880	-1.4456	0.4333	
		Tehran south1	-1.54592(*)	0.22873	0.000	-2.3270	-0.7648	
		Tehran center2	-0.61966	0.33540	0.877	-1.7650	0.5257	
		Tehran east2	-1.77244(*)	0.30537	0.000	-2.8152	-0.7296	
		Fars	-1.22067(*)	0.25202	0.000	-2.0813	-0.3601	
		Tehran south2	-0.39744	0.43527	1.000	-1.8839	1.0890	
	Tehran south2	Gilan	-0.51587	0.44488	0.998	-2.0351	1.0034	
		Tehran center1	-0.60000	0.44735	0.991	-2.1276	0.9276	
		Tehran west1	-0.52222	0.46423	0.999	-2.1075	1.0631	
		Tehran east1	0.01515	0.48776	1.000	-1.6505	1.6808	
		Tehran north1	-0.25362	0.44056	1.000	-1.7581	1.2509	
		Esfahan	0.08889	0.41150	1.000	-1.3163	1.4941	
		Eilam	-0.95926	0.41769	0.594	-2.3856	0.4671	
		Markazi	-0.44872	0.47433	1.000	-2.0685	1.1711	
		Tehran north2	-0.10870	0.44056	1.000	-1.6132	1.3958	
		Tehran south1	-1.14848	0.41320	0.263	-2.5595	0.2625	
use		Tehran center2	-0.22222	0.48053	1.000	-1.8632	1.4187	
		Tehran east2	-1.37500	0.46007	0.163	-2.9461	0.1961	
		Fars	-0.82323	0.42653	0.836	-2.2798	0.6333	
		Tehran west2	0.39744	0.43527	1.000	-1.0890	1.8839	
		Gilan	Tehran center1	0.51250	0.23014	0.645	-0.2734	1.2984
			Tehran west1	-0.12500	0.24902	1.000	-0.9753	0.7253
			Tehran east1	0.38636	0.27416	0.986	-0.5498	1.3225
			Tehran north1	0.52174	0.22232	0.556	-0.2374	1.2809
			Esfahan	0.17917	0.18676	1.000	-0.4586	0.8169
			Eilam	0.12766	0.19334	1.000	-0.5326	0.7879
	Markazi		-0.15385	0.25995	1.000	-1.0415	0.7338	
	Tehran north2		0.20807	0.22232	1.000	-0.5511	0.9673	
	Tehran south1		0.16364	0.18895	1.000	-0.4816	0.8089	
	Tehran center2		0.51042	0.26656	0.844	-0.3998	1.4206	
	Tehran center1	Tehran east2	-0.04688	0.24443	1.000	-0.8816	0.7878	
		Fars	0.23485	0.20562	0.998	-0.4673	0.9370	
		Tehran west2	0.23077	0.21611	0.999	-0.5072	0.9688	
		Tehran south2	0.41667	0.34098	0.997	-0.7477	1.5810	
		Gilan	-0.51250	0.23014	0.645	-1.2984	0.2734	
		Tehran west1	-0.63750	0.25160	0.419	-1.4966	0.2216	
Tehran east1		-0.12614	0.27650	1.000	-1.0703	0.8181		
Tehran north1		0.00924	0.22521	1.000	-0.7598	0.7783		
Esfahan		-0.33333	0.19019	0.915	-0.9828	0.3161		
Eilam		-0.38484	0.19665	0.822	-1.0564	0.2867		
Markazi	-0.66635	0.26242	0.415	-1.5625	0.2298			

		Tehran north2	-0.30443	0.22521	0.991	-1.0735	0.4646
		Tehran south1	-0.34886	0.19234	0.891	-1.0057	0.3079
		Tehran center2	-0.00208	0.26897	1.000	-0.9205	0.9164
		Tehran east2	-0.55938	0.24706	0.618	-1.4030	0.2843
		Fars	-0.27765	0.20874	0.992	-0.9904	0.4351
		Tehran west2	-0.28173	0.21908	0.994	-1.0298	0.4664
		Tehran south2	-0.09583	0.34287	1.000	-1.2666	1.0750
	Tehran west1	Gilan	0.12500	0.24902	1.000	-0.7253	0.9753
		Tehran center1	0.63750	0.25160	0.419	-0.2216	1.4966
		Tehran east1	0.51136	0.29240	0.916	-0.4871	1.5098
		Tehran north1	0.64674	0.24446	0.343	-0.1880	1.4815
		Esfahan	0.30417	0.21264	0.984	-0.4219	1.0303
		Eilam	0.25266	0.21844	0.998	-0.4933	0.9986
		Markazi	-0.02885	0.27912	1.000	-0.9820	0.9243
		Tehran north2	0.33307	0.24446	0.990	-0.5017	1.1679
		Tehran south1	0.28864	0.21456	0.991	-0.4440	1.0213
		Tehran center2	0.63542	0.28528	0.645	-0.3388	1.6096
		Tehran east2	0.07813	0.26473	1.000	-0.8259	0.9821
		Fars	0.35985	0.22938	0.964	-0.4234	1.1431
		Tehran west2	0.35577	0.23883	0.977	-0.4598	1.1713
		Tehran south2	0.54167	0.35581	0.972	-0.6733	1.7567
	Tehran east1	Gilan	-0.38636	0.27416	0.986	-1.3225	0.5498
		Tehran center1	0.12614	0.27650	1.000	-0.8181	1.0703
		Tehran west1	-0.51136	0.29240	0.916	-1.5098	0.4871
		Tehran north1	0.13538	0.27003	1.000	-0.7867	1.0575
		Esfahan	-0.20720	0.24159	1.000	-1.0322	0.6178
		Eilam	-0.25870	0.24672	0.999	-1.1012	0.5838
		Markazi	-0.54021	0.30176	0.901	-1.5707	0.4902
		Tehran north2	-0.17829	0.27003	1.000	-1.1004	0.7438
		Tehran south1	-0.22273	0.24329	1.000	-1.0535	0.6081
		Tehran center2	0.12405	0.30747	1.000	-0.9259	1.1740
		Tehran east2	-0.43324	0.28851	0.975	-1.4184	0.5519
		Fars	-0.15152	0.25645	1.000	-1.0272	0.7242
		Tehran west2	-0.15559	0.26494	1.000	-1.0603	0.7491
		Tehran south2	0.03030	0.37384	1.000	-1.2463	1.3069
	Tehran north1	Gilan	-0.52174	0.22232	0.556	-1.2809	0.2374
		Tehran center1	-0.00924	0.22521	1.000	-0.7783	0.7598
		Tehran west1	-0.64674	0.24446	0.343	-1.4815	0.1880
		Tehran east1	-0.13538	0.27003	1.000	-1.0575	0.7867
		Esfahan	-0.34257	0.18065	0.854	-0.9594	0.2743
		Eilam	-0.39408	0.18744	0.733	-1.0342	0.2460
		Markazi	-0.67559	0.25559	0.345	-1.5484	0.1972
		Tehran north2	-0.31366	0.21721	0.983	-1.0554	0.4281
		Tehran south1	-0.35810	0.18291	0.821	-0.9827	0.2665
		Tehran	-0.01132	0.26231	1.000	-0.9070	0.8844

		center2					
		Tehran east2	-0.56861	0.23979	0.538	-1.3875	0.2502
		Fars	-0.28689	0.20008	0.984	-0.9701	0.3963
		Tehran west2	-0.29097	0.21085	0.989	-1.0110	0.4290
		Tehran south2	-0.10507	0.33767	1.000	-1.2581	1.0480
	Esfahan	Gilan	-0.17917	0.18676	1.000	-0.8169	0.4586
		Tehran center1	0.33333	0.19019	0.915	-0.3161	0.9828
		Tehran west1	-0.30417	0.21264	0.984	-1.0303	0.4219
		Tehran east1	0.20720	0.24159	1.000	-0.6178	1.0322
		Tehran north1	0.34257	0.18065	0.854	-0.2743	0.9594
		Eilam	-0.05151	0.14348	1.000	-0.5415	0.4385
		Markazi	-0.33301	0.22534	0.979	-1.1025	0.4365
		Tehran north2	0.02891	0.18065	1.000	-0.5880	0.6458
		Tehran south1	-0.01553	0.13751	1.000	-0.4851	0.4540
		Tehran center2	0.33125	0.23293	0.985	-0.4642	1.1267
		Tehran east2	-0.22604	0.20725	0.999	-0.9338	0.4817
		Fars	0.05568	0.15964	1.000	-0.4894	0.6008
		Tehran west2	0.05160	0.17295	1.000	-0.5390	0.6422
		Tehran south2	0.23750	0.31539	1.000	-0.8395	1.3145
		Eilam	Gilan	-0.12766	0.19334	1.000	-0.7879
	Tehran center1		0.38484	0.19665	0.822	-0.2867	1.0564
	Tehran west1		-0.25266	0.21844	0.998	-0.9986	0.4933
	Tehran east1		0.25870	0.24672	0.999	-0.5838	1.1012
	Tehran north1		0.39408	0.18744	0.733	-0.2460	1.0342
	Esfahan		0.05151	0.14348	1.000	-0.4385	0.5415
	Markazi		-0.28151	0.23083	0.997	-1.0697	0.5067
	Tehran north2		0.08041	0.18744	1.000	-0.5597	0.7205
	Tehran south1		0.03598	0.14632	1.000	-0.4637	0.5356
	Tehran center2		0.38276	0.23824	0.956	-0.4308	1.1963
	Tehran east2		-0.17453	0.21320	1.000	-0.9026	0.5535
	Fars		0.10719	0.16729	1.000	-0.4641	0.6784
	Tehran west2		0.10311	0.18003	1.000	-0.5117	0.7179
	Tehran south2		0.28901	0.31933	1.000	-0.8014	1.3795
	Markazi		Gilan	0.15385	0.25995	1.000	-0.7338
		Tehran center1	0.66635	0.26242	0.415	-0.2298	1.5625
		Tehran west1	0.02885	0.27912	1.000	-0.9243	0.9820
		Tehran east1	0.54021	0.30176	0.901	-0.4902	1.5707
		Tehran north1	0.67559	0.25559	0.345	-0.1972	1.5484
		Esfahan	0.33301	0.22534	0.979	-0.4365	1.1025
		Eilam	0.28151	0.23083	0.997	-0.5067	1.0697
		Tehran north2	0.36192	0.25559	0.986	-0.5109	1.2347
		Tehran south1	0.31748	0.22716	0.987	-0.4582	1.0932
		Tehran center2	0.66426	0.29488	0.626	-0.3427	1.6712
		Tehran east2	0.10697	0.27504	1.000	-0.8322	1.0462
		Fars	0.38869	0.24120	0.955	-0.4350	1.2123

		Tehran west2	0.38462	0.25021	0.970	-0.4698	1.2390
		Tehran south2	0.57051	0.36355	0.964	-0.6709	1.8119
	Tehran north2	Gilan	-0.20807	0.22232	1.000	-0.9673	0.5511
		Tehran center1	0.30443	0.22521	0.991	-0.4646	1.0735
		Tehran west1	-0.33307	0.24446	0.990	-1.1679	0.5017
		Tehran east1	0.17829	0.27003	1.000	-0.7438	1.1004
		Tehran north1	0.31366	0.21721	0.983	-0.4281	1.0554
		Esfahan	-0.02891	0.18065	1.000	-0.6458	0.5880
		Eilam	-0.08041	0.18744	1.000	-0.7205	0.5597
		Markazi	-0.36192	0.25559	0.986	-1.2347	0.5109
		Tehran south1	-0.04444	0.18291	1.000	-0.6690	0.5802
		Tehran center2	0.30234	0.26231	0.998	-0.5934	1.1981
		Tehran east2	-0.25495	0.23979	0.999	-1.0738	0.5639
		Fars	0.02677	0.20008	1.000	-0.6565	0.7100
		Tehran west2	0.02269	0.21085	1.000	-0.6973	0.7427
		Tehran south2	0.20859	0.33767	1.000	-0.9445	1.3617
	Tehran south1	Gilan	-0.16364	0.18895	1.000	-0.8089	0.4816
		Tehran center1	0.34886	0.19234	0.891	-0.3079	1.0057
		Tehran west1	-0.28864	0.21456	0.991	-1.0213	0.4440
		Tehran east1	0.22273	0.24329	1.000	-0.6081	1.0535
		Tehran north1	0.35810	0.18291	0.821	-0.2665	0.9827
		Esfahan	0.01553	0.13751	1.000	-0.4540	0.4851
		Eilam	-0.03598	0.14632	1.000	-0.5356	0.4637
		Markazi	-0.31748	0.22716	0.987	-1.0932	0.4582
		Tehran north2	0.04444	0.18291	1.000	-0.5802	0.6690
		Tehran center2	0.34678	0.23469	0.979	-0.4546	1.1482
		Tehran east2	-0.21051	0.20923	1.000	-0.9250	0.5040
		Fars	0.07121	0.16219	1.000	-0.4826	0.6251
		Tehran west2	0.06713	0.17531	1.000	-0.5315	0.6658
		Tehran south2	0.25303	0.31669	1.000	-0.8284	1.3345
	Tehran center2	Gilan	-0.51042	0.26656	0.844	-1.4206	0.3998
		Tehran center1	0.00208	0.26897	1.000	-0.9164	0.9205
		Tehran west1	-0.63542	0.28528	0.645	-1.6096	0.3388
		Tehran east1	-0.12405	0.30747	1.000	-1.1740	0.9259
		Tehran north1	0.01132	0.26231	1.000	-0.8844	0.9070
		Esfahan	-0.33125	0.23293	0.985	-1.1267	0.4642
		Eilam	-0.38276	0.23824	0.956	-1.1963	0.4308
		Markazi	-0.66426	0.29488	0.626	-1.6712	0.3427
		Tehran north2	-0.30234	0.26231	0.998	-1.1981	0.5934
		Tehran south1	-0.34678	0.23469	0.979	-1.1482	0.4546
		Tehran east2	-0.55729	0.28129	0.808	-1.5178	0.4033
		Fars	-0.27557	0.24831	0.999	-1.1235	0.5723
		Tehran west2	-0.27965	0.25707	0.999	-1.1575	0.5982
		Tehran south2	-0.09375	0.36830	1.000	-1.3514	1.1639
	Tehran	Gilan	0.04688	0.24443	1.000	-0.7878	0.8816

	east2	Tehran center1	0.55938	0.24706	0.618	-0.2843	1.4030
		Tehran west1	-0.07813	0.26473	1.000	-0.9821	0.8259
		Tehran east1	0.43324	0.28851	0.975	-0.5519	1.4184
		Tehran north1	0.56861	0.23979	0.538	-0.2502	1.3875
		Esfahan	0.22604	0.20725	0.999	-0.4817	0.9338
		Eilam	0.17453	0.21320	1.000	-0.5535	0.9026
		Markazi	-0.10697	0.27504	1.000	-1.0462	0.8322
		Tehran north2	0.25495	0.23979	0.999	-0.5639	1.0738
		Tehran south1	0.21051	0.20923	1.000	-0.5040	0.9250
		Tehran center2	0.55729	0.28129	0.808	-0.4033	1.5178
		Fars	0.28172	0.22439	0.995	-0.4845	1.0480
		Tehran west2	0.27764	0.23405	0.997	-0.5216	1.0769
		Tehran south2	0.46354	0.35262	0.993	-0.7406	1.6677
	Fars	Gilan	-0.23485	0.20562	0.998	-0.9370	0.4673
		Tehran center1	0.27765	0.20874	0.992	-0.4351	0.9904
		Tehran west1	-0.35985	0.22938	0.964	-1.1431	0.4234
		Tehran east1	0.15152	0.25645	1.000	-0.7242	1.0272
		Tehran north1	0.28689	0.20008	0.984	-0.3963	0.9701
		Esfahan	-0.05568	0.15964	1.000	-0.6008	0.4894
		Eilam	-0.10719	0.16729	1.000	-0.6784	0.4641
		Markazi	-0.38869	0.24120	0.955	-1.2123	0.4350
		Tehran north2	-0.02677	0.20008	1.000	-0.7100	0.6565
		Tehran south1	-0.07121	0.16219	1.000	-0.6251	0.4826
		Tehran center2	0.27557	0.24831	0.999	-0.5723	1.1235
		Tehran east2	-0.28172	0.22439	0.995	-1.0480	0.4845
		Tehran west2	-0.00408	0.19316	1.000	-0.6637	0.6555
		Tehran south2	0.18182	0.32691	1.000	-0.9345	1.2981
	Tehran west2	Gilan	-0.23077	0.21611	0.999	-0.9688	0.5072
		Tehran center1	0.28173	0.21908	0.994	-0.4664	1.0298
		Tehran west1	-0.35577	0.23883	0.977	-1.1713	0.4598
		Tehran east1	0.15559	0.26494	1.000	-0.7491	1.0603
		Tehran north1	0.29097	0.21085	0.989	-0.4290	1.0110
		Esfahan	-0.05160	0.17295	1.000	-0.6422	0.5390
		Eilam	-0.10311	0.18003	1.000	-0.7179	0.5117
		Markazi	-0.38462	0.25021	0.970	-1.2390	0.4698
		Tehran north2	-0.02269	0.21085	1.000	-0.7427	0.6973
		Tehran south1	-0.06713	0.17531	1.000	-0.6658	0.5315
		Tehran center2	0.27965	0.25707	0.999	-0.5982	1.1575
		Tehran east2	-0.27764	0.23405	0.997	-1.0769	0.5216
		Fars	0.00408	0.19316	1.000	-0.6555	0.6637
		Tehran south2	0.18590	0.33361	1.000	-0.9533	1.3251
	Tehran south2	Gilan	-0.41667	0.34098	0.997	-1.5810	0.7477
		Tehran center1	0.09583	0.34287	1.000	-1.0750	1.2666
		Tehran west1	-0.54167	0.35581	0.972	-1.7567	0.6733

ease		Tehran east1	-0.03030	0.37384	1.000	-1.3069	1.2463
		Tehran north1	0.10507	0.33767	1.000	-1.0480	1.2581
		Esfahan	-0.23750	0.31539	1.000	-1.3145	0.8395
		Eilam	-0.28901	0.31933	1.000	-1.3795	0.8014
		Markazi	-0.57051	0.36355	0.964	-1.8119	0.6709
		Tehran north2	-0.20859	0.33767	1.000	-1.3617	0.9445
		Tehran south1	-0.25303	0.31669	1.000	-1.3345	0.8284
		Tehran center2	0.09375	0.36830	1.000	-1.1639	1.3514
		Tehran east2	-0.46354	0.35262	0.993	-1.6677	0.7406
		Fars	-0.18182	0.32691	1.000	-1.2981	0.9345
		Tehran west2	-0.18590	0.33361	1.000	-1.3251	0.9533
	Gilan	Tehran center1	0.13980	0.22419	1.000	-0.6258	0.9054
		Tehran west1	0.11837	0.24258	1.000	-0.7100	0.9467
		Tehran east1	0.38590	0.26707	0.983	-0.5261	1.2979
		Tehran north1	0.19787	0.21657	1.000	-0.5417	0.9374
		Esfahan	-0.00782	0.18193	1.000	-0.6291	0.6134
		Eilam	-0.31973	0.18834	0.933	-0.9629	0.3234
		Markazi	-0.24647	0.25323	1.000	-1.1112	0.6183
		Tehran north2	0.44166	0.21657	0.773	-0.2979	1.1812
		Tehran south1	-0.13748	0.18406	1.000	-0.7660	0.4911
		Tehran center2	0.43027	0.25966	0.944	-0.4564	1.3170
		Tehran east2	-0.52806	0.23811	0.652	-1.3412	0.2850
		Fars	0.00928	0.20030	1.000	-0.6747	0.6933
		Tehran west2	0.59969	0.21053	0.226	-0.1192	1.3186
		Tehran south2	0.72789	0.33216	0.671	-0.4064	1.8622
	Tehran center1	Gilan	-0.13980	0.22419	1.000	-0.9054	0.6258
		Tehran west1	-0.02143	0.24509	1.000	-0.8584	0.8155
		Tehran east1	0.24610	0.26935	1.000	-0.6737	1.1659
		Tehran north1	0.05807	0.21939	1.000	-0.6911	0.8072
		Esfahan	-0.14762	0.18527	1.000	-0.7803	0.4850
		Eilam	-0.45952	0.19157	0.517	-1.1137	0.1946
		Markazi	-0.38626	0.25564	0.974	-1.2592	0.4867
		Tehran north2	0.30186	0.21939	0.989	-0.4473	1.0510
		Tehran south1	-0.27727	0.18737	0.978	-0.9171	0.3625
		Tehran center2	0.29048	0.26201	0.999	-0.6042	1.1852
		Tehran east2	-0.66786	0.24068	0.265	-1.4897	0.1540
		Fars	-0.13052	0.20334	1.000	-0.8249	0.5638
		Tehran west2	0.45989	0.21342	0.697	-0.2689	1.1887
		Tehran south2	0.58810	0.33400	0.912	-0.5525	1.7286
	Tehran west1	Gilan	-0.11837	0.24258	1.000	-0.9467	0.7100
		Tehran center1	0.02143	0.24509	1.000	-0.8155	0.8584
		Tehran east1	0.26753	0.28484	1.000	-0.7051	1.2402
		Tehran north1	0.07950	0.23814	1.000	-0.7337	0.8927
		Esfahan	-0.12619	0.20714	1.000	-0.8335	0.5811
		Eilam	-0.43810	0.21279	0.761	-1.1647	0.2885

		Markazi	-0.36484	0.27190	0.991	-1.2933	0.5637
		Tehran north2	0.32329	0.23814	0.990	-0.4899	1.1365
		Tehran south1	-0.25584	0.20901	0.997	-0.9696	0.4579
		Tehran center2	0.31190	0.27791	0.999	-0.6371	1.2609
		Tehran east2	-0.64643	0.25789	0.438	-1.5271	0.2342
		Fars	-0.10909	0.22345	1.000	-0.8721	0.6539
		Tehran west2	0.48132	0.23266	0.755	-0.3131	1.2758
		Tehran south2	0.60952	0.34661	0.913	-0.5741	1.7931
	Tehran east1	Gilan	-0.38590	0.26707	0.983	-1.2979	0.5261
		Tehran center1	-0.24610	0.26935	1.000	-1.1659	0.6737
		Tehran west1	-0.26753	0.28484	1.000	-1.2402	0.7051
		Tehran north1	-0.18803	0.26305	1.000	-1.0863	0.7102
		Esfahan	-0.39372	0.23535	0.940	-1.1974	0.4099
		Eilam	-0.70563	0.24034	0.185	-1.5263	0.1151
		Markazi	-0.63237	0.29396	0.699	-1.6362	0.3714
		Tehran north2	0.05576	0.26305	1.000	-0.8425	0.9540
		Tehran south1	-0.52338	0.23700	0.659	-1.3327	0.2859
		Tehran center2	0.04437	0.29952	1.000	-0.9784	1.0672
		Tehran east2	-0.91396	0.28105	0.081	-1.8737	0.0458
		Fars	-0.37662	0.24982	0.975	-1.2297	0.4765
		Tehran west2	0.21379	0.25809	1.000	-0.6675	1.0951
		Tehran south2	0.34199	0.36417	1.000	-0.9016	1.5856
	Tehran north1	Gilan	-0.19787	0.21657	1.000	-0.9374	0.5417
		Tehran center1	-0.05807	0.21939	1.000	-0.8072	0.6911
		Tehran west1	-0.07950	0.23814	1.000	-0.8927	0.7337
		Tehran east1	0.18803	0.26305	1.000	-0.7102	1.0863
		Esfahan	-0.20569	0.17598	0.998	-0.8066	0.3952
		Eilam	-0.51760	0.18260	0.233	-1.1411	0.1059
		Markazi	-0.44434	0.24898	0.903	-1.2946	0.4059
		Tehran north2	0.24379	0.21160	0.998	-0.4788	0.9663
		Tehran south1	-0.33535	0.17818	0.861	-0.9438	0.2731
		Tehran center2	0.23240	0.25553	1.000	-0.6402	1.1050
		Tehran east2	-0.72593	0.23359	0.120	-1.5236	0.0717
		Fars	-0.18859	0.19491	1.000	-0.8542	0.4770
		Tehran west2	0.40182	0.20540	0.822	-0.2996	1.1032
		Tehran south2	0.53002	0.32894	0.955	-0.5932	1.6533
	Esfahan	Gilan	0.00782	0.18193	1.000	-0.6134	0.6291
		Tehran center1	0.14762	0.18527	1.000	-0.4850	0.7803
		Tehran west1	0.12619	0.20714	1.000	-0.5811	0.8335
		Tehran east1	0.39372	0.23535	0.940	-0.4099	1.1974
		Tehran north1	0.20569	0.17598	0.998	-0.3952	0.8066
		Eilam	-0.31190	0.13977	0.642	-0.7892	0.1654
		Markazi	-0.23864	0.21952	0.999	-0.9882	0.5110
		Tehran north2	0.44948	0.17598	0.405	-0.1514	1.0504
		Tehran south1	-0.12965	0.13395	1.000	-0.5871	0.3278

		Tehran center2	0.43810	0.22691	0.836	-0.3368	1.2129
		Tehran east2	-0.52024	0.20190	0.389	-1.2097	0.1692
		Fars	0.01710	0.15551	1.000	-0.5139	0.5481
		Tehran west2	.60751(*)	0.16848	0.027	0.0322	1.1828
		Tehran south2	0.73571	0.30724	0.520	-0.3134	1.7849
	Eilam	Gilan	0.31973	0.18834	0.933	-0.3234	0.9629
		Tehran center1	0.45952	0.19157	0.517	-0.1946	1.1137
		Tehran west1	0.43810	0.21279	0.761	-0.2885	1.1647
		Tehran east1	0.70563	0.24034	0.185	-0.1151	1.5263
		Tehran north1	0.51760	0.18260	0.233	-0.1059	1.1411
		Esfahan	0.31190	0.13977	0.642	-0.1654	0.7892
		Markazi	0.07326	0.22486	1.000	-0.6946	0.8411
		Tehran north2	.76139(*)	0.18260	0.003	0.1379	1.3849
		Tehran south1	0.18225	0.14254	0.995	-0.3045	0.6690
		Tehran center2	0.75000	0.23208	0.086	-0.0425	1.5425
		Tehran east2	-0.20833	0.20769	1.000	-0.9175	0.5009
		Fars	0.32900	0.16296	0.786	-0.2275	0.8855
		Tehran west2	.91941(*)	0.17538	0.000	0.3205	1.5183
		Tehran south2	1.04762	0.31108	0.058	-0.0146	2.1099
	Markazi	Gilan	0.24647	0.25323	1.000	-0.6183	1.1112
		Tehran center1	0.38626	0.25564	0.974	-0.4867	1.2592
		Tehran west1	0.36484	0.27190	0.991	-0.5637	1.2933
		Tehran east1	0.63237	0.29396	0.699	-0.3714	1.6362
		Tehran north1	0.44434	0.24898	0.903	-0.4059	1.2946
		Esfahan	0.23864	0.21952	0.999	-0.5110	0.9882
		Eilam	-0.07326	0.22486	1.000	-0.8411	0.6946
		Tehran north2	0.68813	0.24898	0.272	-0.1621	1.5383
		Tehran south1	0.10899	0.22129	1.000	-0.6467	0.8646
		Tehran center2	0.67674	0.28725	0.549	-0.3042	1.6576
		Tehran east2	-0.28159	0.26793	0.999	-1.1965	0.6333
		Fars	0.25574	0.23497	0.999	-0.5466	1.0581
		Tehran west2	.84615(*)	0.24374	0.042	0.0138	1.6785
		Tehran south2	0.97436	0.35415	0.279	-0.2350	2.1837
	Tehran north2	Gilan	-0.44166	0.21657	0.773	-1.1812	0.2979
		Tehran center1	-0.30186	0.21939	0.989	-1.0510	0.4473
		Tehran west1	-0.32329	0.23814	0.990	-1.1365	0.4899
		Tehran east1	-0.05576	0.26305	1.000	-0.9540	0.8425
		Tehran north1	-0.24379	0.21160	0.998	-0.9663	0.4788
		Esfahan	-0.44948	0.17598	0.405	-1.0504	0.1514
		Eilam	-.76139(*)	0.18260	0.003	-1.3849	-0.1379
		Markazi	-0.68813	0.24898	0.272	-1.5383	0.1621
		Tehran south1	-0.57914	0.17818	0.081	-1.1876	0.0293
		Tehran center2	-0.01139	0.25553	1.000	-0.8839	0.8612
		Tehran east2	-.96972(*)	0.23359	0.004	-1.7674	-0.1720

		Fars	-0.43238	0.19491	0.651	-1.0979	0.2332
		Tehran west2	0.15803	0.20540	1.000	-0.5434	0.8594
		Tehran south2	0.28623	0.32894	1.000	-0.8370	1.4095
	Tehran south1	Gilan	0.13748	0.18406	1.000	-0.4911	0.7660
		Tehran center1	0.27727	0.18737	0.978	-0.3625	0.9171
		Tehran west1	0.25584	0.20901	0.997	-0.4579	0.9696
		Tehran east1	0.52338	0.23700	0.659	-0.2859	1.3327
		Tehran north1	0.33535	0.17818	0.861	-0.2731	0.9438
		Esfahan	0.12965	0.13395	1.000	-0.3278	0.5871
		Eilam	-0.18225	0.14254	0.995	-0.6690	0.3045
		Markazi	-0.10899	0.22129	1.000	-0.8646	0.6467
		Tehran north2	0.57914	0.17818	0.081	-0.0293	1.1876
		Tehran center2	0.56775	0.22862	0.455	-0.2129	1.3484
		Tehran east2	-0.39058	0.20382	0.844	-1.0866	0.3054
		Fars	0.14675	0.15800	1.000	-0.3928	0.6863
		Tehran west2	.73716(*)	0.17078	0.002	0.1540	1.3203
		Tehran south2	0.86537	0.30851	0.249	-0.1881	1.9188
	Tehran center2	Gilan	-0.43027	0.25966	0.944	-1.3170	0.4564
		Tehran center1	-0.29048	0.26201	0.999	-1.1852	0.6042
		Tehran west1	-0.31190	0.27791	0.999	-1.2609	0.6371
		Tehran east1	-0.04437	0.29952	1.000	-1.0672	0.9784
		Tehran north1	-0.23240	0.25553	1.000	-1.1050	0.6402
		Esfahan	-0.43810	0.22691	0.836	-1.2129	0.3368
		Eilam	-0.75000	0.23208	0.086	-1.5425	0.0425
		Markazi	-0.67674	0.28725	0.549	-1.6576	0.3042
		Tehran north2	0.01139	0.25553	1.000	-0.8612	0.8839
		Tehran south1	-0.56775	0.22862	0.455	-1.3484	0.2129
		Tehran east2	-.95833(*)	0.27402	0.039	-1.8941	-0.0226
		Fars	-0.42100	0.24189	0.919	-1.2470	0.4050
		Tehran west2	0.16941	0.25042	1.000	-0.6857	1.0245
		Tehran south2	0.29762	0.35878	1.000	-0.9275	1.5228
	Tehran east2	Gilan	0.52806	0.23811	0.652	-0.2850	1.3412
		Tehran center1	0.66786	0.24068	0.265	-0.1540	1.4897
		Tehran west1	0.64643	0.25789	0.438	-0.2342	1.5271
		Tehran east1	0.91396	0.28105	0.081	-0.0458	1.8737
		Tehran north1	0.72593	0.23359	0.120	-0.0717	1.5236
		Esfahan	0.52024	0.20190	0.389	-0.1692	1.2097
		Eilam	0.20833	0.20769	1.000	-0.5009	0.9175
		Markazi	0.28159	0.26793	0.999	-0.6333	1.1965
		Tehran north2	.96972(*)	0.23359	0.004	0.1720	1.7674
		Tehran south1	0.39058	0.20382	0.844	-0.3054	1.0866
		Tehran center2	.95833(*)	0.27402	0.039	0.0226	1.8941
		Fars	0.53734	0.21859	0.473	-0.2091	1.2838
		Tehran west2	1.12775(*)	0.22800	0.000	0.3492	1.9063
		Tehran south2	1.25595(*)	0.34350	0.023	0.0830	2.4289

	Fars	Gilan	-0.00928	0.20030	1.000	-0.6933	0.6747
		Tehran center1	0.13052	0.20334	1.000	-0.5638	0.8249
		Tehran west1	0.10909	0.22345	1.000	-0.6539	0.8721
		Tehran east1	0.37662	0.24982	0.975	-0.4765	1.2297
		Tehran north1	0.18859	0.19491	1.000	-0.4770	0.8542
		Esfahan	-0.01710	0.15551	1.000	-0.5481	0.5139
		Eilam	-0.32900	0.16296	0.786	-0.8855	0.2275
		Markazi	-0.25574	0.23497	0.999	-1.0581	0.5466
		Tehran north2	0.43238	0.19491	0.651	-0.2332	1.0979
		Tehran south1	-0.14675	0.15800	1.000	-0.6863	0.3928
		Tehran center2	0.42100	0.24189	0.919	-0.4050	1.2470
		Tehran east2	-0.53734	0.21859	0.473	-1.2838	0.2091
		Tehran west2	0.59041	0.18816	0.111	-0.0521	1.2329
		Tehran south2	0.71861	0.31846	0.623	-0.3689	1.8061
	Tehran west2	Gilan	-0.59969	0.21053	0.226	-1.3186	0.1192
		Tehran center1	-0.45989	0.21342	0.697	-1.1887	0.2689
		Tehran west1	-0.48132	0.23266	0.755	-1.2758	0.3131
		Tehran east1	-0.21379	0.25809	1.000	-1.0951	0.6675
		Tehran north1	-0.40182	0.20540	0.822	-1.1032	0.2996
		Esfahan	-0.60751(*)	0.16848	0.027	-1.1828	-0.0322
		Eilam	-0.91941(*)	0.17538	0.000	-1.5183	-0.3205
		Markazi	-0.84615(*)	0.24374	0.042	-1.6785	-0.0138
		Tehran north2	-0.15803	0.20540	1.000	-0.8594	0.5434
		Tehran south1	-0.73716(*)	0.17078	0.002	-1.3203	-0.1540
		Tehran center2	-0.16941	0.25042	1.000	-1.0245	0.6857
		Tehran east2	-1.12775(*)	0.22800	0.000	-1.9063	-0.3492
		Fars	-0.59041	0.18816	0.111	-1.2329	0.0521
		Tehran south2	0.12821	0.32499	1.000	-0.9816	1.2380
	Tehran south2	Gilan	-0.72789	0.33216	0.671	-1.8622	0.4064
		Tehran center1	-0.58810	0.33400	0.912	-1.7286	0.5525
		Tehran west1	-0.60952	0.34661	0.913	-1.7931	0.5741
		Tehran east1	-0.34199	0.36417	1.000	-1.5856	0.9016
		Tehran north1	-0.53002	0.32894	0.955	-1.6533	0.5932
		Esfahan	-0.73571	0.30724	0.520	-1.7849	0.3134
		Eilam	-1.04762	0.31108	0.058	-2.1099	0.0146
		Markazi	-0.97436	0.35415	0.279	-2.1837	0.2350
		Tehran north2	-0.28623	0.32894	1.000	-1.4095	0.8370
		Tehran south1	-0.86537	0.30851	0.249	-1.9188	0.1881
		Tehran center2	-0.29762	0.35878	1.000	-1.5228	0.9275
		Tehran east2	-1.25595(*)	0.34350	0.023	-2.4289	-0.0830
		Fars	-0.71861	0.31846	0.623	-1.8061	0.3689
		Tehran west2	-0.12821	0.32499	1.000	-1.2380	0.9816
play	Gilan	Tehran center1	0.24476	0.24588	1.000	-0.5949	1.0844
		Tehran west1	-0.17524	0.26604	1.000	-1.0837	0.7332

		Tehran east1	0.12294	0.29290	1.000	-0.8773	1.1231
		Tehran north1	0.33954	0.23752	0.984	-0.4716	1.1506
		Esfahan	0.01810	0.19953	1.000	-0.6633	0.6995
		Eilam	-0.32133	0.20725	0.968	-1.0291	0.3864
		Markazi	0.05861	0.27772	1.000	-0.8898	1.0070
		Tehran north2	0.14824	0.23752	1.000	-0.6629	0.9593
		Tehran south1	-0.48797	0.20187	0.504	-1.1773	0.2014
		Tehran center2	0.40476	0.28478	0.985	-0.5677	1.3772
		Tehran east2	-0.78274	0.26114	0.160	-1.6745	0.1090
		Fars	-0.44675	0.21967	0.777	-1.1969	0.3034
		Tehran west2	.87399(*)	0.23089	0.015	0.0855	1.6624
		Tehran south2	0.37143	0.36429	1.000	-0.8726	1.6154
	Tehran center1	Gilan	-0.24476	0.24588	1.000	-1.0844	0.5949
		Tehran west1	-0.42000	0.26880	0.965	-1.3379	0.4979
		Tehran east1	-0.12182	0.29541	1.000	-1.1306	0.8869
		Tehran north1	0.09478	0.24060	1.000	-0.7268	0.9164
		Esfahan	-0.22667	0.20319	0.999	-0.9205	0.4672
		Eilam	-0.56609	0.21078	0.318	-1.2859	0.1537
		Markazi	-0.18615	0.28036	1.000	-1.1435	0.7712
		Tehran north2	-0.09652	0.24060	1.000	-0.9181	0.7251
		Tehran south1	-.73273(*)	0.20549	0.031	-1.4344	-0.0310
		Tehran center2	0.16000	0.28735	1.000	-0.8213	1.1413
		Tehran east2	-1.02750(*)	0.26395	0.010	-1.9289	-0.1261
		Fars	-0.69152	0.22301	0.123	-1.4530	0.0700
		Tehran west2	0.62923	0.23406	0.316	-0.1700	1.4285
		Tehran south2	0.12667	0.36631	1.000	-1.1242	1.3775
	Tehran west1	Gilan	0.17524	0.26604	1.000	-0.7332	1.0837
		Tehran center1	0.42000	0.26880	0.965	-0.4979	1.3379
		Tehran east1	0.29818	0.31239	1.000	-0.7686	1.3649
		Tehran north1	0.51478	0.26117	0.814	-0.3771	1.4067
		Esfahan	0.19333	0.22717	1.000	-0.5824	0.9691
		Eilam	-0.14609	0.23399	1.000	-0.9451	0.6529
		Markazi	0.23385	0.29820	1.000	-0.7845	1.2522
		Tehran north2	0.32348	0.26117	0.996	-0.5684	1.2153
		Tehran south1	-0.31273	0.22923	0.990	-1.0955	0.4701
		Tehran center2	0.58000	0.30479	0.850	-0.4608	1.6208
		Tehran east2	-0.60750	0.28283	0.702	-1.5733	0.3583
		Fars	-0.27152	0.24506	0.999	-1.1083	0.5653
		Tehran west2	1.04923(*)	0.25516	0.004	0.1779	1.9206
		Tehran south2	0.54667	0.38013	0.983	-0.7514	1.8448
	Tehran east1	Gilan	-0.12294	0.29290	1.000	-1.1231	0.8773
		Tehran center1	0.12182	0.29541	1.000	-0.8869	1.1306
		Tehran west1	-0.29818	0.31239	1.000	-1.3649	0.7686
		Tehran north1	0.21660	0.28849	1.000	-0.7685	1.2017
		Esfahan	-0.10485	0.25811	1.000	-0.9863	0.7766

		Eilam	-0.44427	0.26413	0.937	-1.3462	0.4577
		Markazi	-0.06434	0.32239	1.000	-1.1653	1.0366
		Tehran north2	0.02530	0.28849	1.000	-0.9598	1.0104
		Tehran south1	-0.61091	0.25992	0.554	-1.4985	0.2767
		Tehran center2	0.28182	0.32849	1.000	-0.8399	1.4036
		Tehran east2	-0.90568	0.30823	0.184	-1.9582	0.1469
		Fars	-0.56970	0.27398	0.748	-1.5053	0.3659
		Tehran west2	0.75105	0.28305	0.338	-0.2155	1.7176
		Tehran south2	0.24848	0.39939	1.000	-1.1154	1.6123
	Tehran north1	Gilan	-0.33954	0.23752	0.984	-1.1506	0.4716
		Tehran center1	-0.09478	0.24060	1.000	-0.9164	0.7268
		Tehran west1	-0.51478	0.26117	0.814	-1.4067	0.3771
		Tehran east1	-0.21660	0.28849	1.000	-1.2017	0.7685
		Esfahan	-0.32145	0.19300	0.942	-0.9805	0.3376
		Eilam	-0.66087	0.20097	0.073	-1.3471	0.0254
		Markazi	-0.28094	0.27306	0.999	-1.2134	0.6515
		Tehran north2	-0.19130	0.23206	1.000	-0.9838	0.6011
		Tehran south1	-.82751(*)	0.19541	0.003	-1.4948	-0.1602
		Tehran center2	0.06522	0.28024	1.000	-0.8918	1.0222
		Tehran east2	-1.12228(*)	0.25619	0.001	-1.9971	-0.2474
		Fars	-.78630(*)	0.21376	0.021	-1.5162	-0.0563
		Tehran west2	0.53445	0.22527	0.537	-0.2348	1.3037
		Tehran south2	0.03188	0.36075	1.000	-1.2000	1.2638
	Esfahan	Gilan	-0.01810	0.19953	1.000	-0.6995	0.6633
		Tehran center1	0.22667	0.20319	0.999	-0.4672	0.9205
		Tehran west1	-0.19333	0.22717	1.000	-0.9691	0.5824
		Tehran east1	0.10485	0.25811	1.000	-0.7766	0.9863
		Tehran north1	0.32145	0.19300	0.942	-0.3376	0.9805
		Eilam	-0.33942	0.15422	0.664	-0.8661	0.1872
		Markazi	0.04051	0.24075	1.000	-0.7816	0.8626
		Tehran north2	0.13014	0.19300	1.000	-0.5289	0.7892
		Tehran south1	-.50606(*)	0.14691	0.046	-1.0077	-0.0044
		Tehran center2	0.38667	0.24886	0.967	-0.4631	1.2365
		Tehran east2	-.80083(*)	0.22142	0.026	-1.5570	-0.0447
		Fars	-0.46485	0.17055	0.294	-1.0473	0.1176
		Tehran west2	.85590(*)	0.18477	0.000	0.2249	1.4869
		Tehran south2	0.35333	0.33695	0.999	-0.7973	1.5040
	Eilam	Gilan	0.32133	0.20725	0.968	-0.3864	1.0291
		Tehran center1	0.56609	0.21078	0.318	-0.1537	1.2859
		Tehran west1	0.14609	0.23399	1.000	-0.6529	0.9451
		Tehran east1	0.44427	0.26413	0.937	-0.4577	1.3462
		Tehran north1	0.66087	0.20097	0.073	-0.0254	1.3471
		Esfahan	0.33942	0.15422	0.664	-0.1872	0.8661
		Markazi	0.37993	0.24719	0.970	-0.4642	1.2240
		Tehran north2	0.46957	0.20097	0.564	-0.2167	1.1558

		Tehran south1	-0.16664	0.15723	0.999	-0.7036	0.3703
		Tehran center2	0.72609	0.25509	0.227	-0.1450	1.5972
		Tehran east2	-0.46141	0.22841	0.785	-1.2414	0.3186
		Fars	-0.12543	0.17953	1.000	-0.7385	0.4876
		Tehran west2	1.19532(*)	0.19309	0.000	0.5360	1.8547
		Tehran south2	0.69275	0.34158	0.780	-0.4737	1.8592
	Markazi	Gilan	-0.05861	0.27772	1.000	-1.0070	0.8898
		Tehran center1	0.18615	0.28036	1.000	-0.7712	1.1435
		Tehran west1	-0.23385	0.29820	1.000	-1.2522	0.7845
		Tehran east1	0.06434	0.32239	1.000	-1.0366	1.1653
		Tehran north1	0.28094	0.27306	0.999	-0.6515	1.2134
		Esfahan	-0.04051	0.24075	1.000	-0.8626	0.7816
		Eilam	-0.37993	0.24719	0.970	-1.2240	0.4642
		Tehran north2	0.08963	0.27306	1.000	-0.8428	1.0221
		Tehran south1	-0.54657	0.24269	0.627	-1.3753	0.2822
		Tehran center2	0.34615	0.31503	0.999	-0.7296	1.4219
		Tehran east2	-0.84135	0.29384	0.219	-1.8448	0.1621
		Fars	-0.50536	0.25769	0.820	-1.3853	0.3746
		Tehran west2	0.81538	0.26731	0.140	-0.0975	1.7282
		Tehran south2	0.31282	0.38840	1.000	-1.0135	1.6391
	Tehran north2	Gilan	-0.14824	0.23752	1.000	-0.9593	0.6629
		Tehran center1	0.09652	0.24060	1.000	-0.7251	0.9181
		Tehran west1	-0.32348	0.26117	0.996	-1.2153	0.5684
		Tehran east1	-0.02530	0.28849	1.000	-1.0104	0.9598
		Tehran north1	0.19130	0.23206	1.000	-0.6011	0.9838
		Esfahan	-0.13014	0.19300	1.000	-0.7892	0.5289
		Eilam	-0.46957	0.20097	0.564	-1.1558	0.2167
		Markazi	-0.08963	0.27306	1.000	-1.0221	0.8428
		Tehran south1	-0.63621	0.19541	0.080	-1.3035	0.0311
		Tehran center2	0.25652	0.28024	1.000	-0.7004	1.2135
		Tehran east2	-.93098(*)	0.25619	0.025	-1.8058	-0.0561
		Fars	-0.59499	0.21376	0.261	-1.3249	0.1350
		Tehran west2	0.72575	0.22527	0.088	-0.0435	1.4950
		Tehran south2	0.22319	0.36075	1.000	-1.0087	1.4551
	Tehran south1	Gilan	0.48797	0.20187	0.504	-0.2014	1.1773
		Tehran center1	.73273(*)	0.20549	0.031	0.0310	1.4344
		Tehran west1	0.31273	0.22923	0.990	-0.4701	1.0955
		Tehran east1	0.61091	0.25992	0.554	-0.2767	1.4985
		Tehran north1	.82751(*)	0.19541	0.003	0.1602	1.4948
		Esfahan	.50606(*)	0.14691	0.046	0.0044	1.0077
		Eilam	0.16664	0.15723	0.999	-0.3703	0.7036
		Markazi	0.54657	0.24269	0.627	-0.2822	1.3753
		Tehran north2	0.63621	0.19541	0.080	-0.0311	1.3035
		Tehran center2	.89273(*)	0.25073	0.031	0.0365	1.7489

		Tehran east2	-0.29477	0.22353	0.993	-1.0581	0.4685
		Fars	0.04121	0.17328	1.000	-0.5505	0.6329
		Tehran west2	1.36196(*)	0.18729	0.000	0.7224	2.0015
		Tehran south2	0.85939	0.33834	0.415	-0.2960	2.0148
Tehran center2		Gilan	-0.40476	0.28478	0.985	-1.3772	0.5677
		Tehran center1	-0.16000	0.28735	1.000	-1.1413	0.8213
		Tehran west1	-0.58000	0.30479	0.850	-1.6208	0.4608
		Tehran east1	-0.28182	0.32849	1.000	-1.4036	0.8399
		Tehran north1	-0.06522	0.28024	1.000	-1.0222	0.8918
		Esfahan	-0.38667	0.24886	0.967	-1.2365	0.4631
		Eilam	-0.72609	0.25509	0.227	-1.5972	0.1450
		Markazi	-0.34615	0.31503	0.999	-1.4219	0.7296
		Tehran north2	-0.25652	0.28024	1.000	-1.2135	0.7004
		Tehran south1	-.89273(*)	0.25073	0.031	-1.7489	-0.0365
		Tehran east2	-1.18750(*)	0.30052	0.008	-2.2137	-0.1613
		Fars	-0.85152	0.26528	0.091	-1.7574	0.0544
		Tehran west2	0.46923	0.27464	0.929	-0.4686	1.4071
		Tehran south2	-0.03333	0.39348	1.000	-1.3770	1.3103
Tehran east2		Gilan	0.78274	0.26114	0.160	-0.1090	1.6745
		Tehran center1	1.02750(*)	0.26395	0.010	0.1261	1.9289
		Tehran west1	0.60750	0.28283	0.702	-0.3583	1.5733
		Tehran east1	0.90568	0.30823	0.184	-0.1469	1.9582
		Tehran north1	1.12228(*)	0.25619	0.001	0.2474	1.9971
		Esfahan	.80083(*)	0.22142	0.026	0.0447	1.5570
		Eilam	0.46141	0.22841	0.785	-0.3186	1.2414
		Markazi	0.84135	0.29384	0.219	-0.1621	1.8448
		Tehran north2	.93098(*)	0.25619	0.025	0.0561	1.8058
		Tehran south1	0.29477	0.22353	0.993	-0.4685	1.0581
		Tehran center2	1.18750(*)	0.30052	0.008	0.1613	2.2137
		Fars	0.33598	0.23973	0.987	-0.4827	1.1546
		Tehran west2	1.65673(*)	0.25005	0.000	0.8029	2.5106
		Tehran south2	1.15417	0.37673	0.135	-0.1323	2.4406
Fars		Gilan	0.44675	0.21967	0.777	-0.3034	1.1969
		Tehran center1	0.69152	0.22301	0.123	-0.0700	1.4530
		Tehran west1	0.27152	0.24506	0.999	-0.5653	1.1083
		Tehran east1	0.56970	0.27398	0.748	-0.3659	1.5053
		Tehran north1	.78630(*)	0.21376	0.021	0.0563	1.5162
		Esfahan	0.46485	0.17055	0.294	-0.1176	1.0473
		Eilam	0.12543	0.17953	1.000	-0.4876	0.7385
		Markazi	0.50536	0.25769	0.820	-0.3746	1.3853
		Tehran north2	0.59499	0.21376	0.261	-0.1350	1.3249
		Tehran south1	-0.04121	0.17328	1.000	-0.6329	0.5505
		Tehran center2	0.85152	0.26528	0.091	-0.0544	1.7574
		Tehran east2	-0.33598	0.23973	0.987	-1.1546	0.4827
		Tehran west2	1.32075(*)	0.20636	0.000	0.6161	2.0254

	Tehran west2	Tehran south2	0.81818	0.34926	0.559	-0.3745	2.0108
		Gilan	-0.87399(*)	0.23089	0.015	-1.6624	-0.0855
		Tehran center1	-0.62923	0.23406	0.316	-1.4285	0.1700
		Tehran west1	-1.04923(*)	0.25516	0.004	-1.9206	-0.1779
		Tehran east1	-0.75105	0.28305	0.338	-1.7176	0.2155
		Tehran north1	-0.53445	0.22527	0.537	-1.3037	0.2348
		Esfahan	-0.85590(*)	0.18477	0.000	-1.4869	-0.2249
		Eilam	-1.19532(*)	0.19309	0.000	-1.8547	-0.5360
		Markazi	-0.81538	0.26731	0.140	-1.7282	0.0975
		Tehran north2	-0.72575	0.22527	0.088	-1.4950	0.0435
		Tehran south1	-1.36196(*)	0.18729	0.000	-2.0015	-0.7224
		Tehran center2	-0.46923	0.27464	0.929	-1.4071	0.4686
		Tehran east2	-1.65673(*)	0.25005	0.000	-2.5106	-0.8029
		Fars	-1.32075(*)	0.20636	0.000	-2.0254	-0.6161
		Tehran south2	-0.50256	0.35642	0.986	-1.7197	0.7146
	Tehran south2	Gilan	-0.37143	0.36429	1.000	-1.6154	0.8726
		Tehran center1	-0.12667	0.36631	1.000	-1.3775	1.1242
		Tehran west1	-0.54667	0.38013	0.983	-1.8448	0.7514
		Tehran east1	-0.24848	0.39939	1.000	-1.6123	1.1154
		Tehran north1	-0.03188	0.36075	1.000	-1.2638	1.2000
		Esfahan	-0.35333	0.33695	0.999	-1.5040	0.7973
		Eilam	-0.69275	0.34158	0.780	-1.8592	0.4737
		Markazi	-0.31282	0.38840	1.000	-1.6391	1.0135
		Tehran north2	-0.22319	0.36075	1.000	-1.4551	1.0087
		Tehran south1	-0.85939	0.33834	0.415	-2.0148	0.2960
		Tehran center2	0.03333	0.39348	1.000	-1.3103	1.3770
		Tehran east2	-1.15417	0.37673	0.135	-2.4406	0.1323
		Fars	-0.81818	0.34926	0.559	-2.0108	0.3745
		Tehran west2	0.50256	0.35642	0.986	-0.7146	1.7197
		Attit	Gilan	Tehran center1	0.46810	0.26001	0.897
Tehran west1	-0.00190			0.28133	1.000	-0.9626	0.9588
Tehran east1	0.52900			0.30973	0.930	-0.5287	1.5867
Tehran north1	0.59462			0.25117	0.541	-0.2631	1.4523
Esfahan	0.24810			0.21100	0.998	-0.4724	0.9686
Eilam	0.10331			0.21916	1.000	-0.6451	0.8517
Markazi	-0.23883			0.29368	1.000	-1.2417	0.7640
Tehran north2	0.16853			0.25117	1.000	-0.6892	1.0262
Tehran south1	-0.09281			0.21347	1.000	-0.8218	0.6361
Tehran center2	0.48810			0.30114	0.953	-0.5403	1.5165
Tehran east2	-0.04940			0.27615	1.000	-0.9924	0.8936
Fars	0.05628			0.23230	1.000	-0.7370	0.8495
Tehran west2	-0.04652			0.24416	1.000	-0.8803	0.7872
Tehran south2	0.33810			0.38522	1.000	-0.9774	1.6536
Tehran center1	Gilan			-0.46810	0.26001	0.897	-1.3560
	Tehran west1		-0.47000	0.28424	0.945	-1.4406	0.5006

		Tehran east1	0.06091	0.31238	1.000	-1.0058	1.1276
		Tehran north1	0.12652	0.25443	1.000	-0.7423	0.9954
		Esfahan	-0.22000	0.21487	0.999	-0.9537	0.5137
		Eilam	-0.36478	0.22289	0.949	-1.1259	0.3964
		Markazi	-0.70692	0.29647	0.528	-1.7193	0.3055
		Tehran north2	-0.29957	0.25443	0.998	-1.1684	0.5693
		Tehran south1	-0.56091	0.21730	0.386	-1.3029	0.1811
		Tehran center2	0.02000	0.30387	1.000	-1.0177	1.0577
		Tehran east2	-0.51750	0.27912	0.874	-1.4707	0.4357
		Fars	-0.41182	0.23582	0.917	-1.2171	0.3935
		Tehran west2	-0.51462	0.24751	0.748	-1.3598	0.3306
		Tehran south2	-0.13000	0.38736	1.000	-1.4528	1.1928
	Tehran west1	Gilan	0.00190	0.28133	1.000	-0.9588	0.9626
		Tehran center1	0.47000	0.28424	0.945	-0.5006	1.4406
		Tehran east1	0.53091	0.33034	0.956	-0.5972	1.6590
		Tehran north1	0.59652	0.27618	0.693	-0.3466	1.5396
		Esfahan	0.25000	0.24023	0.999	-0.5703	1.0703
		Eilam	0.10522	0.24743	1.000	-0.7397	0.9502
		Markazi	-0.23692	0.31534	1.000	-1.3138	0.8399
		Tehran north2	0.17043	0.27618	1.000	-0.7727	1.1136
		Tehran south1	-0.09091	0.24240	1.000	-0.9187	0.7369
		Tehran center2	0.49000	0.32230	0.973	-0.6106	1.5906
		Tehran east2	-0.04750	0.29908	1.000	-1.0688	0.9738
		Fars	0.05818	0.25914	1.000	-0.8267	0.9431
		Tehran west2	-0.04462	0.26982	1.000	-0.9660	0.8768
		Tehran south2	0.34000	0.40198	1.000	-1.0327	1.7127
	Tehran east1	Gilan	-0.52900	0.30973	0.930	-1.5867	0.5287
		Tehran center1	-0.06091	0.31238	1.000	-1.1276	1.0058
		Tehran west1	-0.53091	0.33034	0.956	-1.6590	0.5972
		Tehran north1	0.06561	0.30507	1.000	-0.9761	1.1074
		Esfahan	-0.28091	0.27294	0.999	-1.2130	0.6512
		Eilam	-0.42569	0.27931	0.972	-1.3795	0.5281
		Markazi	-0.76783	0.34092	0.627	-1.9320	0.3964
		Tehran north2	-0.36047	0.30507	0.998	-1.4022	0.6813
		Tehran south1	-0.62182	0.27486	0.619	-1.5604	0.3168
		Tehran center2	-0.04091	0.34737	1.000	-1.2271	1.1453
		Tehran east2	-0.57841	0.32594	0.907	-1.6915	0.5346
		Fars	-0.47273	0.28973	0.951	-1.4621	0.5166
		Tehran west2	-0.57552	0.29932	0.840	-1.5977	0.4466
		Tehran south2	-0.19091	0.42235	1.000	-1.6332	1.2513
	Tehran north1	Gilan	-0.59462	0.25117	0.541	-1.4523	0.2631
		Tehran center1	-0.12652	0.25443	1.000	-0.9954	0.7423
		Tehran west1	-0.59652	0.27618	0.693	-1.5396	0.3466
		Tehran east1	-0.06561	0.30507	1.000	-1.1074	0.9761
		Esfahan	-0.34652	0.20409	0.933	-1.0434	0.3504

		Eilam	-0.49130	0.21252	0.582	-1.2170	0.2344
		Markazi	-0.83344	0.28876	0.208	-1.8195	0.1526
		Tehran north2	-0.42609	0.24540	0.920	-1.2641	0.4119
		Tehran south1	-0.68743	0.20664	0.065	-1.3931	0.0182
		Tehran center2	-0.10652	0.29634	1.000	-1.1185	0.9054
		Tehran east2	-0.64402	0.27091	0.533	-1.5691	0.2811
		Fars	-0.53834	0.22604	0.530	-1.3102	0.2336
		Tehran west2	-0.64114	0.23821	0.314	-1.4546	0.1723
		Tehran south2	-0.25652	0.38148	1.000	-1.5592	1.0462
	Esfahan	Gilan	-0.24810	0.21100	0.998	-0.9686	0.4724
		Tehran center1	0.22000	0.21487	0.999	-0.5137	0.9537
		Tehran west1	-0.25000	0.24023	0.999	-1.0703	0.5703
		Tehran east1	0.28091	0.27294	0.999	-0.6512	1.2130
		Tehran north1	0.34652	0.20409	0.933	-0.3504	1.0434
		Eilam	-0.14478	0.16309	1.000	-0.7017	0.4121
		Markazi	-0.48692	0.25458	0.846	-1.3563	0.3824
		Tehran north2	-0.07957	0.20409	1.000	-0.7765	0.6174
		Tehran south1	-0.34091	0.15535	0.669	-0.8714	0.1896
		Tehran center2	0.24000	0.26316	1.000	-0.6586	1.1386
		Tehran east2	-0.29750	0.23415	0.995	-1.0971	0.5021
		Fars	-0.19182	0.18035	0.999	-0.8077	0.4241
		Tehran west2	-0.29462	0.19539	0.975	-0.9618	0.3726
		Tehran south2	0.09000	0.35632	1.000	-1.1268	1.3068
	Eilam	Gilan	-0.10331	0.21916	1.000	-0.8517	0.6451
		Tehran center1	0.36478	0.22289	0.949	-0.3964	1.1259
		Tehran west1	-0.10522	0.24743	1.000	-0.9502	0.7397
		Tehran east1	0.42569	0.27931	0.972	-0.5281	1.3795
		Tehran north1	0.49130	0.21252	0.582	-0.2344	1.2170
		Esfahan	0.14478	0.16309	1.000	-0.4121	0.7017
		Markazi	-0.34214	0.26139	0.993	-1.2348	0.5505
		Tehran north2	0.06522	0.21252	1.000	-0.6605	0.7909
		Tehran south1	-0.19613	0.16627	0.998	-0.7639	0.3717
		Tehran center2	0.38478	0.26975	0.984	-0.5364	1.3059
		Tehran east2	-0.15272	0.24153	1.000	-0.9775	0.6721
		Fars	-0.04704	0.18984	1.000	-0.6953	0.6012
		Tehran west2	-0.14983	0.20418	1.000	-0.8471	0.5474
		Tehran south2	0.23478	0.36121	1.000	-0.9987	1.4683
	Markazi	Gilan	0.23883	0.29368	1.000	-0.7640	1.2417
		Tehran center1	0.70692	0.29647	0.528	-0.3055	1.7193
		Tehran west1	0.23692	0.31534	1.000	-0.8399	1.3138
		Tehran east1	0.76783	0.34092	0.627	-0.3964	1.9320
		Tehran north1	0.83344	0.28876	0.208	-0.1526	1.8195
		Esfahan	0.48692	0.25458	0.846	-0.3824	1.3563
		Eilam	0.34214	0.26139	0.993	-0.5505	1.2348
		Tehran north2	0.40736	0.28876	0.986	-0.5787	1.3934

		Tehran south1	0.14601	0.25664	1.000	-0.7304	1.0224
		Tehran center2	0.72692	0.33314	0.678	-0.4107	1.8645
		Tehran east2	0.18942	0.31073	1.000	-0.8717	1.2505
		Fars	0.29510	0.27250	0.999	-0.6354	1.2257
		Tehran west2	0.19231	0.28268	1.000	-0.7730	1.1576
		Tehran south2	0.57692	0.41072	0.987	-0.8256	1.9795
	Tehran north2	Gilan	-0.16853	0.25117	1.000	-1.0262	0.6892
		Tehran center1	0.29957	0.25443	0.998	-0.5693	1.1684
		Tehran west1	-0.17043	0.27618	1.000	-1.1136	0.7727
		Tehran east1	0.36047	0.30507	0.998	-0.6813	1.4022
		Tehran north1	0.42609	0.24540	0.920	-0.4119	1.2641
		Esfahan	0.07957	0.20409	1.000	-0.6174	0.7765
		Eilam	-0.06522	0.21252	1.000	-0.7909	0.6605
		Markazi	-0.40736	0.28876	0.986	-1.3934	0.5787
		Tehran south1	-0.26134	0.20664	0.995	-0.9670	0.4443
		Tehran center2	0.31957	0.29634	0.999	-0.6924	1.3315
		Tehran east2	-0.21793	0.27091	1.000	-1.1430	0.7072
		Fars	-0.11225	0.22604	1.000	-0.8842	0.6596
		Tehran west2	-0.21505	0.23821	1.000	-1.0285	0.5984
		Tehran south2	0.16957	0.38148	1.000	-1.1331	1.4723
	Tehran south1	Gilan	0.09281	0.21347	1.000	-0.6361	0.8218
		Tehran center1	0.56091	0.21730	0.386	-0.1811	1.3029
		Tehran west1	0.09091	0.24240	1.000	-0.7369	0.9187
		Tehran east1	0.62182	0.27486	0.619	-0.3168	1.5604
		Tehran north1	0.68743	0.20664	0.065	-0.0182	1.3931
		Esfahan	0.34091	0.15535	0.669	-0.1896	0.8714
		Eilam	0.19613	0.16627	0.998	-0.3717	0.7639
		Markazi	-0.14601	0.25664	1.000	-1.0224	0.7304
		Tehran north2	0.26134	0.20664	0.995	-0.4443	0.9670
		Tehran center2	0.58091	0.26514	0.671	-0.3245	1.4863
		Tehran east2	0.04341	0.23638	1.000	-0.7638	0.8506
		Fars	0.14909	0.18324	1.000	-0.4766	0.7748
	Tehran center2	Tehran west2	0.04629	0.19806	1.000	-0.6300	0.7226
		Tehran south2	0.43091	0.35779	0.997	-0.7909	1.6527
		Gilan	-0.48810	0.30114	0.953	-1.5165	0.5403
		Tehran center1	-0.02000	0.30387	1.000	-1.0577	1.0177
		Tehran west1	-0.49000	0.32230	0.973	-1.5906	0.6106
		Tehran east1	0.04091	0.34737	1.000	-1.1453	1.2271
		Tehran north1	0.10652	0.29634	1.000	-0.9054	1.1185
		Esfahan	-0.24000	0.26316	1.000	-1.1386	0.6586
		Eilam	-0.38478	0.26975	0.984	-1.3059	0.5364
		Markazi	-0.72692	0.33314	0.678	-1.8645	0.4107
		Tehran north2	-0.31957	0.29634	0.999	-1.3315	0.6924
		Tehran south1	-0.58091	0.26514	0.671	-1.4863	0.3245
		Tehran east2	-0.53750	0.31779	0.935	-1.6227	0.5477

		Fars	-0.43182	0.28053	0.970	-1.3898	0.5261
		Tehran west2	-0.53462	0.29042	0.880	-1.5264	0.4571
		Tehran south2	-0.15000	0.41609	1.000	-1.5709	1.2709
	Tehran east2	Gilan	0.04940	0.27615	1.000	-0.8936	0.9924
		Tehran center1	0.51750	0.27912	0.874	-0.4357	1.4707
		Tehran west1	0.04750	0.29908	1.000	-0.9738	1.0688
		Tehran east1	0.57841	0.32594	0.907	-0.5346	1.6915
		Tehran north1	0.64402	0.27091	0.533	-0.2811	1.5691
		Esfahan	0.29750	0.23415	0.995	-0.5021	1.0971
		Eilam	0.15272	0.24153	1.000	-0.6721	0.9775
		Markazi	-0.18942	0.31073	1.000	-1.2505	0.8717
		Tehran north2	0.21793	0.27091	1.000	-0.7072	1.1430
		Tehran south1	-0.04341	0.23638	1.000	-0.8506	0.7638
		Tehran center2	0.53750	0.31779	0.935	-0.5477	1.6227
		Fars	0.10568	0.25351	1.000	-0.7600	0.9714
		Tehran west2	0.00288	0.26442	1.000	-0.9001	0.9058
		Tehran south2	0.38750	0.39838	1.000	-0.9729	1.7479
	Fars	Gilan	-0.05628	0.23230	1.000	-0.8495	0.7370
		Tehran center1	0.41182	0.23582	0.917	-0.3935	1.2171
		Tehran west1	-0.05818	0.25914	1.000	-0.9431	0.8267
		Tehran east1	0.47273	0.28973	0.951	-0.5166	1.4621
		Tehran north1	0.53834	0.22604	0.530	-0.2336	1.3102
		Esfahan	0.19182	0.18035	0.999	-0.4241	0.8077
		Eilam	0.04704	0.18984	1.000	-0.6012	0.6953
		Markazi	-0.29510	0.27250	0.999	-1.2257	0.6354
		Tehran north2	0.11225	0.22604	1.000	-0.6596	0.8842
		Tehran south1	-0.14909	0.18324	1.000	-0.7748	0.4766
		Tehran center2	0.43182	0.28053	0.970	-0.5261	1.3898
		Tehran east2	-0.10568	0.25351	1.000	-0.9714	0.7600
		Tehran west2	-0.10280	0.21822	1.000	-0.8480	0.6424
		Tehran south2	0.28182	0.36933	1.000	-0.9794	1.5430
	Tehran west2	Gilan	0.04652	0.24416	1.000	-0.7872	0.8803
		Tehran center1	0.51462	0.24751	0.748	-0.3306	1.3598
		Tehran west1	0.04462	0.26982	1.000	-0.8768	0.9660
		Tehran east1	0.57552	0.29932	0.840	-0.4466	1.5977
		Tehran north1	0.64114	0.23821	0.314	-0.1723	1.4546
		Esfahan	0.29462	0.19539	0.975	-0.3726	0.9618
		Eilam	0.14983	0.20418	1.000	-0.5474	0.8471
		Markazi	-0.19231	0.28268	1.000	-1.1576	0.7730
		Tehran north2	0.21505	0.23821	1.000	-0.5984	1.0285
		Tehran south1	-0.04629	0.19806	1.000	-0.7226	0.6300
		Tehran center2	0.53462	0.29042	0.880	-0.4571	1.5264
		Tehran east2	-0.00288	0.26442	1.000	-0.9058	0.9001
		Fars	0.10280	0.21822	1.000	-0.6424	0.8480
		Tehran south2	0.38462	0.37690	1.000	-0.9024	1.6717

Tehran south2	Gilan	Gilan	-0.33810	0.38522	1.000	-1.6536	0.9774
		Tehran center1	0.13000	0.38736	1.000	-1.1928	1.4528
		Tehran west1	-0.34000	0.40198	1.000	-1.7127	1.0327
		Tehran east1	0.19091	0.42235	1.000	-1.2513	1.6332
		Tehran north1	0.25652	0.38148	1.000	-1.0462	1.5592
		Esfahan	-0.09000	0.35632	1.000	-1.3068	1.1268
		Eilam	-0.23478	0.36121	1.000	-1.4683	0.9987
		Markazi	-0.57692	0.41072	0.987	-1.9795	0.8256
		Tehran north2	-0.16957	0.38148	1.000	-1.4723	1.1331
		Tehran south1	-0.43091	0.35779	0.997	-1.6527	0.7909
		Tehran center2	0.15000	0.41609	1.000	-1.2709	1.5709
		Tehran east2	-0.38750	0.39838	1.000	-1.7479	0.9729
		Fars	-0.28182	0.36933	1.000	-1.5430	0.9794
		Tehran west2	-0.38462	0.37690	1.000	-1.6717	0.9024
inten	Gilan	Tehran center1	0.37262	0.26097	0.984	-0.5186	1.2638
		Tehran west1	-0.01905	0.28237	1.000	-0.9833	0.9452
		Tehran east1	0.70671	0.31088	0.611	-0.3549	1.7683
		Tehran north1	0.37371	0.25210	0.978	-0.4872	1.2346
		Esfahan	0.23512	0.21178	0.999	-0.4881	0.9583
		Eilam	0.22697	0.21998	0.999	-0.5242	0.9781
		Markazi	-0.37546	0.29477	0.995	-1.3821	0.6311
		Tehran north2	0.29762	0.25210	0.998	-0.5633	1.1585
		Tehran south1	0.04307	0.21426	1.000	-0.6886	0.7747
		Tehran center2	0.75595	0.30226	0.442	-0.2762	1.7881
		Tehran east2	-0.29613	0.27718	0.999	-1.2426	0.6504
		Fars	0.24459	0.23316	0.999	-0.5516	1.0408
		Tehran west2	0.09570	0.24506	1.000	-0.7412	0.9325
		Tehran south2	0.21429	0.38665	1.000	-1.1061	1.5346
	Tehran center1	Gilan	-0.37262	0.26097	0.984	-1.2638	0.5186
		Tehran west1	-0.39167	0.28530	0.989	-1.3659	0.5826
		Tehran east1	0.33409	0.31354	0.999	-0.7366	1.4048
		Tehran north1	0.00109	0.25538	1.000	-0.8710	0.8732
		Esfahan	-0.13750	0.21567	1.000	-0.8740	0.5990
		Eilam	-0.14565	0.22372	1.000	-0.9096	0.6183
		Markazi	-0.74808	0.29758	0.433	-1.7642	0.2681
		Tehran north2	-0.07500	0.25538	1.000	-0.9471	0.7971
		Tehran south1	-0.32955	0.21810	0.974	-1.0743	0.4152
		Tehran center2	0.38333	0.30500	0.995	-0.6582	1.4248
		Tehran east2	-0.66875	0.28016	0.526	-1.6254	0.2879
		Fars	-0.12803	0.23670	1.000	-0.9363	0.6803
	Tehran west1	Tehran west2	-0.27692	0.24843	0.999	-1.1253	0.5714
		Tehran south2	-0.15833	0.38880	1.000	-1.4860	1.1693
		Gilan	0.01905	0.28237	1.000	-0.9452	0.9833
	Tehran center1	Tehran center1	0.39167	0.28530	0.989	-0.5826	1.3659
		Tehran east1	0.72576	0.33157	0.673	-0.4065	1.8580

		Tehran north1	0.39275	0.27721	0.985	-0.5539	1.3394
		Esfahan	0.25417	0.24112	0.999	-0.5692	1.0776
		Eilam	0.24601	0.24835	1.000	-0.6021	1.0941
		Markazi	-0.35641	0.31651	0.999	-1.4372	0.7244
		Tehran north2	0.31667	0.27721	0.998	-0.6300	1.2633
		Tehran south1	0.06212	0.24330	1.000	-0.7687	0.8930
		Tehran center2	0.77500	0.32350	0.520	-0.3297	1.8797
		Tehran east2	-0.27708	0.30019	1.000	-1.3022	0.7480
		Fars	0.26364	0.26010	1.000	-0.6246	1.1518
		Tehran west2	0.11474	0.27082	1.000	-0.8101	1.0396
		Tehran south2	0.23333	0.40347	1.000	-1.1445	1.6111
	Tehran east1	Gilan	-0.70671	0.31088	0.611	-1.7683	0.3549
		Tehran center1	-0.33409	0.31354	0.999	-1.4048	0.7366
		Tehran west1	-0.72576	0.33157	0.673	-1.8580	0.4065
		Tehran north1	-0.33300	0.30620	0.999	-1.3786	0.7126
		Esfahan	-0.47159	0.27396	0.925	-1.4071	0.4639
		Eilam	-0.47974	0.28034	0.929	-1.4371	0.4776
		Markazi	-1.08217	0.34219	0.104	-2.2507	0.0863
		Tehran north2	-0.40909	0.30620	0.992	-1.4547	0.6365
		Tehran south1	-0.66364	0.27588	0.512	-1.6057	0.2784
		Tehran center2	0.04924	0.34866	1.000	-1.1414	1.2399
		Tehran east2	-1.00284	0.32715	0.134	-2.1200	0.1143
		Fars	-0.46212	0.29080	0.960	-1.4552	0.5309
		Tehran west2	-0.61101	0.30043	0.777	-1.6369	0.4149
		Tehran south2	-0.49242	0.42392	0.998	-1.9400	0.9552
	Tehran north1	Gilan	-0.37371	0.25210	0.978	-1.2346	0.4872
		Tehran center1	-0.00109	0.25538	1.000	-0.8732	0.8710
		Tehran west1	-0.39275	0.27721	0.985	-1.3394	0.5539
		Tehran east1	0.33300	0.30620	0.999	-0.7126	1.3786
		Esfahan	-0.13859	0.20485	1.000	-0.8381	0.5609
		Eilam	-0.14674	0.21331	1.000	-0.8752	0.5817
		Markazi	-0.74916	0.28983	0.384	-1.7389	0.2406
		Tehran north2	-0.07609	0.24631	1.000	-0.9172	0.7650
		Tehran south1	-0.33063	0.20741	0.959	-1.0389	0.3776
		Tehran center2	0.38225	0.29744	0.994	-0.6335	1.3980
		Tehran east2	-0.66984	0.27192	0.470	-1.5984	0.2587
		Fars	-0.12912	0.22688	1.000	-0.9039	0.6456
		Tehran west2	-0.27801	0.23910	0.998	-1.0945	0.5385
		Tehran south2	-0.15942	0.38290	1.000	-1.4670	1.1481
	Esfahan	Gilan	-0.23512	0.21178	0.999	-0.9583	0.4881
		Tehran center1	0.13750	0.21567	1.000	-0.5990	0.8740
		Tehran west1	-0.25417	0.24112	0.999	-1.0776	0.5692
		Tehran east1	0.47159	0.27396	0.925	-0.4639	1.4071
		Tehran north1	0.13859	0.20485	1.000	-0.5609	0.8381
		Eilam	-0.00815	0.16369	1.000	-0.5671	0.5508

		Markazi	-0.61058	0.25553	0.524	-1.4832	0.2620
		Tehran north2	0.06250	0.20485	1.000	-0.6370	0.7620
		Tehran south1	-0.19205	0.15593	0.996	-0.7245	0.3404
		Tehran center2	0.52083	0.26414	0.814	-0.3811	1.4228
		Tehran east2	-0.53125	0.23502	0.621	-1.3338	0.2713
		Fars	0.00947	0.18102	1.000	-0.6087	0.6276
		Tehran west2	-0.13942	0.19612	1.000	-0.8091	0.5303
		Tehran south2	-0.02083	0.35764	1.000	-1.2421	1.2005
	Eilam	Gilan	-0.22697	0.21998	0.999	-0.9781	0.5242
		Tehran center1	0.14565	0.22372	1.000	-0.6183	0.9096
		Tehran west1	-0.24601	0.24835	1.000	-1.0941	0.6021
		Tehran east1	0.47974	0.28034	0.929	-0.4776	1.4371
		Tehran north1	0.14674	0.21331	1.000	-0.5817	0.8752
		Esfahan	0.00815	0.16369	1.000	-0.5508	0.5671
		Markazi	-0.60242	0.26236	0.594	-1.4984	0.2935
		Tehran north2	0.07065	0.21331	1.000	-0.6578	0.7991
		Tehran south1	-0.18389	0.16689	0.999	-0.7538	0.3860
		Tehran center2	0.52899	0.27075	0.824	-0.3956	1.4536
		Tehran east2	-0.52310	0.24243	0.695	-1.3510	0.3048
		Fars	0.01762	0.19055	1.000	-0.6331	0.6683
		Tehran west2	-0.13127	0.20494	1.000	-0.8311	0.5686
		Tehran south2	-0.01268	0.36255	1.000	-1.2507	1.2254
	Markazi	Gilan	0.37546	0.29477	0.995	-0.6311	1.3821
		Tehran center1	0.74808	0.29758	0.433	-0.2681	1.7642
		Tehran west1	0.35641	0.31651	0.999	-0.7244	1.4372
		Tehran east1	1.08217	0.34219	0.104	-0.0863	2.2507
		Tehran north1	0.74916	0.28983	0.384	-0.2406	1.7389
		Esfahan	0.61058	0.25553	0.524	-0.2620	1.4832
		Eilam	0.60242	0.26236	0.594	-0.2935	1.4984
		Tehran north2	0.67308	0.28983	0.575	-0.3166	1.6628
		Tehran south1	0.41853	0.25759	0.952	-0.4611	1.2982
		Tehran center2	1.13141	0.33438	0.055	-0.0104	2.2732
		Tehran east2	0.07933	0.31188	1.000	-0.9857	1.1444
		Fars	0.62005	0.27351	0.616	-0.3140	1.5540
		Tehran west2	0.47115	0.28373	0.943	-0.4977	1.4400
		Tehran south2	0.58974	0.41225	0.984	-0.8180	1.9975
	Tehran north2	Gilan	-0.29762	0.25210	0.998	-1.1585	0.5633
		Tehran center1	0.07500	0.25538	1.000	-0.7971	0.9471
		Tehran west1	-0.31667	0.27721	0.998	-1.2633	0.6300
		Tehran east1	0.40909	0.30620	0.992	-0.6365	1.4547
		Tehran north1	0.07609	0.24631	1.000	-0.7650	0.9172
		Esfahan	-0.06250	0.20485	1.000	-0.7620	0.6370
		Eilam	-0.07065	0.21331	1.000	-0.7991	0.6578
		Markazi	-0.67308	0.28983	0.575	-1.6628	0.3166
		Tehran south1	-0.25455	0.20741	0.996	-0.9628	0.4537

		Tehran center2	0.45833	0.29744	0.969	-0.5574	1.4741
		Tehran east2	-0.59375	0.27192	0.676	-1.5223	0.3348
		Fars	-0.05303	0.22688	1.000	-0.8278	0.7217
		Tehran west2	-0.20192	0.23910	1.000	-1.0184	0.6146
		Tehran south2	-0.08333	0.38290	1.000	-1.3909	1.2242
	Tehran south1	Gilan	-0.04307	0.21426	1.000	-0.7747	0.6886
		Tehran center1	0.32955	0.21810	0.974	-0.4152	1.0743
		Tehran west1	-0.06212	0.24330	1.000	-0.8930	0.7687
		Tehran east1	0.66364	0.27588	0.512	-0.2784	1.6057
		Tehran north1	0.33063	0.20741	0.959	-0.3776	1.0389
		Esfahan	0.19205	0.15593	0.996	-0.3404	0.7245
		Eilam	0.18389	0.16689	0.999	-0.3860	0.7538
		Markazi	-0.41853	0.25759	0.952	-1.2982	0.4611
		Tehran north2	0.25455	0.20741	0.996	-0.4537	0.9628
		Tehran center2	0.71288	0.26613	0.322	-0.1959	1.6217
		Tehran east2	-0.33920	0.23725	0.984	-1.1494	0.4710
		Fars	0.20152	0.18392	0.999	-0.4265	0.8296
		Tehran west2	0.05262	0.19879	1.000	-0.6262	0.7315
		Tehran south2	0.17121	0.35912	1.000	-1.0551	1.3975
	Tehran center2	Gilan	-0.75595	0.30226	0.442	-1.7881	0.2762
		Tehran center1	-0.38333	0.30500	0.995	-1.4248	0.6582
		Tehran west1	-0.77500	0.32350	0.520	-1.8797	0.3297
		Tehran east1	-0.04924	0.34866	1.000	-1.2399	1.1414
		Tehran north1	-0.38225	0.29744	0.994	-1.3980	0.6335
		Esfahan	-0.52083	0.26414	0.814	-1.4228	0.3811
		Eilam	-0.52899	0.27075	0.824	-1.4536	0.3956
		Markazi	-1.13141	0.33438	0.055	-2.2732	0.0104
		Tehran north2	-0.45833	0.29744	0.969	-1.4741	0.5574
		Tehran south1	-0.71288	0.26613	0.322	-1.6217	0.1959
		Tehran east2	-1.05208	0.31897	0.071	-2.1413	0.0372
		Fars	-0.51136	0.28157	0.890	-1.4729	0.4501
		Tehran west2	-0.66026	0.29150	0.617	-1.6557	0.3352
		Tehran south2	-0.54167	0.41763	0.994	-1.9678	0.8845
	Tehran east2	Gilan	0.29613	0.27718	0.999	-0.6504	1.2426
		Tehran center1	0.66875	0.28016	0.526	-0.2879	1.6254
		Tehran west1	0.27708	0.30019	1.000	-0.7480	1.3022
		Tehran east1	1.00284	0.32715	0.134	-0.1143	2.1200
		Tehran north1	0.66984	0.27192	0.470	-0.2587	1.5984
		Esfahan	0.53125	0.23502	0.621	-0.2713	1.3338
		Eilam	0.52310	0.24243	0.695	-0.3048	1.3510
		Markazi	-0.07933	0.31188	1.000	-1.1444	0.9857
		Tehran north2	0.59375	0.27192	0.676	-0.3348	1.5223
		Tehran south1	0.33920	0.23725	0.984	-0.4710	1.1494
		Tehran center2	1.05208	0.31897	0.071	-0.0372	2.1413
		Fars	0.54072	0.25445	0.717	-0.3282	1.4096

		Tehran west2	0.39183	0.26540	0.979	-0.5145	1.2981
		Tehran south2	0.51042	0.39985	0.995	-0.8550	1.8759
	Fars	Gilan	-0.24459	0.23316	0.999	-1.0408	0.5516
		Tehran center1	0.12803	0.23670	1.000	-0.6803	0.9363
		Tehran west1	-0.26364	0.26010	1.000	-1.1518	0.6246
		Tehran east1	0.46212	0.29080	0.960	-0.5309	1.4552
		Tehran north1	0.12912	0.22688	1.000	-0.6456	0.9039
		Esfahan	-0.00947	0.18102	1.000	-0.6276	0.6087
		Eilam	-0.01762	0.19055	1.000	-0.6683	0.6331
		Markazi	-0.62005	0.27351	0.616	-1.5540	0.3140
		Tehran north2	0.05303	0.22688	1.000	-0.7217	0.8278
		Tehran south1	-0.20152	0.18392	0.999	-0.8296	0.4265
		Tehran center2	0.51136	0.28157	0.890	-0.4501	1.4729
		Tehran east2	-0.54072	0.25445	0.717	-1.4096	0.3282
		Tehran west2	-0.14889	0.21903	1.000	-0.8969	0.5991
		Tehran south2	-0.03030	0.37070	1.000	-1.2962	1.2356
	Tehran west2	Gilan	-0.09570	0.24506	1.000	-0.9325	0.7412
		Tehran center1	0.27692	0.24843	0.999	-0.5714	1.1253
		Tehran west1	-0.11474	0.27082	1.000	-1.0396	0.8101
		Tehran east1	0.61101	0.30043	0.777	-0.4149	1.6369
		Tehran north1	0.27801	0.23910	0.998	-0.5385	1.0945
		Esfahan	0.13942	0.19612	1.000	-0.5303	0.8091
		Eilam	0.13127	0.20494	1.000	-0.5686	0.8311
		Markazi	-0.47115	0.28373	0.943	-1.4400	0.4977
		Tehran north2	0.20192	0.23910	1.000	-0.6146	1.0184
		Tehran south1	-0.05262	0.19879	1.000	-0.7315	0.6262
		Tehran center2	0.66026	0.29150	0.617	-0.3352	1.6557
		Tehran east2	-0.39183	0.26540	0.979	-1.2981	0.5145
		Fars	0.14889	0.21903	1.000	-0.5991	0.8969
		Tehran south2	0.11859	0.37830	1.000	-1.1733	1.4104
	Tehran south2	Gilan	-0.21429	0.38665	1.000	-1.5346	1.1061
		Tehran center1	0.15833	0.38880	1.000	-1.1693	1.4860
		Tehran west1	-0.23333	0.40347	1.000	-1.6111	1.1445
		Tehran east1	0.49242	0.42392	0.998	-0.9552	1.9400
		Tehran north1	0.15942	0.38290	1.000	-1.1481	1.4670
		Esfahan	0.02083	0.35764	1.000	-1.2005	1.2421
		Eilam	0.01268	0.36255	1.000	-1.2254	1.2507
		Markazi	-0.58974	0.41225	0.984	-1.9975	0.8180
		Tehran north2	0.08333	0.38290	1.000	-1.2242	1.3909
		Tehran south1	-0.17121	0.35912	1.000	-1.3975	1.0551
		Tehran center2	0.54167	0.41763	0.994	-0.8845	1.9678
		Tehran east2	-0.51042	0.39985	0.995	-1.8759	0.8550
		Fars	0.03030	0.37070	1.000	-1.2356	1.2962
		Tehran west2	-0.11859	0.37830	1.000	-1.4104	1.1733

*. The mean difference is significant at the .05 level.

