



**Szent István University Gödöllő**

**Thesis of the Doctoral (PhD) dissertation**

**THE EFFECTS OF THE INTRADAY CREDIT  
TRANSFER SYSTEM'S INTRODUCTION ON  
THE CREDIT TRANSFERS AND ON THE  
HUMAN RESOURCES EFFECTIVENESS OF  
THE SME-s**

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## 2 INTRODUCTION

### 2.1 Relevance and significance of the topic

On the 2nd of July 2012, on the first successful day of up and running, the new intraday credit transfer system was started in Hungary. Among the expectations of the bank experts, the faster money circulation, the greater transparency of the fee calculation, and as an overall consequence, a sharper competition in the banking sector can be mentioned.

During the last three years, several research works, analysis, scientific publications confirmed that the intraday credit transfer system brought significant advantages to the the macroeconomy and to the interbank clearing system or to the entire banking sector as well.

A recent study (Császár, 2015) demonstrated that the clearing process in the intraday credit transfer system on average lasted 2 hours and 5 minutes.

So far, when the effects on the domestic payment sytem have been analysed, several research works dealt with the whole corporate sector (Divéki-Olasz, 2012, Divéki-Helmeczi, 2013, Luspay-Madarász, 2014), but the small and medium size enterprises were not in the focus.of their attention. The published financial or-macroeconomic papers have not assessed the effects of the intraday credit transfer system on the operations and especially on the credit transfer turnover of the small and medium size enterprises.

There have not been any research conducted regarding the effects on the daily works and processes of the SME-s, not to mention the effects on the development of the human resource effectiveness of the finance staff either.

Now it seems, that the elapsed time and experience since the introduction of the intraday credit transfer system made large enough amount of data available for such an analysis.

The dissertation is even more topical because the Hungarian National Bank, based on the favourable experience of the intraday credit transfer system's introduction since July 2012, is planning to introduce further modules in the years of 2015 and 2016. At the end of 2015, the frequency increase of cycles was already implemented, and in 2016 the overnight settlement will be terminated.

## 2.2 Research propositions and objectives

The objectives of the research cover the actual effects of the intraday credit transfer system on the small and medium size enterprises' credit transfer turnover and on the human resources effectiveness. In order to successfully apply a complex approach, several special areas had to be reviewed. The objectives of the research are summarized in the following table of hypothesis:

1. Table: Summary of objectives

Hypothesis	
H1	As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and assuming the same credit transfer turnover, in the second half of the year the daily average account balances and the total value of credit transfers did not change compared to those in the first half of the year.
H2	As a consequence of the introduction of the intraday credit transfer system on the 1st of July, the small and medium size enterprises could make better cash flow plans compared to the previous period, and could execute their credit transfers closer to the deadlines. This gave them more safety in paying scheduled public charges on time towards the state.
H3	As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period, the small and medium size enterprises executed their credit transfers only if the intraday settlement was ensured, so number of transactions went up before holidays and weekends.
H4	As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period, the effectiveness of the cash flow planning and the cost effectiveness of the small and medium size enterprises were increased.
H5	As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period, it was mainly the motivation, authority and responsibility of the accountable financial managers in charge of the decisions that went up, they could make a better contribution to the successful operations of the small and medium size enterprises.
H6	As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period it was mainly the effectiveness of the accountable financial managers in charge of the decisions that went up, they could make a better contribution to the stable and successful operations of the small and medium size enterprises.
H7	As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period, the finance staff of the small and medium size enterprises received positive feedbacks from the management of their companies, they received financial and /or moral rewards as well.

## **3 MATERIALS AND METHODS**

### **3.1 Materials**

#### **3.1.1 Presentation of the empirical research**

##### **3.1.1.1 GIRO data, 1000 micro and 1000 small and medium size enterprises' commercial banking data**

The first step was to analyse the data available on the website of the GIRO Zrt. The transactions included corporate transactions as well, but there was no further breakdown that could have helped identify the transactions relating to the small and medium size enterprises. As a second step, Erste Bank gave access to an anonymous, randomly selected data base with 1000 small and medium size enterprises' and 1000 micro corporates' credit transfers and daily average account balances from the year 2012.

##### **3.1.1.2 10.000 Questionnaires, elektronically sent out, with 269 responses from small and medium size enterprises**

The gathering of data through questionnaires, sent out to appr. 10.000 companies, represented the first built in control measure for cross checking the conclusions from the commercial banking data analysis. We were gathering answers from the respondents of the questionnaires during three months from May till July of 2015. We received 269 questionnaires back under the surveillance of the system administrator, representing roughly 2,7% as a response rate. The number of questionnaires with full answers to all questions was lower, we had 74 of them.

##### **3.1.1.3 Qualitative analysis and control measure through 26 personal interviews with SME-s.**

After the assessment of the results deriving from the analysis of the commercial banking data and the questionnaires, we used a third data source, through personal interviews. The direct answers with valuable pieces of information represented a very solid basis for the qualitative analysis, and paralelly to that for controlling and cross checking the results coming from the other two data sources. After several months

of preparations in total, 26 micro, small and medium size enterprises took part in the interviews between September-October 2015 over a two months period.

## **3.2 Methods**

### **3.2.1 Methods applied during the research**

The following methods were applied during the research.

#### **3.2.1.1 Paired „t” test**

The paired „t” test is used for comparing two samples’ averages, when the data recorded in two groups could be corresponding to each other.- Corresponding data is possible when for example we measure twice one attribute of the same subject.

#### **3.2.1.2 Autocorrelation function**

The autocorrelation function measure the correlation of two probability variables. Consequently this function gives the linear connection of the same process in different times.

#### **3.2.1.3 Cluster analysis**

The cluster analysis is a data analysing method with multiple variables, with the aim of grouping the data by common properties and similarities. The cluster analysis is popular and widely used method in different disciplines, that can be successfully applied in data structures detection and making types. (Füstös et al.1986) During our analysis, from the applicable methods the hierarchic ones were selected. There were several methods for making the calculations too, we used the Ward method with the aim of minimizing the variance within the groups. The final objective was to identify the optimal grouping. Afterwards we had to validate our result, the proper method for that was the discriminant analysis (Duda et al, 1999, McLachlan, 2004).



#### **3.2.1.4 Factor Analysis**

The factor analysis is a summary term covering several methods, the best known among them are the Principal Component Analysis and the Factor Analysis.

They are mostly used to reduce and to analyse the variance among observed, correlated variables into a lower number of unobserved, latent variables. In this research the reason for selecting this method was our aim of reducing the number of dimensions or variables in order to better understand and analyse the factors.

In both methods, validation of the data was necessary in order to verify if the methods could be applied at all. The KMO value (Kaiser-Meyer-Olkin) gave us the right answer, confirming the applicability. Another test, the Bartlett test was used to control the level of significance, where the null hypothesis was that in the correlation matrix the variables are not correlated in pairs.

The end results of the calculations, or the factor solution could be rotated. This is not a recommended method in case of the Principal Component Analysis, but it could and was applied in case of the Factor Analysis when we evaluated the questionnaires.

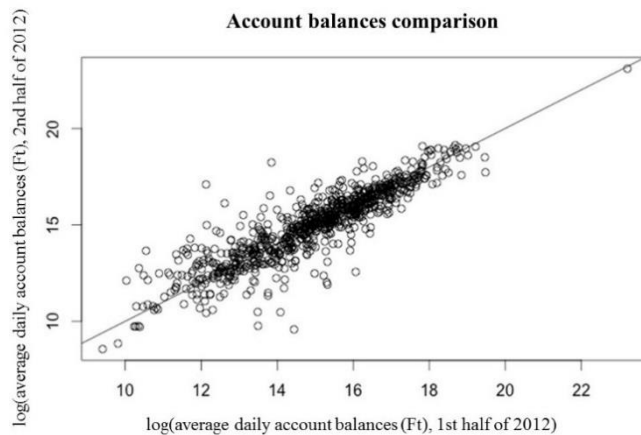
## 4 MAIN FINDINGS AND RESULTS

### 4.1 Evaluation of the small and medium size enterprises' credit transfers

#### 4.1.1 Summary of the paired „t” tests, hypothesis

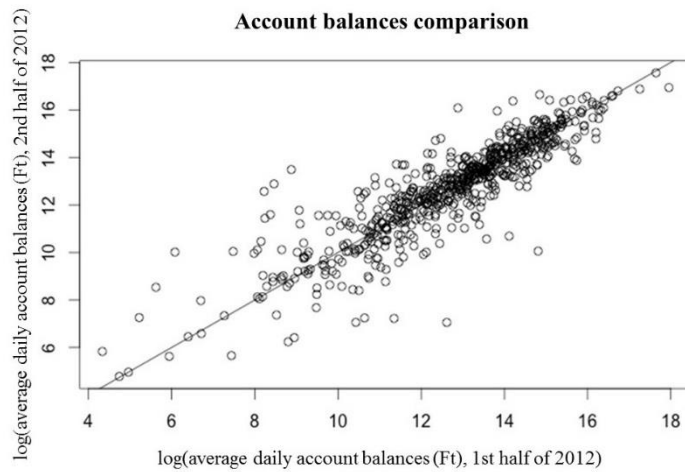
##### 4.1.1.1 Average daily current account balances

According to the paired „t” test results, the logarithmic average daily current account balances in the first and second halves of 2012 did not show significant differences (see table 2). In other words there was no evidence of differences in the amounts kept on their current accounts. This statement was confirmed both in case of the micro corporates and in case of the small and medium size enterprises as well. This is also reflected on the figures 1, and 2, where the black line indicates the theoretical correspondence of the first and second half's average current account balances. Since in both segments the values are deviating around that black line when comparing the two halves of 2012, it is confirming that no significant changes took place. When analysing the two figures, we found conspicuous difference in the amounts kept on the current accounts by the micro corporates and by the small and medium size enterprises.



1. Figure: Average daily account balances (after logarithmic transformation) of the first and second half of 2012 in the small and medium size enterprises' segment.

Source: own edition based on R Core Team 2014 software

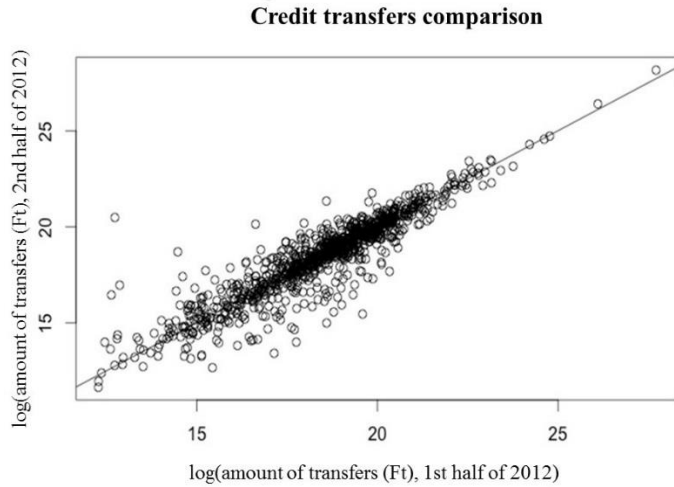


2. *Figure: Average daily account balances (after logarithmic transformation) of the first and second half of 2012 in the micro corporates' segment.*

*Source: own edition based on R Core Team 2014 software*

#### **4.1.1.2 Credit transfers**

When the credit transfers were analysed, special attention needed to be given to the micro corporates' data, because there was a relatively high number of inactive current accounts with a distorting effect. If this distortion caused by the inactive accounts is taken out, there was no evidence of significant differences in the micro corporates segment either, as in the case of the small and medium size enterprises' segment. See on figure 3.

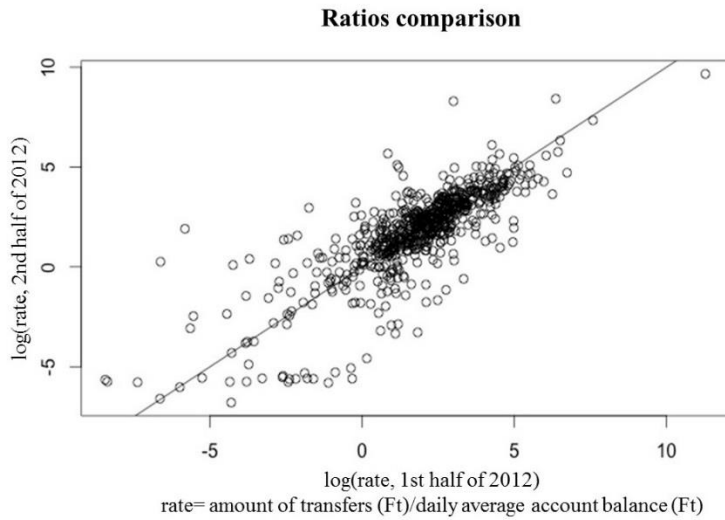


3. *Figure: Credit transfers (after logarithmic transformation) of the first and second halves of 2012 in the small and medium size enterprises' segment*

*Source: own edition based on R Core Team 2014 software*

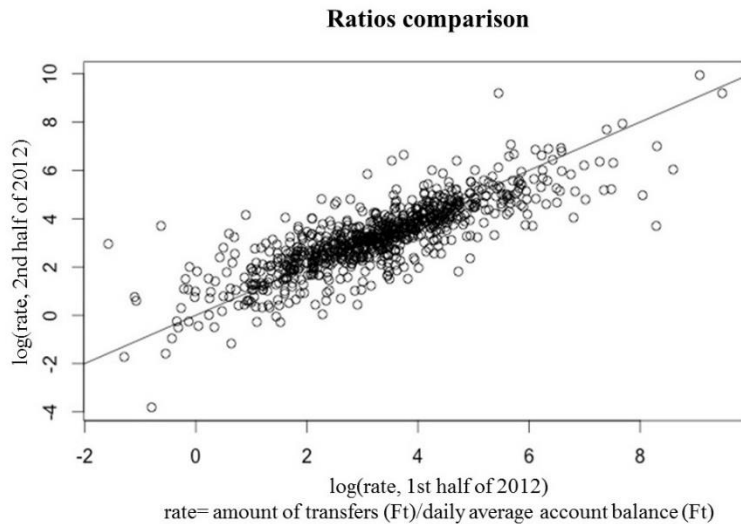
#### **4.1.1.3 Control measure: development of the ratio of the credit transfers to the average current account balances**

As a cross check of the results, we analysed the development of the ratio of the cumulated credit transfers to the daily average current account balances. Figure 4 regarding the micro corporates, and figure 5 regarding the small and medium size enterprises are showing the ratio of cumulated credit transfers / daily average account balances after logarithmic transformation.



4. Figure: Comparing Credit Transfers to daily average account balances (after logarithmic transformation) of the first and second halves of 2012 in the micro corporates' segment.

Source: own edition based on R Core Team 2014 software



5. Figure: Comparing credit transfers to daily average account balances (after logarithmic transformation) of the first and second halves of 2012 in the small and medium size enterprises' segment.

Source: own edition based on R Core Team 2014 software

The fully comprehensive results of the relevant calculations are summarized in table 2.

2. Table: Calculations of the paired „t” tests

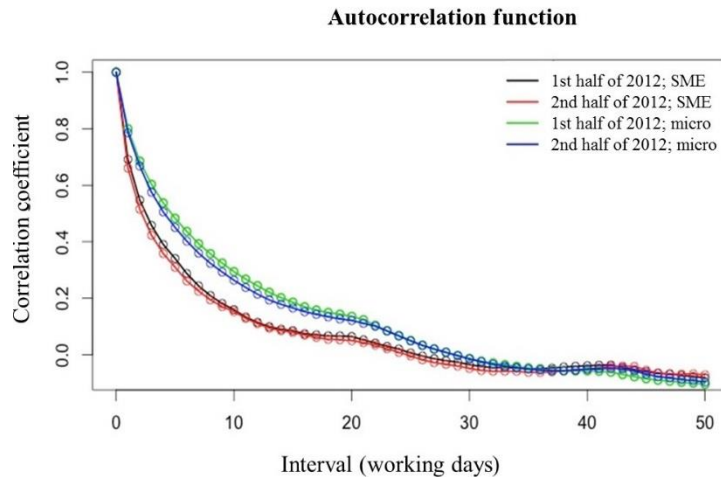
Source: own edition based on R Core Team 2014 software

<u>segment</u>	<u>null hypothesis</u>	<u>„p” value</u>	<u>number of companies</u>	<u>comments</u>
SME			1000	SME, in total 1000
SME	$\log(\text{credit transfers 1st half}) = \log(\text{credit transfers 2nd half})$	0.5663	1000	all companies can be used since all have credit transfers data regarding both halves
SME	$\log(\text{daily average account-balance; 1st half}) = \log(\text{daily average account-balance; 2nd half})$	0.2813	833	-167 companies were not considered because of their negative account balances either in the first or second halves in order to meet logarithmic transformation requirements
SME	$\log(\text{rate; 1st half}) = \log(\text{rate; 2nd half})$	0.286	833	
<u>micro</u>				in total 1000 micro corporations
<u>micro</u>	$\log(\text{credit transfers 1st half}) = \log(\text{credit transfers 2nd half})$	0.00000615	828	-172 companies did not have data for both halves of 2012, the remaining 828 included active and inactive ones as well
<u>micro</u>	$\log(\text{credit transfers 1st half}) = \log(\text{credit transfers 2nd half})$	0.3573	749	-79 considered to be inactive
<u>micro</u>	$\log(\text{daily average account-balance; 1st half}) = \log(\text{daily average account-balance; 2nd half})$	0.7777	670	-79 having either in the first or second halves negative account balances
<u>micro</u>	$\log(\text{credit transfers 1st half}) = \log(\text{credit transfers 2nd half})$	0.6222	670	
<u>micro</u>	$\log(\text{rate; 1st half}) = \log(\text{rate; 2nd half})$	0.4924	670	

#### 4.1.1.4 Autocorrelation

Before taking the final conclusions, the autocorrelation function was calculated regarding every company with averages in both segments. The results are summarized in Figure 6. The two halves’ credit transfer data did not practically demonstrate any difference, but between the two segments, there are important differences. In case of

the micro corporations the credit transfer movements are not as fast and did not show as much variety as they were and they did in case of the small and medium size enterprises. Consequently small and medium size enterprises have faster circulation of credit transfers compared to that of the micro corporations.



6. Figure: Autocorrelation functions in the two segments and in the two halves of 2012

Source: own edition based on SPSS software

#### 4.1.2 Evaluation of the hypothesis

As a result of the analysis, the following H1 hypothesis, the only relevant one regarding the analysis of the credit transfer data was confirmed.

**H1:** *As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and assuming the same credit transfer turnover in the second half of the year, the average account balances and the total value of credit transfers did not change compared to those in the first half of the year.*

Based on the actual findings of the research the following thesis were set up:

**T1:** *In summary, it was demonstrated and confirmed, by analysing through statistical methods the electronically initiated credit*

*transfers and the average daily account balances of the micro, small and medium size enterprises, that according to the paired „t” tests, at 5% significance level, as a consequence of the introduction of the intraday credit transfer system, there were no relative changes in terms of percentages from the first half to the second half of the year 2012:*

*-in the average daily account balances*

*-in the cumulated half yearly credit transfers*

*-in the ratio of the cumulated credit transfers to the average account balances*

**T2:** *The application of the autocorrelation function to the available average account balances over a period enabled us to analyse the “memory of the banking payments” and the liquidity process. This autocorrelation function showed shorter memory of payments in case of the small and medium size enterprises than that of the micro enterprises, thus confirming that the SME-s had higher variety in their credit transfers.*

## **4.2 Evaluation of the questionnaires’ results**

### **4.2.1 Descriptive statistical analysis of the responses: minimum, maximum values, averages, deviations, relative deviations**

Firstly the table 3 is displaying the results of the descriptive statistical analysis of the responses to the questionnaires, with minimum, maximum values, averages, deviations and relative deviations too.



3. Table: Descriptive statistics of the responses: minimum, maximum, average, deviations, relative deviations (on a scale of 1-10, when 1=least agreed, and 10=mostly agreed)

Source: own edition, based on SPSS software

	Minimum	Maximum	Average	Deviation	Relative deviation
1. Credit transfers made closer to deadline	1	10	7.24	2.61	0.36
2. Greater safety in case of scheduled public charges	1	10	7.39	2.61	0.35
3. Credit transfers started if intraday execution ensured only	1	10	6.63	2.80	0.42
4. Greater number of credit transfers before holidays	1	10	6.67	2.62	0.39
5. Increased effectiveness in cash flow planning	1	10	6.46	2.88	0.45
6. Increased cost effectiveness	1	10	6.15	2.80	0.45
7. Greater motivation of finance staff	1	10	5.56	3.02	0.54
8. Increased authority and responsibility of finance staff	1	10	4.86	3.07	0.63
9. Easier work and greater satisfaction of finance staff	1	10	6.01	2.95	0.49
10. Better contribution of finance staff to the effective operation of the company	1	10	5.69	2.91	0.51
11. Greater reward from the management to the finance staff	1	10	4.71	2.69	0.57

A correlation matrix was also set up, playing an important role further in the analysis.

#### 4.2.2 Grouping of respondents through cluster analysis

Cluster analysis was applied to the assessment of the responses of the questionnaires. As a result it seemed to be meaningful to set up three groups. Each company belonged to one of the groups, none of them was part of several groups, and there was no overlap between groups.

The soundness of grouping was cross checked by discriminant analysis, the separation of groups was by 100% confirmed to be correct.

Based upon the results of both the cluster analysis and the discriminant analysis, the three groups were accepted and confirmed, and further research was based on them. The table 4 gives information about the sizes of the groups.

4. Table: Numbers in groups

Groups	Number of respondents
I.	39
II.	14
III.	19

#### 4.2.3 Principal Component Analysis

As a first step, Principal Component Analysis (PCA), was carried out, but before starting it a test was made to check if data were suitable for that type of analysis. The KMO (Kaiser-Meyer-Olkin) value was calculated:  $KMO=0,874$ , which was a good result for further analysis. Bartlett's test was made as well, thus reconfirming that PCA could be applicable to further analysing our variables. The tests results are summarized in table 5 below:

5. Table: KMO és Bartlett's tests results

Kaiser-Meyer-Olkin .		0,874
Bartlett's test	Chi square statistics	584,886
	Degree of freedom	55
	Significance	,000

The two components accounted for 70,9% of the total variance, although it is true the first one had a higher value than the second one, which was 59,1%. Calculations are summarized in table 6.

6. Table: Principal Components' eigenvalues and relative importances (Method: Principal Component Analysis)

Source: own edition, based on SPSS software

Principal Component	Initial			After PCA		
	Eigenvalue	Variance (%)	Cumulative %	Eigenvalue	Variance (%)	Cumulative %
1	6,509	59,177	59,177	6,509	59,177	59,177
2	1,291	11,739	70,916	1,291	11,739	70,916
3	0,769	6,995	77,911			
4	0,585	5,315	83,225			
5	0,524	4,759	87,984			
6	0,308	2,797	90,781			
7	0,290	2,640	93,421			
8	0,265	2,410	95,831			
9	0,196	1,779	97,611			
10	0,159	1,446	99,057			
11	0,104	0,943	100,000			

Finally we did not end up justifying a well based principal component from that components' matrix, consequently we had to apply other methods as well.

#### 4.2.4 Factor Analysis

If we assume just a couple of potential factors accounting for the observed variables, the factor analysis is an adequate choice for further analysis.

We chose from the available methods the method of the least squares. Similar tests to the PCA analysis were carried out, and rotation was done too. The eigenvalues of the original and rotated solutions are included into the table 7. It was demonstrated that the relative

importances of the higher than "1" eigenvalues changed (from 70,916%- to 65,694%).

7. Table: Eigenvalues and their relative importances after factor analysis and rotation (Method: unweighted least squares)

Source: own edition, based on SPSS software

Factor	Initial			After FA			After FA and rotation		
	Eigenvalues	Variance (%)	Cumulative variance (%)	Eigenvalues	Variance (%)	Cumulative variance (%)	Eigenvalues	Variance (%)	Cumulative variance (%)
1	6,509	59,177	59,177	6,263	56,940	56,940	4,068	36,982	36,982
2	1,291	11,739	70,916	0,963	8,754	65,694	3,158	28,712	65,694
3	0,769	6,995	77,911						
4	0,585	5,315	83,225						
5	0,524	4,759	87,984						
6	0,308	2,797	90,781						
7	0,290	2,640	93,421						
8	0,265	2,410	95,831						
9	0,196	1,779	97,611						
10	0,159	1,446	99,057						
11	0,104	0,943	100,000						

As a result of further calculations we had the following results (table 8).

8. Table: Original factor matrix (Method: unweighted least squares)  
 Source: own edition, based on SPSS software

	Factor	
	1	2
1. Credit transfers made closer to deadlines	0,796	0,436
2. Greater safety in case of scheduled public charges	0,732	0,334
3. Credit transfers started only if intraday execution was ensured	0,558	0,442
4. Greater number of credit transfers before holidays	0,577	0,291
5. Increased effectiveness in cash flow planning	0,736	0,026
6. Increased cost effectiveness	0,807	0,005
7. Greater motivation of finance staff	0,847	-0,232
8. Increased authority and responsibility of finance staff	0,746	-0,450
9. Easier work and greater satisfaction of finance staff	0,870	-0,114
10. Better contribution of finance staff to the effective operation of the company	0,893	-0,145

11. Greater reward from the management to the finance staff	0,655	-0,301
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As indicated, these values did not give clear guidance yet as to the understanding of the potential factors, consequently it seemed to be appropriate to apply rotation. The matrix of the rotated factors is shown in Table 9. The final results led us to the following conclusions:

In the first factor, several questions related to the finance staff had an important role, and in the second one the questions related to the timing of executing the credit transfers.

The third group of questions regarding the cash flow planning and the cost effectiveness did not become determining in any factors.

9. Table: Rotated factor matrix (Method: unweighted least squares, Rotation: Varimax)  
 Source: own edition, based on SPSS software

	Factor	
	1	2
1. Credit transfers made closer to deadlines	0,340	0,841
2. Greater safety in case of scheduled public charges	0,355	0,722
3. Credit transfers started only if intraday execution was ensured	0,152	0,695
4. Greater number of credit transfers before holidays	0,262	0,590
5. Increased effectiveness in cash flow planning	0,553	0,487
6. Increased cost effectiveness	0,621	0,515
7. Greater motivation of finance staff	0,803	0,357
8. Increased authority and responsibility of finance staff	0,863	0,124
9. Easier work and greater satisfaction of finance staff	0,746	0,462
10. Better contribution of finance staff to the effective operation of the company	0,783	0,453
11. Greater reward from the management to the finance staff	0,697	0,182

#### 4.2.5 Comments to the questionnaires

When filling out the questionnaires, some respondents- but naturally not all of them, followed our instructions and made some comments to the questions. In cases when the exact positions of the respondents were known, the answers of the accountable managers (finance director, finance manager, or managing director) were clearly different from the answers of the staff regarding the role of the finance staff and the human resources effectiveness. The accountable managers in charge of decisions much more appreciated the changes, they unequivocally gave higher scores as to the increase of their effectiveness, motivation, authorities, responsibilities, and their satisfaction with the new system.

They felt that by using up the potential of the new intraday credit transfer system, they could deliver better personal contribution to the

effective operations of their companies. The finance staff however, did not feel any or just a minor improvement in these areas. Their scores reflected that statement (5, and 6 on a scale of 10).

#### **4.2.6 Evaluation of the hypothesis**

As a result of the analysis, the following hypothesis were confirmed:

Role of the Human Resources:

**H5:** *As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period, it was mainly the motivation, authority and responsibility of the accountable financial managers in charge of the decisions that went up, and they could make a better contribution to the successful operations of the small and medium size enterprises.*

**H6:** *As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period it was mainly the effectiveness of the the accountable financial managers in charge of the decisions that went up, they had a better contribution to the stable and successful operations of the small and medium size enterprises.*

Swiftiness of the credit transfers:

**H2:** *As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period the small and medium size enterprises could make better cash flow plans, and could execute their transactions closer to the deadlines. This gave them more safety in paying scheduled public charges on time towards the state.*

In summary regarding the finance staff and the human resources effectiveness the following thesis could be set up:

**T3:** *In respect of the survey by questionnaires with the micro, small and medium size enterprises, principal component analysis, factor analysis with least squares method and with rotation were all applied. As a result of the variance maximization rotation, it was confirmed that in the first factor the roles of the finance staff and the human resources effectiveness were important. By evaluating the written comments and the conclusions of the personal interviews together*



*with further qualitative analyses it was confirmed that the accountable financial managers in charge of the decisions, their increased motivation, satisfaction, and responsibility represented the decisive factors in the consequences of the intraday credit transfer system and in the enhancement of the human resources effectiveness.*

Regarding the swiftness of the credit transfers and the safety of the scheduled transactions, the following thesis could be set up:

**T4:** *The swiftness of the credit transfers and the greater safety in keeping deadlines of the scheduled payments played a smaller, but still dominant role in the consequences of the intraday credit transfer system's introduction. In general, the companies favourably evaluated the swiftness of credit transfers, the better timing and cash flow planning the new intraday credit transfer system permitted. The favourable impacts on the business operations of the companies were especially appreciated when companies were paying scheduled public charges towards the state.*

The following hypothesis were not confirmed because statistically they could not have been proved:

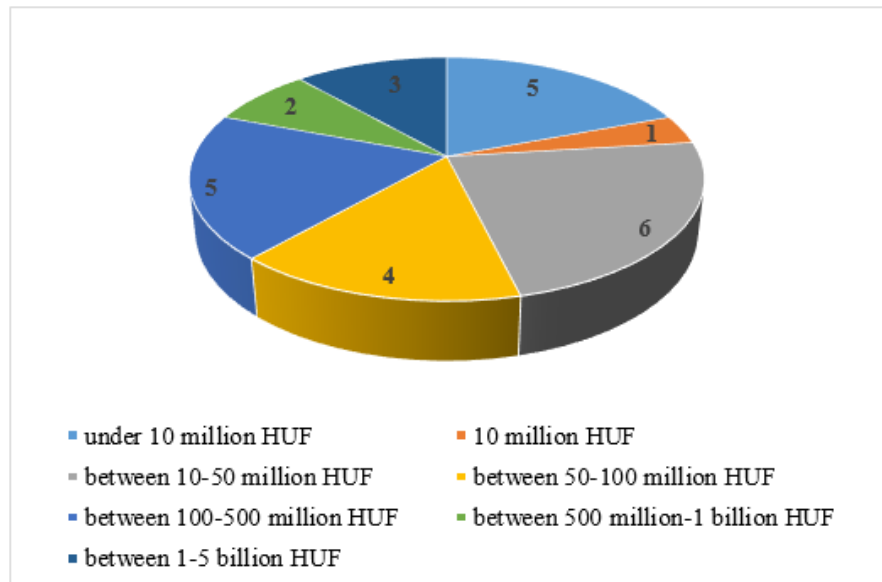
**H3:** *As a consequence of the introduction of the intraday credit transfer system on the 1st of July, 2012 and compared to the previous period, the small and medium size enterprises executed their credit transfers only if the intraday settlement was ensured, consequently number of credit transfers went up before holidays and weekends.*

**H4:** *As a consequence of the introduction of the intraday credit transfer system on the 1st of July, 2012 and compared to the previous period, the effectiveness of the cash flow planning and the cost effectiveness went up at the small and medium size enterprises.*

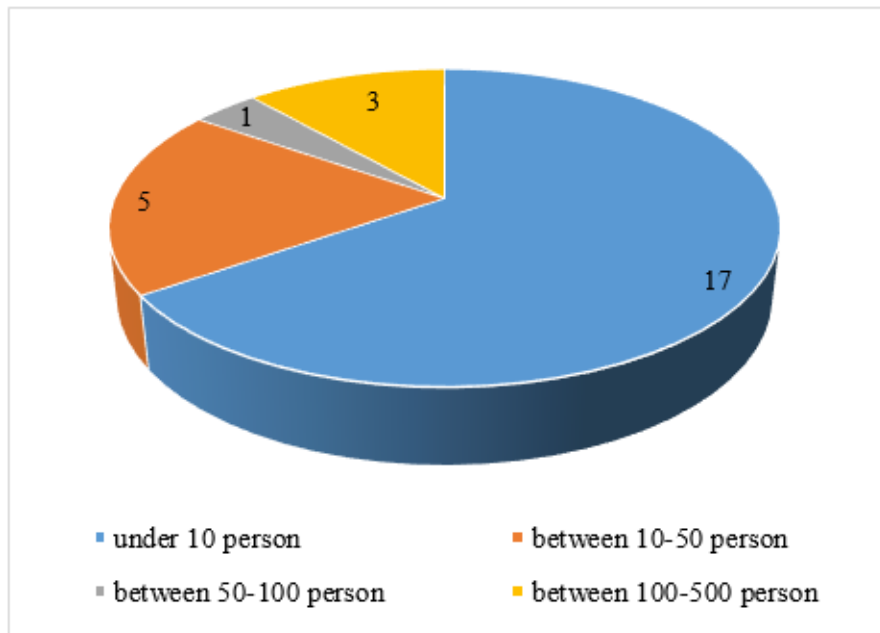
**H7:** *As a consequence of the introduction of the intraday credit transfer system on the 1st of July, and compared to the previous period, the financial staff of the small and medium size enterprises received positive feedbacks from the management of their companies, they received financial and/or moral rewards.*

### 4.3 Qualitative analysis and control measure through 26 personal interviews with SME-s

During the period of October- November 2015 personal interviews were made with SME-s. The selection of participating companies was made randomly but based on personal and business relationships. 26 micro, small and medium size enterprises were interviewed. The sales revenues and number of employees data are demonstrated respectively on the figures 7 and 8 below.



7. Figure: Interviewed enterprises by sales revenue  
Source: Own edition



8. Figure: Interviewed enterprises by number of employees  
 Source: Own edition

#### 4.3.1 Control measure of the conclusions from the analysis of the credit transfers and the questionnaires, confirmation of the relevant hypothesis

The answers we received during the interviews have unequivocally and repeatedly confirmed the H1 hypothesis and T1 and T2 thesis.

#### 4.3.2 Swiftiness, safety, and timing of the credit transfers after the introduction of the intraday credit transfer system.

The respondents without almost any exception, 24 of the 26, highly appreciated the swiftiness offered by the intraday credit transfer system with an average score of 7,9 on a scale of 1-10. As to the scores regarding the increased safety in keeping the deadlines, they were even higher, reaching 8,3. Concerning the payment of scheduled public charges, the appreciation was highly positive regardless of the size of companies with the average score of 9,2. The respondents were pleased not to be forced to execute credit transfers too early in order to avoid late payments's consequences.

### **4.3.3 Effectiveness of cash flow planning and cost effectiveness**

Regarding the effectiveness of the cash flow planning, the scores in the answers were high, with an average of 7,0. The fundamental difference in scores was directly linked to the differences in the number of credit transfers the interviewed companies executed and in connection with that to the differences in sizes of companies and in sizes of the finance staff. Sometimes it boiled down to the differences in their actual responsibilities and authorities. Companies with low number of credit transfers told us they did not feel any change, while companies with high number of credit transfers and with sales revenues of hundreds of millions or of billions HUF, highly appreciated the increased effectiveness in cash flow planning. Their average score was 9,6.

### **4.3.4 Motivation and satisfaction of the finance staff and the human resources effectiveness**

During the interviews, the answers were different depending upon the actual position of the respondents. The managers, managing directors or finance directors gave different answers from those of the finance staff members executing instructions only. Further differences of less importance were found depending upon the size of the companies. The decision makers of the biggest ones with sales revenues of several hundreds of millions or billions HUF gave the highest scores with an average of 9,6 on the scale of 1-10. According to their opinions the effectiveness of their work clearly went up, the finance department could deliver better contribution to the successful operations of the companies, and their motivation and satisfaction were higher as well. The greater effectiveness could have been used in other areas within finances, but internal analysis or measures were not prepared, consequently it was not possible to discuss numbers during the interviews.

### **4.3.5 Control measure and the confirmation of hypothesis regarding finance staff and human resources' effectiveness**

The hypothesis of H1, H2, H5, H6 and the thesis of T3, T4 were once more confirmed during the interviews

#### 4.4 New and novel findings

The summary of the financial and statistical analysis and the qualitative evaluations together with the control measure results are demonstrated in the table 10 below:

10. Table: Summary of analysis regarding hypothesis

Source: Own edition

Number	Hypothesis	Analysis			Comments
		Evaluation of the credit transfers data of the micro, small and medium size enterprises	Evaluation of the questionnaires' results	Qualitative analysis and control measure through personal interviews with 26 companies	
1.	H1	√	√	√	statistically proved with two control measures and cross checked with qualitative analysis, it was confirmed
2.	H2	n/a	√	√	statistically proved with two control measures and cross checked with qualitative analysis, it was confirmed
3.	H3	n/a	∅	∅	statistically not proved, cross checked with control measure and with qualitative analysis. it was rejected
4.	H4	n/a	∅	∅	statistically not proved, cross checked with control measure and with qualitative analysis, it was rejected
5.	H5	n/a	√	√	statistically proved, cross checked with control measures and with qualitative analysis, it was confirmed
6.	H6	n/a	√	√	statistically proved , cross checked with control measure and with qualitative analysis, it was confirmed
7.	H7	n/a	∅	∅	statistically not proved, cross checked with control measure and with qualitative analysis, it was rejected

The following new or novel findings were set up in the dissertation:

**E1:** *In summary, it was demonstrated and confirmed, by analysing through statistical methods the electronically initiated credit transfers and the average daily account balances of the micro, small and medium size enterprises, that according to the paired „t” tests, at 5% significance level, as a consequence of the introduction of the intraday credit transfer system, there were no relative changes in terms of percentages from the first half to the second half of the year 2012:*

*-in the average daily account balances*

*-in the cumulated half yearly credit transfers*

*-in the ratio of the cumulated credit transfers to the average account balances.*

**E2:** *The application of the autocorrelation function to the available average account balances over a period enabled us to analyse the “memory of the banking payments” and the liquidity process. This autocorrelation function showed shorter memory of payments in case of the small and medium size enterprises than that of the micro enterprises, thus confirming that the SME-s had higher variety in their credit transfers.*

**E3:** *In respect of the survey by questionnaires with the micro, small and medium size enterprises, principal component analysis, factor analysis with least squares method and rotation were all applied. As a result of the variance maximization rotation, it was confirmed that in the first factor the role of the employees in charge of finances and the role of the human resources effectiveness were important. By evaluating the written comments and the conclusions of the personal interviews together with further qualitative analysis it was confirmed that the accountable financial managers in charge of the decisions, their increased motivation, satisfaction, and responsibility represented the decisive factors in the consequences of the intraday credit transfer system and in the enhancement of the human resources effectiveness.*

**E4:** *The swiftness of the credit transfers and the bigger safety in keeping the deadlines of the scheduled payments played a smaller, but still dominant role in the consequences of the intraday credit transfer system’s introduction. In general, the companies favourably evaluated the swiftness of credit transfers, the better timing and cash flow planning the new intraday credit transfer system permitted. The favourable impacts on the business operations of the companies were especially appreciated when companies were paying scheduled public charges towards the state.*

## 5 CONCLUSIONS AND RECOMMENDATIONS

**J1:** *After 1st of July, 2012 as a consequence of the intraday credit transfers system's introduction and assuming the same turnover in the second half of the year there were no changes from the first half year neither in the average daily account balances nor in the cumulated values of the credit transfers of the micro, small, and medium size enterprises. It would be useful to repeat the research in a later stage and to analyse data of a longer period of time. Naturally as the elapsed time from 1st of July 2012 is growing, the likelihood of having distorting factors in the actual results is bigger because of the changes in the underlying market conditions and in the operations of the companies.*

**J2:** *Besides analysing the daily credit transfers, which was in the focus of the research, it would be important to make other researches or to have panel discussions with the managers of the SME-s, and debating all of those financial and economic factors that can positively influence their liquidity positions. The aim would be to identify the most important factors through which their liquidity positions could be improved.*

**J3:** *The research confirmed that after 1st of July 2012, as a consequence of the intraday credit transfer system's introduction, mostly the motivation of the accountable managers in charge of the decisions increased, because they felt they could better contribute to the effective operations of their companies. It would be worth discussing with the managers of the SME-s how this increased motivation, commitment and effectiveness could be used up in other areas for the companies.*

**J4:** *After 1st of July 2012, as a consequence of the intraday credit transfer system's introduction, mostly the motivation of the accountable managers in charge of the decisions increased. It would be meaningful to further analyse the role of delegation of authorities and responsibilities within SME-s. Lack of delegation is a well known problem among SME-s, so it would be useful to identify other areas where further delegation can lead to similarly good results. This would be especially true in case of larger companies and in case of their accountable managers in charge of decisions.*

**J5:** *After 1st of July 2012, as a consequence of the intraday credit transfer system's introduction, mostly the work of the accountable managers in charge of the decisions became easier, their satisfaction and effectiveness were increased, they could better contribute to the successful operations of their companies. Based upon that, it would be beneficial and promising to analyse which other government decisions, laws or measures in the administration or foreign trade regulation could have similar beneficial impacts on the effectiveness of the SME-s, thus resulting in easier and simpler ways of performing both at the level of SME-s and nationwide.*

**J6:** *After 1st of July 2012, as a consequence of the intraday credit transfer system's introduction, small and medium size enterprises had sharper cash flow planning, and they could execute credit transfers closer to deadlines. This resulted in a greater safety in paying the scheduled public charges on time. Besides greater safety and faster credit transfers, through the access- limited to well defined research scope- to databases of the state administration might lead to some important new findings by checking*

*whether the SME-s had to pay less penalties, fees or interests for late payments towards the state after 1<sup>st</sup> of July 2012.*



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