

An Analysis of the Factors Influencing Success of Bank-issued Micropayment Systems in Iran

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Abstract

The object of this study is to analyze the factors influencing success of Bank-issued micropayment systems in Iran. Based on an existing IS post acceptance model which considers well known factors, we focus on studying the influence of a new factor related to compulsion (direct and indirect). Our model consists of seven main factors along with 'Direct compulsion' defined as a mediator variable between "Satisfaction", "Perceived Usefulness", "Network Externalities" and "Continuance Intension". 409 filled questionnaires were gathered and analyzed to check thirteen hypotheses related to our model. The collected data have been analyzed at three levels. First, some descriptive statistics are derived in order to obtain an overview of the characteristics of the sample. Second, bivariate

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correlations between variables are analyzed with respect to the correlation between scales of variables and mediator variables. The final stage of the analysis adopts a regression analysis in order to identify the eventual existence of association and relationship between the dependent and independent variables.

Keywords: *bank-issued, e-micropayment program, electronic bill payment*

JEL Classification: *C12, C21, C42, C81, G21, M15*

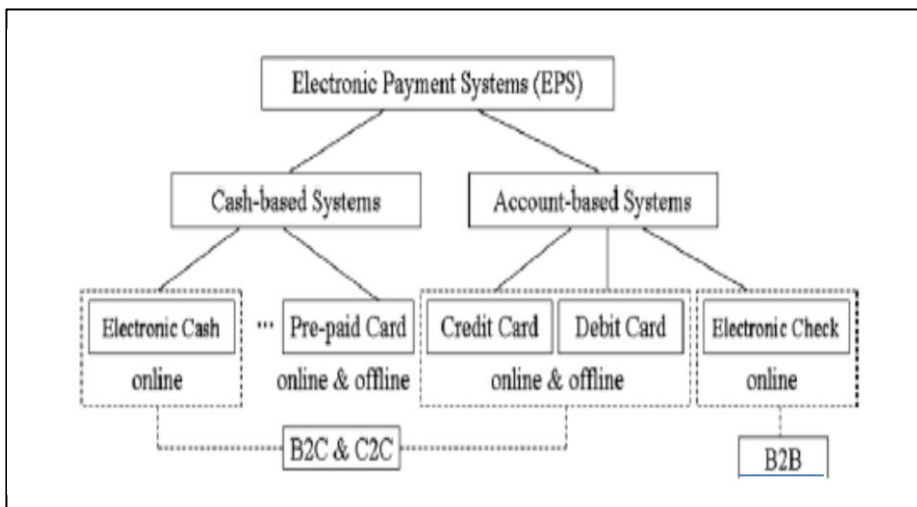
1. Introduction

Lacking payment systems becomes a bottleneck for the vision of the Information Economy. In many cases, the payments of a fraction of a cent, the so-called micropayments, are of particular interest"(Schmidt et al., 1999).

Points of sale (POS) transactions involving micropayment are common in our daily affairs (Tan et al., 2008).

According to the Central Bank of Iran, the payment value less than 50 Million Rials is considered as a micropayment's transaction. Because of the amount of this value (50 Million Rials), all instruments of Cash-based systems and Account-based systems in EPS (Electronic Payment Systems) except electronic check are engaged in Iran's micropayment system definition. It means Micropayment systems are equivalent to e-payment. Common payment method, i.e. credit card is uneconomical because its processing charge may exceed the value of the micropayment. Hence, in this study a value margin for Micropayments in Iran will be defined (see figure 1) and we will focus on transactions which we will consider as Bank-issued micropayment system definition in Iran.

Figure 1: Classification of Electronic Payment System, (Kim, 2009)



Operators have introduced a number of *e-micropayment* programs around the world to replace cash and coins for such low-value payments. As mentioned by Clark (2005), some payment analysts predicted that smart cards could lead to a cashless society. However, with the exception of a few, e.g. Smart card, many of such programs are not so successful especially in Iran and the vision of a cashless society is still a dream and the very smallest payments have stubbornly remained the domain of cash and coin (McGrath, 2006).

Success of POS *e-micropayment* program depends to a large extent on the presence of network externality. POS *e-micropayment* program is a network good (Baddeley, 2004) with micropayment market being a two-sided market with both consumers (demand side) and merchants (supply side). He mentioned, when the value of a product depends on the number of users, the product exhibits network effects. When the value increases with the number of users, there are positive network effects.

The other success of *E-micropayment* system depends on Government Direct Compulsion and Indirect Compulsion related to Lock-in customer. *First*, one report (tabnak.ir, 2010) says: now in Iran/Tehran, some branches of Government banks refuse the receiving invoice bills (telecommunication bill, electrical bill, water bill ۴). Those bank's tellers enforce customers to use ATM machines and the other *e-payment* media which are the only ways to pay these bills. Another report (ravy.ir, 2010) says: according to Central Bank Circular in Tehran for Mobile phone bills in case of face to face payment in a physical branch, customers must pay 2000 Rials extra charge. *Second*, in case of Lock-in customer related to indirect compulsion, gifts, bonus and zero *e-payment* transaction charges for customers are noticeable things to IS continuance intention program.

There is recent growing activities showing that *e-micropayment* program in Iran is now going through a revival. Iran local banks and financial institutes have started to pay attention to the potential offers of the micropayment market. They are co-operating with organizations which have

existing captive markets, i.e. department stores (e.g. loyalty cards), to issue e-micropayment programs so as to extract commercial benefits for themselves and their partners. This study examines the opinion of consumers on such programs and uses an extended Post-acceptance Model of IS Continuance to study the factors influencing consumers' intention to continue using such e-micropayment system.

The micropayment systems in IRAN have considerably changed into electronic payment, especially in the large cities. This thesis looks into issues related to e-micropayment systems offered by Banking and financial institutions. We also analyze the factors which influence success of these financial institutes' micropayment systems in Iran.

Payment Systems in Iran

"Electronic payment is widely used all over the world, but it is not common yet in Iran" (Keramati et al., 2008).

About the history of Payment systems in Iran, a report of the Central bank of Iran (CBI, 2009) says: "Considering the double digit inflation rate and relative stability in the currency denomination, the recent trend of the payment instrument has gradually moved from notes to various kinds of cheques, particularly traveler's cheques. The introduction of modern payment instruments can be traced back to early 1990s where commercial bank of Sepah launched its Aber Bank Debit Card and ATM services. Since then, almost all Iranian banks have provided their customers with the card payment services focusing on cards with debit function and ATM services to tackle the problem of heavy branch traffics. The interbank card switch (SHETAB) was introduced in 2002 and now all card issuing banks in Iran are connected to the center; building up a uniform card payment network where all issued cards are accepted in all acquiring terminals".

The history of the payment system in Iran offers a backdrop for better understanding data on the most common payment instruments in use today.

The Research Subject

The POS, ATM, Mobile, and Telephone as well as E-micropayment programs are undergoing a revival in IRAN. The growth of E-Payment services instruments in the last decade in Iran is considerable. Local banks and financial institutes are co-operating with organizations which have existing captive markets to issue a variety of cards (Debit, Credit, Gift, and prepaid). This thesis aims at helping researchers and the programs operators to understand the dynamics influencing such a revival. In order to reach our goal, we intend to:

- Analyze the current situation of micropayment instruments in Iran in Bank-issued sector.
- Define a value margin for Micropayment system in IRAN.
- Analyze the success factors in bank-issued micropayment systems in Iran.
- Compare the Iranian bank issued micropayment system with the other countries like Taiwan for example.
- Survey the characteristics which lead to successful adoption and diffusion of such programs.

2. Literature Review

What is Payment?

All commerce is about payment; commerce is making payment and receiving payment. If there is no payment, there is no commerce (A first data whitepaper, 2008).

A payment is the transfer of wealth from one party (such as a person or company) to another. A payment is usually made in exchange for the provision of goods, services or both, or to fulfill a legal obligation.

Definitions of E-Payment Systems (EPS)

Several authors have proposed different definitions and classifications for e-payment. Here are some of the main definitions found in the literature.

E-Payment is defined as the transfer of an electronic value of payment from a payer to a payee through an e-payment mechanism. E-Payment services exist as web-based user-interfaces that allow customers to remotely access and manage their bank accounts and transactions (Weir, 2006; Lim, 2008).

When EC created the need for e-payment services, traditional cash-based and account-based payment instruments were used as a model. Simultaneously, new intermediaries such as PayPal succeeded in fulfilling some of the new needs of online merchants and consumers (Dahlberg, T. et al, 2008).

International banking statistics from the Bank of International Settlements and the European Central Bank show that the popular payment instruments used for the payment of day-to-day purchases include cash, cheques, debit cards, and credit cards. In general, EPS can be classified into five categories which are listed below (Lawrence, 2002; Guan, 2003; Abrazhevich, 2004; Dai, 2007 and Schneider, 2007).

1. Electronic-cash: transactions are settled via the exchange of electronic currency.
2. Pre-paid card: customers use a pre-paid card for a specified amount by making an entry of the unique card number on merchant sites. The value of the card is decreased by the amount paid to the merchant.
3. Credit cards: a server authenticates consumers and verifies with the bank whether adequate funds are available prior to purchase; charges are posted against a customer's account; and the customer is billed later for the charges and pays the balance of the account to the bank.
4. Debit cards: a customer maintains a positive balance in the account, and money is deducted from the account when a debit transaction is performed.

5. Electronic checks: an institution electronically settles transactions between the buyer's bank and the seller's bank in the form of an electronic cheque.

Electronic-cash, pre-paid cards, credit cards, and debit cards are widely used in B2C and C2C EC (Theodosios et al., 2005).

Overviews on Micropayment

From a formal point of view, *Castiglione et al., (2009)* defined a *micropayment scheme* as a distributed protocol where a party, the *Client User*, is interested in paying a *Vendor*.

The Bank for International Settlements (Bank for International Settlements, 2001) defines micropayment as a small payment (sometimes taken as under US\$10, sometimes meaning not more than a few cents, but in Iran it is under 50 million Rials according to the CBI) which would be uneconomical to process through traditional payment system. Generally, micropayment involves coins and cash (*Kou, 2003*).

In CBI micropayment's definition, Bill payment is one good choice for e-micropayment program in bank-issued micropayment. Except for few bill payments (industrial sectors and large companies), most of bill payments are under 50 million Rials, and they can be studied in micropayment category in the context of our research.

Consider a market with three parties: a *micro-payment system provider* (Bank and financial institutes as Bank-issued micropayment in this study), a number of merchants e.g. telecommunication sectors, and a number of consumers. Consumers and merchants trade with each other and the trades are settled with transactions of their bill amounts i.e. *micro-payments*.

Consumers and merchants must also be convinced of the benefits brought by the program. Standardization is often critical to its success and is achieved either through strategic alliance between key players or through government's control or co-ordination. Such strategic alliance should also

move beyond standardization to develop functionalities that will increase the value proposition of the program.

Size of Electronic Payment

Electronic payment system is conducted in different e-commerce categories such as Business-to-Business (B2B), Business-to-Consumer (B2C), Consumer-to-Business (C2B) and Consumer-to-Consumer (C2C). Each of which has special characteristics that depend on the value of order. Danial in 2002 classified electronic payment systems in the following way:

س Micro Payment (less than \$ 10) that is mainly conducted in C2C and B2C e-commerce.

س Consumer Payment that has a value between \$ 10 and \$ 500. It is conducted mainly in B2C transactions.

س Business Payment that has a value greater than \$ 500 is conducted mainly in B2B e-commerce .

B2B transactions account about 95% of e-commerce transactions, while others account about 5% (Turban et al., 2004). P2P, which is related to the C2C category transactions, is relatively small due to its stiff usability. Further, Cavarretta and de Silva (1995), identify three classes of typical electronic transactions:

س Tiny value transactions: below \$1.

س Medium value transactions: between \$ 1 and \$ 1,000

س Large value transactions: above \$ 1,000.

Systems that can support tiny value transactions have to trade-off between conveniences of transactions (the major part of a cost in an extremely cheap transaction) vs. the security or durability of transactions. On the other side of the amount range, large value transactions will require highly secure protocols whose implementations are costly: be on-line and/or carry traceability information. Finally, nearly all the system can perform medium value transactions (Sumanjeet, 2009).

Size of Electronic Payment in Iran

According to the Central Bank of Iran, a payment value less than 50 Million Rials is considered as a micropayment transaction. Because of the amount of this value (50 Million Rials), all instruments of Cash-based systems and Account-based systems in EPS (Electronic Payment Systems) except electronic checks are engaged in Iran's micropayment system definition. It means Micropayment systems are equivalent to E-Payment in Iran according to CBI definition.

Micro Payment or Retail Payment (less than 50,000,000 Rilas or \$ 5,000) that is mainly conducted in C2C and B2C e-commerce.

Business Payment that has a value of more than 50,000,000 Rials or \$ 5000. It is conducted mainly in B2B e-commerce.

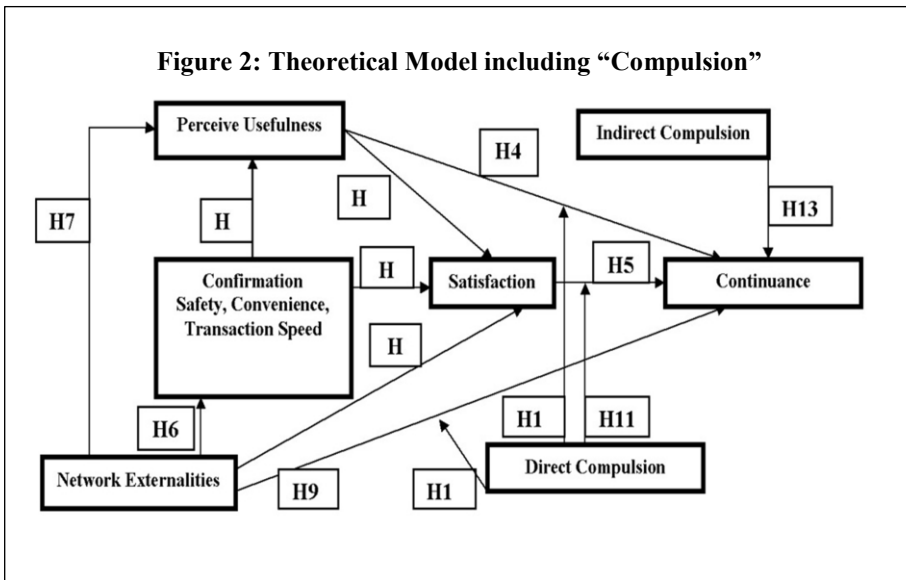
Theoretical Model

This research will use the Post-acceptance Model of IS (Information System) Continuance as the theoretical foundation to analyze the factors influencing continuance usage of e-micropayment programs in IRAN.

Tan's research in 2008 describes this model as the following: "This model, introduced by Bhattacharjee (2001) combines the expectation° confirmation theory (Oliver, 1980), a theory used to study consumer satisfaction and post-purchase behavior, and the Technology Acceptance Model (TAM). This theory explains a user s intention to continue using an information system. It suggests that such users intention is determined by their satisfaction with IS use and perceived usefulness of continued IS use. Users satisfaction, in turn, is influenced by their confirmation of expectation from prior IS use and perceived usefulness". Chuttur in 2009 confirmed again that TAM is indeed a very popular model for explaining and predicting system use. He mentioned also that although many models have been proposed to explain and predict the use of a system, the TAM has been the only one which has the most attention of the IS community.

The theoretical model we are proposing is as shown in figure below. Considering our literature review and the findings of Tan's study in a similar

research in Taiwan, we will include *safety, convenience and transaction processing speed* as the three elements under confirmation and we intend to explore whether they are influential in Iran consumers continuance intention to use the program. In addition, as network externality is important, we will extend Bhattacharjee's model to incorporate supply side and demand side of network externality. Tan believes initial acceptance is an important first step toward realizing IS success. Long-term viability of an IS and its eventual success depend on its *continued* use rather than *first-time* use. For our study, we will analyze the impact of Direct Compulsion in success of the e-micropayment in Iran. Direct compulsion refers to "Must use E-payment system and do not have any other option". There is also Indirect Compulsion which refers to Lock-in customer to continuance intention of the program that we have to investigate in our study. Thus, we have defined thirteen hypotheses concerning the program as shown in figure 2 below:



The concrete security requirements of electronic payment systems vary, depending both on their features and the trust assumptions placed on their operation (Asokan, 1997). Micropayments are low-value payments that are

made very quickly, like paying for each tick of a phone call. Given these constraints, micropayment techniques must be fast. The first hypothesis for this study considers the three elements of user's confirmation with respect to satisfaction including security, convenience and processing speed of transaction.

H1. Users confirmation (*with safety, convenience and processing Speed transaction*) is positively associated with their satisfaction with the program.

The second hypothesis for this study will show the relation and effect of user's confirmation with respect to perceived usefulness to the micropayment program as follows:

H2. Users confirmation (*with safety, convenience and processing Speed transaction*) is positively associated with their perceived usefulness of the program.

Perceived usefulness is an important primarily belief construct of TAM and is the degree to which a person believes that use of a system will improve his or her performance (Davis, 1989). Hence, our suggestion is that the relation between perceived usefulness and user's satisfaction derives the third hypothesis of this study as follows:

H3. Users perceived usefulness is positively associated with their satisfaction with the program.

According to the TAM model and post-purchase user's behavior, there is a relation between perceived usefulness and continuance intension of using a micropayment program. This is expressed below by the 4th hypothesis for this study.

H4. Users perceived usefulness is positively associated with their continuance intention to use the program.

Finally, through the fifth hypothesis below, we will investigate the relation between users satisfaction and their continuance intension using the micropayment program:

H5. User s level of satisfaction is positively associated with their continuance intention to use the program.

Saloner et al. (1995) mentioned that the networks literature suggests that a network's value increases in the number of locations it serves (the "network effect") and the number of its users (the "production scale effect"). They said that a good sample is telephone systems, which are perhaps the best-known example of a technology with important network effects; there are two types of effects. *First*, the benefit of the technology to an individual user increases in the number of telephones, i.e., in the number of locations from which the system can be accessed. This accessibility effect also exists, for example, in retail distribution networks where consumer benefit increases in the number of outlets at which the good is available. *Second*, the benefit increases in the number of people on the system: as the number of people who make and receive calls increases, each individual can communicate with more people. This second effect is the source of network externalities because each new user confers a benefit on all other users.

On the other hand, (Tan, 2008) noted the following: "the economic value of an e-micropayment program is an increasing function of its ubiquity, that is the more users (demand side) use it and the more merchants (supply side) accept it, the more valuable the system is to users, merchants and system operators."

In the case of our study, we are going to investigate the benefit of the technology as the Number of Location (NOL) from merchants (supply side) from which the system can be accessed and served. We will also investigate the benefit of Number of Users (NOU) who engaged (demand side) to the micropayment program. Hence, we will define four hypotheses as follows:

H6. Network externality of the program is positively associated with users extent of confirmation.

H7. Network externality of the program is positively associated with users' perceived usefulness.

H8. Network externality of the program is positively associated with users' level of satisfaction with the program.

H9. Network externality of the program is positively associated with users' continuance intention to use the program.

As we have mentioned before, we intend in this study to consider the specificity related to the compulsion of the Iranian government in the banking sector to make some bill payment by electronic media. Hence, we will define three hypotheses related to the government (direct) compulsion using *E-Payment* facilities offered by Banking system and financial institutes. We use Government Compulsion as a Moderator variable to define hypotheses. The mediator variable, then, serves to clarify the nature of the relationship between the independent and dependent variables (MacKinnon, 2008).

H10. Government Compulsion of the program has a positive effect on the relation between users' perceived usefulness and their continuance intention using the program.

H11. Government Compulsion of the program has a positive effect on the relation between users' level of satisfaction and their continuance intention using the program.

H12. Government compulsion of the program has a positive effect on the relation between network externality of the program and users' continuance intention using the program.

The last hypothesis for this study is related to Indirect Compulsion (Lock-in customers) as the 13th one.

H13. User Lock-in is positively associated with their continuance intention to use the program.

As a result of the restriction imposed by the Iran's Banking Act, we include department store in our analysis because IRAN has high department store density and the operators of department stores are active in introducing

such programs. All kinds of cards that are issued by banking systems are used in department stores.

3. Methodology

In this section, we will concentrate on the method we adopted throughout this study and research. First of all, the choice of method for the study will be used for. We will then discuss the research method, research strategy, research process and the quality of the research.

This study used primary sources in a form of "Consumer Survey" questionnaire in obtaining the perceptions of bank customers (mostly individual customers) and Iranian citizens who are customers of department stores in case of Bank-issued Micropayment program. An extensive review of the available literature provided the foundations for the writing of the thesis. The study collected data from secondary sources such as the internet, articles, databases, and books, and were analyzed and interpreted. In the rare situations when official statistics are available, the recentness of the data determined its usefulness.

Survey Study Design

In this study it was necessary to first examine the area of electronic retail payment and its influence in retail payments and so expand to Micropayment. Through in-depth case study of IRAN, how electronic payment has influenced the retail payment and Micropayment market in IRAN were investigated and analyzed. This study is based on both primary and secondary data and it provides a framework for considering how Micropayment system can help solve retail payments problems.

This research work involves the use of survey. Questionnaires were sent to bank customers and department stores customers also to ascertain how the various Micropayment products have proved to be a solution to their payment problems.

Pre Testing

To improve the validity and reliability of research data; pre-testing was conducted before sending questionnaires to respondents. In order to control elements such as understanding, number, order, sensitiveness, and required time of questions, initial personal interviews with eight experts (including academic and industrial experts) were held. First, we asked two experts for any modifications. After applying their views, the test was administered for the second time. When the last two experts did not have any significant points to add, we stopped the modification process.

Pilot Testing

After pre-testing, the questionnaire was sent to a group of 13 respondents in positions similar to those of final respondents. They were asked to answer the questions and suggest any modifying views concerning our questions. We then applied slight modifications and prepared the final draft.

Sampling

Hair et al. (2009), states that to determine a sample size from a large population, three decisions must be made: (1) the degree of confidence (often 95%); (2) the specified level of precision (amount of acceptable error); and (3) the amount of variability (population homogeneity). Thus, as a result he formulated the amount of sample size as the following statement:

Sample size= [(degree of confidence required * variability)/ (desired precision)]²

In the pilot study as we calculated the value of variability or standard variation and found it equal to 1 (because of the used Likert question). The degree of confidence level (95%) for a Normal distribution is 1.96, and for the last item which is desired precision, we assumed that 0.1 (e.g. the difference between two means: population means and sample means should be lower than 0.1).

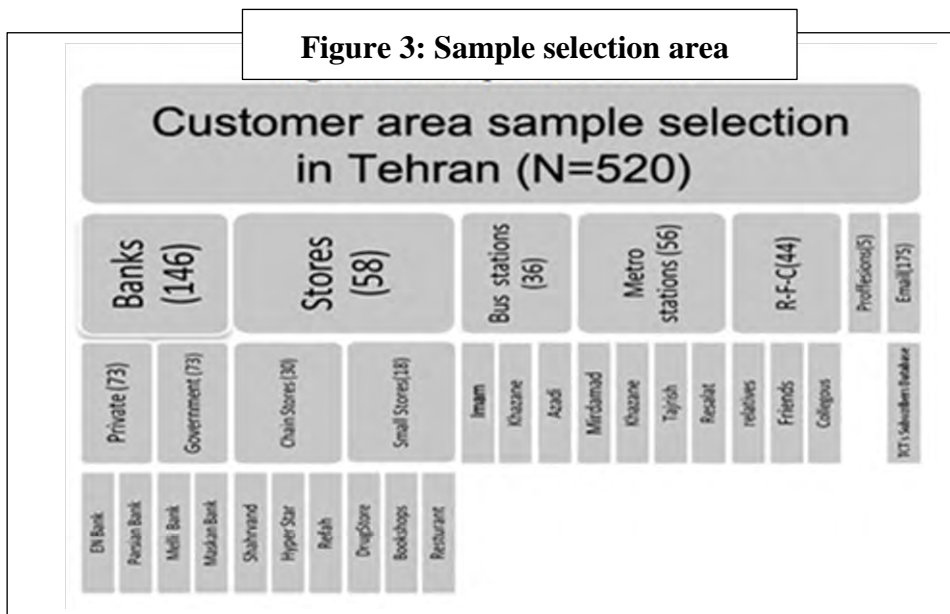
The minimum sample size has been calculated according to the above information.

$$\text{Sample size} = [(1 * 1.96) / 0.1] \hat{=} 384$$

Hence the **minimum** sample size should be equal to 384.

Sample Selection Area

Considering the minimum sample size calculated in the last section, 520 questionnaires were sent and delivered by hand and by Email and telephone to the different areas shown in figure 3. Three weeks later, 409 filled questionnaires were available to us.



Reliability and Validity Testing

The reliability analysis of a questionnaire determines its ability to yield the same results on different occasions and validity refers to the measurement of what the questionnaire is supposed to measure (Cooper and Schindler, 2003).

Testing the Reliability of the Questionnaire

The approach we used to test the reliability of the questionnaire points to internal consistency, which means correlating the response of each question with the other questions of the questionnaire.

To calculate internal consistency, we used the most common frequently used method, called Cronbach's *alpha* (Saunders, 2009) with a sample of 13 respondents (employee of a Welfare state office in Tehran) chosen for our pilot study. On the first attempt of gathering the data, the Cronbach's *alpha* calculated (for all Likert questions $n=20$) was 0.814. Then, we changed some questions of the questionnaire, and submitted it again to the respondents. The calculated Cronbach's *alpha* (for all Likert question $n=20$) became 0.888.

First Reliability Statistics

Cronbach's Alpha	No. of Items
0.814	20

First Reliability Statistics

Cronbach's Alpha	No. of Items
0.888	20

Table 1 illustrates the Cronbach's alpha scale value which is calculated for reliability analysis of each of the seven main factors in our questionnaire, for 13 gathered questionnaires.

Table 1: Reliability statistics of each main factor

Main Factors	Cronbach's Alpha	Number of Items	Mean	Variance
Confirmation	0.754	5	3.492	.577
Satisfaction	0.876	3	3.538	.867
Perceive Usefulness	0.674	3	4.077	0.769
Continuance Intension	0.840	2	3.920	.954
Network Externalities	0.702	6	3.200	.641
Direct Compulsion	No Likert	2	-	-
Indirect Compulsion	No Likert	4	-	-

Source: Author's calculation.

Method of Data Analysis

The method of the collected data analysis has been applied at three levels of the study. First, data are examined and some descriptive statistics obtained in order to obtain an overview of the characteristics of the sample and to assess issues such as mean and standard deviation. Second, bivariate correlations between variables are analyzed with respect to the correlation between scales of variables and mediator variables. In particular, it examines the research hypothesizes.

The final stage of the analysis adopts a regression analysis in order to identify the eventual existence of association and relationship between the

dependent and independent variables. SPSS and Mplus[®] software have been used for the tests.

4. Data and Data Transformations

Factors Analysis

Relation between factors and the corresponding questions in the questionnaire are shown in table 2. For the first factor "Confirmation", we have 11 questions. For the 2nd factor, we assign five questions. For the 3rd factor "Perceived usefulness" three questions are assigned. The 4th factor "Continuance intension" includes two questions, for the 5th factor "Network Externalities six questions are assigned and two questions for the 6th factor "Direct Compulsion" and for the 7th factor "Indirect Compulsion", we assigned 4 questions.

Table 2: Relation between Factors and Questionnaire

	Factors	Related questions
1	Confirmation	5, 6-2, 9-2, 9-3, 9-4, 9-5, 9-6, 15, 16, 17, 18
2	Satisfaction	20, 30, 31, 33, 40
3	Perceive Usefulness	19,30,39
4	Continuance Intension	21, 41
5	Network Externalities	22, 23, 24, 26, 27, 28
6	Direct Compulsion	35-3, 35-4, 44
7	Indirect Compulsion	38-1, 38-2, 38-3, 38-4

Source: Author's calculation.

Descriptive statistics have been done for the seven factors as shown in the table 3. Column N indicates the number of valid answers received by respondents. Minimum and maximum validity for each factor are indicated in the 3rd and 4th columns, and arithmetic average or "Mean" and Standard Deviation are shown in the 5th and 6th columns.

Table 3: Descriptive Statistics Related to the Main Factors

7 Main Factors	N	Minimum	Maximum	Mean	Std. Deviation
Confirmation	396	1.91	4.27	3.0996	0.42271
Satisfaction	381	2	5	4.3879	0.45556
Perceived Usefulness	404	2.33	5	4.4266	0.52911
Continuance Intension	401	2.5	5	4.3529	0.57515
Network Externalities	384	1.83	5	3.5907	0.51516
Direct Compulsion	401	1	5	2.882	1.2324
Indirect Compulsion	408	1	5	2.8064	1.06969

Source: Author's calculation.

Now, let s investigate hypotheses related to the different factors.

Solving Hypothesis 1

User s confirmation (Increase or Decrease) is positively associated with their Satisfaction with the program.

Solving Hypothesis 2

User s confirmation (Increase or Decrease) is positively associated with their Perceived Usefulness with the program.

Solving Hypothesis 3

User's Perceive Usefulness (Increase or Decrease) is positively associated with their Satisfaction with the program

Solving Hypothesis 4

User's Perceive Usefulness (Increase or Decrease) is positively associated with their Continuance Intensions with the program

Solving Hypothesis 5

User's level of Satisfaction (Increase or Decrease) is positively associated with their Continuance Intension with the program

Table 4: Spearman Nonparametric Correlation Result

		Confirmation	Satisfaction	Perceive Usefulness	Continuance Intention	
Spearman's rho	Confirmation	Correlation Coefficient	.345(**)	.291(**)		
		Sig. (2-tailed)	0.000	0.000		
		N	372	394		
	Satisfaction	Correlation Coefficient				.641(**)
		Sig. (2-tailed)				0.000
		N				379
	Perceive Usefulness	Correlation Coefficient		.762(**)		.650(**)
		Sig. (2-tailed)		0.000		0.000
		N		381		399
	Network Externalities	Correlation Coefficient	.280(**)	.442(**)	.328(**)	.338(**)
		Sig. (2-tailed)	0.000	0.000	0.000	0.000
		N	375	362	381	378
	Indirect Compulsion	Correlation Coefficient				.127(*)
		Sig. (2-tailed)				0.011
		N				400
	** Correlation is significant at the 0.01 level (2-tailed).					
	* Correlation is significant at the 0.05 level (2-tailed).					

Table 5: Pearson Correlation Result

		Confirmation	Satisfaction	Perceive Usefulness	Continuance Intention
Confirmation	Pearson Correlation		.409(**)	.348(**)	
	Sig. (2-tailed)		0.000	0.000	
	N		372	394	
Satisfaction	Pearson Correlation				.705(**)
	Sig. (2-tailed)				0.000
	N				379
Perceive Usefulness	Pearson Correlation				.703(**)
	Sig. (2-tailed)				0.000
	N				399
Network Externalities	Pearson Correlation		.449(**)	.377(**)	.346(**)
	Sig. (2-tailed)		0.000	0.000	0.000
	N		375	381	378
Indirect Compulsion	Pearson Correlation				.170(**)
	Sig. (2-tailed)				0.001
	N				400
** Correlation is significant at the 0.01 level (2-tailed).					
* Correlation is significant at the 0.05 level (2-tailed).					

Solving Hypothesis 6

Network Externalities (Increase or Decrease) is positively associated with user's extent of Confirmation

Solving Hypothesis 7

Network Externalities (Increase or Decrease) is positively associated with

user's Perceive Usefulness

Solving Hypothesis 8

Network Externalities (Increase or Decrease) is positively associated with user's level of Satisfaction

Solving Hypothesis 9

Network Externalities (Increase or Decrease) is positively associated with user's Continuance Intension

Solving Hypothesis 10

Direct Compulsion (Increase or Decrease) has a positive effect on the relation between user's perceive Usefulness and their continuance intention

Solving Hypothesis 11

Direct Compulsion (Increase or Decrease) has a positive effect on the relation between user's level of satisfaction and their continuance intention

Solving Hypothesis 12

Direct Compulsion (Increase or Decrease) has a positive effect on the relation between Network Externalities of the program and their Continuance Intention

Solving Hypothesis 13

Indirect Compulsion or Lock-in Customers (Increase or Decrease) is positively associated with user's Continuance Intension

5. Results

Regression Analysis

For regression analysis, we define dependent and independent variables as follows:

Dependent variables (DV) or factors for this study are:

DV1) Confirmation

DV2) Continuance Intension

Independent Variables (IDV) or Factors for this study are:

IDV1) Satisfaction

IDV2) Perceived usefulness

IDV3) Network Externalities

IDV4) Direct Compulsion

IDV5) Indirect Compulsion

We used a multiple regression analysis to assess the effectiveness and priority of the five components (Satisfaction , Perceived Usefulness , "Network Externalities" , Direct Compulsion and Indirect Compulsion) relatively to the **first** dependent variable (Confirmation).

The method used for this analysis was stepwise forward (Stepwise (Criteria: Probability of F-to-enter \leq .050, Probability-of-F-to-remove \geq .100)).

Multiple ANOVA (analysis of variance) showed respectively Satisfaction , Network Externalities and Indirect Compulsion effect on Confirmation (See table 5-2-1-1).

Linear Regression: Satisfaction determines 15.2% of Confirmation alone.

Binary regression: Satisfaction and Network Externalities determine 16.7% of Confirmation .

Regression of triplet (Plane): Satisfaction , Network Externalities , and Indirect Compulsion determine 17.7% of Confirmation .

Perceived Usefulness and Direct Compulsion with predicted level of confidence 95% are not present in regression and do not have any effect on Confirmation .(Perceived usefulness, Sig = 0.409 > .05 and Direct compulsion, Sig = 0.139 > .05)

Table 6: Regression (Confirmation)

Variables Entered	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sum of Squares	Sig.	F
Satisfaction	.390(a)	0.152	0.15	0.37611	8.854	.000(a)	62.588
Network Externalities	.409(b)	0.167	0.163	0.37333	9.718	.000(b)	34.863
Indirect Compulsion	.421(c)	0.177	0.17	0.37169	10.282	.000(c)	24.808

The same approach has been adopted to assess the effectiveness and priority of the five components relatively to the *second* dependent variable (Continuance Intension). Multiple ANOVA showed Religion Studies, Perceived Usefulness, and Satisfaction have effect on Continuance Intension (see table 7).

- Linear Regression: Perceive Usefulness determines 51% of Continuance Intension alone.

- Binary regression: Perceive Usefulness and Satisfaction determine 54% of Continuance Intension .

Network Externalities and Indirect Compulsion with predicted level of confidence 95% are not present in regression and do not affect Continuance Intension (Network Externalities, Sig = 0.236 > .05 and Indirect compulsion, Sig = 0.208 > .05)

Table 7: Regression (Continuance Intension)

Variables Entered	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sum of Squares	Sig.	F
Perceive Usefulness	.714(a)	0.51	0.508	0.40992	61.669	.000(a)	367.001
Satisfaction	.739(b)	0.545	0.543	0.39528	65.989	.000(b)	211.154

Relation of the Main Factors with Education and with Age

As a last investigation, we have been looking for a relation of the seven main factors with education and then with age.

Relation between the Main Factors and Education

Respondent's state of education is measured by the question "Secondary school", "High school", "Diploma", "University Degree", and "Religion Studies" in the questionnaire.

Considering the type of this question which is ordinal, and because of the number of respondents (just 8) who have "Religion Studies", we omitted

Religion Studies in this analysis. In table 8, it can be seen that the relationship between education levels and significant bits of the seven variables are not observed (Sig. = 0.688, 0.163, 0.325, 0.783, 0.108, and 0.833 > 0.05). This is probably due to lack of linear relationship between education levels and seven main factors. In table 9 also, seven main factors studied in level of education, in case of Mean, Number, and Standard variation of sample are shown.

Table 8: Nonparametric Spearman Correlation, Factors/Education

Main Factors		Education
Confirmation	Correlation Coefficient	-0.02
	Sig. (2-tailed)	0.688
	N	388
Satisfaction	Correlation Coefficient	-0.073
	Sig. (2-tailed)	0.163
	N	372
Perceive Usefulness	Correlation Coefficient	-0.05
	Sig. (2-tailed)	0.325
	N	395
Continuance Intension	Correlation Coefficient	0.014
	Sig. (2-tailed)	0.783
	N	392
Network Externalities	Correlation Coefficient	-0.083
	Sig. (2-tailed)	0.108
	N	375
Direct Compulsion	Correlation Coefficient	-0.011
	Sig. (2-tailed)	0.833
	N	392
Indirect Compulsion	Correlation Coefficient	0.013
	Sig. (2-tailed)	0.799
	N	399

Table 9: Seven Main Factors / Education

Education	Confirmation	Satisfaction	Perceive Usefulness	Continuance Intention	Network Externalities	Direct Compulsion	Indirect Compulsion
	Mean	2.8333	3.92	3.8889	3.6667	4.0278	2.4286
N	6	5	6	6	6	7	7
Std. Deviation	0.62302	0.72938	0.86066	0.8756	0.66179	1.1661	1.34519
Mean	3.3561	4.8667	4.8056	4.75	4.2857	4.25	2.9167
N	12	9	12	12	7	12	12
Std. Deviation	0.512	0.1	0.17164	0.2612	0.38145	1.07426	0.51493
Mean	3.0909	4.4027	4.4515	4.3117	3.5968	2.6751	2.8375
N	78	74	79	77	74	79	80
Std. Deviation	0.43562	0.42587	0.4805	0.54434	0.42738	1.16938	1.03659
Mean	3.1024	4.3739	4.4139	4.3552	3.5602	2.8628	2.81
N	292	284	298	297	288	294	300
Std. Deviation	0.41046	0.45492	0.53623	0.57473	0.52855	1.22036	1.08835
Mean	2.8977	4.425	4.4167	4.5	3.6667	3.7083	2.75
N	8	8	8	8	8	8	8
Std. Deviation	0.28516	0.42003	0.46291	0.53452	0.1643	0.95015	1.16496
Mean	3.0996	4.3863	4.4251	4.3513	3.5901	2.8767	2.8059
N	396	380	403	400	383	400	407
Std. Deviation	0.42271	0.45508	0.52899	0.57496	0.51659	1.22937	1.07096
Total							

Relation between Main Factors / Age

Spearman Correlation coefficient of the relationship "age" and the seven factors with 95% confidence level showed that these differences are not significant (Sig. = 0.61, 0.75, 0.96, 0.46, 0.87, 0.63, and .49 > .05) (see table 10). Therefore, we use descriptive statistics (mean, number, standard deviation) of seven main factors which are shown in table 10.

Table 10: Nonparametric Spearman Correlation, Factors / Age

Main Factors		Age
Confirmation	Correlation Coefficient	0.025
	Sig. (2-tailed)	0.613
	N	396
Satisfaction	Correlation Coefficient	0.017
	Sig. (2-tailed)	0.746
	N	381
Percieve Usefulness	Correlation Coefficient	0.002
	Sig. (2-tailed)	0.964
	N	404
Continuance Intension	Correlation Coefficient	0.037
	Sig. (2-tailed)	0.463
	N	401
Network Externalities	Correlation Coefficient	-0.009
	Sig. (2-tailed)	0.867
	N	384
Direct Compulsion	Correlation Coefficient	0.024
	Sig. (2-tailed)	0.626
	N	401
Indirect Compulsion	Correlation Coefficient	0.034
	Sig. (2-tailed)	0.489
	N	408

Table 11: Seven Main Factors / Age

Age	Confirmation	Satisfaction	Perceive Usefulness	Continuance Intesion	Network Externalities	Direct Compulsion	Indirect Compulsion
15-19	Mean	4.6909	4.6667	4.5	4.2273	3.6875	2.75
	N	11	15	15	11	16	16
	Std. Deviation	0.49516	0.45925	0.45426	0.65465	0.50151	1.3688
20-29	Mean	4.3912	4.3614	4.3105	3.5417	2.8014	2.734
	N	91	95	95	92	94	94
	Std. Deviation	0.40987	0.47973	0.60468	0.61962	0.45535	1.28619
30-39	Mean	4.3063	4.4296	4.3045	3.5801	2.7318	2.763
	N	128	135	133	129	133	135
	Std. Deviation	0.43074	0.4244	0.49352	0.57681	0.5112	1.08048
40-49	Mean	4.4378	4.4181	4.3846	3.5641	2.9715	2.877
	N	111	118	117	117	117	122
	Std. Deviation	0.39273	0.46045	0.54291	0.5508	0.55917	1.2966
50 and more	Mean	4.42	4.5041	4.4634	3.6476	2.9837	2.9268
	N	40	40	41	35	41	41
	Std. Deviation	0.46699	0.4433	0.41581	0.49232	0.40779	1.23592
Total	Mean	4.3879	4.4266	4.3529	3.5907	2.882	2.8064
	N	381	404	401	384	401	408
	Std. Deviation	0.42271	0.45556	0.52911	0.57515	0.51516	1.2324

Graphs

Figure 4: Men/Women Attitude toward Seven Factors of Success of Bank-issued Micropayment System in Iran (2010)

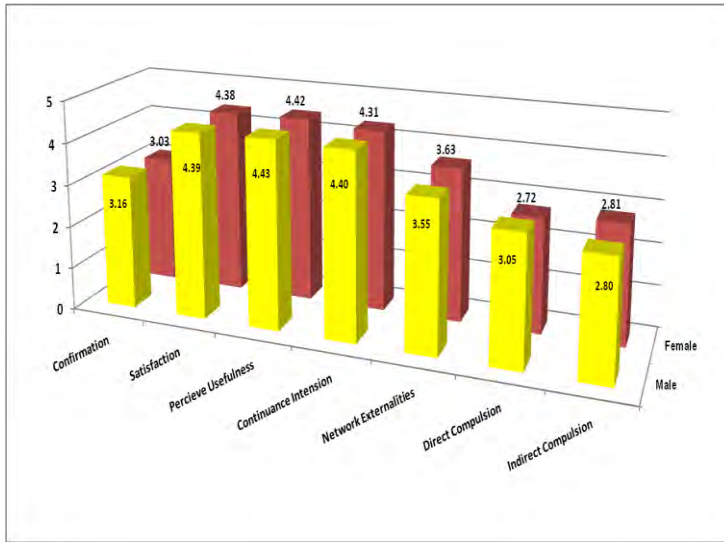
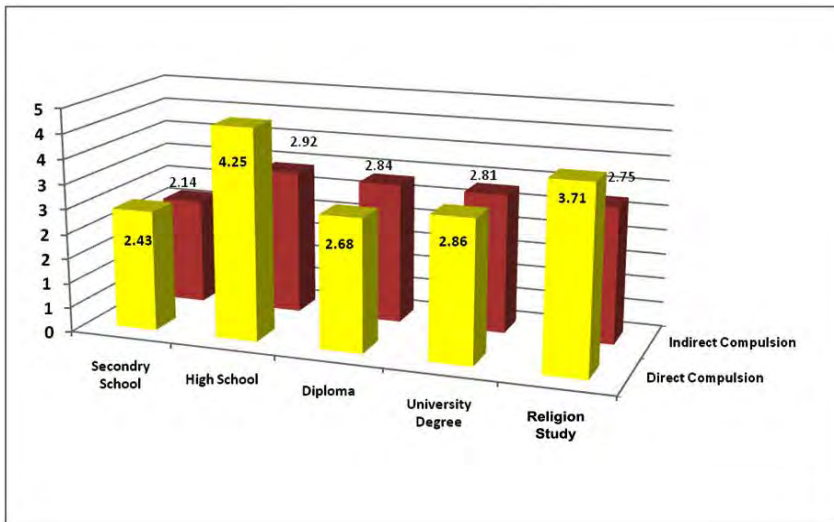


Figure 5: Impact of Compulsion in Success of Bank-issued Micropayment System in Iran (2010) in Case of Education Level



Other Results of this Study

We dealt with the defined success factors from different perspectives related to: gender, age, dependency and education.

Gender Attitude toward Success Factors

In a further analysis we compare the level of acceptance of the seven main factors in case of Male or Female respondents.

Table 12 illustrate that the scale of level of acceptance Confirmation and Indirect Compulsion in E-Payment for Male which is more than female, and for the other five main factors (Satisfaction, Continuance Intension, Network Externalities, Perceive Usefulness , and Direct Compulsion) the scale of level of acceptance for Male and Female are the same.

**Table 12: Scale of the Level of Acceptance of Respondents
in Case of Genders**

	Scale of Level of Acceptance
Confirmation	Male more than Female
Satisfaction	Male/Female
Perceive Usefulness	Male/Female
Network Externalities	Male/Female
Continuance Intension	Male/Female
Direct Compulsion	Male more than Female
Indirect Compulsion	Male/Female

Age Attitude toward Success Factor

As a conclusion (see table 13) of evaluation of E-Payment Confirmation, Perceived Usefulness, Satisfaction, Network Externalities and Direct Compulsion age group of (15-19) has confirmed the E-Payment more than the other groups of age. The age group of (50 and more) or the oldest group has confirmed the E-Payment Indirect Compulsion more than the other groups of ages.

**Table 13: Scale of the Level of Acceptance of Respondents
in Case of Genders**

	15-19	20-29	30-39	40-49	>50
Confirmation	1	5	4	2	3
Satisfaction	1	4	5	2	3
Perceived Usefulness	1	5	3	4	2
Continuance Intension	1	4	5	3	2
Network Externalities	1	5	3	4	2
Direct Compulsion	1	4	5	3	2
Indirect Compulsion	4	5	3	2	1

Dependency of Factor

As a conclusion of last chapter (regression analysis) there is a mathematical relationship between confirmation as a dependent variable and the other factors as independent variables as follows:

1. Model 1 could be: $Confirmation = f(Satisfaction)$
2. Model 2 could be: $Confirmation = f(Satisfaction, Network Externalities)$
3. Model 3 could be: $Confirmation = f(Satisfaction, Network Externalities, Indirect Compulsion)$

There is a mathematical relation between Continuance Intension as a dependent variable and the other factors as independent variables as follows:

1. Model 1 could be: $Continuance Intension = F(Perceived Usefulness)$
2. Model 2 could be: $Continuance Intension = F(Perceived Usefulness, Satisfaction)$

Education Attitude toward Success Factors

The respondents with education level of high school and University degree and secondary School respectively accepted Neato high of E-Payments factors. Table 14 shows these relations between acceptance of E-Payment Factors and education of respondents.

6. Conclusion

Main Findings of this Study

The goal of this research was to understand and find success factors influencing micropayment programs in banking sectors in Iran. In addition to the success factors presented by Tan (2008), we have added two factors of Direct Compulsion and Indirect Compulsion.

We have derived some descriptive statistics in order to obtain an overview of the characteristics of the considered sample. Then, bivariate correlations between variables were analyzed with respect to the correlation between scales of variables and mediator variables. Finally, we performed a regression analysis in order to identify the eventual existence of association and relationship between the dependent and independent variables.

Table 14: Seven Main Factors / Education

	Secondary School	High School	Diploma	University Degree	Total
Confirmation	<Moderate	> Moderate	Moderate	Moderate	3.10
Satisfaction	>Moderate	High	High	High	4.39
Perceived Usefulness	>Moderate	Near to High	>Moderate	Near to High	4.43
Continuance Intension	>Moderate	Near to High	Near to High	Near to High	4.36
Network Externalities	Near to High	Near to High	<Moderate	<Moderate	3.6
Direct Compulsion	<Moderate	Near to High	<Moderate	<Moderate	2.88
Indirect Compulsion	<Moderate	<Moderate	<Moderate	<Moderate	2.81

All main questions of this study were answered successfully in form of thirteen hypotheses, which we have explored. Direct compulsion is defined as a mediator variable between 1) "Satisfaction" and "Continuance Intension" 2) "Perceived Usefulness" and "Continuance Intension" 3) "Network

Externalities" and "Continuance Intension", which has positive effects (H10, H11, and H12). On the other hand, we had a direct question (number 44) in the questionnaire. Compulsory use of e-payment systems in Tehran was answered by 401 respondents out of 409 (mean calculated for this data is 3.91 out of 5). e.g. most of the people in this sample agreed with direct compulsion. Impact of indirect compulsion or lock-in customers on user's continuance intension is positively associated also (H13). In fact, many operators have given millions of Rials worth of prizes, gifts and discounts to their consumers, who use electronic payment services to pay their bills (a win-win business) and pushed their customers to use these services continuously.

Suggestions

General Purpose Card

Having a General-Purpose Card was one of the ideas submitted in our questionnaire. Out of 406 valid answers, 218 respondents (53.7%) strongly agreed with this idea. Whereas 109 respondents (26.8%) agreed, 30 respondents (7.4%) were Neutral and only 33 respondents (8.1%) disagreed.

Respondents were also questioned about The amount of money for Password need .15 of them (3.8%) suggested 1,000,000 Rials, 10 (2.5%) suggested 500,000 Rials, 69 (17.4%) said 100,000 Rials, 115 (29%) said 50,000 Rials, and 32 (8.1%) suggested 10,000 Rials.

This question is a guide to *General Purpose Card* (a combination of banking payment and micropayment card system).

So a general purpose card could be defined and depends on the customers, the amount of money predefined by customers (no need of password and the other security for this amount).

Micropayment Margin

According to the Central Bank of Iran, a payment value less than 50 Million Rials is considered as a micropayment's transaction. Because of the amount of this value (50 Million Rials), all instruments of Cash-based systems and Account-based systems in EPS (Electronic Payment Systems) except electronic check are engaged in Iran's micropayment system definition. It means *Micropayment* systems are equivalent to *E-Payment* in Iran according to CBI definition.

Now we have to define a new category for E-Micropayment system. EPS size in Iran could be as follows:

س Medium value transactions: between 100,000 Rials (\$10) and 50,000,000 Rilas (\$5000).

س Large value transactions: above 50,000,000 Rials or \$ 5000.

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