MANAGEMENT AND BUSINESS ADMINISTRATION DOCTORAL SCHOOL

Thesis Booklet

Erika Jáki

The behavioural motives of the optimistic EPS forecasting error
Analysing Hungarian and Austrian companies' EPS forecasts
Ph.D. thesis

Supervisor:

Dr. Miklós Virág

Professor

Budapest, 2012

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Table of contents

I. Research background and the rationale for theme selection

The theme of my thesis is financial planning, with a focus on the earnings per share (EPS) forecasting error (hereinafter: EPSerr). I have been already active in the field of corporate financial planning for more than 10 years. First, as SAP adviser in controlling area in 2001-2002, then as controlling manager at a multinational company from 2002 to 2008, where I was in charge of financial planning and regular financial reporting. Since 2005, during my academic carrier, I have been teaching corporate finance and corporate financial planning at the Corvinus University of Budapest.

There is a multitude of evidence for systematic optimism observed in EPS forecasting:

1. Most of the evidence comes from analyses of EPSerr of American companies listed on the stock exchange (Zacks, 1979, DeBondt, Thaler, 1990, Dreman, Berry, 1995, Clayman, Schwartz, 1994, Easterwood, Nutt, 1999, summary study Brown, 1983).
2. Some researchers analysed the EPSerr of companies floating on stock exchanges in Western-Europe (Capstaff, Paudyal, Rees, 2001, Beckers, Steliaros, Thomson, 2004, Bagella, Becchetti, Ciciretti, 2007).
3. I have only found one study on Central and Eastern European countries (Djatej, Gao, Sarikas, Senteney, 2008), which examines how the introduction of the IFRS has impacted EPS forecasting accuracy.

The causes of overplanning have been investigated from many aspects. There have been studies on **planning fallacy** resulting in the conclusion that costs are underplanned to a lesser extent than revenues are overplanned (Buhler, Griffin, Ross, 1994; Kahneman, Lovallo, 2003). Other research has looked into **what motivates** (especially EPS forecasting) analysts to project higher EPS values (Lim, 2001, Brown 1993, Francis, Philbrick, 1993, Libby, Hunton, Tan, Seybert, 2008; Ke, Yu, 2006; Cotter, Tuna, Wysocki, 2006). What is relevant to the current theme is a third focus of studies, namely cognitive mechanisms. The thesis presents and categorises different **psychological factors**. This categorisation may not necessarily be appropriate in other disciplines as the correlation with cognitive mechanisms as outlined in this paper is strictly specific to financial planning. The research idea has been

taken from an article by Kahneman and Lovallo (2003) entitled "Delusion of Success", which is the most comprehensive publication on behavioural causes related to this subject.

A.   Review of the references

Overconfidence bias is the most frequently mentioned reason of overplanning in the literature. (Camerer, Lovallo, 1999; Kahneman, Lovallo, 2003; Lovallo, Viguerie, Uhlaner, Horn, 2007, Nofsinger, 2007 Weinstein, 1980, Larwood, és Whittaker, 1977). The following factors play also important role in overplanning and are strongly connected to the overconfidence bias:

1. *the attribution error* (Kahneman, Lovallo, 2003, Kahneman, Miller, 1986 Buehler, Griffin, Ross, 2002),
2. *the illusion of control* (Krizan és Windschitl 2007, Nofsinger, 2007; Kahneman, Lovallo, 2003; March, Shapira, 1987), és
3. *the illusion of knowledge* (Brown, 1993, Easterwood és Nutt, 1999, Nofsinger, 2007).

The roles of the following factors were confirmed in the development of "illusion of knowledge":

1. *The anchoring heuristic* is an accentuated area in the financial overplanning (Kahneman, Lovallo, 2003, Webby, O'Connor, 1996, Chapman, Johnson, 2002, Mussweiler; Englich, 2005 Kopelman, Davis, 2004).
2. *The confirmation bias* (Camerer, Lovallo, 1999, Lovallo, Viguerie, Uhlaner, Horn, 2007, Krizan és Windschitl 2007 Moisland, 2000, Strack, Mussweiser, 1997),
3. *Structure of information* (strategy in scenario or in a list format) (Sedor 2002),
4. The evaluation of the probability of *conjunctive and disjunctive events* (Kahneman és Tversky, 1974).

Several researches have proved that higher *uncertainty* leads to higher forecast-optimism (Ackert, Athanassakos, 1997; Irwin, 1953, Marks 1951, Ashbaugh, Pincus, 2001,

De Bondt, Thaler 1990, Duru, Reeb, 2002, Das, Levine, Sivaramakrishnan, 1998, Haw, Jung, Ruland, 1994).

B.   The structure of the thesis

I have divided my thesis into three sections. **Chapter One** gives an overview of the conceptual framework necessary for processing this subject, including:

1. An introduction to the criteria of rational decision-making and to decision-making models;
2. Normative and descriptive schools of decision sciences. These present two different approaches to examining decision-making;
3. A brief overview of notions used by descriptive decision theory (with a focus on the phenomenon of overplanning);
4. The definition of EPS;
5. The notion of overplanning; empirical evidence from the areas of corporate financial planning and EPS forecasting.

Chapter Two of the thesis will discuss financial overplanning (a form of which is the typically optimistic EPS forecast) and especially the underlying psychological causes as well as summarising and categorising existing research findings. The psychological causes of overplanning can be grouped into three main categories of impact:

1. overconfidence and overoptimism
2. illusion of knowledge
3. illusion of control.

The most frequently identified reason for overplanning in budgeting is the decision-maker's or analyst's *overconfidence and overoptimism*. The other frequently mentioned reason is the *illusion of knowledge*, for an explanation of which the dynamics of information processing is to be examined. There are a number of cognitive mechanisms at play. Many publications exist examining and proving such impacts (Epley and Gilovich 2001; Chapman and Johnson, 2002; Mussweiler and Englich 2005; Strack and Mussweiler, 1997; Slovic, Griffin and Tversky, 2002; Simonson and Drolet, 2004, etc.); it is on the basis of the

conclusions of such publications that I present, along the anchoring effect, the formation of the illusion of knowledge in financial planning.

Chapter Three of the thesis is dedicated to **empirical research**. The **main focus of research** was the weighting of information and making a distinction between positive and negative information, or, strictly speaking, the empirical study of confirmation bias as one of the causative factors of the illusion of knowledge.

II. Methods applied

C.   Database

For the empirical study I make a distinction between the periods 2003-2007 and 17.09.2008-2010. I have excluded from the analysis forecasts made for the year 2008 before 17.09.2008, as in that period analysts did not yet took into account the impact of the global financial crisis, and therefore those data may bias the conclusions.

Geographically, the study analyses EPS forecasts made for 3 Hungarian and 4 Austrian companies:

Hungarian firms:

1.   Hungarian Telecom Ltd. (MATAV)
2.   Hungarian Oil and Gas Trust Ltd. (MOL)
3.   OTP Bank Ltd. (OTP)

Austrian firms:

1.   Telekom Austria AG (TKA)
2.   OMV AG (OMV)
3.   Raiffeisen Bank International AG (RBI)
4.   Erste Group Bank AG (EBS)

As opposed to earlier research studies proving the systematic optimism of EPSerr, the research I have carried out is different in both its temporal focus (post-2003 years) and geographical scope (Hungary and Austria).

Compensated factual EPS data have been taken from the Bloomberg[1] database. In the case of missing values, I took over undiluted factual EPS data from annual reports. The number of forecasts subject to study (hereinafter: N) was 2,793, of which 1,045 were made for Hungarian and 1,748 for Austrian companies. Three industries were examined including telecommunications (N=752); oil industry (N=943); and the banking sector (N=1,098). The database is exhaustive (not sample-based).

Company/ Industry	2003	2004	2005	2006	2007	2008	2009	2010	Sum.
Matav	32	43	41	34	34	35	37	30	286
TKA	34	51	53	45	62	67	81	73	466
Telekom.	66	94	94	79	96	102	118	103	752
MOL	34	43	51	58	50	43	55	53	387
OMV	53	61	67	68	59	70	93	85	556
Oil	87	104	118	126	109	113	148	138	943
OTP	29	46	46	46	36	51	59	59	372
RBI			13	31	42	55	45	52	238
EBS	35	54	57	60	60	72	76	74	488
Bank	64	100	116	137	138	178	180	185	1098
Sum.	217	298	328	342	343	393	446	426	2793
Hungarian company									1045
Austrian company									1748

Table 1. Number of database items broken down by company and year

The limitation of the research is that it covers 2 countries, 7 companies and 3 industries, and thus its conclusions are only valid for those data. That said, its great advantage is that the database is exhaustive, i.e. it includes all the EPS forecasts made for the companies under review in that given period.

D.   Hypotheses and methodology

I have grouped my hypotheses into three areas. First, I looked into whether in the two periods – 2003-2007 and 17.09.2008-2010 – one can speak of **systematic optimism** in respect of the EPSerr.

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[1] Bloomberg is a leading business and financial information news website.

H1.On the analysed database, individual EPS forecasts are generally optimistic, i.e. the EPSerr exceeds zero in the period 2003-2007.

H2.On the analysed database, individual EPS forecasts are generally optimistic, i.e. the EPSerr exceeds zero in the period 17.09.2008-2010.

Making the EPSerr comparable between different companies and currencies requires defining the relative value of the error. I have found the EPSerr definition (1) of Capstaff, Paudyal and Rees (2001) the most suitable for studying the EPSerr.

$$Rel.Err = \frac{EPS_{fct} - EPS_{act}}{|EPS_{act}|}$$

(1)

For the analysis of H1 and H2, I use **DeBondt and Thaler's (1990)** research method considered to be a milestone in EPS forecast studies, whereby they performed a regression analysis of the actual and forecasted change in EPS.

Then I go on to focus on the **impact of the crisis**. On the one hand, the crisis is *negative information*, to which analysts underreact as so far shown by results, and thus the EPSerr grows in the optimistic direction (Easterwood, Nutt, 1999, Sedor, 2002). On the other hand, the crisis has resulted in increased *uncertainty*, as a consequence of which heuristics come into play during information processing, again pushing the final decision in the optimistic direction[2]. As the product of the two, what we experience is that the systematic optimism of the EPSerr increases as a result of the crisis.

Many researchers (Agans, Shaffer, 1994; Strack, Mussweiler, 1997; Sedor, 2002; Kadeus et al., 2006) have used the ANOVA test to substantiate a correlation between the formed groups and the EPSerr. I perform an ANOVA test to examine whether the averages of the two periods are significantly different.

H3.On the analysed database, the optimism of the EPSerr is greater in the crisis years (17.09.2008-2010) than in the pre-crisis period (2003-2007).

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[2] Many studies have proven that as uncertainty grows so does the optimism of the EPSerr (Ackert, Athanassakos, 1997; Irwin, 1953, Marks 1951, Ashbaugh, Pincus, 2001, De Bondt, Thaler 1990, Duru, Reeb, 2002, Das, Levine, Sivaramakrishnan, 1998, Haw, Jung, Ruland, 1994).

I perform a separate analysis of whether analysts appropriately weighted the news of the crisis as negative information in their projections and how in the uncertain environment in the wake of the crisis the scatter of EPSerr changed. Naturally, a distinction must be made here between the period where the crisis was a piece of news and the period where it was a factor of uncertainty. That can be accurately defined based on the scatter of the forecasted ΔEPS, based on which I have divided the period 17.09.2008-2010 into two sub-periods – one in which the crisis still had news value and another in which it was an uncertainty factor. I then compare the two sub-periods using DeBondt and Thaler's (1990) aforementioned regression analysis method and verify the difference between averages using the ANOVA test.

> *H4. On the analysed database, analysts underreacted to the news of the crisis after 17.09.2008 and thus the EPSerr was optimistic.*
>
> *H5. On the analysed database, the uncertainty triggered by the crisis after 17.09.2008 caused the EPSerr to grow in the optimistic direction.*

I perform a further test for **weighting the information**. Many studies (Sedor, 2002; Kadous, Krische, Sedor, 2006; Ali, Klein, Rosenfeld, 1992; Easterwood, Nutt, 1999) have proven that ΔEPS_{t-1} works as an anchor in making EPS forecasts. The increase in ΔEPS_{t-1} is positive information drawing overreaction from analysts, which causes the EPSerr to increase, while its decrease is considered negative information drawing underreaction, which again causes the EPSerr to increase.

> *H6. On the analysed database, a higher ΔEPS_{t-1} value increases the systematic optimism of the EPSerr as analysts overreact to positive information in both sub-periods.*
>
> *H7. On the analysed database, a lower ΔEPS_{t-1} value increases the systematic optimism of the EPSerr as analysts underreact to negative information in both sub-periods.*

I use Easterwood and Nutt's (1999) test to verify the effect of ΔEPS_{t-1} on EPS forecasts. I re-perform their test modified by the insertion in the denominator of the EPS_{t-2} value rather than the exchange rate.

According to the authors, both positive and negative information adds to optimism, and therefore these two cases should be distinguished from a situation where the change in EPS is considered to be neither particularly positive nor negative news. The interpretation of coefficients is identical with DeBondt and Thaler's formula with the tests here also focussing on the value of β, but the interpretation of ß is rather complicated. A more simple analysis will be made possible if I divide ΔEPS_{t-1} into quartiles and percentiles and look at whether a more optimistic EPSerr is characteristic with extreme percentiles and quartiles as opposed to middle ΔEPS_{t-1}. As in previous studies, I also verify the correlation by using the ANOVA test.

I. Systematic optimism
H1. On the analysed database, the EPSerr is syst. opt. in the period of 2003-2007.
H2. On the analysed database, the EPSerr is syst. opt. in the period of 17.09.2008–2010.

II. The effect of the financial crisis on EPSerr
H3. On the analysed database, the EPSerr syst. opt. grew due to the fin. crisis.
H4. On the analysed database, the EPSerr syst. opt. grew due to underreaction to negative information about the financial crisis.
H5. On the analysed database, the EPSerr syst. opt. grew amidst uncertainty caused by the fin. crisis.

III. Weighting information:
H6. On the analysed database, higher ΔEPS_{t-1} as overreaction to positive information increased the EPSerr syst. opt. in both sub-periods.
H7. On the analysed database, lower ΔEPS_{t-1} as underreaction to negative information increased the EPSerr syst. opt. in both sub-periods.
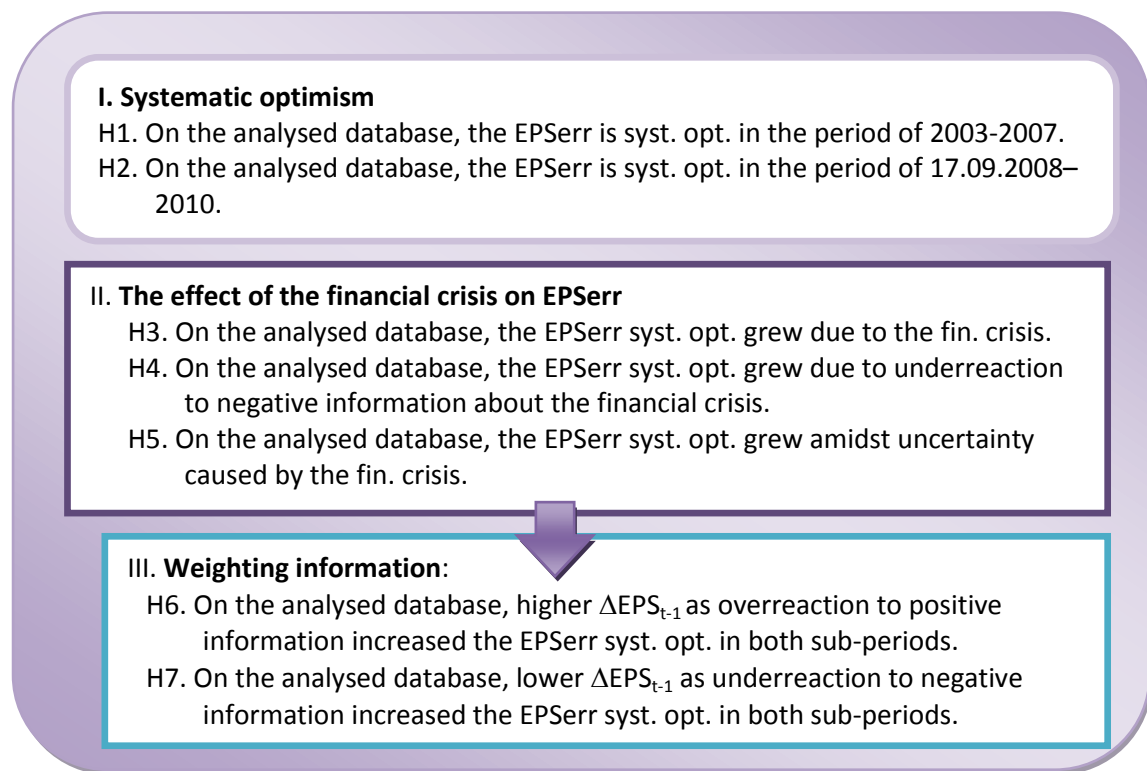
Figure 1. The structure of hypotheses

II. The results of the thesis

A. Systematic optimism

Contrary to expectations, for the period 2003-2007 the average EPSerr was -5.93%, i.e. EPS forecasts were pessimistic. By contrast, for the period 17.09.2008-2010 the EPSerr was optimistic (+5,29% on average). The scatter of EPSerr grew one and half times compared to

the period 2003-2007 (from 20.19% to 36.68%), which can be explained by increased uncertainty.

EPSerr		2003 - 2007	17.09.2008-2010
N	Valid	1528	973
Mean		-5,93%	5,29%
Stand. Err.		0,52%	1,18%
Median		-4,94%	1,32%
Mode		0,00%	0,00%
Std. Deviation		20,19%	36,68%
Skewness		126,98%	88,96%
Std. Error of		6,26%	7,84%
Kurtosis		661,16%	415,12%
Std. Error of Kurtosis		12,51%	15,67%
Range		190,27%	356,57%
Minimum		-79,56%	-163,64%
Maximum		110,71%	192,93%

Table 2. Descriptive statistics of EPSerr

The result of the period 2003-2007 disconfirms many earlier studies[3]. In this period the economy grew dynamically, which was also followed by the actual EPS values of the companies under review. Overall, analysts did not incorporate *extreme* good news into EPS forecasts, i.e. they underreacted to them, which contradicts the received wisdom that positive news draw overreaction.

The results of linear regression analysis applied by DeBondt and Thaler (1990) confirm those of descriptive statistics. In the period 2003-2007, the values of $\alpha=0.122$ and $\beta=1.044$ suggest pessimistic forecasts. The crisis period is not that simple to evaluate as the value of $\alpha=0.091$ is near zero but still in positive territory, as opposed to the negative value found in earlier studies. However, the value of $\beta=0.983$ indicates slight optimism. Given that the

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[3] Zhaoyang Gu, Jian Xue (2007) examined the effect of extreme positive news and proved that analysts' EPSerr increased in the optimistic direction. Becchetti, Hasan, Santoro, and Anandarajan (2007) studied the impact of the high-tech stock exchange boom between 1995-2001 and proved analysts' optimism. Bagella, Becchetti, Ciciretti (2007) also analysed the impact of the high-tech boom but compared the US and the Eurozone (W-Europe) and came to the same conclusion as the other study.

descriptive analysis also revealed moderate optimism, the value of ß around one and that of α around zero are acceptable.

Method	Period	α	t-stat	Sig.	*ß*	t-stat	Sig.	R^2%	N	Pearson	Szig. (2-
DeBondt, Thaler (1990)	2003-2007	*,122*	9,160	,000	*1,044*	110,499	,000	88,89%	1528	,943	,000
	17.09.2008-2010	*,091*	4,532	,000	*,983*	49,748	,000	71,82%	973	,847	,000

Table 3. Results of regression analysis

H1 is rejected based on the analysis of EPSerr since in the period 2003-2007 forecasts were significantly pessimistic on average.

I accept H2 as after 17.09.2008 the EPSerr was in the positive direction in respect of both the average and median values.

A.   The impact of the crisis as negative information and an uncertainty factor

The EPSerr averages of the two periods clearly diverge but I have performed further tests to verify H3. Based on the results of descriptive statistics, the scatter of EPSerr increased one and a half times, a consequence of great uncertainty caused by the crisis. The Levene test also proves the divergence of EPSerr variances in the two periods.

Test of Homogeneity of Variances EPSerr 2003-2007 és 17.09.2008-2010

Levene Statistic	df1	df2	Sig.
177,303	1	2499	,000

Table 4. H3 Levene test

Based on the ANOVA, the EPSerr averages significantly differ in the two periods. The correlation is weak, eta^2=0.037.

ANOVA Table

ANOVA table 2003-2007 and 17.09.2008-2010	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7,486	1	7,486	96,919	,000
Within Groups	193,032	2499	,077		
Total	200,519	2500			

Measures of Association

Eta Squared	0,037

Table 5. H3 ANOVA test

Overall, the above tests have confirmed that the two periods significantly differ in respect of both scatter on the basis of the Levene test and average values based on the ANOVA test. These findings are also borne out by the values of descriptive statistics, and thus I accept H3.

The crisis as negative information was a piece of news immediately after the bankruptcy of Lehman Brothers in 2008. The **uncertainty** arising from the crisis only had a discernible effect on Austrian and Hungarian companies at a later stage. I distinguish the period in which the crisis was a piece of news from the period when it was an uncertainty factor by studying the forecasted ΔEPS. If analysts are uncertain the scatter of the forecasted ΔEPS will be greater, while if the crisis "*only*" negative information which is underweighted the scatter of the forecasted ΔEPS will not change to a significant extent.

The chart below clearly shows how drastically the scatter of the forecasted ΔEPS increased in Q4 2009. At that time the crisis was no longer merely a piece of news but an uncertainty factor. According to the foregoing, I divide the period 17.09.2008-2010 into two sub-periods – 09.2008-09.2009, when the crisis is negative news and 09.2009-2010, when it is already an uncertainty factor, too.
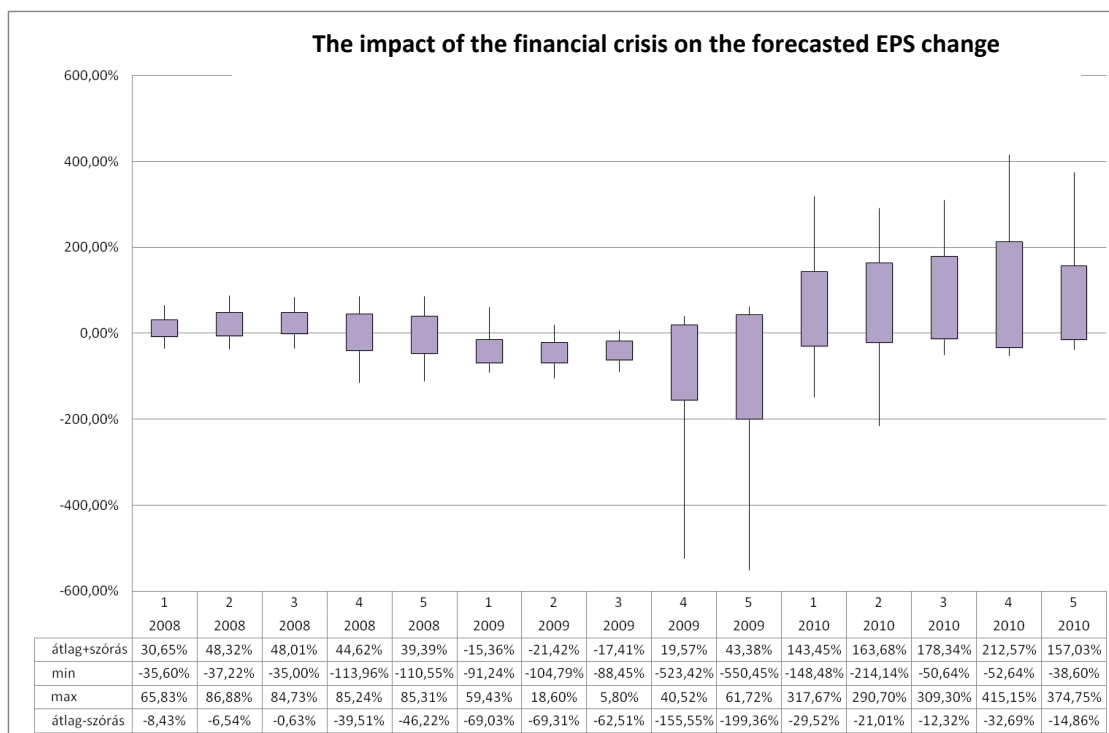
The impact of the financial crisis on the forecasted EPS change

	1 2008	2 2008	3 2008	4 2008	5 2008	1 2009	2 2009	3 2009	4 2009	5 2009	1 2010	2 2010	3 2010	4 2010	5 2010
átlag+szórás	30,65%	48,32%	48,01%	44,62%	39,39%	-15,36%	-21,42%	-17,41%	19,57%	43,38%	143,45%	163,68%	178,34%	212,57%	157,03%
min	-35,60%	-37,22%	-35,00%	-113,96%	-110,55%	-91,24%	-104,79%	-88,45%	-523,42%	-550,45%	-148,48%	-214,14%	-50,64%	-52,64%	-38,60%
max	65,83%	86,88%	84,73%	85,24%	85,31%	59,43%	18,60%	5,80%	40,52%	61,72%	317,67%	290,70%	309,30%	415,15%	374,75%
átlag-szórás	-8,43%	-6,54%	-0,63%	-39,51%	-46,22%	-69,03%	-69,31%	-62,51%	-155,55%	-199,36%	-29,52%	-21,01%	-12,32%	-32,69%	-14,86%

Figure 2. Impact of the crisis on forecasted ΔEPS

The chart below reflects well how in 2006 and 2007 the forecasted ΔEPS (FC) fluctuated around the actual ΔEPS (AC) with limited scatter. In the first three quarters of the years 2008 and 2009, the forecasted change was above the actual value, i.e. forecasts were optimistic, and then in Q4 and Q5 it approximated the actual value. It was not until the last two quarters of 2009, when the scatter of the forecasted ΔEPS increased, that analysts made heavy downward revisions. In this period they already gave pessimistic forecasts. In 2010 they overreacted to the effect of the crisis, i.e. forecasts remained pessimistic in Q1-3, excluding Q4, and then in Q5, after the closure of the year, they were pessimistic again.
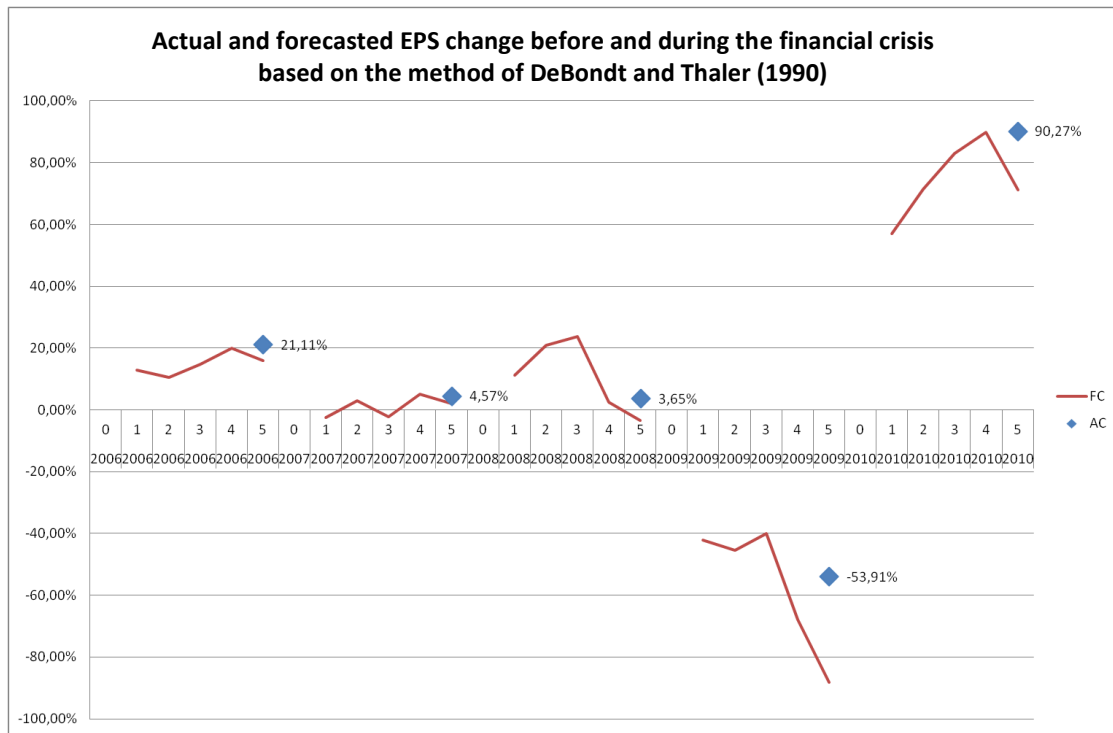
13

Figure 3. The average value of forecasted ΔEPS in 2006-2010 by quarter and the actual EPS value

The results of regression analysis also confirm the fact that while the crisis was negative information (09.2008-09.2009), forecasts remained optimistic based on the values of ß=0.872 and α=-0.16, where the confidence interval of ß is also below zero. By contrast, when the crisis was an uncertainty factor (09.2009-2010), optimistic forecasts were made based on the values of ß=1.091 and α=0.086.

Period	$α$	t-stat	Sig.	$β$	t-stat	Sig.	Lowwer Bound	Upper Bound	R^2%	N	Durbin Watson
09.2008-09.2009	*-,016*	-1,113	,267	*,872*	28,086	,000	,811	,933	68,2%	370	,943
10.2009-2010	*,086*	2,710	,007	*1,091*	39,525	,000	1,037	1,145	75,0%	522	,847

Table 6. Study of the crisis as negative information and then as uncertainty factor using DeBondt and Thaler's regression analysis

Based on the ANOVA test, the *forecasted ΔEPS values* are also significantly different in the two periods; the strength of the correlation is eta^2=0.061.

Anova table

ANOVA - Forecasted ΔEPS 09.2008-09.2009 and 10.2009-2010	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	55,839	1	55,839	58,032	,000
Within Groups	864,062	898	,962		
Total	919,901	899			

Measures of Association

Eta Squared	0,061

<div align="center">

Table 7. Forecasted ΔEPS; ANOVA test on H4 and H5

</div>

I accept H4 on the basis of descriptive statistics, regression analysis and the ANOVA test since while the crisis was negative news EPS forecasts remained optimistic. I reject H5 since when the crisis was already an uncertainty factor optimistic forecasts were already made.

B. Weighting the information: the effect of ΔEPS_{t-1} on the EPSerr

The period 2003-2007 proved the inadequate weighting of (or underreaction to) positive information. I explain this phenomenon by concluding that analysts underreact to *extreme* positive news.

In the uncertain environment created by the crisis analysts did not underreact but overreacted to the impact of the crisis (negative news), i.e. they made pessimistic forecasts. I interpret it as overreaction to *extreme* negative news. Let us look at how EPSerr changes in the light of ΔEPS_{t-1}. In forming groups the objective was to have equal numbers of items in all groups.

In the period 2003-2007, there was growth in several categories.

2003-2007		decline	gentle growth	middle growth	great growth	|ΔEPS$_{t-1}$|< 2, a the four category together	above 1000% growth
N		237	396	389	421	1443	85
N %		15,51%	25,92%	25,46%	27,55%	94,44%	5,56%
ΔEPS$_{t-1}$	Range	-1,083	0,255	0,727	1,852	2,390	61,077
	Minimum	-1,1244	0,045	0,232	0,586	-1,124	10,154
	Maximum	-0,04099	0,209	0,495	1,266	1,266	50,923
	Mean	-0,323	0,118	0,376	0,841	0,326	26,462
EPSerr	Range	162,43%	116,15%	162,45%	104,22%	190,27%	78,32%
	Minimum	-51,72%	-79,56%	-63,65%	-74,51%	-79,56%	-52,28%
	Maximum	110,71%	36,59%	98,80%	29,71%	110,71%	26,04%
	Mean	9,74%	-6,02%	-11,79%	-6,58%	-5,15%	-19,16%

Table 8. Statistical values of ΔEPS$_{t-1}$ group formation for 2003-2007

The following chart shows well that with *above 1,000% growth* the absolute value of EPSerr still remains higher but its direction is pessimistic (negative). Analysts underweight *extreme* good news and thus forecasts underestimate the EPS value for the next year. This is the same as the experience, i.e. the underweighting of *extreme* good news, in the period 2003-2007.
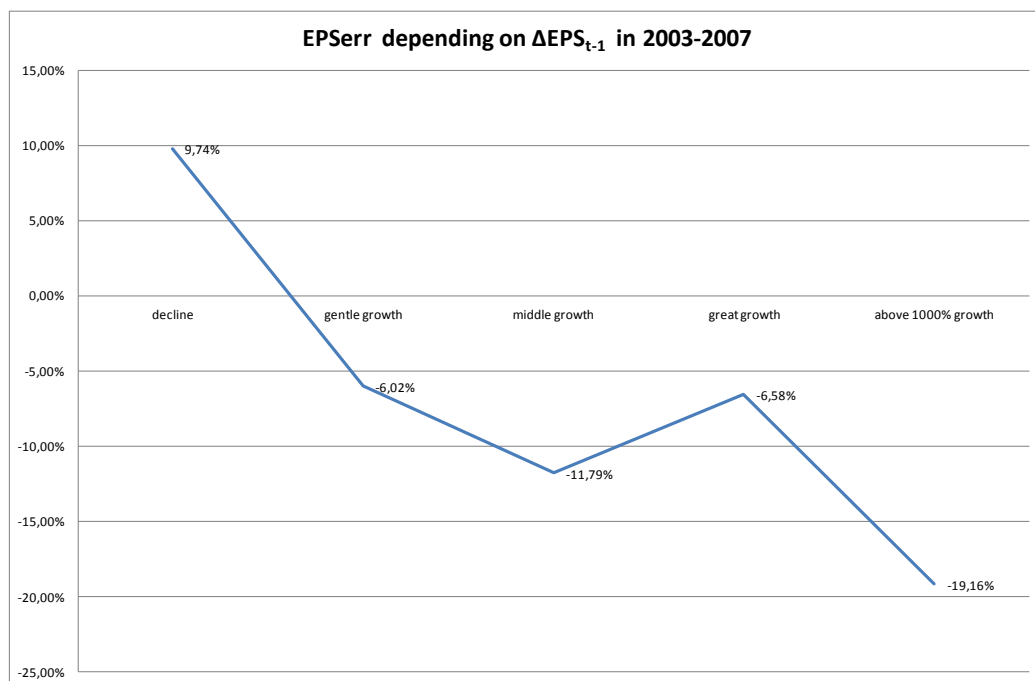

Figure 4. EPSerr relative to ΔEPS$_{t-1}$ in 2003-2007

During the crisis, there was of course a decline in several categories.

17.09.2008-2010		drastic decline	middle decline	gentle decline	stagnation	growth
N		228	190	173	131	251
N %		23,43%	19,53%	17,78%	13,46%	25,80%
ΔEPSt-1	Range	225,51%	23,10%	6,80%	20,89%	32,96%
	Minimum	-2,93694	-0,504	-0,203	-0,107	0,21627
	Maximum	-0,68186	-0,273	-0,135	0,102	0,54586
	Mean	-147,43%	-40,35%	-15,26%	2,81%	35,33%
EPSerr	Range	257,34%	173,00%	208,16%	356,57%	249,38%
	Minimum	-124,78%	-76,71%	-42,91%	-163,64%	-65,27%
	Maximum	132,56%	96,29%	165,25%	192,93%	184,11%
	Mean	-8,40%	-2,58%	18,42%	0,17%	17,32%

Table 9. Statistical values of ΔEPS$_{t-1}$ group formation for 09.2008 -2010

In the chart below, it is along the last three categories that we see a V-shaped curve (highlighted in bold line). The growth path called *stagnation* was followed by what can be considered accurate forecasts (EPSerr=0.17%), while *growth* per se (EPSerr=17.32%) was over and the *gentle decline* phase (EPSerr=18,42%) was underreacted by analysts and so the EPSerr increased in both cases. In the case of *drastic decline* (EPSerr=-147.43%) and *middle decline* (EPSerr=-40.35%), the EPSerr was pessimistic, i.e. it is a case of overreaction to negative news. This agrees with overreaction to the news of the crisis in the period 09.2009-2010, when uncertainty was also felt. Here we can speak of *extreme* negative news, which already drew overreaction from analysts.
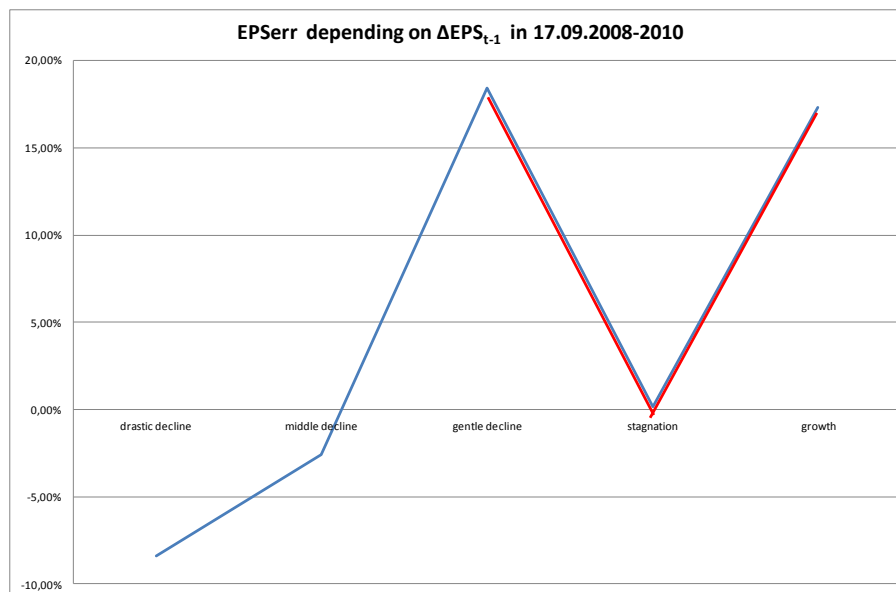

Figure 5. EPSerr relative to ΔEPS$_{t-1}$ in 09.2008-2010

In **Easterwood and Nutt's (1999) regression analysis,** in the pre-crisis period the category of *decline* emerges from the other data where the EPSerr=9.74% was. Based on the Pearson correlation, there is a strong opposite-directed relationship between variables, which means that after such a sharp decline analysts forecast massive growth as is also suggested by ß=-8.542.

In the case of great growth (EPSerr=-6.58%) and *above 1,000% growth* (EPSerr=-19.16%), the value of the Pearson correlation indicates a moderately negative relationship. In the case of *great growth*, analysts project a decline for the next year based on the value ß=-0.885, and thus pessimistic values are forecasted, while in the case of *above 1,000% growth,* ß=-0.006 indicates that such an extent of growth is not taken into consideration for the next year.

In the event of *gentle* and *middle growth*, the correlation is very weak; thus ΔEPS_{t-1} has hardly any impact on forecasts made for the next year.

Easterwood és Nutt (1999)

2003-2007	α	t-stat	Sig.	β	t-stat	Sig.	R^2%	N	Pearson korr.	Szig. (2-tailed)
decline	-1,300	-12,793	,000	-8,542	-39,690	,000	87,02%	237	-,933	,000
gentle growth	,155	8,614	,000	-,290	-2,132	,034	1,14%	396	-,107	,034
middle growth	,544	6,452	,000	-,749	-3,437	,001	2,96%	389	-,172	,001
great growth	1,005	18,643	,000	-,885	-14,262	,000	32,68%	421	-,572	,000
above 1000% growth	,413	10,618	,000	-,006	-5,395	,000	25,96%	85	-,510	,000

Table 10. Results of Easterwood and Nutt's (1999) regression analysis based on ΔEPS_{t-1} in 2003-2007

Examining the period 17.09.2008-2010 it is striking that there is no or little correlation between the two variables and further that the relationship is typically not significant. The significance level of the value of ß is similar to that. The R^2 indicator is also evidence that the independent variable only explains a negligible part of the dependent variable's scatter. The absence of correlation draws the attention to the fact that in the two years after the crisis the value of ΔEPS_{t-1} did not influence forecasts for the next year.

Easterwood és Nutt (1999)

17.09.2008-2010	α	t-stat	Sig.	β	t-stat	Sig.	R^2%	N	Pearson korr.	Szig. (2-tailed)
drastic decline	,188	1,066	,288	-,599	-6,072	,000	14,03%	228	-,375	,000
middle decline	-,176	-2,422	,016	,063	,360	,720	0,07%	190	,026	,720
gentle decline	-,502	-2,860	,005	-3,961	-3,472	,001	6,59%	173	-,257	,001
stagnation	-,291	-5,662	,000	,245	,363	,717	0,10%	131	,032	,717
growth	-,469	-9,404	,000	,359	2,743	,007	2,93%	251	,171	,007

Table 11. Results of Easterwood and Nutt's (1999) regression analysis based on ΔEPS_{t-1} in 09.2008-2010

In Easterwood and Nutt's (1999) study R^2=0.02, while it is even lower (R^2=0.01) in Abardanell and Bernard's (1992) study. My conclusion from the value of R^2 is that in their case, too, the correlation was very low.

Overall, it cannot definitely be concluded that analysts overreacted to positive news and underreacted to negative news, and therefore H6 and H7 are rejected. Interestingly, however, in the period 17.09.2008 this hypothesis can be accepted for the *gentle decline – stagnation – growth* phase. The negative news (the *gentle decline* of ΔEPS_{t-1}) still drew underreaction, i.e. analysts did not take it seriously. However, they overreacted to *drastic* and *middle decline*, i.e. took it too seriously, which is why H7 has been rejected. In the case of the 2003-2007, following *above 1.000% growth* I observed underraction to it as *extreme* positive news, which was the reason for rejecting H6.

C.   Conclusion

The empirical part of the thesis examined the EPSerr between 2003-2010 in the case of 3 Hungarian and 4 Austrian companies. I distinguished between two periods – the pre-crisis years (2003-2007) and the period after the bankruptcy of Lehman Brothers identified as the starting point of the crisis (17.09.2008-2010). The period 2003-2007 was characterised by positive news, and therefore I was able to study their weighting in the actual environment. During the crisis I was able to examine negative news in its actual environment. In the course of the research several highly **interesting conclusions** were drawn.

One was that, contrary to previous research findings, I observed **systematic pessimism** in the period 2003-2007, the reason being a highly favourable economic climate in this period, in particular in the banking sector and oil industry, which was also reflected by the profitability of the companies under review. That phenomenon is evidence that analysts did

not believe **positive news** and underrated growth trends. All this proves that positive news was undervalued, which contradicts existing research results.

Another interesting finding is that analysts continued to underrate **news of the crisis** throughout the first three quarters of 2009. I was able to examine the news value of the crisis through the change of the scatter of *forecasted ΔEPS*. Its value remained unchanged until 09.2009 compared to the preceding period, and so the crisis still had news value, which drew underreaction, i.e. the EPSerr was optimistic.

The uncertainty caused by the crisis was felt after 10.2009; then the scatter of the *forecasted ΔEPS* significantly increased and the EPSerr turned into pessimistic. That was the third interesting finding, namely **the uncertainty**, which arose from the crisis, did not add to the optimism of the EPSerr but pessimistic forecasts were made. In examining the period 2003-2007, what we can also see with regard to uncertainty is that uncertainty can increase the EPSerr not only in a clearly optimistic direction but also in a negative direction, i.e. it can raise the value of EPSerr in absolute terms while the latter's direction is pessimistic (negative). In this particular case analysts overreacted to negative news in a highly uncertain environment.

In order to weight positive and negative information I conducted an analysis (in line with previous research) of the effect of ΔEPS_{t-1} on the EPSerr. Between 2003 and 2007, the revenue-generating capacity of the oil industry, i.e. MOL and OMV, and of the banking sector, i.e. OTP and Erste Bank, was characterised by *extreme* good news, as was also evidenced by those firms' EPS growth. The level of EPSerr in the period 2003-2007 was pessimistic and thus I found pessimistic EPSerr in all ΔEPS_{t-1} categories except *decline* ($\Delta EPS_{t-1}<0$). Interestingly, however, in the case of *above 1,000% growth* the EPSerr was even more pessimistic, i.e. the growth in the preceding period was even more underweighted. In other words, analysts underreacted to *extreme* positive news. Examining negative news was made possible in the period 07.09.2008-2010. Again, an interesting finding here was that analysts overreacted to *drastic decline*, i.e. the EPSerr assumed a pessimistic value.

It can be concluded from the overall results that credible and acceptable news draws overreaction, while *extreme* news draws underreaction from analysts. Underreaction, i.e. disbelief, is also typical with negative news but *extreme* bad news causes overreaction. It must

be added that *extreme* news also intensifies uncertainty. Both *extreme* positive and negative news causes a pessimistic EPSerr. As a consequence of overconfidence and optimism, people are more inclined to believe the good news than the bad news. Initially they believe and overreact to the good news and gather information that provides confirmation. In the event of bad news, they seek the opposite information and try to *"play down"* and thus underweight the bad news, but as the bad news is confirmed so grows uncertainty causing the EPSerr to increase in the pessimistic direction.

The research would be worth extending to the whole of Europe, e.g. to include Central and Eastern European and Western European countries in order to compare the regions. Another option is to extend the study to oil companies and examine how rising oil prices as positive news from a revenue-generating aspect impact the EPSerr. Yet another interesting possibility could be to repeat the foregoing studies for 2011 and subsequent years. Just as exciting would be to look into how sell-side and buy-side analysts react to positive news or, knowing analysts' nationality, to see whether EPS analysts enjoy any *"home-ground"* advantage, i.e. whether a local analyst makes forecasts with a smaller EPSerr compared to a foreign analyst.

III.   Main references of the dissertation

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