## CSABA BALOGH

# ANALYSIS OF FACTORS DETERMINING SUCCESS OF CROSS-BORDER MERGERS & ACQUISITIONS

## INVESTMENTS PROFESSORSHIP

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CORVINUS UNIVERSITY OF BUDAPEST Ph.D. PROGRAMME IN MANAGEMENT AND BUSINESS ADMINISTRATION

# ANALYSIS OF FACTORS DETERMINING SUCCESS OF CROSS-BORDER MERGERS & ACQUISITIONS

Ph.D. THESIS

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Tab	le of	contents

List of tables	7
List of figures	8
List of appendixes	9
INTRODUCTION	10
Actuality of the theme	10
Structure of the thesis	13
Results	14
PART I	16
THEORETHICAL BACKGROUND OF THE THEME	16
1. DEFINITIONS	16
2. TRENDS	18
2.1 International trends	18
2.2 Trends in the Central and Eastern European region	21
3. DRIVING FORCES AND OBJECTIVES OF THE TRENDS	23
3.1 Driving forces of the trends	23
3.2 Synergy as objective	28
4. LITERATURE OF THE THEME	32
4.1 International literature	32
4.2 Domestic literature	34
5. SUCCESS OF TRANSACTIONS	36
5.1 Definition of the success	
5.2 Selection of the event window	
5.3 Determination of the valuation viewpoint	
5.4 Sample election	38
6. TYPE OF METHODS ANALYSING SUCCESS	40
6.1 Market-based return studies	40
6.2 Accounting studies	40
6.3 Studies based on survey of managers	
6.4 Case studies	
7. STUDIES ANALYSING THE SUCCESS	43
7.1 Results of market-based return studies	44
7.2 Results of accounting studies	
7.3 Results of studies based on surveys of managers	45
7.4 Results of case studies	
7.5 Results of studies analysing success of CBM&A transactions	46
8. FACTORS AFFECTING THE SUCCESS UPON PRIOR STUDIES	53
8.1 Cultural differences	53
8.2 Human resource	
8.3 Relative size	55
8.4 Paid premium	56
8.5 Preliminary experiences	
8.6 Economic situation of the target company's country	57
8.7 Speed of transaction	
8.8 Industrial effect	
8.9 Geographical distance	
8.10 Type of bidding	58

8.11 Method of payment	
8.12 Other factors	
PART II	
METHODS AND PROCEDURES	
9. RESEARCH PLAN	
9.1 Character of research, sample election and type of analysis	
9.2 The sample	
9.3 Methodology	
9.4 Time horizon of the analysis	
9.5 Analysis of the success and the chosen viewpoint	
9.6 Methods used for model construction	
10. VARIABLES TO BE USED IN ANALYSIS	67
10. 1 Variables of organizational approach to M&A	
10.2 Variables of the traditional approach to M&A	
11. HYPOTHESES	
PART III.	
THE EMPIRICAL RESEARCH	
12. DATA COLLECTION AND PROCESSING	
13. MODEL ESTIMATION	
13.1 Preliminary analysis	
13.2 Yield calculations.	
13.3 A-posterior grouping of transactions	
13.4 Data reduction	
13.5 Effects analysis	
13.6 A-prior grouping of transactions	
13.7 Yield forecasting	
14. HYPOTHESES TESTING	
15. MODEL TRANSFORMING	
16. INTERPRETATION OF THE RESEARCH RESULTS	
17. SUGGESTIONS	
17.1 Suggestions for companies planning a cross-border M&A tra	ansaction
17.2 Limits of the research and their probable extension	
18. APPENDIX 19. LIST OF REFERENCES	
20. BIBLIOGRAFY	
20. BIBLIOORAFT	
acquiring firm shareholders 20.2 Studies for M&A transactions reporting negative returns to a	
firm shareholders 20.3 Studies reporting LBO M&A transaction results	
20.4 Studies for M&A transaction reporting returns to the tais shareholders	0 1
20.5 Studies for M&A transaction reporting long-term returns to a	
firm shareholders	
Own main publications in the field of thesis	1/7

## List of tables

Tab 1. Strategic background of M&A waves	19
Tab 2. CBM&A with values over 1 billion USD in 1987-2004 period	
Tab 3. Functional grouping of synergies	
Tab 4. Synergy systematization	29
Tab 5. Calculation mode of M&A transaction's synergy value	
Tab 6. Calculation mode of M&A transaction's cost	
Tab 7. Calculation mode of M&A transaction's net present value	30
Tab 8. Comparison of Research Approaches Regarding the Profitability of M&A	
Tab 9. Results of studies measuring corporate performance after acquisitions	43
Tab 10. Studies analysing short-run CAR of USA acquirers' involved in CBM&	A
	48
Tab 11. Studies analysing short-run CAR of companies acquiring USA targets	in
a CBM&A transaction	
Tab 12. Studies analysing long-run returns of domestic M&A transactions	51
Tab 13. Studies analysing long-run returns of CBM&A transactions	
Tab 14. General form of the estimated regression model	74
Tab 15. Starting model based on variables of the organizational approached of	on
	75
Tab 16. Starting model based on variables of the traditional approach on M&A.	75
Tab 17. The results of BAHR and CAR methods	79
Tab 18. The results of the one sample t test statistics calculated for the BAHR and	ıd
CAR returns	
Tab 19. Comparison of the research result with the previous studies dealing with	th
the long run profitability of the CBM&A transaction	80
Tab 20. Classification of the CBM&A transaction according the results	81
Tab 21. Results of the one sample "t" test calculated on the classification resul	ts
of CBM&A transactions involved in the sample	82
Tab 22. Comparison of the models according to their classification correctness.	85
Tab 23. Comparison of the regression models according to the model selection	on
	86
Tab 24. Comparison of the adjusted and starting models upon the model selection	on
criterions	92

# List of figures

Figure 1. The flowchart of the planned research	13
Figure 2. Merger and acquisition waves	18
Figure 3. CBM&A in 1988-2004 period	20
Figure 4. CBM&A purchases in V4 countries in 1988-2004 period (Bil. USI	D)
	21
Figure 5. CBM&A sales in V4 countries in 1988-2004 period (Bil. USD)2	21
	22
Figure 7. Strategies for entering foreign markets	24
Figure 8. Driving factors of strategic alliances	25
Figure 9. The volume of Foreign Direct Investments and CBM&A in the	he
world in 1987-2000 period (billion USD)	26
Figure 10. The driving forces of CBM&A	27
Figure 11. Moving forces of synergy	29
Figure 12. Overview of M&A transaction's failure rates by some studies?	36
Figure 13. Abnormal return of companies involved in M&A transactions?	38
Figure 14. Classification of CBM&A transactions according CAR or BAH	ĪR
methods of performance measuring	65
Figure 15. The relationship of corporate and national cultures	68
Figure 16. Factors and their variables analysed in models	73
Figure 17. Structure of the developed model	78
Figure 18. Graphical classification of the CBM&A transaction according to	he
results	81

## List of appendixes

## **INTRODUCTION**

### Actuality of the theme

After the 1989/90's economic transformation the Hungarian economy is still becoming from the emerging markets category to the even more developed markets category. Encouraging signs of this process are not only the country's membership in OECD and EU but also the *Cross – Border Mergers & Acquisitions* transactions carried out by Hungarian companies in the past 4-5 years. Even the results of PricewaterhouseCoopers' researches about Central European countries are confirming this process. "In terms of outbound crossborder transactions, Hungary remains the leading country in the region whose domestic companies are expanding outside their national borders. Having reached their domestic market ceilings, many Hungarian companies continue looking for revenue growth abroad." (Dezse [2001] 2. p)

It is evident that the flagships of the economy like MOL, OTP, DANUBIUS, TVK, VIDEOTON etc. are involved in the mentioned topics, because M&A transactions especially if these are directing across borders need some size, capital volume and management knowledge. Despite the fact that M&A are still rare and new things in the life of Hungarian companies, they are not an invention of recent times. M&A waves occurred several times in the past hundred years in the world.

However, the success hit of M&A transactions is shaded by the results of researches and analyses referred to by consultants and economic press, that 80% of the realized M&A transactions had failed and only 20% of them ended successfully.

On the base of this information according to King we can develop the following implications (King [2002]). First, M&A transactions on average do not rise the value of the companies. If this is true, why do managers continue to pursue M&A transactions and why corporate governance mechanisms fail to stop M&A activity?

The question is well-founded: "Why do people continue to pursue something if it does not work?" If we argue with Milton Friedman's opinion, that the peoples' rationality is bounded the answer is unambiguous (Friedman [1953]). A M&A transaction is such a complex task, that exclude the ability of participants to take into account every possible factors and their probable affects upon the analyses of which they could be make the optimal decision.

In opposite of this if we accept Conlinsk's arguments beside the unbounded rationality (Conlinsk [1996] p.669-701.), in which according to his opinion people act if they were unbounded rational the support of M&A transactions can be uncomprehensible for us. Mainly if we mean the 2<sup>nd</sup> point of the argumentation, the "Learning". According to Conlinsk: "Though people's rationality is bounded, they learn optima through practice, in the end acting as if unboundedly rational".

The first part of the well known proverb that "The clever learns from the mistakes of others, but the stupid does not learn even from his own mistakes" does not seems to be applicable in this field. Probably Popper's train of thought is in the background, according to which there is no inductive logic, while the theory can not be deduced upon experience: "It was true this time, but it can not be true later." Although their M&A transactions were not successful, nonetheless ours can be successful indeed. According to a KPMG research 82 percent of the companies thinking about M&A transaction believe that their planned transaction will be successful. This concept is no problem. The problem is that most of the new participants (with some exceptions) make similar mistakes to their predecessors. In practice 53 percent of the M&A transactions end with value decrease and 83 percent of the transactions end with loss for the shareholders.

Second, M&A transactions do add value but researchers may not have detected that value due to contingent or moderating relationships, sampling issues or measurement problems (King [2002]). According to Bródy, failures of measurement can be caused not only by the misreadings of the indicator and the measurer's/observer's mistakes, but even by smoldering relationships not detected

at this time and by other occurrences also (Bródy [1990]). He wrote: The reality can not be measured directly, not even in the cases of most basic physical measurements. The measurement shows only one dimension, the chosen characteristic flavor, of the observed subject and always upon an abstract picture, definition or model about the reality." (Bródy [1990] p. 522). M&A transactions are not simple processes, therefore Bródy's consequences are increasingly valid for them.

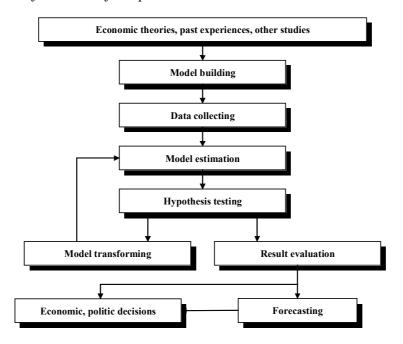
In my research I would like to focus on the second problem. Thus upon the processing of relevant economic literature in a frame of an empirical research I am trying to identify factors and their critical values characteristical for M&A transactions and companies involved in such transactions, which could be used in a given threshold for estimation of planned transaction results. Then, upon the result of above mentioned process I am going to build a model which would be suitable for Hungarian companies to plan and realize a successful cross-border M&A transactions after the testing on sample of transactions carried out at this time and after necessary modification of the test results.

My objective is to integrate the two different approaches on M&A transactions, the traditional approach and the organizational approach into one model. In this case I would like to use processes and built in variables from both approaches parallel in this planned model. The expected result from the integration of these two approaches would be the combination of the strengths and elimination of the weaknesses of the approaches.

### Structure of the thesis

As mentioned previously, the planned research is built like an empirical analysis as it can be seen on the figure 1.

Figure 1. The flowchart of the planned research



Source: Ramanathan [2003] 21. p.

The first part of the thesis discusses the theoretical background of the theme upon the relevant international and domestic literature. It starts with the definition of concepts used in the thesis introduces M&A processes and their driving forces. It discusses the questions of success and the probable methods of success analysis. It gives an overview about the results of previous researches from the literature concerning the subject and the potential factors that may determine success.

The second part of the thesis introduces the methodology of empirical research and the used mathematical and statistical procedures. It lists the variables used in the analyses, presents the starting models and hypothesizes.

Data collection, model estimation, hypothesis testing, model transforming and result evaluation steps of the planed research are comprised in the third part of the

thesis. In this part there are drafted advices, limits of the research and their probable extension.

### Results

On the base of the results of analyses prepared in the 13.6 chapter we can conclude, that with the help of the combined model (model integrating both the traditional and organizational approaches) can reach more precise results than in the case of models based only on one theoretical approach. Based on this statement we can say that in the future in case of analyzing M&A transactions it is more suitable to use an integrated approach beside or instead of the traditional and organizational approaches.

In the highlight of the results we can suggest the followings to Hungarian companies planning a CBM&A transaction in order that they could carry out a successful transaction for choosing the target company and for the after-transaction period. In the phase of planning and selecting the target company they should take care both on the hard variables (variables easy to measure and express in money) preferred by the traditional approach and on the soft variables (variables difficult to measure and express in money) preferred by the

Differences between the countries of the acquirer and target company can have significant effects on the post transaction performance. Cultural differences, differences in expenditures spent on information, and quality differences of central political-economical regulations between countries of the acquirer and target companies suggest a negative, performance decreasing relationship. On the other side the minority share of the acquirer company's country living in the target company's country suggest a positive, performance increasing relationship.

But it is recommended to keep the post transaction average long term debt ratio and the average receivable ratio in the working assets at as a low level as it is possible, because these ratios suggest a negative, performance decreasing relationship.

It is suggested to have the industrial correlation between the acquirer company and target company as close as it is possible. As significant is the difference between the country risk indexes of the acquirer and target companies as higher is the expectable return. It is aimful to increase the after transaction average liquidity quick ratio and average inventory turnover ratio of the combined new company. The increase of after transaction average liability ratio has no negative effect if it is manifested in the increase of the average short term debt ratio. The mentioned ratios all suggest a positive, performance improving relationship.

## PART I.

## THEORETHICAL BACKGROUND OF THE THEME

## **1. DEFINITIONS**

In market economies where free competition is the principal rule by establishment and extinction of enterprises, a third natural process, the concentration of companies can be observed. In the widest meaning concentration is the gaining control over the other company, gaining influence on the decisions of the other company and the joining of companies. In a more narrow sense only the achievement of influence above a certain extent and the joining of companies can be considered as concentration. Corporate merges and acquisitions are the most spectacular forms of concentration

Merge is an incorporation or fusion that results in the decrease of the companies' number. The acquisition or takeover is a qualified case of the sharing, according to the corporate and security act the obtaining of a majority part in a given company or at least the 25% - in case of public corporation the 33% - of the shares.

Merger is a most important form of the corporate concentration, when at least one of the companies is winding up and on the organizational level joins with another company. According to the corporate act the merger can be realized through incorporation  $(A + B \gg A)$  and through fusion  $(A + B \gg C)$ . In the case of incorporation one of the companies is winding up and the other company remains its general successor whose subject will not change. The fusion winds up both of the companies and their capital falls to the newly established legal successor company.

Acquisition is obtaining a share or gaining influence. It means obtaining the rule above the company or obtaining a certain part of the right of disposal above the company. Takeover generally means obtaining at least the majority part of the votes and capital rights of a given company. Obtaining a share according to each of the rules prescribed by legal consequences is an influence on the company's decisions in the operative level on the base of voting rights, agreements or actual behavior. Takeover can be realized by share purchasing or by purchasing assets.

In addition to the previous mergers and acquisition can be characterized as the following also. In case of acquisitions we can differentiate between: *Leverage Buy Out - LBO* where the transaction is financed from debt and the target company's assets are the coverage. In case of *Management Buy Out - MBO* the company's management takes over the owners' right. We are talking about *Employee Buy Out - EBO* if employees of the company become the owners.

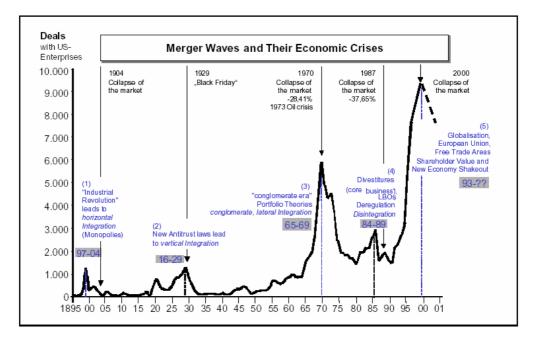
Mergers can be characterized as follows. In case of *horizontal mergers* the transaction takes place between the companies with the same activity (merger with a competitor company). The *merger* is of *vertical type* if companies join from a different level of the production-purchasing chain (merger with a supplier company). We consider a *merger* to be of a *conglomerate type* if companies are from different industries and there had been no previous connection between them.

## 2. TRENDS

## 2.1 International trends

Mergers and acquisitions are not inventions of recent times. Internationally, M&A transaction intensive periods occurred several times in the past hundred years. As it can be seen on the figure 2. we can observe five M&A intensive waves when the number of transactions was enormous.

Figure 2. Merger and acquisition waves



Source: Jansen/Müller-Stewens [2000] 2. p.

The certain waves upon different strategic considerations have tried to suit the challenges of the economic environment of the time with various transaction types. In cases of analyzing decision motives leading to transactions, according to literature we can differentiate between microeconomic and macroeconomic aspects or mixed with these financial motives we can also find the management motives and other reasons.

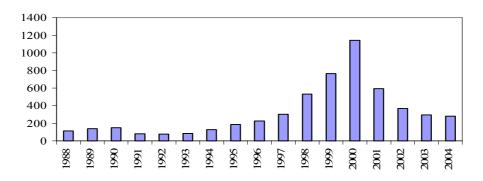
According to Mody and Negishi there two basic motivation forces can be distinguished behind the transactions. Establishment of the future opportunities – search of strategic options and solving the past problems – corporate restructuring (Mody, Negishi [2000]). To sum up there can be only one rational, economically acceptable argument behind the mentioned motives and this is the increase of shareholders value. Actually M&A waves can basically be interpreted as business reactions to a changed environment (Kleinert, Klodt [2002]). These changes may vary and differ over time, but are mostly related to technology changes. The following tab1. summarizes the probable strategic considerations and business reactions regarding to the five M&A waves showed on figure2.

M&A	Period	Strategic background	Transaction	
wave			type	
1.wave	1880-1904	Realization of monopoly rents. Pooling of market power.	Horizontal M&A	
2. wave	1916-1929	Integration to gain control of the complete Vertical M&A value chain. Optimization of the Interface-Management.		
3. wave	1965-1969	Anti-cyclical portfolio building to harmonize Conglomerate different industry-driven economic downturns. M&A		
4. wave	1984-1989	Back to core-business. Speculative gains for LBO financial acquirers.		
5. wave	1993-2000	Increasing Shareholder Value and Globalization. Technology & consolidation of the New Economy	Cross-border M&A	

Source: own completion upon the figure 2. and Jansen/Müller-Stewens [2000] 5. p.

As we could seen on figure 2. among the M&A waves the last wave, 5<sup>th</sup> in the line (period 1993-2000) was the largest. Knowing the strategic considerations and business reactions to the changed environment as it can be seen on table1., *Cross-Border Mergers and Acquisitions* were the most typical transactions in that wave. These transactions differ from the traditional M&A transactions in the means that the origin country of the two participating companies is not the same. According to Mody and Negishi, restructuring of corporate operations and assets reallocation are the most important task of CBM&A transactions on the long run (Mody, Negishi [2000]).

Figure 3. CBM&A in 1988-2004 period



Source: from UNCTAD [2004] Tab B.8, 416. p. and UNCTAD [2005] B.4 tab. 325. p.

The last M&A wave was characterized not only by the CBM&A transactions but with the enormous transaction value both in developed and developing countries (UNCTADT [2000]). In the fifth M&A wave CBM&A transaction volume has reached its top in year 2000. The total sum of transaction value was 1144 billion USD and the number of transactions was 6520. The number of mega deals / deals with value over 1 billion US\$ / was 175, and as it can be seen on the tab 2. the top year in this category was also 2000.

Year	Number of Deals	Percentage of total CBM&A	Transaction value	Percentage of total
		no.		CBM&A value
1987	14	1,6	30,0	40,3
1988	22	1,5	49,6	42,9
1989	26	1,2	59,5	42,4
1990	33	1,3	60,9	40,4
1991	7	0,2	20,4	25,2
1992	10	0,4	21,3	26,8
1993	14	0,5	23,5	28,3
1994	24	0,7	50,9	40,1
1995	36	0,8	80,4	43,1
1996	43	0,9	94,0	41,4
1997	64	1,3	129,2	42,4
1998	86	1,5	329,7	62,0
1999	114	1,6	522,0	68,1
2000	175	2,2	866,2	75,7
2001	113	1,9	378,1	63,7
2002	81	1,8	213,9	58,1
2003	56	1,2	141,1	47,5
2004	75	1,5	199,8	52,5

Tab 2. CBM&A with values over 1 billion USD in 1987-2004 period

Source: UNCTAD [2005] 9. p.

#### 2.2 Trends in the Central and Eastern European region

The sum of transaction data in the Central and Easter European region is only the thousandth of the world's total CBM&A transaction value. As I have mentioned in the introduction, in terms of outbound cross-border transactions Hungary remains the principal country in the Central European region whose domestic companies are expanding outside their national borders. (See figure 4.)

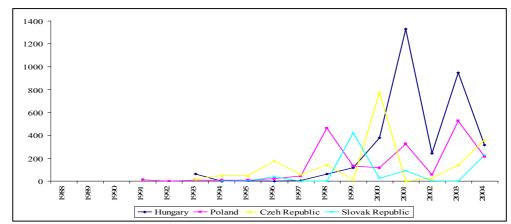


Figure 4. CBM&A purchases in V4 countries in 1988-2004 period (Bil. USD)

Source: UNCTAD [2004] Annex B.8. 416. p. and UNCTAD [2005] B.4 tab. 325. p.

In the possession of sales data it can be concluded that companies from the region are rather targets than acquirers in a CBM&A transaction. As is shows on figure 5, the volume of the CBM&A sales data from the past period are much larger than the purchasing data from the same period.

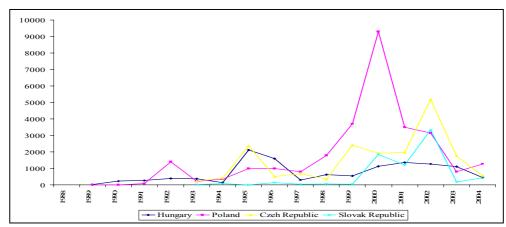
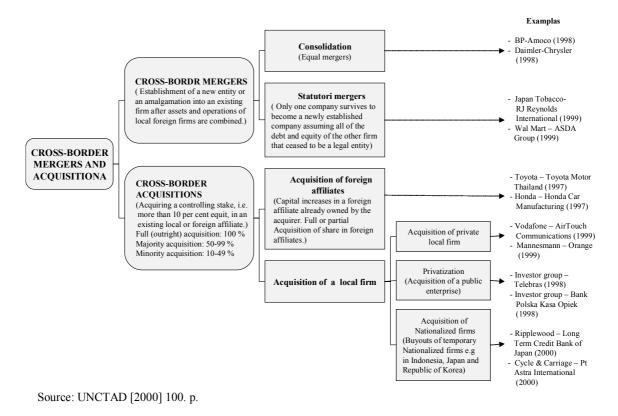


Figure 5. CBM&A sales in V4 countries in 1988-2004 period (Bil. USD)

Source: UNCTAD [2004] Annex B.7. 415. p. and UNCTAD [2005] B.4 tab. 325. p.

The figure 6. introduces the structure of cross-border merger and acquisition transactions and gives examples for each type.

*Figure 6. The structure of cross-border M&As* 



## **3. DRIVING FORCES AND OBJECTIVES OF THE TRENDS**

## 3.1 Driving forces of the trends

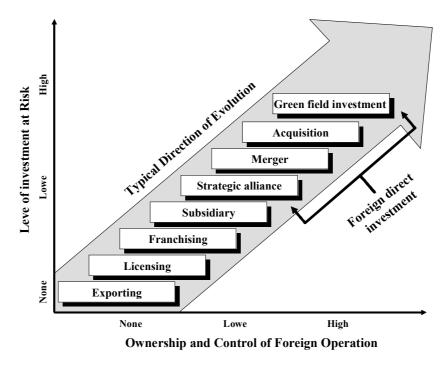
How do companies get to CBM&A transactions? The process can be explained by the following. A company's life cycle, which on the company level can be similarly defined so the product life cycle can be divided into introduction, growth, maturity and decline stages (see eg. Chikán [1994]).

In countries with smaller volume economies (naturally it can be interpreted in the light of economic growth) while in countries with larger volume economies later – the domestic companies in their life cycle arrive to a point, when in order to enforce the aspect of the company's economic of scale they have to cross the national borders. The domestic companies after crossing the national borders become multi national companies and after additional development transnational companies.

There are several ways for companies to cross the national borders. The most common forms are product exporting, strategic alliances, mergers, acquisitions and green field investments (Lall 2002). Except for product exporting the other opportunities are declared by literature as *Foreign Direct Investments*.

The decision (selection from the options) is made upon transaction costs. The aim of decision makers is to minimize the cost of transactions. According to Gonzalez et al acquirer companies in order to minimize the transaction cost of entering foreign markets are searching under valued target companies (Gonzalez et al [1997]). The used method in most of the cases is the cost-benefit analysis.

Figure 7. Strategies for entering foreign markets

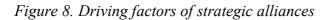


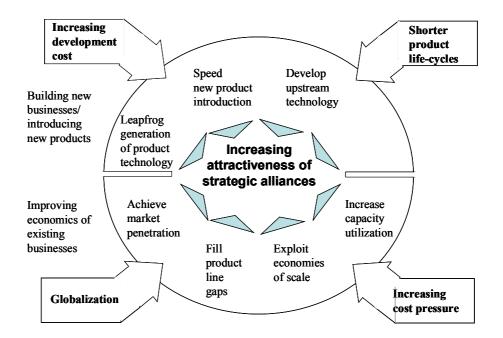
Source: Webster [2000] 19. p. and own completion

However as it can be seen on the figure 7. the selection from the given opportunities means decision about the level of ownership and control of foreign operation at the same time, which is in direct proportion with the level of investment's risk. If the company takes a greater part in a foreign concern then it bears a greater investment risk too. Of course this high risk bearing is compensated by taking a greater part from foreign company's profit due to ownership rights.

Strategic alliance is the second very interesting and important aspect from besides the CBM&A transactions in the strategic management's point of view. "Strategic alliance is a specifically particular form of inter-organizational connections, for which base characteristics and distinctive features there is no common viewpoint in the international literature" (Tari [1998] p. 19.). According to another definition the strategic alliance is an intermediate cooperation form between the market and the hierarchy, with definite specific signs (Thorelli [1986]; Bronder-Pritzl [1992]; Lorange-Roos [1992]; Tari [1998]). "Strategic alliance is an answer of the market economy members to the challenges caused by world wide competition, market globalization, increase of R&D costs and by the high speed of technological and technical changes" (Tari [1998] p. 21.). No companies are competing on the global level but groups of companies (multinational companies entered in strategic alliances) are fighting in an even stronger competition (Gomes-Casseres [1994]).

The following figure 8. introduces the driving factors of strategic alliances.



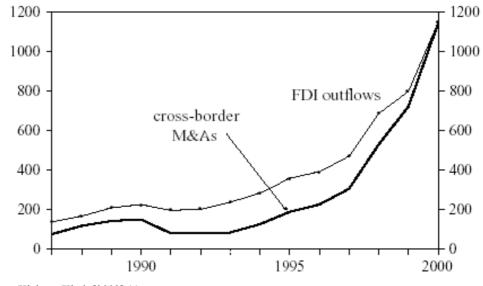


Source: Webster [2000] 27. p.

Generally there can be two critical periods in the activity of strategic alliances. The first can appear in the first 2-3 years of cooperation, when the dissatisfaction of the participants emerges. The second is in the  $5^{th}-6^{th}$  year of the cooperation, when one of the participants feels to be prepared to leave the alliance. The average period of strategic alliances is 7 years and 80 percent of them end with merger or acquisition. Actually a strategic alliance is a low cost, cheap option for the future merger or acquisition (Bleeke, Ernst [1995])

The rising importance of cross-border mergers and acquisitions in the process of globalization also shows up in the structure in foreign direct investment. This evolution process of CBM&A importance around the world can be seen on figure 9. Until the mid-1990s, cross-border mergers and acquisitions accounted for about 50 per cent of total FDI outflows, whereas this share significantly increased. In 1999, a ratio of cross-border mergers and acquisitions to foreign direct investment increased to a level of 84 per cent, and in the year 2000 it reached almost 100 per cent (CBM&As: 1144 billion USD; FDI outflows: 1150 billion USD).

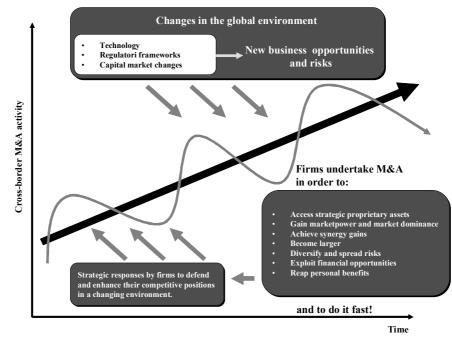
*Figure 9. The volume of Foreign Direct Investments and CBM&A in the world in 1987-2000 period (billion USD)* 



Source: Kleinert-Klodt [2002] 11. p.

To the interpretation and analysis of the reasons of the presented process the investigation of economic factors affecting on the development of CBM&A is essential, showed by the figure 10.

Figure 10. The driving forces of CBM&A



Source: UNCTAD [2000] 154. p.

Previously mentioned technology driven by environmental changes, deregulations in regulatory frameworks and capital markets create new business opportunities and risk for companies which in order to defend and enhance their competitive positions are running into growth. To explain why CBM&A transactions become an almost unique form of growth (figure 9.), two factors stand out as being particularly important, speed and access to proprietary assets. In an economic environment, where according to the members "a year has only 50 days" and "speed is our friend – time is our enemy" there is no time to wait for the results of organic growth, run up of green field investments, or the yield of strategic alliances and cooperation. Planning and acting are simultaneous processes, therefore they can not be separated anymore. There is a need to plan and act at once, the solution is "placation" (UNCTAD [2000]). Companies that are not able to react immediately in this rapid world will be left behind by the others. Ready made access to proprietary assets (supplier or distribution networks, brand names, local permits and licenses, R&D results, technical know-how etc.) can be important in such a situation.

In addition, in developing countries CBM&A transactions can immediately provide liquidity and prevent asset losses and enhance resource allocation (Mody, Negishi [2000]). In the long term CBM&A potentially introduces new management and operation systems, thereby improving efficiency and competitiveness.

However, speed can only be useful if we do not make mistakes. In the other case, a transaction can result in the opposite of what the arrangers of the transaction have expected. Due to pressing time, ill planned and structured, badly realized CBM&A transactions can lead even a previously good performing company into bankruptcy, making it a potential target in a hostile takeover.

### 3.2 Synergy as objective

Similarly to the domestic M&A in case of a CBM&A transaction the aim is also to reach and utilize synergy effects. Therefore it is not surprising that one can not find even in the M&A literature a study which does not deal with the synergy, according to which the sum of the parts has higher value than the parts separately. The question remains, how will 2+2=5. Standardization of synergies and revealing their sources are the central theme of several studies. In case of the definition of the concept in the M&A literature we can encounter groupings based on two variables. For the preceding period functional based approach, then mixed, and for the later period resource based approach is characteristical (Tóth [2004]). A sample for the functional based grouping of the synergy, according to main authors, can be seen in the following tab3.

Ansoff [1965]	Salte and Weinhold. [1979]	Chaterjee [1986]	Gaughan [1996]
• sales	• marketing	<ul> <li>market power</li> </ul>	<ul> <li>operating</li> </ul>
<ul> <li>operating</li> </ul>	<ul> <li>economic of scale</li> </ul>	<ul> <li>operating</li> </ul>	<ul> <li>financial</li> </ul>
<ul> <li>investment</li> </ul>	• R&D	<ul> <li>financial</li> </ul>	
<ul> <li>management</li> </ul>	• financial		

Source: Tóth [2004] 44. p.

Larsson tried to define the concept and types of synergy with the help of a synergy arrangement matrix, which is a resource based approach of the concept (Larsson [1989]).

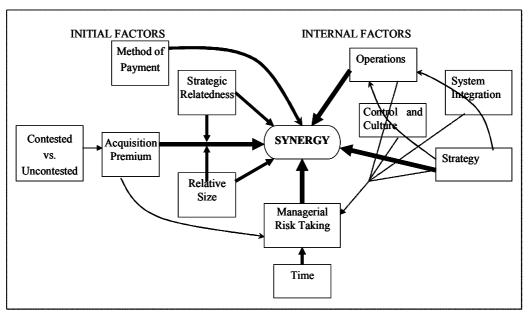
Tab 4.	Synergy	systematization
--------	---------	-----------------

	Synchronic	Diachronic
	(One point in time)	(Over time)
Economies of	Economies of scale	Economies of
sameness	(Less cost per units as	experience
(Interaction of	volume increases	(The learning
similar parts)		curve, etc.)
Economies of	Complementary	Economies of speed
fitness	(Mutually supportive	(Just in time
(Interaction of	parts)	production, etc.)
Different parts)		

Source: Larsson [1989] 82. p.

The complex structure of the factors, affecting the synergy development, divided into the initial and internal groups can be seen on figure 11.

Figure 11. Moving forces of synergy



Source: Jindra [2002] 12. p.

In case of some transactions definite values can be found, but about the methods to measure the synergy we can read only general comments. Mathematical appraisal of the synergy is based upon a simple formula including free cash flows and present value method. Usually it is a problem to fill this formula with data, and get results suitable to present and future value, or at least to give a rough estimate within an appropriate failure interval.

Tab 5. Calculation mode of M&A transaction's synergy value

```
M&A synergy value = PV_{AB} - (PV_A + PV_B)
```

Where:  $PV_{AB}$  - present value of combined AB company after transaction

 $PV_A$  - present value of A company

PV<sub>B</sub> - present value of B company

Source: Brealy - Myers [1994] 340. p.

The cost of M&A transactions can be calculated with the following simple formula.

Tab 6. Calculation mode of M&A transaction's cost

 $M\&A cost = Payments - PV_B$ 

Where: Payments - price paid to B company's shareholders + consultants' fee  $PV_B$  - present value of B company

Source: Brealy - Myers [1994] 341. p.

With compounding of the two formulas we can get the net present value of the M&A transaction, the difference between the synergy value and cost.

Tab 7. Calculation mode of M&A transaction's net present value

NPV= M&A synergy value - M&A cost = =  $PV_{AB}$  - ( $PV_A$ +  $PV_B$ ) - (Payments -  $PV_B$ )

Source: Brealy - Myers [1994] 341. p.

The realization of the transaction makes sense only in case the result NPV  $\ge 0$ .

It is inevitable to make difference between the potential and realized synergies. While the first is based only on a rational hypothesis, the second means a real achieved result. From the potential synergies only a part, the intentional synergy, is going to built into the realized synergy, while another part of a potential synergy is going to fail, but this part can be replaced by newly appeared synergies (Tóth [2004]). According to the results of the Mercer Management consultant studies only 30 percent of the potential synergies are realizing, 55 percent are missing and 15 percent are ill planned (Tetenbaum [1999]). In most of the cases managers try to achieve synergy effect by cost cutting. As it will show in the following samples the simplest methods of cost cutting are employment reduction, plant liquidation and different reorganization programs.

After 8 months of common evaluation and careful estimation process the managers expected 3,3 billion US\$ saving, due to synergies from the 1999 march Renault-Nissan transaction in the 2000-2002 period. Synergies were expected to emerge from purchasing, production and R&D processes and from geographical regions. Due to "Nissan Renovation Plan" the new company following the initial 6 billion USD loss in the 2000 year achieved 3 billion USD after tax profit in 2001. This result was repeated again in 2002. The main steps of the renovation plan were the following: dismissal of 21 thousand employees, 20 percent cut from purchasing expenses and administration costs, sell out of non core business units and minority shares and significant product development (Tari [2003]).

In case of the Exxon-Mobil transaction the planned saving was equal to 2,8 billion USD. This saving was expected from the dismissal of 9 thousand employees, office closing and from parallel business units cutting. From the ChaseManhattan-Chemical Bank transaction was expected 1,5 billion USD cost saving only in the first quarter of the 1999, naturally after the dismissal of 12 thousand employees (Tetenbaum [1999]).

## 4. LITERATURE OF THE THEME

## 4.1 International literature

Although there is a growing literature on the area of M&A, it does not form coherent whole. Instead it is characterized by different researchers studying these phenomena from different perspectives (Vaara [1995] 15. p.). However two distinct approaches to M&A can be emphasized. The first approach is called the *"traditional approach"* and explains M&A only as a matter of finance and strategy. While the second approach, the *"organizational approach"*, is more focused on the human issue of the M&A phenomenon (Pascal [1999]).

In case of *traditional approach* on M&A financial performance has been the general measure of success for organizations. It has also been a measure of success in many cases of M&A. In the 80s, economists, strategists and financial advisers were the ones who implemented M&As. M&As were based on financial or value-maximizing motives, while the main objective was to increase shareholders' wealth and financial synergy through economies of scale, transfer of knowledge and increased control (Cartwright, Cooper [1996]).

Actually M&As are renowned for having a high rate of failure. Research evidence has demonstrated that quite often M&As had an unfavourable impact on the profitability. Instead of achieving the expected goals, such as economies of scale, M&As have become associated with lowered productivity and profitability, worse strike records, higher absenteeism (Cartwright, Cooper [1996]). Research evidence provided by Cartwright and Cooper led to the conclusion that around 50 percent of M&As are considered financially unsuccessful.

M&As were considered to fail because of rational economic reasons, e.g. economies of scale were not achieved, the strategic fit was poor or ill-matched, or there were unexpected changes in the market conditions. But making a successful M&A, as many organizations have learnt, is more than just "getting the sums

right". Indeed, although M&As are thought to be rational and strategic processes, decision-makers are subject to personal emotions and aspirations which tend to override rational thinking, and neglect the organizational implications.

To the contrary of the traditional approach that emphasizes strategic fit, which concerns shared or complementary business strategies and goals, the *organizational approach* is focused on the organizational fit that is related to the degree to which partnering organizations are compatible, in terms of their cultures, administrative systems and procedures, managerial style, decision making approach, and communication patterns. A distinction can be drawn between making an M&A decision and doing M&A work. The former concerns more the justification process (i.e. recognizing the synergistic potential), while the latter is more about managing the integration process (i.e. realizing that potential) (Cartwright, Cooper [1996]).

Cultural issues are of high importance in the organizational approach to M&As. One of the most important factors that raise problems in M&As is a clash in corporate culture. One hypothesis relating to the culture match between two partnering organizations is that the extent to which there exists a fit between the culture of the acquiring organization and the acquired organization will be directly correlated to the success of the acquisition (Cartwright, Cooper [1996]).

The problem with the traditional approach of M&A is that, by considering M&A only as financial and strategic alliances, it misses a quite important aspect of M&A, which is the human issue.

To conceptualize M&A exclusively as rational financial and strategic activities rather than human activities is quite likely to be incomplete. All decisions can be considered involving two elements: the rational and the affective. The rational element concerns the technical content of the decision, based on available knowledge relating to financial and strategic factors. While the *affective* aspect concerns the emotionality of the decision makers, which is influenced by cultural

factors, and the organizational quality of the decision (Cartwright, Cooper [1996]).

The process of M&A can be considered as a marriage where the compatibility of the partners is of crucial importance. Thus the problem with the traditional view of M&A is that the compatibility of the partners is taken only as a matter of ensuring a good strategic fit, while the compatibility of management styles and corporate cultures is not much considered in the pre-acquisition stage (Cartwright, Cooper [1996]).

## 4.2 Domestic literature

These are only few researches in the domestic literature regarding the analyzed theme, therefore publications about this topic are too rare. As far as I know, only Tari's study deals with the success of cross-border mergers and acquisitions. In his research Tari analyses the circumstances and results of the Renault-Nissan transaction (Tari [2003]). Heidrich's research is the second closest study to our subject with the analysis of CBM&A transaction's cultural questions (Heidrich [2002]).

The rest of the publications about the subject can be divided into two groups. The first group contains the studies dealing with the theoretical questions of mergers and acquisitions. About the definitions of mergers and acquisitions and their theoretical point of view we can read in detail from Bélyácz (Bélyácz [2003a]; [2003b]; [2003c]; [2003d]). Molnár in his study deals with the reasons of corporate mergers and acquisitions, with type of transactions and with the process of these transactions (Molnár [2000]). Czehlár writes about the corporate valuation in mergers and acquisitions processes (Czehlár [2000]).

Rules regarding to mergers and acquisitions are the theme of Lengyel's article. He wrote about the Hungarian and European practice also (Lengyel [2001]). We can come across with the role of organizational culture in merger and acquisition processes we can meet in the Gyulai and Német article (Gyulai, Német [2003]).

Liebner in his study analyses the human resource role as one of the success factors in M&A transactions (Liebner [1999]). Karsai in her publication writes about management buy outs (Karsai [1991]; [1993a]; [1993b]; [1994]). The synergy, as the central question of M&A transaction, is the theme of Tóth's studies (Tóth [1999]; [2002]). Theoretical and practical questions of tax systems influencing the merger and acquisition activity are discussed in Balogh's study (Balogh [2003]).

Gáspár Bencéné in her study analyses the effects of computer nets / like the internet/ on the economic and corporate life (Gáspár Bencéné [1999]). Mathematical examples regarding to M&A can be found in Fazakas et al's university study book (Fazakas et al [2003]).

The second group of studies contains report about mergers and acquisitions. In this category we can distinguish three subgroups. To the first group belong annual report and comparisons of consultant firms about Central and Eastern European M&A activity (PricewaterhouseCoopers, [2001]; [2002]). The second group contains report about Hungarian M&A activity like (Berecz [2001]; Tompa et al [2001]). The third group collects the studies (Csáky et al [2001]; Sulok [2001]) reporting of the GKI and Ernst &Young's research about Hungarian M&A activity. This research is the most detailed and important one carried out in Hungary in this field at this time.

### **5. SUCCESS OF TRANSACTIONS**

As it was indicated in the introduction of the M&A literature overview, the success of transactions is the central question of the analyzed theme. Therefore it is not surprising that in the M&A literature we can find more than hundreds of researches analyzing the profitability of M&A transactions. It seems to be, as if we could recognize the simplified generalization, the 80/20 percent success and failure rate of M&A transaction on figure 12. mentioned in the introduction, according which M&A transactions decrease value instead of value increasing.

Though the a-priori expectation of the post transaction performance analyzing M&A literature is that performance improves, in other words value increase is the prior objective of the companies carrying out M&A transactions (Carper [1990]; Lubatkin [1983]).

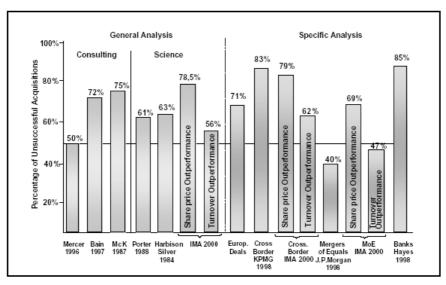


Figure 12. Overview of M&A transaction's failure rates by some studies

Before we could interpret the results of each M&A transaction regarding its analysis of success from a scientific point of view, it is inevitable to answer the following questions. What is the definition of success? How long is the event window of the success analysis? From whose viewpoint is the success defined?

Source: Jansen [2000] 6. p.

What is the consistence of the sample like? What kind of method do we use for the analysis? Answers to the above listed questions can not be left out of consideration because these all influence the validity of our consequences.

#### **5.1 Definition of the success**

Because of the very different measuring possibilities it is essential to have an aprior definition of success (Jansen [2001]). While M&A and CBM&A transactions can be considered as investments, in case of their valuation economic aspect should be taken into account. It means that we proceed correctly if we use the net present value method as valuation criteria (Brealy, Myers [1995]). Therefore a transaction can be considered successful if it produces at least such gain for its realizators, than any other similar risky investment. It means that the NPV  $\geq 0$ .

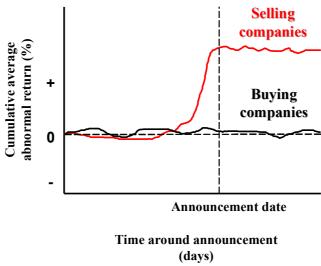
#### 5.2 Selection of the event window

The eligible time period can be short run or long run. Under the short run it can mean a couple of days, maximum to 10 days. In 80 percent of analyses using the short run period the time horizon does not reach 5 days (one week). Under the long run we usually mean one year or a longer period. But most of the analyses use only 365 days (one year). The appropriate event window for analyzing the effect on shareholder returns of mergers and acquisitions is controversial even in economic literature. According to supporters of short run long windows may introduce noise, but in opposite of this supporters of the long run say that short windows are unlikely to capture the full effect of the transaction (Danbolt [2001]). According to Kleinert and Klodt most effects of transactions are included in the three-year period after the transaction (Kleinert, Klodt [2002]). Otherwise the elected event window strongly depends from the used methodology and even from available data.

#### 5.3 Determination of the valuation viewpoint

The success can be evaluated from three viewpoints: From the viewpoint of the acquirer company, from the viewpoint of the target company and from the common viewpoint of the participants. As it can be seen on figure 13., it is not indifferent that whose point of view the result is analyzed from. In the short run target company shareholders gain extra profit from the increased share prices after the announcement of transaction, while in the case of acquirer companies' share prices the change is not unanimous.

Figure 13. Abnormal return of companies involved in M&A transactions



Source: Buckland [2002]

In most of the cases the change in the acquirer companies' share prices is imperceptible in short run, but on the contrary in some cases price decrease is observable which leads to a value decrease in acquirer company (Conn et al [2001]; Goergen, Renneboog [2002]).

#### **5.4 Sample election**

There are several related issues involving sampling procedures that limit the ability to make conclusions from previous studies and may contribute to equivocal results. The validity and generalizability of results, on the degree that results can

be expected to be consistent across settings and time can vary from sample to sample (King [2002]). To obtain a suitable sample for researchers in most of the cases means a serious problem. The insufficient financial sources of researches in advance limit the possibility of sampling. However, the free databases are incomplete and out of date, therefore they make a serious research impossible and the credibility of analyses made on such datasets can be objectionable. There are databases though, which are day to day revised and contain every closed M&A transaction and more than 60 item about the participant companies in the transaction and even about the transaction itself. These databases are commercial databases, though, therefore their fees are too high for researchers.

#### 6. TYPE OF METHODS ANALYSING SUCCESS

There are four types of techniques used for the analyses of success in case of M&A transactions (Bruner [2002]):

- market-based return studies,
- accounting studies,
- studies based on survey of managers
- case studies.

#### 6.1 Market-based return studies

Market based return studies examine the cumulative abnormal returns to shareholders. The raw return for one day is simply the change in share price (plus any dividends paid) decreased by a benchmark (alternative cost of capital) of what investors required that day from a similar risky investment. Generally the benchmark is a market index (Dow Jones Average, S&P 500 etc). These daily returns are added and analyzed in the period before and after the transaction, depending on the chosen event window length. For example in a case of (-10;+10) event window 10 days cumulative abnormal return before the transaction is compared to a 10 day cumulative abnormal return after transaction. These studies are regarded to be forward-looking on the assumption that share prices are simply the present value of expected future cash flows to shareholders. Since the 1970's these studies have arguably dominated the field. Such kind of method was used for example by DeLong's study (DeLong [2001]).

## 6.2 Accounting studies

Accounting studies examine the reported financial results of acquirers before and after acquisitions to see how financial performance changed due to transaction. The focus of these studies ranges across net income, return on equity or assets, ESP, leverage, and liquidity of the firm. The best studies are structured as matched-sample comparisons, matching acquirers with non-acquirers based on industry and size of firm. In these studies, the question is whether the acquirers outperformed their non-acquirer peers. In this category Ravenscraft and Scherer's study belongs to the most cited (Ravenscraft, Scherer [1987).

## 6.3 Studies based on survey of managers

In case of methods based on surveys of managers they simply ask executives about the circumstances of transactions, and whether a M&A transaction created value or not. These present a sample of executives with a standardized questionnaire, and aggregate across the results to yield generalization from the sample. Hitt and Tyler's work is a good sample for this kind of study (Hitt, Tyler [1991]).

# 6.4 Case studies

Event studies focus on one transaction or on a small sample in great depth. They usually derive insight from field interviews with executives and knowledgeable observers, from internal and external documents of transactions, articles in economic press and from information analyzes of commercial databases connected to transactions. By drilling down into the detail and factual background of a deal, the researchers often induce new insights. An excellent sample of this type of study is the Clerc's research analyzing the Renault-Nissan case (Clerc [1999]).

Market return based and accounting based methods complete each other, since market return performance represents ex ante expectation, because the return is calculated upon the stock prices, which are the present values of the future performances, while accounting based method represent ex post measures of performance (Anand, Singh [1997]). Individually market return based and accounting based methods each have limitations. The mentioned methods of analyses can be considered as advantageous and disadvantageous according to different points of view. As it shows tab 8. each of them has its strengths and weaknesses.

	Market-based Returns to Shareholders Studies	Accounting Studies	Surveys of Managers	Case Studies
STRENGTHS	<ul> <li>A direct measure of value created for investors.</li> <li>A forward-looking measure of value creation. In theory stock prices are the present value of expected future cash flows.</li> </ul>	<ul> <li>Credibility. Statements have been certified. Accounts have been audited.</li> <li>Used by investors in judging corporate performance. An indirect measure of economic value creation.</li> </ul>	<ul> <li>Yields insights into value creation that may not be known in the stock market.</li> <li>Benefits from the intimate familiarity with the actual success of the acquisition.</li> </ul>	<ul> <li>Objectivity and depth in reconstructing an actual experience.</li> <li>Inductive research. Ideal for discovering new patterns and behaviors.</li> </ul>
WEAKNESSES	<ul> <li>Requires significant assumptions about the functioning of stock markets: efficiency, rationality, and absence of restrictions on arbitrage. Research suggests that for most stocks these are not unreasonable assumptions, on average and over time.</li> <li>Vulnerable to confounding events, which could skew the returns for specific companies at specific events. Care by the researcher and law of large numbers deal with this.</li> </ul>	<ul> <li>Possibly non-comparable data for different years. Companies may change their reporting practices. Reporting principles and regulations change over time.</li> <li>Backward looking.</li> <li>Ignores value of intangible assets.</li> <li>Sensitive to inflation and deflation because of historic cost approach.</li> <li>Possibly inadequate disclosure by companies. Great latitude in reporting financial results.</li> <li>Differences among companies in accounting polices adds noise.</li> <li>Differences in accounting principles from one country to the next make cross-border comparison difficult.</li> </ul>	<ul> <li>Gives the perspectives of managers who may or may not be shareholders, and whose estimates of value creation may or may not be focused on economic value.</li> <li>Recall of historical results can be hazy, or worse, slanted to present results in the best light.</li> <li>Typically surveys have a low rate of participation (2-10%) that makes them vulnerable to criticisms of generalizability.</li> </ul>	<ul> <li>Ill-suited to hypothesis testing because the small number of observations limits the researcher's ability to generalize from the case(s).</li> <li>The research reports can be idiosyncratic making it difficult for the reader to abstract larger implications from one or several reports.</li> </ul>

Tab 8. Comparison of Research Approaches Regarding the Profitability of M&A

Source: Bruner [2002] 16. p.

#### 7. STUDIES ANALYSING THE SUCCESS

There is a long history of acquisition research with academic research studying mergers and acquisitions since Deving's study (Deving [1921]). More than a hundred of studies have been prepared since in the subject. Despite the fact that these studies are different in most of details, even their results, one thing is common in all of them. This is the success as a central question of these studies.

Therefore the researchers' effort is comprehensible to summarize this scope of wide spreading analysis and studies. Into this general literature belong researches from King (King [2000]), Bruner (Bruner [2002]) and Conn et al (Conn et al [2001]).

King in his review focused on empirical research on post acquisition firm performance. Starting with the Jensen and Ruback study (Jensen, Ruback [1983]) he concluded the consequences of the 42 most important studies published in strategic management literature from the 1983-2001 period (King [2000]). 31 of the 42 studies made conclusions on the post acquisition performance. 14 studies observed performance increase, while 17 studies reported about no impact on performance or decreased performance after transaction. Tab 9. shows these studies according to a division of the research type and result.

Type of methods	Increased performance	No impact or decreased performance
Stock market method	6	7
Accounting method	1	3
Both stock market and accounting method	3	4
Other methods	4	3
Total	14	17

Tab 9. Results of studies measuring corporate performance after acquisitions

Source: King [2000] 38. p.

Bruner in his work analyzed the results of (the most cited) 114 M&A post transaction performance measuring researches (Bruner [2002]). To sum up the establishments of this work regarding to each transaction type we can make the following conclusions.

## 7.1 Results of market-based return studies

According to the results of profitability analyses of target companies made with market based return method it is unambiguously ascertainable that the shareholders of target companies can realize a positive abnormal return after the transaction (see figure 13.). +24,9% was the average abnormal return of the 21 analyzed studies. The average sample consisted 250 transactions. Studies analyzed 17 year periods in average from the 1919-1999 interval, generally with the use of (-5;+5) days event window. The length of the event window exceeded this volume only in 5 cases from the 21 studies.

In case of studies analyzing the profitability of acquirer companies the situation is not so unambiguous. 20 studies from 44 reported negative cumulative abnormal returns, of which the average volume was -1,4%, in 13 cases the results were significantly negative. Studies analyzed 13 year periods on average from the 1929-1999 interval, generally with use of (-5;+5) days event window. The length of the chosen event window exceeded this volume only in 3 cases. The remaining 24 studies reported a positive cumulative abnormal return, on average +2,21%. Studies analyzed 16 year periods on average from a 1919-1996 interval, the chosen event window length did not reach (-5;+5) days in 60% of the cases. 17 studies from this 24 reported a significant positive return. 14 studies from the 44 studies reported cumulative abnormal return around zero.

As it can be unambiguously deduced from the size of the event windows, the studies analyzed the short-run performance of transactions. Further 11 studies analyzed the profitability of acquirer companies in the long-run period, where generally the length of the event windows was between 1 and 5 years. Studies

analyzed 18 year periods on average from the 1929-1991 interval. An average sample consisted from 350 transactions. One of the studies worked with an extreme large sample of 4000 pieces. -6% was the average cumulative abnormal return reported by these 11 studies. Agrawal and Jaffe summarizing the results of researches dealing with long-run success of domestic transactions found significant negative abnormal returns, though these results hold only for mergers (Agrawal, Jaffe [2000]).

20 studies analyzed the combined after M&A transaction return from both of the acquirer and the target companies. Most of these studies weighted the cumulative abnormal returns - realized by the shareholders of two companies – according to the portfolio return calculation method with the acquirer and target company's capital. 180 transactions were of average sample size. Studies analyzed 15 year periods on average from the 1919-1999 interval. The length of the used event window is generally below (-20;+20) days, they exceed this interval only in 4 cases. The average combined cumulative abnormal return is positive in all of the 20 studies, in 11 cases this positive result is significant.

## 7.2 Results of accounting studies

Most of the 14 accounting based studies observed decrease in the Return on Equity and Return on Assets ratios after transaction by acquirer companies. The studies on average analyzed 16 year intervals from the 1948-1995 period. An average sample consisted 200 transactions.

#### 7.3 Results of studies based on surveys of managers

6 from the 13 studies based on surveys of managers reported about a performance decrease of the acquirer companies after the transactions, and the rest detected no impact or slight positive change in post transaction performance. Except of one study which analyzed a 5409 piece sample, the average sample size contained 185 transactions. Studies were analyzed 5 year intervals on average from the 1955-

1998 period. This type of a study is not widely used due to its questionable validity.

## 7.4 Results of case studies

From the 6 case studies 3 ended successfully from the acquirer company's point of view and the remaining 3 resulted in total failure. The cases are from the end of the 1980's and from the beginning of the 1990's.

# 7.5 Results of studies analysing success of CBM&A transactions

One can find fewer researches in the M&A literature dealing explicitly with CBM&A transactions. The reason of this phenomena is that cross-border transactions were carried out in higher volume only in the last, 5<sup>th</sup> wave (1993-2000 in the period).

However as some prior researches had forecasted, comparing domestic and crossborder transactions, takeover premiums paid in cross-border transactions were significantly higher than those paid in domestic transactions, making it even more difficult to increase shareholder value (Dewenter [1995]).

According to the results of their research Kleinert and Klodt found that crossborder mergers and acquisitions do not differ from national ones. The same result has been found for horizontal transactions versus vertical and conglomerate transactions. According to their opinion company specific factors determine widely the success of transactions (Kleinert, Klodt [2002]).

As in earlier M&A waves, the probability of success does not differ from a coin toss even in this 5<sup>th</sup> wave rich in CBM&A transactions. Jaquemi et al observed that the shareholders of target companies involved in domestic M&A transactions earned higher profit than owners of the target companies that took part in CBM&A transactions (Jaquemin et al [1989]).

On the contrary, Danbolt found target company shareholders in the UK to gain significantly more in cross-border than in domestic transactions (Danbolt [2001]).

As it can be seen, the domestic and cross-border transactions can result in a different level of abnormal results, mainly if the markets of corporate control are segmented by national borders (Fatemi, Furtado [1988]). Factors suggested in the literature to explain why target shareholders may gain more in cross-border than in domestic acquisitions fall into four main categories. These were international risk diversification, market access, exchange rate effects and managerial factors (Danbolt [2001]). According to Madura and White companies with only international diversification try to stabilize their cash-flows, minimizing the risks of their shareholders and creditors (Madura, White [1990]). The level of abnormal returns can also vary according to the countries different M&A acts and rules and against of the efficiency of markets (Conn, Connell [1990]).

Few studies have considered abnormal returns in cross-border deals, and most researches have examined short-window abnormal returns. Markides and Ittner find that one-day abnormal returns for 276 US international acquisitions made between 1975 and 1988 are positive (Markides, Ittner [1994]). Doukas and Travlos's researches confirm this finding (Doukas, Travlos [1988]). Morck and Yeung examined 322 foreign acquisitions by US based firms between 1979 and 1988 and found one-day positive abnormal returns to occur only if the firm has substantial intangible assets (Morck, Yeung [1991]). As it can be seen in tab 10., from the researches analyzing the success of US acquirer companies involved in CBM&A transactions it follows that the short-run CAR return of these transactions are generally zero.

Author(s)	Target's country(s)	Sample size	Iodel type& interval	CAR short-run	CAR Long-run
		& period			
Black et al.,	Multiple	360 firms	market	0,15	
(2001)		1985-95	daily		
Cakici et al.,	Multiple	112 firms	market	0,28	
(1996)		1983-92	daily		
Conn-Connell	U.K.	35 firms	market	from -2,53	-11,49 to
(1990)		1971-80	daily	to 10,41	11,37
Doukas	Multiple	463 firms	market	0.41	
(1995)		1975-89	daily		
Doukas-	Multiple	301 firms	market	0,08	
Travlos	_	1975-83	daily		
(1988)					
Eckbo-	Canada	394 firms	market	0,22	-3,72
Thorburn		1964-83	monthly		+1, +12
(2000)					month
Erwin-Perry	Multiple	185 firms	market	0,65 horizontal	
(2000)		1985-97	daily	1,93 diversif.	
Markides-	Multiple	276 firms	market	0,32	
Ittner	_	1975-88	daily		
(1994)			-		
Morck-Yeung	Multiple	322 firms	index	0,29	
(1992)	1	1978-88	daily		

Tab 10. Studies analysing short-run CAR of USA acquirers' involved in CBM&A transactions

Source: Conn et al. [2001] 43. p.

In case of these studies, where US companies are targets, the after transaction results are not so uniform, as it is shown on tab 11. According to one third of these studies the short-run CAR yield is zero, according to another one third it is negative and according to the rest the CAR is positive. Cakici et al found significant positive abnormal returns for 195 foreign firms that acquired US targets between 1983 and 1992, but no gains for US acquisitions of foreign targets during the same period (Cakici et al. [1996]).

Eckbo and Thorburn report similar findings when examining bids by US and Canadian firms between 19964 and 1983. The Canadian bidders earned significantly positive abnormal returns, but US bidder returns were insignificant (Eckbo, Thorburn [2000]). Kiymaz and Mukherjee examining 141 US targets acquired by foreign firms and 112 foreign targets acquired by US firms between 1982 and 1991 report similar results (Kiymaz, Mukherjee [2000]).

Author(s)	Acquirer's	Sample size	Model type	CAR	CAR
	country(s)	& period	& interval	short-run	long-run
Aw-Chatterjee	U.K.	79 firms	Market	-4,46	-8,07
(2000)		1991-96	monthly		
Cakici et al.,	Multiple	195 firms	Market	1,96	
(1996)		1983-92	daily		
Conn-Connell	U.K.	38 firms	Market	-7.87 to	-22,62 to
(1990)		1971-80	monthly	9.49	11,33
Corhay-Rad	W. Europe	17 firms	market	1,97	
(2000)	_	1990-96	daily		
Danbolt	Multiple	71 firms	market, index	0,23	-5,14
(1995)	_	1986-91	daily	0,8	-2,45
Eun et al.	Multiple	225 firms	market	-1,20	
(1996)		1979-90	monthly		
Kang	Japan	102 firms	market	0,51	
(1993)		1975-88	daily		
Mathur et al.	Multiple	77 firms	market	-1,84	
(1994)		1984-88	daily		
Servaes-	Multiple	779 firms	index	0,05	
Zenner		1974-90	daily		
(1994)					

Tab 11. Studies analysing short-run CAR of companies acquiring USA targets in a CBM&A transaction

Source: Conn et al. [2001] 43-44. p.

No doubt, that in 95 percent of cases in M&A or CBM&A transactions - analyzed by studies published so far - at least one of the participant companies came from the US or UK. The main reason for this is that mergers and acquisitions were typical of the Anglo-Saxon corporate governance practice and only in the past few decades became a widely used strategic asset.

Long-run time series regarding to share prices and accounting data from previous years which are essential for analyzes were available for researchers similarly only for US and UK companies in the highest number, at the easiest way accessible and for free of charge. It is not surprising, that the first studies analyzing long-run profitability were concerned to US and UK companies. Otherwise the need for long-run analyses was justified by the controversial results produced by short-run analyses.

This is also confirmed by results of studies analyzed by Bruner (Bruner [2002]). On strong efficient capital markets every available information and expectations are built in into the exchange rates, which can be considered as a present value of future cash-flows from share holding. Because the market not everywhere and not always fulfills the criteria of strong level efficiency, sometimes it happens that the market can not accurately forecast the post M&A transaction performance of the acquirer company. Therefore there is a need for a longer-run analysis, which could corrugate the short-run imperfections of the market.

As we can see in tabs 10. and 11. in case of long-run analyzes in the early stage similar methods were used like in short-run analyzes. Some of the early studies dealing with the subject suggested that methods used in short-run analyses do not suit for the long-run analyses (Conn, Connell [1990]).

The new suggested method is the Buy and Hold Return (BAHR) calculation method, where the yield calculated from the purchasing value and end value of analyzed time period is decreased by the benchmark return. The use of this method for long-run analyzes was suggested by Fama (Fama [1998]) and Lyon et al (Lyon et al [1999]). This method was also used by studies analyzing the long-run profitability of national M&A transactions presented in tab12.

Author(s)	Sample size	Methodology	Long-run
	& period		BAHR or CAR
Loughran-	947 USA	5 year holding period returns	-25 for stock mergers
Vijh	transaction	adjusted with matching firms	+61.7 for cash tender offers, buy
(1997)	1970-89	based on size and MTBV	and
			hold returns vary by medium of
			payment & friendly/hostile
Gregory	420 U.K.	6 different models	CAR API
(1997)	transaction	1. CAPM	-17,73 -12,44
	1984-92	2. Dimson-Marsh model	-12,52 -11,25
		3. Size decile model	-11,82 -11,03
		4. Multi-index SML model	-14,29 -9,18
		5. Multi-index HG model	-2,03 -8,15
		6. Fama-French 3 factor model	-18,01 -12,22
Higson-	830 U.K.	Announcement to $+ 3$ years	At announcement AR to acquirer
Elliot	transaction	monthly using BAHR	0,43
(1998)	1975-90		AR at +3 years 0,82
			AR at +3 for largest 100 merger
			4,61
			Results sensitive to size-decile v.
			FTA
			Benchmark due to changing
			Performance of larger firms.
Cosh-	U.K.	Matched firms based on size	4 year BAHR 0 at hostile
Guest		and	4 year BAHR -22 at friendly
(2001)	1985-96	MTBV	
Baker-	595 USA	Matched firms & portfolios	Negative AR for acquirers +3 to +5
Limmack	transaction	based	years after adjusting for biases
(2001)	1977-90	on size, MTBV and prior	from
		performance. Fama-French 3	survivorship, selection and prior
		factor model	performance. Cash bids with 0 AR
			and
			equity bids with negative AR

Tab 12. Studies analysing long-run returns of domestic M&A transactions

Source: Conn et al. [2001] 45-46. p.

Black et al analyzing the long-run success of acquirer companies involved in CBM&A transactions in the 1985 and 1995 interval, upon 361 transactions, where US companies acquired foreign targets, observed negative abnormal return both in tree and five year period after transaction (Black et al [2001]). This finding is confirmed by the results of Gugler et al's research, while they also observed significant decrease in the acquirer companies' market value in the five year period after CBM&A transaction (Gugler et al. [2000]). On the contrary, Conn et al analysing long-run return of 1065 CBM&A transactions found, that acquirer companies realised a significantly positive BAHR return after transaction in a one year period and zero BAHR return in a three year period (Conn et al. [2001]).

This result as we can see in tab 13. is in opposite with the results of Black et al's researches. This analysis used the mentioned BAHR method for the calculation of the long run returns.

Tab 13.	Studies	analysing	long-run	returns of	CBM&A	transactions
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Author(s)	Sample size	Methodology	Long-run
	& period		BAHR or CAR
Black et al.	361 transaction	3-5 year BAHR adjusted with	-13% for 1 year
(2001)	1985-95	matching control portfolios based	-43% for 5 year
		on	
		size, MTBV & prior	
		performance	
Conn et al.	1065	1-2-3 year BAHR adjusted with	6% for 1 year
(2001)	transaction	prior performance	0% for 3 year
	1984-2000		

Source: Conn et al. [2001] 46. p. and own preparation

#### 8. FACTORS AFFECTING THE SUCCESS UPON PRIOR STUDIES

#### 8.1 Cultural differences

It is justified by more researches that corporate managers take into account the national cultures in cases of M&A transactions. British, Swedish and Danish companies definitely looked for partnerships with North-European and USA companies, and tried to avoid strategic alliances with Japanese and South-European companies (Heidrich [2002]; Cartwright et al [1995]). From the viewpoint of potential synergies the cross-border strategic alliances and M&A transactions are much more successful, because in these cases cultural differences are supposed in advance. Therefore the cultural difference gets higher attention and the participants in the integration process are more sensitive to this question. This cultural openness and awareness more often leads to real results, like domestic transactions. The merger of two organizational cultures, believed to be similar, in generally is more unsuccessful than an international transaction carried out with a higher attention (Heidrich [2002]). Jansen also supposed that in case of CBM&A transactions the culture is named as a substantial factor of success or failure (Jansen [2001]). The differences in corporate cultures play a major role for the success or failure of CBM&A transactions. Surprisingly, he experienced that there could not be found a significant correlation between the corporate culture fit and the success of CBM&A transactions (Jansen [2001]).

Evenet emphasizes the importance of the common cultural environment and legal rules background of companies involved in M&A transactions from the viewpoint of transaction's success also (Evenett [2002], [2003]). The different culture and the differences in legal rules are often mentioned as a reason of failure. This means difficulties in communication, different problem handling and therefore their elimination in the integration phase needs more time and it is of a higher cost which results the decrease of the synergy value. Datta and Puia argue that the full potency of culture only becomes apparent after a transaction in the implementation phase when the interaction of two often disparate cultures takes place (Datta, Puia

[1995]). Heidrich mentions this process as aculturalization, in which two groups contact with each other in order to solve conflicts and problems arising from the relationships. The relation induces changes in both of the groups' culture (Heidrich [2002]; Nahavandi, Malekzadeh [1993]). In case of M&A transaction of two different companies we can speak about double aculturalization (Heidrich [2002]).

The result can be a culture shock, often accompanied by negative effects on performance. It is true that the cultural difference can lead to an aculturalization shock (Nahavandi, Malekzadeh [1993]), but in the case that the culture of the other organization is positively valued it can has several advantages (Heidrich [2002]).

"Morosini defines the aculturalization process and conditions of operations in a wider framework. According to himself, M&A transaction is not only a simple management task, the roots of national cultures play also important role in the integration process. The social medium, in which the company operates, strongly influences the methods used by the company. Therefore it should be interpreted not only the evident internal and external factors, but even the social embeddency of the organization in order to understand its market behavior and the role of cultural values in the whole process" (Heidrich [2002] p. 13). The more convergent the cultures themselves are, the more difficult to change them. It is also true that the two organizations are not equally touched by changes due to M&A transaction. Very characteristic for M&A transactions, that manly in the initial phase managers try to implement changes on the top level, while on the operative level the day to day practices remain without changes. Therefore according to Vaara it is unnecessary to base the cooperation on the commonly declared opinions and beliefs - emphasized by the integration model -, because on the operational level they occur very late (Vaara [1999]). According to Säntti the culture can not be managed - it can be influenced and changed upon common agreement, but to achieve changes there is a need for a lot of agreement from both sides' rulers and even on the long-run only small changes can be perceptible -,

therefore the starting distance between the two cultures is very important (Säntti [2001]).

## 8.2 Human resource

Employees' problems are held responsible for between one-third and a half of all M&A failures. A research done by experts of this field identified sixteen factors associated with unsuccessful M&As. Of these sixteen factors at least half were directly related to people and people management issues (Cartwright, Cooper [1996]). These factors are the following: Underestimating the difficulties of merging two cultures. Underestimating the problems of skills transfer. Demotivation of the employees at the acquired company. Departure of key people in the acquired company. Too much energy devoted to "making the deal", but not enough to post-acquisition planning and integration. Decision making delayed by unclear responsibilities and post-acquisition conflicts. Neglecting existing business due to the amount of attention going to the acquired company. Insufficient research about the acquired company.

According to Jansen and Pohlman after M&A transactions the fluctuation rate increases significantly. This is a substantial reason for the failure of transactions. On average, about 70 % of the higher management leaves the company within five years, often they are switching to competitors (Jansen, Pohlmann, [2000]). Results of Kleinert and Klodt's researches also demonstrate that employment reduction is not characteristical of a successful transaction (Kleinert, Klodt [2002]).

## 8.3 Relative size

The relative size of companies also can influence the post transaction return. According to Kleinert and Klodt the success of M&A transactions depend mainly on the target company's relative size to the acquirer company. The larger the acquired entity relative to the buyer, the worse the success of the transaction in terms of profitability and employment growth (Kleinert, Klodt [2002]). It can be

explained by the fact that a smaller unit can be more easily integrated into an active organization. In reverse, in case of two companies with a relative similar size even the decision of dominance and to get this dominance through with the other company can not be considered as an unanimously easy and fast process. Similarly, Conn and his colleagues find that in case of CBM&A transactions the post transaction performance is worse, but not significantly, when the target company is relative larger, compared to cases when target company is relative smaller (Conn et al [2001]). In opposite of this, according to Agrawal and Jaffe there is no connection between the relative size of target company and the negative post transaction return (Agrawal, Jaffe [2000]).

## 8.4 Paid premium

Some researches show that premium paid for the target company influences the post transaction performance (King [2002]; Sirower [1997]; Hayward and Hambick [1997]). The average premium paid in corporate acquisitions according to Goodwill has increased again in 2000. One of the main motives of international across border mergers and acquisitions is to avoid trade barriers. If the market access for a foreign bidder is valuable then the acquirer company is ready to pay a takeover premium for the target company. According to Goldman Sachs 2001 research the takeover premium for companies listed at a stock exchange can reach an average 50 percent (Jansen [2001]). Otherwise the too high takeover premium may absorb the whole synergistic benefits.

#### **8.5 Preliminary experiences**

Baker and Limmack show that multiple acquirers experience significantly higher returns than single acquirers (Baker, Limmach [2001)]. This establishment is consistent with the observation of Conn et al, that multiply acquirers in CBM&A transactions perform better than single acquirers, but this difference is not statistically significant (Conn et al [2001]). The conclusion that there is a learning curve on the side of frequent acquirers according to some experts could not be

confirmed. Haleblian and Finkelstein's analysis on this issue suggested an U curve relationship between the number of transactions of the company and its success (Haleblian, Finkelstein [1999]). That means that first time buyers are more successful than companies that have already carried out some transactions, and after some more reflected deals the post transaction performance increases again.

#### 8.6 Economic situation of the target company's country

According to Evenet's research results the economic growth of the target company's country has an influence on the success of CBM&A transactions. The GDP growth in the target company country suggests a favorable economic environment, which contributes to the profitable operation of companies (Evenet [2002]). However the owner of this produced profit is the acquirer company and in this case it will improve the acquirer's results.

## 8.7 Speed of transaction

One of the most incessant myths in M&A transaction management is the myth of speed. Although according to Jansen's empirical analyses, no significant correlation could be found between the length from closing up to the start of integration activities and the corresponding development of turnover and market value in the aftermath of the M&A transaction (Jansen [2001]).

## 8.8 Industrial effect

The industrial direction, - which mainly shows the relation of activity fields of companies involved in the transaction and takes shape in the horizontal, vertical and conglomerate type of transactions, - according to Healy et al has a significant effect on return of transactions (Healy et al. [1992]). They found that transactions involving firms with highly overlapping businesses significantly outperform those with few overlapping businesses. Maquiera et al show that acquiring stockholders in non-conglomerate mergers experience wealth gains while those in conglomerate

mergers experience wealth losses (Maguiera et al [1998]). Similar results are found by Megginson, Morgan and Nail (Megginson, Morgan, Nail [2000]).

Conn et al in their analyses investigated the effect of industrial direction on long run performance in case of horizontal and non-horizontal deals both for domestic and CBM&A transactions (Conn et al [2001]). In domestic transactions they found no significant difference between the long run performance of horizontal and nonhorizontal deals. In opposite of this in CBM&A transactions they found a difference between horizontal and non-horizontal deals. The former resulted in marginally significant positive returns whereas the latter resulted negative returns.

## 8.9 Geographical distance

Firms tend to choose targets from nearby countries, especially when strong cultural ties, such as a common language, are present as in the case of the UK and Ireland, the Scandinavian countries, Belgium and Holland and Germany and Austria (Ietto-Gillies et al [2000]).

## 8.10 Type of bidding

According to Franks and Harris [1989] shareholders of target companies in cases of revised bids can earn significantly more. In opposite of this Limmack [1991] in case of English companies, while De et al [1996] in case of USA companies found that the revised bids had a relative weak impact on the shareholders' abnormal profitability of target companies (Danbolt [2001]).

In cases of competition bid Michel and Shaked [1986], Stulz et al [1990], Kaplan and Weisbach [1992], De et al [1996], for USA acquisitions while Song [1993] and Swenson [1993] for cross-border acquisitions found that the shareholders of the target companies realized significantly greater return than shareholders of target companies involved in simple bid. This return surplus was justified even by Dewenter [1995 a,b] but not in a significant amount. Sundarsanam et al [1996] surprisingly found the opposite of this. On the U.K. market shareholders of target companies earn negligible, but fewer in case of competitive bid than in case of simple bid (Danbolt [2001]).

# 8.11 Method of payment

The method of payment also has its influence on the post transaction return. Cash bids result in positive post transaction returns (Loughram, Vijh [1997]). Travlos [1987], Wansley et al. [1987], Franks et al. [1988], Servaes [1991] and Agrawal et al. [1992] in their researches all report about negative abnormal return of acquirer companies after equity financed transactions (Danbolt [2001]). According to Conn et al there is no evidence that cross-border transactions involving all cash offers perform significantly better than cross-border transactions using other payment methods (Conn et al [2001]).

# 8.12 Other factors

According to current studies, the internal as well as the external communication to all stakeholders are crucial aspects for the success of transactions (Jansen [2001]). Information differences lead to cross-border acquisitions being more risky than domestic ones (Conn et al [2001]).

The international character of transactions also presents difficulties for mergers and acquisitions (Heidrich [2002]). Other downward effects on performance in CBM&A transaction may result from cultural assimilation problems and organizational managerial complexity compared to domestic transactions (Conn et al. [2001]).

Positive abnormal return is observable in such CBM&A transactions where:

- there is a vertical connection between the acquirer and target companies (Markides, Ittner [1994]).
- the acquirer company had prior international experience before the

transaction (Markides, Ittner [1994]).

- the acquirer company had previous foreign interest, but not in the target company's country (Doukas, Travlos [1988]).

It is a myth that CBM&A transactions remain without extensive consequences for customers and co-producers. In case of CBM&A transactions according to Jansen's analyses the drop in turnover can reach 63 percent (Jansen [2001]).

Andrade, Mitchell, and Stafford have conclusively demonstrated in their research that M&A activities tend to cluster not only over time and by region, but also by industry (Andrade, Mitchell, Stafford [2001]).

# PART II.

# **METHODS AND PROCEDURES**

#### 9. RESEARCH PLAN

#### 9.1 Character of research, sample election and type of analysis

The planned research is basically of the explanatory type, the aim is to search interpretation and test hypotheses. The statistical analysis is made on the mezzo level, therefore the research is related only to a determined group of economic. The mezzo level is determined ad hoc, as it is common in a case of such kind of analysis concentrated on the given problem (Kerékgyártó et al. [2001]). The cross-sectional research is related to year 2000. Data collection is realized by sampling. The used sampling method is from the random sampling category, the concentrated sampling method. In this case the sample items are chosen from the multitude according to an important qualitative criterion, which concentrate on the majority part of the multitude according to a given criterion. They are chosen from the multitude items with the highest weight /e.g. TOP 100 list/ (Kerékgyártó et al. [2001]). Data analysis is made by second-analysis method, which means that already existing data elements are collected and analyzed from several information and data sources.

#### 9.2 The sample

Cross-border mergers and acquisitions /CBM&A/ subset from the mergers and acquisitions /M&A/ set is the subject of the analyzed multitude. 175 mega deals /deal value is over 1 billion US\$/ from 2000 year are items of the sample. Reasons of this sampling are the following. Year 2000 was the top of the M&A waves (figure 1.) carried out so far. However at the same time this year was also the top in CBM&A transactions (figure 2.) and even in case of mega CBM&& deals (tab 2.). The list of above mentioned mega transactions can be obtained from the

UNCTAD 2001 World Investment Report annex page 244 free of charge (UNCTAD [2001]). The free availability of information and data regarding to the highest number of transactions involved into the sample was an additional important condition.

# 9.3 Methodology

I have accepted Hitt et al's suggestion regarding to the future analyzes of strategic management phenomena, because these phenomena are complex and can not be explained with one theory, they need an integration of several theories in order to find solutions for the problems (Hitt et al [1998]). Therefore I have integrated two different approaches, the traditional and the organizational approach in one model to analyze the success of CBM&A transactions.

The integration of different theoretical approaches in one model is not a new phenomenon in the researches analyzing strategic decisions. Hitt and Tyler's research is a good evidence for this because they integrated the normative, strategic choice and external control approaches in one model in order to analyze the acquisition decisions (Hitt; Tyler [1991]).

In my research I have used the market based return method for analyzes of success of CBM&A transactions. This method is based on the analysis of expected returns realizable by shareholders. Within the theory I have used two kinds of procedures to determine the return, the CAR and BAHR procedures. Incase of CAR procedure /the daily return equals with the per cent changes in the share price, plus any dividend paid/ is calculated from the daily opening and closing share prices. If we sum these data we get the cumulative return for the given period. In case of BAHR procedure the return is calculated upon the share price from the beginning of the analyzed period and upon the share price from the end of the analyzed period. In both of the cases I increased the returns with a reference/benchmark yield, that could be what the investors expected from a similar risky investment. I accepted Fama's (Fama [1998]) and Lyon et al's (Lyon et al. [1999]) recommendations and I have chosen the reference yield according to the industry and size of companies involved in a transaction. Because in my sample there are mega CBM&A transactions /deal value over 1 billion USD/ therefore the reference portfolio should contain the biggest companies which are able to carry out such kinds of transactions.

The international diversification affect should also appear in the benchmark portfolio, because after the transaction the acquirer will operate not only on the domestic market but in foreign markets also. Transactions are from different industries therefore the benchmark portfolios should be divided according to industries in order to capture the industry effects in all of the transactions. Dow Jones Sector Titans Indexes<sup>(1)</sup> are the most suitable benchmark portfolios for the above mentioned criteria. In this index one can find the biggest multinational corporations from the world and they are selected into 18 groups according to industries. In each of the indexes there are the 30 biggest corporations of the given industry.

#### 9.4 Time horizon of the analysis

It is a long-run analysis, therefore the chosen event window length is (-3;+3) years. This means that 3 years before the transaction and 3 years after the transaction are analyzed. Because CBM&A transactions from year 2000 are the sample items, therefore the 3 year before transaction period start uniformly from January 2<sup>nd</sup> 1997 to the day of transaction closure.

<sup>(1)</sup> values of Dow Jones Sector Titans Indexes, information regarding their consistence and computation related data and methodology can be found at the <u>http://www.djindexes.com</u> homepage.

The date of transaction closure is varying across sample items, but in all cases it is a date from year 2000. Generally it is no later than the <sup>3</sup>/<sub>4</sub> of year 2000. The 3 year post transaction period starts from the day after transaction closing /this is the mentioned varying 2000's date/ till September 30<sup>th</sup> 2003.

In case of CAR yield calculation procedure I took into account only those days' data for which both acquirers' share price quotations and reference portfolio price quotations are available. Thus I tried to avoid the probable distortion of Car procedure in long-run use, due to which according to Conn and Connell CAR is not a suitable procedure for such type of analyzes (Conn-Connell [1990]). Corrections in reference portfolios are made by data providers automatically, therefore I did not have to deal with them <sup>(1)</sup>. In case of some reference portfolios the price quotation starts later than the starting date /January 2<sup>nd</sup> 1997/ of the period I analyze. In these cases in the missing period I used the Dow Jones Sector Titans Average index as a reference portfolio. This is not specialized for industries, but contains the major companies from all of the analyzed industries and because the substitution time is not long therefore this is the best solution for replacing the missing values in the reference portfolio quotation.

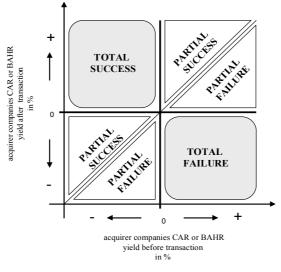
#### 9.5 Analysis of the success and the chosen viewpoint

In this research the success is interpreted from the acquirer company's viewpoint, and it is defined as it follows: A transaction can be considered a total success from the acquirer company's point of view, if the acquirer company shares' CAR or BAHR return before transaction is negative and after transaction becomes positive. The transaction is a total failure if the reverse is a case.

<sup>(1)</sup> values of Dow Jones Sector Titans Indexes, information regarding their consistence and computation related data and methodology can be found at the <u>http://www.djindexes.com</u> homepage.

We can speak about a partial success if there is an improvement between the acquirer company shares' before and after transaction CAR or BAHR return, but there is no sign at change /the negative value decreasing, the positive increasing/. The failure is partial if there is a deterioration between the acquirer company's shares before and after transaction CAR or BAHR return, but there is no sign of change /the negative value increasing, the positive decreasing/. The decision conditions are graphically illustrated on figure 14.

Figure 14. Classification of CBM&A transactions according CAR or BAHR methods of performance measuring



Source: own completion

#### 9.6 Methods used for model construction

As I have mentioned I conducted observations for more variables of the CBM&A transactions involved in my sample. Between the observed variables there are such kinds of variables that are in stochastic relation. Arising from this there is an opportunity to make a factor analysis. In my planned research the number of observed variables reaches 50 pieces. Therefore the factor analysis offers an opportunity to reduce this number / this means that I can replace the original variables with fewer hypothetic variables but without a loss of significant information captured by the original variables (Meszéna [2003]). In the next step

of the research I analyze that the classification of mega CBM&A transactions for successful and failure transactions from the acquirer's point of view can be confirmed with other procedures or with other variables than with the CAR or BAHR methods. Instead of the original variables the classification of transactions can be made with the use of new hypothetic variables resulting from the factor analysis.

The adopted cluster analysis is the "k" means cluster method. This method belongs to the group of non hierarchical procedures. The aim of this method is that we can give the number of clusters to be established. For example in this research there are three clusters /top success, top failure, others/. From the sample we can consider the "k" point as a central point of "k" piece clusters. Every other point from the sample will be classified to this cluster where the central point is closest. After this the new central points will be calculated and the previous step will be repeated with the use of new central points (Meszéna [2003]).

After the cluster analysis with the help of discriminant analysis we can select from the factors or from the variables closely correlated to factors those, that most sharply diverse the formed groups. This is because the discriminant analyzes help us select from a group of variables the most responsible for a diversification of an a priory classified sample elements (Meszéna [2003]).

With the help of regression analysis in the followings I prepared a multi regression model. The aim of this model is to connect the explanatory variables with the given result variable after the factor analysis, cluster analysis and discriminant analysis (Ramanathan [2003]). In a frame of a case study this model is made suitable for a Hungarian company to plan and carry out a successful cross-border merger and acquisition transaction.

#### **10. VARIABLES TO BE USED IN ANALYSIS**

Because in my model there are integrated traditional and organizational approaches when choosing the variables at first I have followed this double grouping.

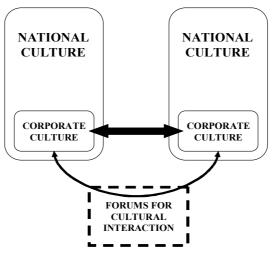
#### 10. 1 Variables of organizational approach to M&A

In case of organizational approach most of the factors like culture can not be measured and expressed in cash. Variables involved in my model according to this approach are the following.

- *Differences in culture and legal systems* are mentioned in most cases as reasons of transaction failures. In order to support or disprove this argument I analyzed the differences between cultures and their effects on the transactions' results. According to Clerc, culture has the biggest effect on the individual's behavior in the frame of organization (Clerc [1999]). Because corporate cultures can be very difficult to be measured and according to Säntti (Säntti [2001]) they can be interpreted only embedded in the national cultures as it can be seen on figure 15., therefore I use Hofstede's indexes for comparison of cultures. Hofstede's indexes are the followings. *Power Distance Index* /PDI/, *Individualism Index* /II/, *Masculinity Index* /MI/ and *Uncertainty Avoidance Index* /UAI/<sup>(1)</sup>.
- *Effects of geographical distance* on transaction results between the two countries are taken into account with the *Distance* /DIS/ index.

<sup>(1)</sup> Values of Hofstede indexes for each country can be found on the http://www.cyborlink.com/besite/hofstede.htm home page.

Figure 15. The relationship of corporate and national cultures



Source: Säntti [2001] 261. p.

- *Cultural differences' effects* can be eliminated by the minority group coming from the acquirer company's country and living in the target company country, which can be a bridge between the two culture, because it knows relatively well both of the cultures. I tried to verify this effect across involving the *Minority group index* /MGI/ into the model.
- *Languages* spoken in each countries are the most important factors affecting the information flow and communication between the acquirer and target companies. Therefore in my model I am taking into account the connections between the each languages with the *Language Correlation Index* /LCI/.
- *The effect of the legal rules background* definitely related to the foreign direct investments can be taken into account only indirectly with the help of measuring transnationality. The *TransNationality Index* /TNI/ of a country shows that how lucrative is a country for the transnational companies and foreign direct investments (UNCTAD [2002]). Indirectly it means that legal rules of the given country and related act ensure favorable frameworks for the mentioned activities.

- Aggregate indexes characterize the *central economic and political governance of countries*. These indexes try to measure and evaluate situations in each countries in six dimensions in order to make them comparable. The mentioned indexes are the following.

- *Voice and Accountability Index* /VAI/ include number of indicators measuring various aspects of the political process, civil liberties and political rights. These indicators measure the extent to which citizens of a country are able to participate in the election of governments. This category includes indicators measuring independence of the media, which serves an important role in monitoring those in authority and holding them accountable for their actions.

- In *Political Stability and Absence of Violence Index* /PAI/ are several indicators combined which measure perceptions of the likelihood that the government in power will be destabilized or overthrown by possibly unconstitutional and/or violent means, including domestic violence and terrorism.

- *Government Effectiveness Index* introduces the quality of public service provision, the quality of bureaucracy, the competence of civil servants, the independence of the civil service from political pressure, and the credibility of the government's commitment to policies.

- *Regulatory Quality Index* /RQI/ includes measures of the incidence of market-unfriendly policies such as price controls or inadequate bank supervision, as well as perceptions of the burdens imposed by excessive regulation in areas such as foreign trade and business development.

- *Rule of Law Index* /RLI/ includes perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts. It measures the success of a society in developing an environment in which fair and predictable rules from the basis for economic and social interactions and importantly the

extent to which property rights are protected.

- *Control of Corruption Index* /CCI/ measures perceptions of corruption, conventionally defined as the exercise of public power for private gain.

- *The human resource*, especially its level of education according to Cartwright and Cooper, is one of the most important key factors of CBM&A transactions (Cartwright, Cooper [1996]). The effect of this factor on the results of transactions is taken into account with the help of *Public expenditure on education* index /PEE/.
- *The state of information forwarding infrastructure* and its effects on the result of transactions are taken into account with the help of *Information and communication technology expenditures index* /ICE/.

# 10.2 Variables of the traditional approach to M&A

In case of a traditional approach on M&A transactions, as I have mentioned before, the stress is on financial processes and factors affecting them. Therefore variables used for analysis are from balance sheets, income statements and cash-flows from financial reports.

There is a wide scale of financial ratios available for analysts, but according to Virág some good selected ratios can give back the most of the desired information (Virág [1996]). Therefore in my research I have used only the most important and well known ratios from each of the financial ratios groups. These ratios for companies participating in a transaction as an acquirer can be obtained from the NASDAQ database <sup>(1)</sup>.

Financial ratios regarding to companies from NASDAQ database can be found at the following home page <u>http://quotes.nasdaq.com</u>.

- From the *liquidity ratios* I have used the *Quick Ratio* /LI1/, the *Current Ratio* /LI2/, the *Receivables/Current Assets* /LI3/ ratio and the *Inventories/Current Assets* /LI4/ ratio.
- My models contain the following *profitability ratios*. *Return on Equity* /ROE/ ratio, *Return on Assets* /ROA/ ratio, *Return on Sales* /ROS/ ratio and the *Cash Flow/Net Sales* /RCF/ ratio.
- From the financial ratio group measuring *the corporate leverage* I have used the *Total Liabilities/Total Assets* /LE1/ ratio, the *Total Liabilities/Common Equity* /LE2/ ratio, the *Current Debt/Common Equity* /LE3/ ratio and the *Long-Term Debt/Common Equity* /LE4/ ratio.
- From the group of financial ratios measuring *turnover* I have used the *Receivable Turnover* /RET/ ratio, *Inventory Turnover* /INT/ ratio, *Net Sales/Net Property, Plant & Equipment* /IAT/ ratio and the *Working Capital Turnover* /WCT/ ratio.
- *Risk* is the most important and considerable question regarding all of investment decisions. In case of CBM&A transaction this is multiply valid, because above the general risks in these cases it must be taken into account the country risk due to difference between acquirer and target company countries. The *Country Risk Index* /CRI/ enables commonly to take into account several kind of risks (UNCTAD [2002]). This aggregate index commonly deals with the political, economical and social stability of a given country.
  - *The economic growth* will be taken into account by the *Gross Domestic Product* /GDP/ index. The economic growth in the target company's country predicts a favorable economic environment which can contribute to a profitable performance of companies insuring through this the success of transaction.

- In order to characterize *the development of private sectors* in countries of the acquirer and target companies I have used the *Domestic credit to Private sector index* /DPI/ This index gives the rate of private sectors credit volume to the GDP (WorldBank [2002]).
- *Industrial Relation Index* /IRI/ measures the correlation between industries of acquirer and target companies. Indirectly it reports about the transaction type (e.g. horizontal, vertical, and conglomerate).
- *Exchange Rate Index* /EXI/ captures changes between the domestic currency exchange rates of acquirer and target company countries involved in the transaction.

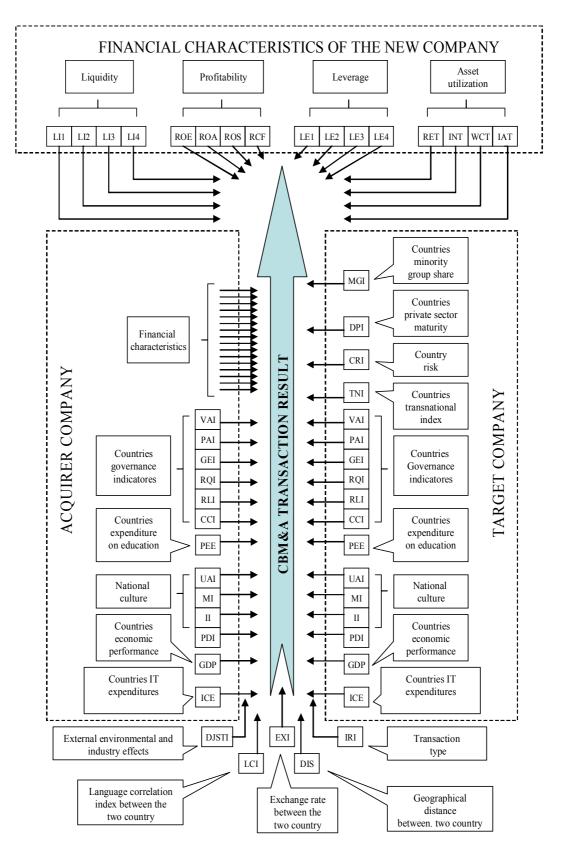


Figure 16. Factors and their variables analysed in models

Source: own completion

## **10.3 Starting models**

During the model building phase as a starting model I would like to use a multi variable linear regression model. The reason of this is the following. Previous researches (Black et al [2001], Conn et al [2001]) have used this model type also. This is the base condition of the comparability of my research results with the results of previous researches. But on the base of the model punctuality there will be an opportunity to change the function type between the dependent variable and the independent variables in the model.

The general form of the starting model is the following:

Tab 14. General form of the estimated regression model

$$\mathbf{Y}_t = \boldsymbol{\beta}_1 + \boldsymbol{\beta}_2 \mathbf{X}_{t2} + \ldots + \boldsymbol{\beta}_k \mathbf{X}_{tk} + \mathbf{u}_t$$

Where:  $Y_t$  - dependent variable  $X_{t2...tk}$  - independent variables  $\beta_{t...k}$  - regression coefficients  $u_t$  - residual

Source: Ramanathan [2003] 340. p.

The planned model will exceed previous models in the following aspects. This model integrates the two different streams from the M&A transaction literature, the *traditional approach* and the *organizational approach*. The two previous reference models were based only on the traditional approach. The number of the selected independent variables is much higher than in the mentioned models. From the starting 124 independent variables after a data reduction I would like to use 55 independent variables. This number of independent variables will be decreased effectively in order to reach the optimal level of independent variables.

Starting models based on variables of two approaches from the related literature can be written as follows.

Tab 15. Starting model based on variables of the organizational approached on *M&A*.

Source: own completion.

Tab 16. Starting model based on variables of the traditional approach on M&A.

$$\begin{split} Y_t &= \beta_1 + \beta_2 DEALVAL_t + \beta_3 INDREAL_t + \beta_4 CRI_t + \beta_5 GDPBTDIF_t + \beta_6 GDPATDIF_t + \beta_7 EXRDIF_t \\ &+ \beta_8 DISTANC_t + \beta_9 L11BT_t + \beta_{10} L11AT_t + \beta_{11} L12BT_t + \beta_{12} L12AT_t + \beta_{13} L13BT_t + \beta_{14} L13AT_t + \\ &\beta_{15} L14BT_t + \beta_{16} L14AT_t + \beta_{17} ROEBT_t + \beta_{18} ROEAT_t + \beta_{19} ROABT_t + \beta_{20} ROAAT_t + \beta_{21} ROSBT_t + \\ &\beta_{22} ROSAT_t + \beta_{23} RCFBT_t + \beta_{24} RCFAT_t + \beta_{25} LE1BT_t + \beta_{25} LE1AT_t + \beta_{26} LE2BT_t + \beta_{27} LE2AT_t + \\ &\beta_{28} LE3BT_t + \beta_{29} LE3AT_t + \beta_{30} LE4BT_t + \beta_{31} LE4AT_t + \beta_{32} RETBT_t + \beta_{33} RETAT_t + \beta_{34} INTBT_t + \\ &\beta_{34} INTAT_t + \beta_{35} IATBT_t + \beta_{36} IATAT_t + \beta_{37} WCTBT_t + \beta_{37} WCTAT_t + u_t \end{split}$$

Source: own completion.

# **11. HYPOTHESES**

According to elaboration of the literature I would like to test the following hypotheses in my planned research.

H1: Both the variables of the traditional and the organizational approach have effects on the results of mega CBM&A transactions.

H2: There is a possibility to create an integrated model which is based on both the traditional and organizational approaches on M&A.

H3: Results calculated with a model based on both the traditional and organizational approaches are more punctual than the results from models based only on one of the approaches.

H4: The integrated model can be used for forecasting with results within acceptable error limits.

I will decide about the hypotheses upon the results of analysis. If the results will support a hypothesis I will accept it and if the reverse will be the case I will drop the hypothesis.

# PART III.

# THE EMPIRICAL RESEARCH

# **12. DATA COLLECTION AND PROCESSING**

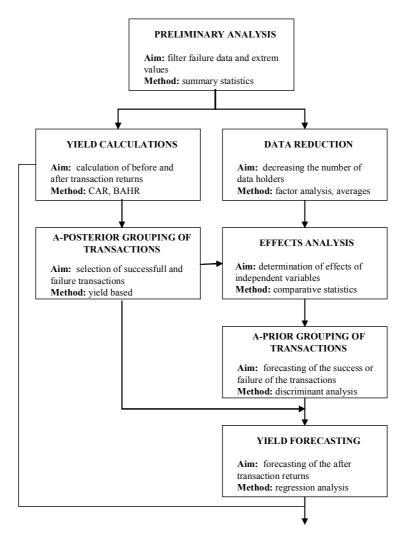
In the phase of data collection upon the treatment of literature, values of variables for the CBM&A transactions and for companies involved in a such process were collected from annual reports and online databases of such international organizations and institutions like IMF, World Bank, OECD, UNCTAD, and NASDAQ. These annual reports and online databases contained the desired information and data for companies and countries on annual levels.

Internet explorer software was also used in the research, which offered an irreplaceable help for detecting data and information related to companies involved in transactions. Collected data were entered into a personal computer during the data treatment phase and were formatted in a suitable form readable for programs used in the analyses. The database was prepared with the MS Excel electronic spreadsheet program. This program's file type is readable by most of the statistical and database management programs. As a result of data collection and treatment I have got a 175x142 database matrix, which contained 175 CBM&A transactions and 142 data per transaction. From the 175 transactions it was possible to determine the before and after transaction return of acquirer company in a 100 cases. In the missing cases there were no available share prices of the acquirer companies or the acquirer companies were not listed/traded on a stock exchange; perhaps in the meantime the acquirer company bankrupted or it was taken over by an other acquirer company.

# **13. MODEL ESTIMATION**

Model shaping and estimation are a bit complex procedures in my case, because the whole system is built up from different self separate parts. Outputs of certain parts are inputs for other parts and sometimes are used as a base of comparison in a later phase. In order to make the whole process transparent, the main steps and connections of each part are showed on figure 17.

# Figure 17. Structure of the developed model



Source: own preparation.

# **13.1 Preliminary analysis**

To prepare preliminary analyses was useful for two reasons. First there was an opportunity to detect the errors, extreme dates, outliers through the summary statistics (min. max. average values, standard deviation, etc.). Second, with the determination of correlation coefficients I was able in some cases to detect the multicollinearity between the independent variables and could predict the level of correlation between the dependent variable and independent variables.

# **13.2 Yield calculations**

Yield calculations were prepared with the previously described CAR and BAHR methods for the 3 years period after CBM&A transaction. The results of the calculations are contained in the following tab 17.

		Descriptive statistics				
Method	Valid N	Min.	Max.	Average	Std. Dev.	
BAHR	94	-69,98	154,23	-5,5878	36,8931	
CAR	94	-93,89	229,60	19,4468	58,6362	

Source: own preparation upon the results of SPSS

From tab 17. it can be seen, that the results calculated with the two methods differ significantly from each other. The reason of this can be found in the different sensitivity level of the methods. While in both of the cases the standard deviation is significant, this means that the calculated values can be either positive or negative, which is the probable consequence of the sample selection. It can be useful therefore to verify the results with a one sample "t" test where the test value should be "0".

Method	Test Value = 0					
						nfidence f difference
			Sig. (2-	Mean	Lower	Upper
	Т	df	Sig. (2- tailed)	difference	Lower	opper
BAHR	-1,468	93	,145	-5,5878	-13,1442	1,9687
CAR	3,215	93	,002	19,4468	7,4369	31,4567

Tab 18. The results of the one sample t test statistics calculated for the BAHR and CAR returns

Source: own preparation upon the results of SPSS

We can conclude upon the results of the one sample "t" test, that the 3 years yield calculated with the BAHR method is not different from "0" as it can be seen in tab 18. This result, as it is showed in the tab 20., is consistent with Con et al's (2001) research result. In the case of CAR method the supposition that the calculated average is equal with "0" was not verified. Probably in this case the CAR should really be positive, against its relative big standard deviation.

Tab 19. Comparison of the research result with the previous studies dealing with the long run profitability of the CBM&A transaction

Authors	Sample	Method	Long-run
	and period		BAHR or CAR
Black et al.	361 deals	3-5 years BAHR adjusted upon size,	-13% 1 year
(2001)	1985-95	MTBV and previous performance	-43% 5 years
Conn et al.	1065 deals	1-2-3 years BAHR adjusted upon size	6% 1 year
(2001)	1984-2000	and previous performance	0% 3 years
Balogh	175 deals	3 years BAHR and CAR adjusted upon	3AHR 0% 3 years
(2005)	2000	size and previous performance	CAR 19,4% 3 years

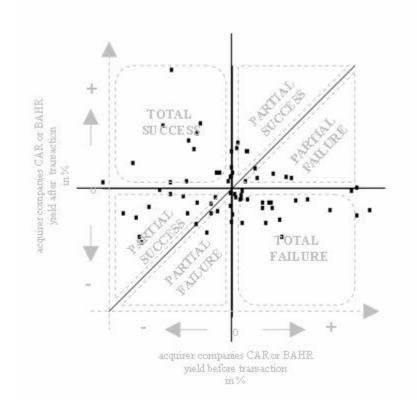
Source: Conn et al. [2001] 46. p. and own preparation (last line contains the results of the own analysis)

## 13.3 A-posterior grouping of transactions

From the a-posterior grouping of CBM&A transactions included in the sample I have used the returns calculated upon the BAHR method. The categorization of each transaction into the one of the total success, partial success, partial failure or total failure groups was made on the base of the method introduced previously in

the 9.5 chapter. The graphical results of the categorization can be seen on the following figure 18.

Figure 18. Graphical classification of the CBM&A transaction according the results



Source: own preparation upon the SPSS

Tab 20. Classification of the CBM&A transaction according the results

			Average BAHR %		
Result groups	Valid	%	before	after	
	Ν		transaction	transaction	
Total success	15	16	-79,8	42,62	
Partial success	20	21	-46,3	-0,45	
Partial failure	17	18	86,1	-4,08	
Total failure	42	45	189,0	-25,86	
Sum	94	100	77,47	-5,58	

Source: own preparation using SPSS

Mathematically interpreting the results from tab 20. we can state that we can speak about strictly speaking success only in the 16% of transactions. This result is very close to the general 20% success – 80% failure rate previously mentioned in the introduction, and almost equals with the 17% success and 83% failure rate of the KPMG [1998] CBM&A transaction success research (KPMG [1998]). In case we define the success only as a positive BAHR after a CBM&A transaction and leave the previous transaction return out of consideration, the success and failure rate will be somewhere between the 36% and 64% level, which is still a weak iteration of a coin toss probability rate, referring to a transaction successful rate mentioned by Kleinert and Klodt [2002] (Kleinert - Klodt [2002]). The average transaction should be classified into the category on the border of the partial failure and total failure if such category would exist. Tab 21. contains the results of a one sample "t" test prepared on the average on transactions classified into the each groups.

Result group		Test value = 0					
	BAHR	t	Df	Sig. (2- tailed)	Mean difference		nfidence difference Upper
Total success	before transaction	-3,300	14	,005	-79,8213	-131,6987	-27,9439
	after transaction	3,934	14	,001	42,6167	19,3803	65,8530
Partial success	before transaction	-3,787	19	,001	-46,2830	-71,8647	-20,7013
	after transaction	-,052	19	,959	-,4510	-18,6334	17,7314
Partial failure	before transaction	2,350	16	,032	86,1262	8,4309	163,8215
	after transaction	-,682	16	,505	-4,0824	-16,7790	8,6143
Total failure	before transaction	6,463	41	,000	189,0785	129,9948	248,1621
	after transaction	-10,316	41	,000	-25,8590	-30,9213	-20,7968
Sample average	before transaction	4,036	93	,000	77,4730	39,3570	115,5890
	after transaction	-1,468	93	,145	-5,5878	-13,1442	1,9687

Tab 21. Results of the one sample "t" test calculated on the classification results of CBM&A transactions involved in the sample

Source: own preparation upon the SPSS results

The new model parts will be prepared along the model building phase based on the literature survey and after the frequent repetition of the model estimation, verification and rebuilding phase there will be an opportunity to select the most suitable models according to the model selection criterion.

# 13.4 Data reduction

I have used with the exception of 8 cases from the 21 base variable 4-6 years' data of the traditional approach (2-2 or 3-3 data before and after transaction year). This means 84 data per transaction. From the organizational approach I have used with the exception of 9 cases from the 15 base variable 2 years' data after the transaction period. This means 39 data per transaction. Both in the case of traditional and organizational approaches some variables were used equally for acquiring and target companies and their countries. More variables came as a result of different data reduction processes (e.g. financial ratios – index calculation, transnationality index – factor analyses). Despite of this, considering that this big amount of data should be handled as simple as it is possible, it was suitable to decrease the number of data further in such a way, that the underlying information content be damaged on the lowest level. I solved this problem with the help of simple mathematical-statistical and multi variable data analysis procedures.

There was a significant data reduction in the dimensions of culture and politicaleconomical direction. In both cases the number of base variables was favorably decreased with the help of factor analyses. In the culture dimension from the 4-4 culture indexes of the acquirer and target company's countries in the first phase 1-1 factors with 70% information content preservation were made and in the next stage I created the culture difference artificial variable with a simple subtraction of them. With a similar procedure in the case of political-economical direction from the 6-6 indexes of the acquirer and target company's countries 1-1 factors with 78% information content preservation were made and then an artificial politicaleconomical direction difference variable with a simple subtraction. Detailed results of the factor analysis can be find in appendixes 1. and 2.

# 13.5 Effects analysis

In the case of effects analyses I tried to demonstrate the effects of independent variables on the dependent variable. I supposed that the independent variables can have effects on the results of transactions (after transaction return) only in the case they have different values in successful or failure transactions. Analyses were made for the two previously classified groups for the total success and total failure. The partial correlation indexes were also determined between the independent variables and dependent variable, the prepared correlation matrix due to its size can not be presented in the appendix, only in electronic form on the attached compact disc. It is true, that we can deduce upon the correlation index from the formation of the independent variable to the formation of dependent variable, but we can not deduce the cause and effect connection between the independent and dependent variables.

From the values of the correlation indexes it can be concluded that there are various levels of stochastic connections between the independent and dependent variables. There were no signs for deterministic relationships or lack of relationships in either case. The analyses were completed both for the variables of the traditional approach and for variables of the organizational approach. In both cases variables where significant differences were detected between the averages of the total success and total failure groups were selected and separated. Compared to the starting situation, as a result there remained 7 data out of 39 data of the organizational approach and 18 data out of 85 data of the traditional approach. The effects of these artificial compressed variables are the most significant ones on the dependent variable therefore these variables will serve as inputs of the later analyses.

# **13.6 A-prior grouping of transactions**

In the case of an a-prior grouping of transactions I supposed that it was possible to forecast a result of a given transaction with the help of independent variables selected earlier in the stage of effects analyses. With the help of discriminant functions I have tried to classify transactions into one of the total success, partial success, partial failure or total failure groups. Artificial variables created from the profitability ratios directly determining and measuring the performance were not used in the analyses. These variables should unambiguously refer to the result of transactions. Therefore the predictability of the model could not be used.

Analyses were completed for the variables of traditional and organizational approaches separately and even for a common combined independent variable group. Detailed results of the analyses can be found in app. 3., 4. and 5.

Data relevant to the classification correctness of each model can be seen in tab 22.

Tab 22. Comparison of the models according to their classification correctness

Classification	Model type			
correctness	Organizational	Traditional	Combined	
in %	42,2	90,9	96,9	

Source: own preparation upon the SPSS results

As we can see in tab 22. the combined model integrating traditional and organizational approaches has the highest value of classification correctness.

# **13.7 Yield forecasting**

Linear regression models. For forecasting the CBM&A post-transaction yield I have used linear regression models. Variables of effects analyses were integrated into the process. Three models were prepared. The first model tries to describe the relationship between the variables of the organizational approach and the post transaction BAHR return. The second model is based on the variables of the traditional approach, while the third model uses both the variables of the

traditional and organizational approaches. Detailed results of the analysis can be find in app. 6., 7. and 8. Tab 23. contains the evaluation of previously mentioned models according to the model selection criteria. We can see that according to 5 criteria from the 8 cases the combined model was the best. The organizational model in 2 cases, while the traditional model only in 1 case proved to beat the others.

Tab 23. Comparison of the regression models according to the model selection criteria

N.	Criterion	Model type					
		Organizational	Traditional	Combined			
1	SGMASQ	963,71	653,15	610,12			
2	AIC	1191,68	870,03	580,96			
3	FPE	1204,65	1040,97	1105,85			
4	GCV	1284,96	1607,77	3254			
5	HQ	1345,58	1160,96	862,16			
6	SCHWARZ	1719,09	2077,27	1911,41			
7	SHIBATA	1084,18	580,44	300,29			
8	$R^2$	0,29	0,52	0,55			

Source: own preparation upon the GRETL results

# **14. HYPOTHESES TESTING**

Testing of hypotheses described in chapter 11. will be carried out upon the test results of the selected model. According to this procedure some hypotheses will be accepted or rejected. Based on the literature my research brought up the following hypotheses:

*H1:* Both variables of the traditional and the organizational approach have effect on the results of mega CBM&A transactions.

The validity of the H1 hypotheses can statistically be tested best with the "t" statistics of the regression coefficients of variables preferred by each approach.

Let: Hj - variable of the traditional approach j = 1,2,3...84SZi - variable of the organizational approach i = 1,2,3...39 $\beta_{Hj}$  - regression coefficient of the j<sup>th</sup> variable of the traditional approach  $\beta_{SZi}$  - regression coefficient of the i<sup>th</sup> variable of the organizational approach

H<sub>0</sub>: all  $\beta_{H_i} = 0$  or all  $\beta_{SZ_i} = 0$ 

 $H_A : \qquad \text{ at least one } \beta_{Hj} \neq 0 \quad \text{and at least one } \beta_{SZi} \neq 0$ 

From the results of the analyses carried out in chapter 13.7 we can conclude that both variables of the traditional and the organizational approach have effect on the results of mega CBM&A transactions. The  $H_0$  hypothesis therefore should be rejected, because there can several variables be found from the traditional approach and several variables from the organizational approach group which I selected and for which the value of the regression coefficient differs from "0". The H1 hypothesis therefore should be accepted. H2: There is a possibility to create an integrated model which is based on both traditional and organizational approaches on M&A transaction.

Statistically we can not test H2 hypothesis because there is no test statistics for it. Therefore in the process of rejection or acceptance of this hypothesis we can rely only on the results of our analyses. On this base the investigation of the H2 hypothesis should proceed on to the following logical sequence of ideas.

Let: 
$$D_{j} = d_{j0} + \sum_{i=1}^{18} d_{jHi}x_{Hi} + \sum_{k=1}^{7} d_{jSZk}x_{jSZk} - j^{th} \text{ discriminant function}$$
$$j = 1,2,3$$
$$x_{Hi} - i^{th} \text{ independent variables of the traditional approach}$$
$$i = 1,2...18$$
$$x_{SZk} - k^{th} \text{ independent variables of the organizational approach}$$
$$k = 1,2...7$$
$$d_{j0} \text{ - constant of the } j^{th} \text{ discriminant function}$$
$$d_{jHi} - x_{Hi}\text{ 's coefficient of the } j^{th} \text{ discriminant function}$$

The H2 hypothesis

should be rejected if: every  $d_{iHi} = 0$  or every  $d_{iSZk} = 0$ 

should be accepted if: at least one  $d_{iHi} \neq 0$  and at least one  $d_{iSZk} \neq 0$ 

According to the results of the analyses made in the 13.6 chapter it can be concluded that in the model integrating both the traditional and organizational approaches the value of coefficients of the three discriminant functions differ from "0". Particular values of each coefficient are included in app. 5. Upon this result the H2 hypothesis is confirmed, therefore it should be accepted.

H3: Results calculated with model based on both traditional and organizational approaches are more precise than results from models based on only one of the approaches.

The correctness of the H3 hypothesis can be tested on the base on the results of classification exactness of the discriminant models. As test statistics in this case can not be prepared, either we can not speak about statistical testing of the hypothesis. The examination of the H3 hypothesis can be realized repeatedly upon the following logical sequence of ideas.

Let:  $X_K=96,9\%$   $X_H=90,9\%$   $X_{Sz}=42,2\%$  be the values of classification correctness of models.

The H3 hypothesis

should be rejected if:	$X_K > X_H$	and	$X_K > X_{Sz}$
should be accepted if:	$X_K < X_H$	and	$X_K < X_{Sz}$

On the base of the results of analyses prepared in the 13.6 chapter we can conclude, that with the help of the combined model (model integrating both the traditional and organizational approaches) can reach more precise results than in the case of models based only on one theoretical approach.

$$X_{K}=96,9\% > X_{H}=90,9\%$$
 and  $X_{K}=96,9\% > X_{Sz}=42,2\%$ 

The H3 hypothesis is true therefore it should be accepted.

*H4: The combined model can be used for forecasting with results within acceptable error limits.* 

The examination of H4 hypothesis can be realized upon the value of adjusted coefficient of determination of the combined regression model. They used to call this ratio the explanatory power of the regression models. Because of lack of test statistics statistical testing of H4 hypothesis can not be realized, therefore the correctness of our premise can be examined only upon the following logical sequence of ideas.

Let:  $\bar{R}^2$  - explanatory power of the combined regression model

The H4 hypothesis

should be rejected if:  $\bar{R}^2 < 0.5$ 

should be accepted if:  $\bar{R}^2 \ge 0.5$ 

The explanatory power of our combined regression model according to the results of analyses realized in chapter 13.7 equals with 0,551. This value is 0,551>0,5 it means that the H4 hypothesis should be accepted.

# **15. MODEL TRANSFORMING**

As it can be seen in tab 23. combined model has the best parameters of the traditional, organizational and combined models. The value of the determining coefficient corrected by the measure of fitting of this model was the highest. The regression analysis computes data not only for the whole model but enables us to test the statistics significance level of all variable. Complete results of the analysis can be found in app. 9. On the base of these results we can find out which independent variables are those, that when left out the goodness of fit of our model can be increased thus enabling the improvement of the model. These are the so called insignificant variables, the explanatory power of which is very low or equals with "0". Therefore those variables whose T statistics value is lower than the 2 Prob (t>T) should be left out. To be on the safe side and taking Ramanathan's advice I only leave out one variable at a time from the model and that is always the variable with the highest "p" value suggested by the program (Ramanathan [2003]).

Upon this criterion from the 25 variables we should leave out the DTNI variable in the first round. The result is promising, since the value of goodness of fit of our model increased from 0,551 to 0,615. The last line of the new result calls our attention for a new variable, the probable omission of which could improve the goodness of fit of our model. Accepting these warnings in the future rounds – leaving out the problematic variables from the model one by one – we will in a 7<sup>th</sup> round on 18 variables get a regression model, the goodness of which fits indeed, because the value of adjusted  $R^2$  increased to a 0,774. The warning that appeared in the last case, according which there still exists a variable in the model with a high "p" value, does not help us to a better model, because due to its omission the goodness of fit of our model significantly decreases, as showed in app. 11.

As a final version therefore remains for us the model of 18 variables, the complete result of which can be found in app. 10. If we compare this final model with the starting model and with the first version of the adjusted model upon the model selection criteria we can conclude from the tab 24. that we accomplished really the best model.

N.	Criterion	Model type					
		Starting model	1 adjusted model	Final model			
1	SGMASQ	610,12	523,08	306,98			
2	AIC	580,96	545,89	408,91			
3	FPE	1105,85	931,74	489,25			
4	GCV	3254	2391,24	755,65			
5	HQ	862,16	797,90	545,65			
6	SCHWARZ	1911,41	1715,61	976,31			
7	SHIBATA	300,29	293,21	272,80			
8	$R^2$	0,55	0,61	77,4			
9	Variables numb.	25	24	18			

Tab 24. Comparison of the adjusted and starting models upon the model selection criterions

Source: own calculation upon GRETL results

Our final model proved to better in 9 cases out of 9 criteria compared to other models.

# **16. INTERPRETATION OF THE RESEARCH RESULTS**

The interpretation of the research results and the drawing of conclusions enable us to compare them with the results of earlier researches and studies, therefore this is the most important part of the thesis.

The yield computations with the CAR and BAHR methods resulted in a significant difference. The reason can be in the different sensitivity of procedures. The CAR procedure supposes, that the given share is bought every day at the opening and is sold at the end of the day, which can be imaginable theoretically, but practical by it is senseless and is out of question. The transaction costs due to repeated buying and selling would consume the exchange profit mainly in the long run. Contrary to this the BAHR procedure which is closer to the practice calculates only with the starting and ending exchange rates of the examined period which is simpler even from the calculation point of view. Therefore it is practical to accept the Fama's (Fama [1998]) and Lyon et al's (Lyon et al [1999]) recommendations, who suggested the BAHR procedure for the long term analysis after a CBM&A transaction. Long term return of acquirer companies involved in the sample is in harmony with the results of Conn et al's researches (Conn et al. [2001]) and is contrary to the results of Black et al's researches (Black et al. [2001]) as it can be seen in tab 19. The reason for this can be found in the difference of the event windows of the researches. The present research analyses transactions realized in the year 2000, which period is a part of the 1984-2000 period analyzed by the Conn et al's (Conn et al. [2001]) research which shows consistent results. Contrary to this the Black et al's (Black et al. [2001]) research representing different results analyzed transactions in the period 1985-1995.

As it can be seen in tab 20. we can conclude from the results of the CBM&A transaction classification calculated in this research, that when speaking strictly about success it can be true only in the case of 16% of the transactions. This result is very close to the 20% success and 80% failure ratio mentioned in the introduction and almost coincides wit the 19% success and 83% failure rate

reported in figure 12. by the KPMG (1998) research analyzing the success of CBM&A transactions. In my case if we define the success only as a positive BAHR after a CBM&A transaction the success and failure rate would be somewhere at 36% to 64% level, which is still a weak iteration of a coin toss probability rate referring to a transaction success rate mentioned by Kleinert and Klodt (Kleinert - Klodt [2002]).

With the help of a data reduction method I managed to decrease the number of starting variables (most of starting variables were created in advance with data reduction /e.g. financial ratios with index calculation, transnationality index with factor analyses/) in a such way that the underlying information content was least damaged. I solved this problem with the help of simple mathematic-statistical and multidimensional data analysis methods. This way I have created 31 derived variables from the starting group of variables analyzed by the traditional approach and 11 derived variables from the starting group of variables analyzed by the organizational approach.

Through effects analyses I tried to demonstrate the effects of independent variables on the dependent variable. Compared to the starting situation as a result there remained 7 variables from the variables of the organizational approach and 18 variables from the variables of the traditional approach. The effects of these artificially compressed variables made the most significant impact on the dependent variable, therefore these variables figured as inputs for the later analyses.

In the case of an a-prior grouping of transactions I supposed that it was possible to forecast a result of a given transaction with the help of independent variables selected earlier in the stage of effects analyses. With the help of discriminant functions I have tried to classify transactions into a group of the total success, partial success, partial failure and total failure. Analyses were completed for the variables of traditional and organizational approach separately and even for a common combined independent group of variables. As it is showen in tab 22. the

combined model with the 96,9% classification correctness value preceded the organizational model with 42,2% classification correctness value and the traditional model with 90,9% classification correctness value.

I have used linear regression models for forecasting the post CBM&A transaction results. Here I had also prepared 3 models. As it is presented in tab 23. from the 8 model selection criteria in 5 cases the combined model was the best. This model with 25 derived independent variables embodied 0,551 explanatory power related to the figuration of post transaction BAHR return of CBM&A transaction involved in the sample. In the phase of model transforming I had reached the final version of the model after 7 steps This final version with 18 derived independent variables embodied as much as 0,774 explanatory power related to the figuration of post transaction BAHR return of CBM&A transaction of post transaction BAHR return of the figuration as much as 0,774 explanatory power related to the figuration approach and 12 from the traditional approach. These were the following:

Derived variables of the organizational approach:

DISTANCE	- geological distance between the countries of acquirer and target companies.
DICE	- the difference in information and telecommunication expenditures paid by the acquirer and target
PEFACDIF	<ul> <li>company's countries.</li> <li>the qualitative difference in central political and economic governance between the acquirer's and target company's countries.</li> </ul>
CULTURDIF	- cultural difference between the acquirer and target company's countries.
LANGCOR	- similarity in the language of the acquirer and target company's countries.
MINSHARE	- minority share of the acquirer company's country living in the target company's country.

Derived variables of the traditional approach:

INDREL	- industrial relation between the acquirer and target companies.
DRISK	- country risk difference between the acquirer and target company's countries.
AINTNC	- average inventory turnover ratio of the new company after the transaction.
AIATNC	- average assets turnover ratio of the new company after the transaction.
ARETNC	- average receivable turnover ratio of the new company after the transaction.
ALE2NC	- average liability ratio of the new company after the transaction.
ALE3NC	- average short term debt ratio of the new company after the transaction.
ALE4NC	- average long term debt ratio of the new company after the transaction.
ALI1NC	- average liquidity quick ratio of the new company after the transaction.
ALI2NC	- average liquidity rate of the new company after the transaction.
ALI3NC	- average receivable ratio in the working assets of the new company after the transaction.
ALI4NC	- average inventory ratio in the working assets of the new company after the transaction.

There can be find 3 such independent variables (ALI1NC, ALI2NC, PEFACDIF) the "p" value of which is greater than 0,1. This means that these variables are not significant at the 10% significance level. But it is a generally accepted practice to keep an independent variable which is not significant, but theoretically fits into the model if the absolute value of its "t" statistics is at least 1 ore its "p" value is lower than 0,25 (Ramanathan [2003]). As it can be seen in app. 10. in the case of the above mentioned 3 independent variables this conditions are granted. The reason of keeping such type of independent variables in the model is to increase the explanatory power of the model.

During the interpretation of regression coefficients of the final model in the case of 5 independent variables (ALI2NC, ALI4NC, ARETNC, AIATNC, LANGCOR) from the 18 independent variables the results were quite in opposition to the expectations based on economical theories. The reason for this is the very close relationship between the variables from the model, while this problem is discussed in the multi-variable mathematical-statistical literature as multicollinearity (Ramanathan [2003]).

The multicollinearity, despite that it may cause problems in the interpretation of the regression coefficient of independent variables and in their foresigns, does not destroy the forecasting ability of the model but it can even improve it (Ramanathan [2003]). According to Ramanathan, if we are interested in the forecasting and not in the interpretation of the coefficients, then the multicollinearity does not mean a problem, it can be left out of the attention without leaving serious consequences (Ramanathan [2003]).

We can verify the existence of multicollinearity between the independent variables in the regression model with the high value of the correlation coefficient. In our case the mentioned variables are really in closer correlation with other variables, thus verifying our hypotheses referring to the existence of multicollinearity, as it can be seen in the correlation matrix in app. 12.

# **17. SUGGESTIONS**

# 17.1 Suggestions for companies planning a cross-border M&A transaction

In the highlight of the above results we can suggest the followings to Hungarian companies planning a CBM&A transaction in order that they could carry out a successful transaction for choosing the target company and for the after-transaction period.

In the phase of planning and selecting the target company they should take care both on the hard variables (variables easy to measure and express in money) preferred by the traditional approach and on the soft variables (variables difficult to measure and express in money) preferred by the organizational approach. Differences between the countries of the acquirer and target company can have significant effects on the post transaction performance. Cultural differences, differences in expenditures spent on information, and quality differences of central political-economical regulations between countries of the acquirer and target companies suggest a negative, performance decreasing relationship. On the other side the minority share of the acquirer company's country living in the target company's country suggest a positive, performance increasing relationship.

But it is recommended to keep the post transaction average long term debt ratio and the average receivable ratio in the working assets at as a low level as it is possible, because these ratios suggest a negative, performance decreasing relationship.

It is suggested to have the industrial correlation between the acquirer company and target company as close as it is possible. As significant is the difference between the country risk indexes of the acquirer and target companies as higher is the expectable return. It is aimful to increase the after transaction average liquidity quick ratio and average inventory turnover ratio of the combined new company. The increase of after transaction average liability ratio has no negative effect if it is manifested in the increase of the average short term debt ratio. The mentioned

ratios all suggest a positive, performance improving relationship.

The developed combined discriminant and combined final regression models offer the acquirer companies planning a transaction an opportunity to prepare forecasting on the probable result of a transaction with a supposed target company. The combined discriminant model makes forecasting on the classification of the planned transaction into one of the total success, partial success, partial failure and total failure groups, whereas the combined final regression model gives a forecasting on the supposed after transaction expected BAHR return decreased with the benchmark yield, of course from the acquirer company's point of view.

# 17.2 Limits of the research and their probable extension

Obtaining of the suitable sample and relevant data required to the completion of the analyses indicated the biggest problem in the course of the research. This problem could be theoretically eliminated, because there exist such databases, which contain all of the M&A transactions carried out till now. These databases are daily actualized and contain more than 60 data about a transaction and the participants. But these are commercial databases, strictly profit oriented and their fees are almost unpayable for the researchers. Building up of the developed model on such database probable can lead us to more precise results. The validity and generalizability of these results and the conclusions drawn be less limited.

Exploration of in the 22,6% unexplained part of formation of the dependent variable belonging to the combined final regression model requires further additional investigations and analyses. Because of lack of data it was not possible to integrate into the model, independent variables like the method of payment, previous experiences and the paid premium, which however according to the literature belong to the factors affecting the success of M&A transactions. By integrating these factors together with the so far applied explanatory variables the fitting of the model could presumably be improved significantly under the conditions that these new variables are really in close relationship with the dependent variable.

With the modification of the consistence of the sample we might as well to make the analyses longitudinal, which enables us to report the temporal changes. The correctness of estimation could be improved with increasing the sample volume. In spite of this the sampling error can not be eliminated, because one of its part is unavoidable and is inevitably concomitant of the method. In addition to this there are multi variable mathematical-statistical methods built consecutively in the developed model, in case of which the statistics error is due to the character of methods, therefore these are accumulating, their value steadily increasing, destroying with this the correctness of the estimations. This common error can not be ceased nor minimized.

It is required to be continue however the proceeding with the researches in the given theme is inevitable in order to specify the effects of already detected factors on the success of cross-border mergers and acquisitions and to enlight the effects of new, so far not analyzed factors offering a more effective help for corporate decision makers involved in a such transactions.

# **18. APPENDIX**

# Appendix 1. Results of the culture dimension factor analysis

## Factor Analysis I.

## KMO and Bartlett's Test

Kaiser-Meyer-Olkin Adequacy.	,670	
Bartlett's Test of	Approx. Chi-Square	309,210
Sphericity	df	28
	Sig.	,000

## Communalities<sup>a</sup>

	Initial	Extraction
ACPDI	,585	,709
ACII	,438	,497
ACUAI	,613	,788
ACMI	6,341E-02	1,849E-02
TCPDI	,684	,738
TCII	,695	,767
TCUAI	,755	,882
TCMI	,255	,794

Extraction Method: Maximum Likelihood.

a. One or more communalitiy estimates greater than

1.0 were encountered during iterations. The resulting solution should be interpreted with caution.

Total Variance Explained

	Initial Eigenvalues		Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings			
Factor	Total	% of Variance	Cumulativ e %	Total	% of Variance	Cumulativ e %	Total	% of Variance	Cumulativ e %
1	2,764	34,550	34,550	2,448	30,594	30,594	2,326	29,069	29,069
2	2,078	25,980	60,530	1,868	23,355	53,949	1,966	24,572	53,642
3	1,108	13,853	74,383	,878,	10,979	64,928	,903	11,286	64,928
4	,977	12,209	86,592						
5	,435	5,442	92,034						
6	,250	3,125	95,159						
7	,227	2,832	97,991						
8	,161	2,009	100,000						

Extraction Method: Maximum Likelihood.

## Factor Matrix<sup>a</sup>

	Factor				
	1	2	3		
ACPDI	,253	,775	,213		
ACII	-,156	-,684	6,600E-02		
ACUAI	,265	,846	4,722E-02		
ACMI	-3,95E-04	-,127	4,876E-02		
TCPDI	,853	-8,71E-02	4,118E-02		
TCII	-,826	4,073E-02	,287		
TCUAI	,922	-,177	-2,77E-03		
TCMI	,163	-,168	,860		

Extraction Method: Maximum Likelihood.

a. Attempted to extract 3 factors. More than 25 iterations required. (Convergence=3,576E-03). Extraction was terminated.

## Rotated Factor Matrix

	Factor			
	1	2	3	
ACPDI	8,460E-02	,821	,166	
ACII	-4,59E-02	-,694	,113	
ACUAI	,109	,881	-2,78E-03	
ACMI	1,403E-02	-,121	6,063E-02	
TCPDI	,841	7,255E-02	,160	
TCII	-,854	-8,86E-02	,172	
TCUAI	,930	-6,41E-03	,134	
TCMI	6,284E-02	-7,06E-02	,886	

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 4 iterations.

#### **Factor Transformation Matrix**

Factor	1	2	3
1	,975	,181	,130
2	-,169	,981	-,099
3	-,145	,075	,987

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

## Factor Analysis II.

## KMO and Bartlett's Test

Kaiser-Meyer-Olkin I Adequacy.	,678	
Bartlett's Test of Sphericity	Approx. Chi-Square df	304,952 21
	Sig.	,000

## Communalities<sup>a</sup>

	Initial	Extraction
ACPDI	,580	,693
ACII	,438	,494
ACUAI	,613	,799
TCPDI	,681	,737
TCII	,682	,747
TCUAI	,752	,883
TCMI	,254	,999

Extraction Method: Maximum Likelihood.

One or more communality estimates greater than 1.0 were encountered during iterations. The resulting solution should be interpreted with caution.

**Total Variance Explained** 

	Initial Eigenvalues		Initial Eigenvalues Extraction Sums of Squared Loadings		Rotation Sums of Squared Loadings				
		% of	Cumulativ		% of	Cumulativ		% of	Cumulativ
Factor	Total	Variance	e %	Total	Variance	e %	Total	Variance	e %
1	2,760	39,428	39,428	1,115	15,923	15,923	2,308	32,972	32,972
2	2,059	29,417	68,845	2,421	34,582	50,506	1,959	27,982	60,954
3	1,091	15,580	84,425	1,816	25,936	76,442	1,084	15,488	76,442
4	,442	6,307	90,733						
5	,250	3,577	94,310						
6	,235	3,353	97,663						
7	,164	2,337	100,000						

Extraction Method: Maximum Likelihood.

#### Factor Matrix<sup>a</sup>

Γ		Factor					
		1	2	3			
Γ	ACPDI	9,474E-02	,254	,787			
	ACII	,153	-,199	-,657			
	ACUAI	-5,62E-02	,297	,841			
	TCPDI	,194	,831	-9,40E-02			
	TCII	,103	-,851	,107			
	TCUAI	,178	,902	-,193			
	тсмі	,999	-1,57E-03	5,103E-04			

Extraction Method: Maximum Likelihood.

a. 3 factors extracted. 19 iterations required.

Goodness-of-fit Test

Chi-Squa re	df	Sig.
1,879	3	,598

## Rotated Factor Matrix<sup>a</sup>

	Factor				
	1	2	3		
ACPDI	7,229E-02	,820	,121		
ACII	-3,17E-02	-,690	,130		
ACUAI	9,104E-02	,889	-2,93E-02		
TCPDI	,841	9,464E-02	,142		
TCII	-,844	-9,74E-02	,156		
TCUAI	,932	1,556E-02	,117		
ТСМІ	6,457E-02	-3,70E-02	,997		

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 4 iterations.

Factor Transformation Matrix

Factor	1	2	3
1	,066	-,037	,997
2	,971	,233	-,056
3	-,230	,972	,052

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

## Factor Analysis III.

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin M Adequacy.	Measure of Sampling	,713
Bartlett's Test of Sphericity	Approx. Chi-Square df Sig.	281,449 15 ,000

Communalities

	Initial	Extraction
ACPDI	,562	,649
ACII	,415	,470
ACUAI	,611	,824
TCPDI	,667	,723
TCII	,624	,669
TCUAI	,740	,899

Extraction Method: Maximum Likelihood.

**Total Variance Explained** 

	Init	tial Eigenvalu	es	Extracti	on Sums of S Loadings	Squared	Rotation Su	ms of Square	ed Loadings
Factor	Total	% of Variance	Cumulativ e %	Total	% of Variance	Cumulativ e %	Total	% of Variance	Cumulativ e %
F actor									
1	2,755	45,917	45,917	2,407	40,114	40,114	2,289	38,143	38,143
2	2,038	33,965	79,882	1,828	30,460	70,574	1,946	32,430	70,574
3	,471	7,844	87,726						
4	,322	5,365	93,091						
5	,246	4,093	97,184						
6	,169	2,816	100,000						

Extraction Method: Maximum Likelihood.

#### Factor Matrix<sup>a</sup>

	Factor			
	1	2		
ACPDI	,247	,767		
ACII	-,160	-,667		
ACUAI	,269	,867		
TCPDI	,846	-8,05E-02		
TCII	-,815	6,414E-02		
TCUAI	,931	-,180		

Extraction Method: Maximum Likelihood.

a. 2 factors extracted. 6 iterations required.

Goodness-of-fit Test

Chi-Squa		
re	df	Sig.
2,817	4	,589

## Rotated Factor Matrix

	Factor				
	1	2			
ACPDI	8,774E-02	,801			
ACII	-2,24E-02	-,685			
ACUAI	8,966E-02	,903			
TCPDI	,845	9,112E-02			
TCII	-,812	-,101			
TCUAI	,948	1,067E-02			

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

#### Factor Transformation Matrix

Factor	1	2
1	,980	,201
2	-,201	,980

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

# Appendix 2. Results of the political-economical dimension factor analysis

# Factor Analysis I.

## Communalities

	Initial	Extraction
AVAI00	,493	,501
APAI00	,760	,751
AGEI00	,163	2,833E-02
ARQI00	,651	,471
ARLI00	,833	,877
ACCI00	,871	,862
TVAI00	,850	,730
TPAI00	,934	,867
TGEI00	,972	,954
TRQI00	,908	,846
TRLI00	,962	,953
TCCI00	,930	,931

Extraction Method: Maximum Likelihood.

## Total Variance Explained

	Init	tial Eigenvalu	es	Extracti	on Sums of S Loadings	Squared	Rotation Su	ms of Square	ed Loadings
		% of	Cumulativ		% of	Cumulativ		% of	Cumulativ
Factor	Total	Variance	e %	Total	Variance	e %	Total	Variance	e %
1	5,619	46,826	46,826	5,421	45,178	45,178	5,276	43,969	43,969
2	3,551	29,588	76,413	3,351	27,926	73,104	3,496	29,136	73,104
3	,976	8,130	84,543						
4	,617	5,142	89,685						
5	,428	3,563	93,249						
6	,304	2,530	95,779						
7	,148	1,237	97,015						
8	,134	1,117	98,133						
9	9,860E-02	,822	98,954						
10	7,227E-02	,602	99,557						
11	3,568E-02	,297	99,854						
12	1,752E-02	,146	100,000						

Extraction Method: Maximum Likelihood.

#### Goodness-of-fit Test

Chi-Squa re	df	Sig.
185,503	43	,000

## Rotated Factor Matrix

	Fac	ctor
	1	2
AVAI00	9,617E-02	,702
APAI00	4,789E-02	,865
AGEI00	1,517E-02	,168
ARQI00	-2,19E-02	,686
ARLI00	,107	,930
ACCI00	6,711E-02	,926
TVAI00	,852	6,130E-02
TPAI00	,928	6,989E-02
TGEI00	,974	8,014E-02
TRQI00	,920	5,094E-03
TRLI00	,971	,106
TCCI00	,961	8,697E-02

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

### Factor Transformation Matrix

Factor	1	2
1	,990	,142
2	-,142	,990

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

## Factor Analysis II.

## Communalities

	Initial	Extraction
AVAI00	,483	,501
APAI00	,749	,746
ARQI00	,616	,477
ARLI00	,832	,872
ACCI00	,854	,870
TVAI00	,850	,775
TPAI00	,931	,909
TRQI00	,802	,788
TRLI00	,943	,948
TCCI00	,915	,926

Extraction Method: Maximum Likelihood.

## **Total Variance Explained**

	Init	tial Eigenvalu	Extraction Sums of Squared Loadings Rotation Sums of Squared Loading			Extraction Sums of Squared Loadings		ed Loadings	
		% of	Cumulativ		% of	Cumulativ		% of	Cumulativ
Factor	Total	Variance	e %	Total	Variance	e %	Total	Variance	e %
1	4,770	47,700	47,700	4,521	45,207	45,207	4,350	43,499	43,499
2	3,420	34,197	81,897	3,291	32,911	78,119	3,462	34,619	78,119
3	,617	6,173	88,070						
4	,430	4,300	92,371						
5	,264	2,642	95,012						
6	,148	1,481	96,493						
7	,140	1,396	97,889						
8	,106	1,061	98,950						
9	7,353E-02	,735	99,686						
10	3,145E-02	,314	100,000						

Extraction Method: Maximum Likelihood.

## Factor Matrix<sup>a</sup>

	Factor		
	1	2	
AVAI00	,224	,671	
APAI00	,208	,838	
ARQI00	9,542E-02	,684	
ARLI00	,275	,892	
ACCI00	,232	,903	
TVAI00	,874	-,102	
TPAI00	,947	-,106	
TRQI00	,875	-,151	
TRLI00	,971	-7,18E-02	
TCCI00	,958	-8,86E-02	

Extraction Method: Maximum Likelihood.

a. 2 factors extracted. 7 iterations required.

#### Goodness-of-fit Test

Chi-Squa		
re	df	Sig.
93,614	26	,000

### Rotated Factor Matrix<sup>a</sup>

	Factor		
	1	2	
AVAI00	9,934E-02	,701	
APAI00	5,366E-02	,862	
ARQI00	-2,97E-02	,690	
ARLI00	,109	,927	
ACCI00	6,474E-02	,930	
TVAI00	,878	5,747E-02	
TPAI00	,951	6,655E-02	
TRQI00	,888,	8,976E-03	
TRLI00	,968	,105	
TCCI00	.959	8,597E-02	

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

#### **Factor Transformation Matrix**

Factor	1	2
1	,984	,181
2	-,181	,984

Extraction Method: Maximum Likelihood. Rotation Method: Varimax with Kaiser Normalization.

## Appendix 3. Results of the discriminant model based on the traditional approach

### **Summary of Canonical Discriminant Functions**

#### Eigenvalues

		% of	Cumulativ	Canonical
Function	Eigenvalue	Variance	e %	Correlation
1	3,406 <sup>a</sup>	52,9	52,9	,879
2	1,929 <sup>a</sup>	30,0	82,9	,812
3	1,103 <sup>a</sup>	17,1	100,0	,724

a. First 3 canonical discriminant functions were used in the analysis.

Wilks' Lambda

	Wilks'	Chi-squar		
Test of Function(s)	Lambda	е	df	Sig.
1 through 3	,037	69,325	54	,078
2 through 3	,162	38,184	34	,285
3	,475	15,615	16	,480

#### Standardized Canonical Discriminant Function Coefficients

	Function				
	1	2	3		
DRISK	-,194	-,045	,377		
ACGDPD	-,801	,788	-,232		
TCGDPBTD	,161	,120	,082		
EXRBTRA	1,148	,423	-,745		
DICE	,442	,573	,842		
INDREL	-,779	-,534	,637		
ALI1NC	-2,022	1,831	-2,129		
ALI2NC	1,892	-1,853	1,505		
ALI3NC	-,565	1,138	-,593		
ALI4NC	,300	,335	,565		
ALE1NC	1,024	,176	-,498		
ALE2NC	1,044	,485	1,121		
ALE3NC	-,613	-,539	,343		
ALE4NC	-1,674	-,191	,835		
ARETNC	-1,331	,234	-1,744		
AINTNC	2,458	-,172	1,302		
AIATNC	1,062	-,615	,128		
AWCTNC	-,109	,599	-,780		

#### Structure Matrix

	Function				
	1	2	3		
ALI4NC	,330*	-,309	,207		
EXRBTRA	,268*	,246	-,203		
INDREL	-,263*	,003	-,006		
AIATNC	,242*	-,125	-,169		
AINTNC	-,195*	,165	-,036		
ALE1NC	,192*	-,027	-,176		
ALE2NC	,180*	,076	-,013		
AWCTNC	,133*	,061	-,022		
ALI3NC	-,145	,412*	,206		
ARETNC	,031	-,235*	-,082		
ALI2NC	,180	-,214*	,095		
ALE3NC	,132	,177*	,162		
DRISK	,089	-,095*	,038		
ALE4NC	-,002	,076*	-,051		
DICE	,090	,222	,418*		
ACGDPD	,047	,079	-,205*		
TCGDPBTD	-,059	-,032	,107*		
ALI1NC	,019	-,004	-,053*		

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions Variables ordered by absolute size of correlation within function.

\*- Largest absolute correlation between each variable and

any discriminant function

#### **Canonical Discriminant Function Coefficients**

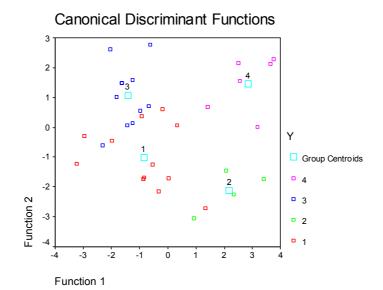
	Function				
	1	2	3		
DRISK	-,035	-,008	,069		
ACGDPD	-1,246	1,225	-,361		
TCGDPBTD	,216	,161	,110		
EXRBTRA	,049	,018	-,032		
DICE	,242	,314	,461		
INDREL	-,028	-,019	,023		
ALI1NC	-5,370	4,863	-5,653		
ALI2NC	3,718	-3,641	2,958		
ALI3NC	-3,512	7,076	-3,690		
ALI4NC	3,006	3,360	5,671		
ALE1NC	4,859	,835	-2,366		
ALE2NC	,100	,046	,107		
ALE3NC	-,934	-,821	,523		
ALE4NC	-,268	-,031	,134		
ARETNC	-,557	,098	-,730		
AINTNC	,092	-,006	,049		
AIATNC	,659	-,381	,079		
AWCTNC	-,005	,025	-,032		
(Constant)	-,354	-1,761	3,666		

Unstandardized coefficients

#### **Functions at Group Centroids**

	Function				
Y	1	2	3		
1,00	-,847	-1,012	-,937		
2,00	2,183	-2,122	1,706		
3,00	-1,424	1,076	,788		
4,00	2,851	1,467	-,706		

Unstandardized canonical discriminant functions evaluated at group means



			Pi	Predicted Group Membership				
		Y	1,00	2,00	3,00	4,00	Total	
Original	Count	1,00	10	1	1	0	12	
		2,00	0	4	0	0	4	
		3,00	1	0	10	0	11	
		4,00	0	0	0	6	6	
	%	1,00	83,3	8,3	8,3	,0	100,0	
		2,00	,0	100,0	,0	,0	100,0	
		3,00	9,1	,0	90,9	,0	100,0	
		4,00	,0	,0	,0	100,0	100,0	

a. 90,9% of original grouped cases correctly classified.

# Appendix 4. Results of the discriminant model based on the organizational approach

#### **Summary of Canonical Discriminant Functions**

#### Eigenvalues

Function	Eigenvalue	% of Variance	Cumulativ e %	Canonical Correlation
1	,162 <sup>a</sup>	50,6	50,6	,373
2	,107 <sup>a</sup>	33,6	84,2	,311
3	,051 <sup>a</sup>	15,8	100,0	,220

a. First 3 canonical discriminant functions were used in the analysis.

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-squar e	df	Siq.
1 through 3	,740	25,193	21	,239
2 through 3	,859	12,651	12	,395
3	,952	4,129	5	,531

#### Standardized Canonical Discriminant Function Coefficients

	Function				
	1	2	3		
DTNI	-,025	,036	,106		
LANGCOR	,940	1,483	-1,750		
MINSHARE	-,641	-,815	2,018		
DISTANCE	-,029	,305	,630		
DPEE	,486	,689	-,332		
CULTDIFF	1,048	-,403	-,181		
PEFACDIF	,302	,106	-,359		

#### Structure Matrix

	Function				
	1	2	3		
CULTDIFF	,843*	-,460	,222		
PEFACDIF	-,353*	,222	-,323		
DTNI	-,081*	,080,	-,065		
LANGCOR	,389	,610*	,192		
MINSHARE	,426	,539*	,381		
DPEE	,260	,399*	-,105		
DISTANCE	-,092	,158	,735*		

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions Variables ordered by absolute size of correlation within function.

\* Largest absolute correlation between each variable and

any discriminant function

		Function	
	1	2	3
DTNI	-,002	,003	,010
LANGCOR	2,030	3,204	-3,781
MINSHARE	-1,565	-1,988	4,926
DISTANCE	,000	,000	,000
DPEE	,083	,117	-,057
CULTDIFF	,823	-,317	-,142
PEFACDIF	,218	,076	-,258
(Constant)	-,209	-,805	-,881

**Canonical Discriminant Function Coefficients** 

Unstandardized coefficients

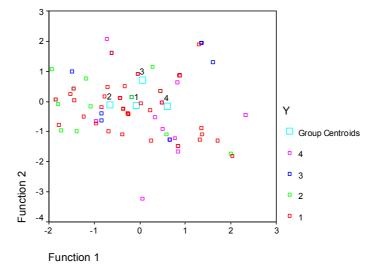
#### **Functions at Group Centroids**

1		Function				
	Y	1	2	3		
1	1,00	-7,13E-02	-,140	-,223		
	2,00	-,659	-,113	,317		
	3,00	5,068E-02	,715	-5,45E-05		
	4,00	,599	-,172	,208		

Unstandardized canonical discriminant

functions evaluated at group means

### **Canonical Discriminant Functions**



		Predicted Group Membership					
	Y	1,00	2,00	3,00	4,00		
Count	1,00	9	15	8	8		
	2,00	2	10	1	2		
	3,00	1	5	8	1		

2

37,5

66,7

33,3

10,0

7

20,0

6,7

53,3

35,0

0

22,5

13,3

6,7

0

Total

11

20,0

13,3

6,7

55,0

40

15

15

20

100,0

100,0

100,0

100,0

Classification Results<sup>a</sup>

a. 42,2% of original grouped cases correctly classified.

4,00

1,00

2,00

3,00

4,00

%

Original

### 113

# Appendix 5. Results of the discriminant model based on the integrated traditional and organizational approaches

Eigenvalues								
		% of	Cumulativ	Canonical				
Function	Eigenvalue	Variance	e %	Correlation				
1	6,817 <sup>a</sup>	49,6	49,6	,934				
2	5,310 <sup>a</sup>	38,6	88,2	,917				
3	1,617 <sup>a</sup>	11,8	100,0	,786				

### **Summary of Canonical Discriminant Functions**

a. First 3 canonical discriminant functions were used in the analysis.

Wilks' Lambda

	Wilks'	Chi-squar		
Test of Function(s)	Lambda	е	df	Sig.
1 through 3	,008	80,197	75	,320
2 through 3	,061	46,269	48	,544
3	,382	15,873	23	,861

#### Standardized Canonical Discriminant Function Coefficients

		Function	
	1	2	3
DRISK	1,389	,160	,342
ACGDPD	,057	-,960	,624
TCGDPBTD	-,333	,114	,159
EXRBTRA	-2,102	,833	-,170
DICE	-1,690	,281	,841
INDREL	2,050	,580	-,036
ALI1NC	-1,029	-4,454	-,261
ALI2NC	1,386	4,584	-,141
ALI3NC	-,427	-1,440	1,121
ALI4NC	-,260	1,129	-,008
ALE1NC	-1,231	,437	-,664
ALE2NC	2,209	1,673	-,024
ALE3NC	1,483	-,245	,122
ALE4NC	3,716	-2,305	1,082
ARETNC	,292	-2,533	,130
AINTNC	-,213	5,714	-,957
AIATNC	-1,059	1,503	-,304
AWCTNC	,706	-1,414	,629
DTNI	-,282	,697	,270
LANGCOR	-,708	-3,335	,542
MINSHARE	2,233	3,437	-,818
DISTANCE	1,102	-,406	,238
DPEE	1,374	-1,079	,721
CULTDIFF	-2,842	-1,311	,221
PEFACDIF	-,436	-1,215	,067

Structure Matrix

		Function	
	1	2	3
EXRBTRA	-,238*	,046	,068
CULTDIFF	-,179*	-,011	-,041
ALE2NC	-,110*	,085	,062
ACGDPD	-,087*	-,040	-,076
AWCTNC	-,085*	,059	,046
TCGDPBTD	,060*	-,005	,033
LANGCOR	,059*	-,025	-,018
DPEE	-,055*	-,028	,046
ALI1NC	-,023*	,009	,001
ALI4NC	-,030	,362*	-,055
DTNI	,148	,226*	,150
DISTANCE	,152	,217*	,151
ALI2NC	-,008	,205*	-,063
AINTNC	,040	-,179*	,075
AIATNC	-,128	,170*	-,138
INDREL	,121	-,160*	-,008
DRISK	-,007	,089*	-,047
ALE4NC	-,031	-,035*	,020
ALI3NC	-,006	-,163	,447*
DICE	-,014	,072	,396*
ALE3NC	-,082	,069	,269*
ARETNC	,035	,068	-,234*
ALE1NC	-,119	,083	-,149*
PEFACDIF	,048	-,013	-,052*
MINSHARE	,000	,003	-,023*

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions Variables ordered by absolute size of correlation within function.

\* Largest absolute correlation between each variable and any discriminant function

		Function	
	1	2	3
DRISK	,249	,029	,061
ACGDPD	,087	-1,473	,957
TCGDPBTD	-,438	,150	,210
EXRBTRA	-,088	,035	-,007
DICE	-,912	,152	,454
INDREL	,073	,021	-,001
ALI1NC	-2,743	-11,876	-,695
ALI2NC	2,764	9,145	-,281
ALI3NC	-2,626	-8,851	6,891
ALI4NC	-2,720	11,822	-,083
ALE1NC	-5,810	2,065	-3,134
ALE2NC	,208	,158	-,002
ALE3NC	2,275	-,376	,186
ALE4NC	,585	-,363	,170
ARETNC	,120	-1,044	,053
AINTNC	-,008	,214	-,036
AIATNC	-,692	,983	-,199
AWCTNC	,029	-,058	,026
DTNI	-,037	,092	,036
LANGCOR	-1,343	-6,325	1,027
MINSHARE	4,558	7,015	-1,669
DISTANCE	,000	,000	,000
DPEE	,208	-,164	,109
CULTDIFF	-2,323	-1,072	,180
PEFACDIF	-,265	-,736	,041
(Constant)	-4,548	-3,348	,462

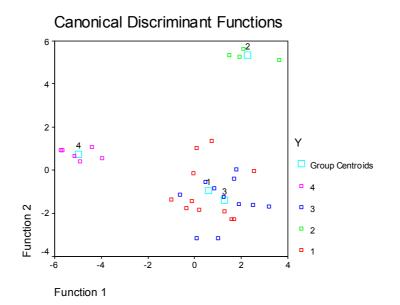
#### **Canonical Discriminant Function Coefficients**

Unstandardized coefficients

#### **Functions at Group Centroids**

		Function			
Y		1	2	3	
1,00	C	,599	-,960	-1,528	
2,00	D	2,281	5,332	,118	
3,00	C	1,281	-1,394	1,312	
4,00	D	-4,967	,761	,318	

Unstandardized canonical discriminant functions evaluated at group means



	Classification Results <sup>a</sup>								
			Pi	redicted Grou	p Membershi	р			
		Y	1,00	2,00	3,00	4,00	Total		
Original	Count	1,00	11	0	0	0	11		
		2,00	0	4	0	0	4		
		3,00	1	0	10	0	11		
		4,00	0	0	0	6	6		
	%	1,00	100,0	,0	,0	,0	100,0		
		2,00	,0	100,0	,0	,0	100,0		
		3,00	9,1	,0	90,9	,0	100,0		
		4,00	,0	,0	,0	100,0	100,0		

a. 96,9% of original grouped cases correctly classified.

## Appendix 6. Result of the regression model based on the organizational approach

VARIABLE	COEFFICIE	TN	STDERROR	T S	TAT 2P	rob(t >  1	])
0) const 24) DTNI 25) LANGCOR 26) MINSHARE 27) DISTANCE 28) DPEE	-5.09 2.33 73.77 -101.78 0.00 3.62	86 59 35 33	11.8052 0.8226 36.8847 46.6319 0.0018 1.6084	2. -2. 1.	843 000	0.669840 0.008987 0.056920 0.039074 0.082234 0.033440	*
29) CULTDIFF 30) PEFACDIF	21.81 13.98		9.2389 7.4611		361 875	0.026696 0.073032	* *
Mean of dep. var Error Sum of Sq Unadjusted R-sq F-statistic (7, Durbin-Watson st	(ESS) 2312 uared 24) :	-2.358 9.2245 0.451 2.8111 1.927	S.D. of d Std Err o Adjusted I p-value f First-ord	f Resid. R-squared or F()	(sgmahat)	0.2 0.0274	138 290 192
MODEL SELECTION	STATISTICS						
SGMASQ HQ GCV	1345.58 S	IC CHWARZ ICE	17	91.68 19.09 45.58	FPE SHIBATA		)4.65 34.18

MODEL 1: OLS estimates using the 32 observations 1-32 Dependent variable: ATBAHR

## Appendix 7. Result of the regression model based on the traditional approach

	VARIABLE	COEFFICIEN	JΤ	STDERROR	T ST	TAT 2P:	rob(t >  '	r )
0)	const	-46.694	10	86.4713	-0.5	540	0.598330	
6)	DRISK	1.682	27	1.3309	1.2	264	0.228309	
7)	ACGDPD	-3.458	36	15.9741	-0.2	217	0.831948	
8)	TCGDPBTD	-0.378	34	10.0726	-0.0	)38	0.970604	
9)	EXRBTRA	-0.10	78	0.3671	-0.2	294	0.773546	
10)	DICE	-2.550	)9	4.1749	-0.6	511	0.551726	
11)	INDREL	0.440	)4	0.2334	1.8	386	0.081773	*
12)	ALI1NC	33.300	)1	56.0351	0.5	594	0.562530	
13)	ALI2NC	-40.180	00	43.0488	-0.9	933	0.367647	
14)	ALI3NC	-176.62	79	89.2519	-1.9	979	0.069400	*
15)	ALI4NC	711.100	)8	150.8057	4.7	715	0.000404	***
16)	ALE1NC	-11.549	96	50.5873	-0.2	228	0.822957	
17)	ALE2NC	2.460	)4	2.3975	1.0		0.323497	
18)	ALE3NC	29.74	73	22.1662	1.3	342	0.202561	
19)	ALE4NC	-4.56	76	2.9991	-1.5	523	0.151708	
20)	ARETNC	-16.104	12	10.2119	-1.5	577	0.138808	
21)	AINTNC	3.61	70	1.0317	3.5	506	0.003871	***
22)	AIATNC	-2.842	25	5.6913	-0.4	199	0.625808	
23)	AWCTNC	-0.375	53	0.4768	-0.7	787	0.445413	
Mean (	of dep. va	r	-2.358	S.D. of d	lep. variał	ole	36.	849
	Sum of Sq		L.0115		of Resid.	(sgmahat)	25.5	
Unadj	usted R-sq		0.798	2	R-squared			519
F-sta	tistic (18	, 13) 2	.85809	p-value for F()			0.029	582
Durbi	n-Watson s	tat.	1.929	First-ord	ler autocom	rr. coeff	0.	035
MODEL	SELECTION	STATISTICS						
SGMAS	Q	653.155 A	IC	8	70.03	FPE	10	40.97
HQ		1160.96 SC	CHWARZ	20	77.27	SHIBATA	5	80.44
GCV		1607.77 R	ICE	unde	fined			

MODEL 2: OLS estimates using the 32 observations 1-32 Dependent variable: ATBAHR

Excluding the constant, p-value was highest for variable 8 (TCGDPBTD)

# Appendix 8. Result of the regression model based on the integrated traditional and organizational approach

MODEL 3: OLS estimates using the 32 observations 1-32 Dependent variable: ATBAHR

	VARIABLE	COEFFICIENT	STDERROR	T STAT	2Prob(t >  T )
0)	const	-147.2887	97.8813	-1.505	0.183087
6)	DRISK	1.8982	1.6550	1.147	0.295075
7)	ACGDPD	2.4712	17.4309	0.142	0.891903
8)	TCGDPBTD	3.5665	11.4515	0.311	0.766001
9)	EXRBTRA	0.1167	0.4376	0.267	0.798665
10)	DICE	-7.8505	6.1980	-1.267	0.252243
11)	INDREL	0.8505	0.3660	2.324	0.059139 *
12)	ALI1NC	56.3385	80.9440	0.696	0.512463
13)	ALI2NC	-36.8431	67.0134	-0.550	0.602314
14)	ALI3NC	-210.1105	109.9297	-1.911	0.104517
15)	ALI4NC	877.0198	246.8676	3.553	0.012034 **
16)	ALE1NC	3.4610	63.3590	0.055	0.958210
17)	ALE2NC	5.8226	3.1802	1.831	0.116847
18)	ALE3NC	13.8350	26.2569	0.527	0.617160
19)	ALE4NC	-6.7925	4.0633	-1.672	0.145624
20)	ARETNC	-20.9591	12.8832	-1.627	0.154892
21)	AINTNC	5.3129	1.7702	3.001	0.023968 **
22)	AIATNC	-7.3491	6.4493	-1.140	0.297929
23)	AWCTNC	-0.3539	0.8014	-0.442	0.674194
24)	DTNI	0.0515	1.3912	0.037	0.971646
25)	LANGCOR	-94.7351	66.1883	-1.431	0.202304
26)		122.5893	87.5932	1.400	0.211175
27)	DISTANCE	0.0022	0.0033	0.680	0.521594
28)	DPEE	-0.5615	2.3957	-0.234	0.822486
29)		-22.0418	18.6090	-1.184	0.281016
30)	PEFACDIF	-6.7487	10.6913	-0.631	0.551164
Mean	of dep. va	r2.35	3 S.D. of dep	. variable	36.849
Error	Sum of Sq	(ESS) 3660.7522	2 Std Err of	Resid. (sgmahat	t) 24.7007
Unadj	usted R-sq	uared 0.913	B Adjusted R-	squared	0.551
F-sta	tistic (25	, 6) 2.51963	8 p-value for	F()	0.126057
Durbi	n-Watson s	tat. 1.65	7 First-order	autocorr. coe	ff 0.148
MODEL	SELECTION	STATISTICS			
SGMAS	0	610.125 AIC	580.	964 FPE	1105.85
HQ	×	862.16 SCHWAR			
GCV		3254 RICE	undefi		5555,255
000			anacti		

Excluding the constant, p-value was highest for variable 24 (DTNI)

## Appendix 9. Result of the first version of the modified combined regression model

	VARIABLE	COEFFICI	ENT	STDERROR	T SI	'AT 2P	rob(t >  T )
0)	const	-148.1	672	87.9321	-1.6	85	0.135854
6)	DRISK	1.8	3939	1.5287	1.2	39	0.255293
7)	ACGDPD	2.5	5171	16.0989	0.1	56	0.880167
8)	TCGDPBTD	3.7	255	9.8309	0.3	79	0.715956
9)	EXRBTRA	0.1	205	0.3939	0.3	06	0.768565
10)	DICE	-7.9	9689	4.9175	-1.6	21	0.149152
11)	INDREL	0.8	3554	0.3157	2.7	09	0.030230 **
12)	ALI1NC	58.0	967	60.7186	0.9	57	0.370529
13)	ALI2NC	-38.4	132	48.0693	-0.7	99	0.450480
14)	ALI3NC	-210.8	3237	100.2142	-2.1	.04	0.073465 *
15)	ALI4NC	882.2	2604	187.3434	4.7	09	0.002185 ***
16)	ALE1NC	2.7	684	56.0542	0.0	49	0.961990
17)	ALE2NC	5.8	3498	2.8654	2.0		0.080535 *
18)	ALE3NC	13.8	3658	24.2998	0.5	71	0.586104
19)	ALE4NC	-6.7		3.7613	-1.8		0.113738
20)	ARETNC	-20.9	9495	11.9264	-1.7		0.122416
21)	AINTNC	5.3	8193	1.6312	3.2	61	0.013846 **
22)	AIATNC	-7.4		5.5220	-1.3		0.219846
23)	AWCTNC	-0.3	3419	0.6782	-0.5	04	0.629638
25)	LANGCOR	-95.6		56.8206	-1.6		0.136166
,	MINSHARE	123.9		73.8363	1.6		0.137151
27)	DISTANCE		023	0.0021	1.1		0.303680
28)	DPEE	-0.5		2.2073	-0.2		0.809475
29)		-22.4		14.5506	-1.5		0.167404
30)	PEFACDIF	-6.8	3222	9.7272	-0.7	01	0.505723
	of dep. va		-2.358		lep. variak		36.849
	Sum of Sq		561.5898		of Resid. (	sgmahat)	22.8710
-	usted R-sq		0.913		R-squared		0.615
	tistic (24		3.06128	p-value f	.,		0.065813
Durbi	n-Watson s	tat.	1.647	First-ord	ler autocor	r. coeff	0.153
MODEL	SELECTION	STATISTICS					
SGMAS	Q	523.084	AIC	5	545.89	FPE	931.744
HQ		797.903	SCHWARZ	17	15.61	SHIBATA	293.213
GCV		2391.24	RICE	unde	efined		

MODEL 2: OLS estimates using the 32 observations 1-32 Dependent variable: ATBAHR

Excluding the constant, p-value was highest for variable 16 (ALE1NC)

# Appendix 10. Result of the final version of the modified combined regression model

MODEL 8: OLS estimates using the 32 observations 1-32 Dependent variable: ATBAHR

	VARIABLE	COEFFIC	CIENT	STDERROR	T STA	T 2Pr	ob(t >	г )
0)	const	-145	.4001	42.8745	-3.39	1	0.004822	* * *
6)	DRISK	2	.3062	0.9253	2.49	2	0.026976	* *
10)	DICE	-10	.1539	2.9728	-3.41	6	0.004602	* * *
11)	INDREL	0	.7539	0.2013	3.74	6	0.002445	* * *
12)	ALI1NC	60	.9088	34.9220	1.74	4	0.104717	
13)	ALI2NC	-45	.6008	28.5372	-1.59	8	0.134068	
14)	ALI3NC	-182	.2778	42.3198	-4.30		0.000852	* * *
15)	ALI4NC		.8542	95.8075	8.40		0.00001	* * *
17)	ALE2NC	5	.2818	1.4291	3.69	6	0.002691	* * *
18)	ALE3NC	24	.6994	12.6966	1.94		0.073682	*
19)	ALE4NC	-5	.0757	1.1263	-4.50	6	0.000590	* * *
20)	ARETNC	-16	.9343	4.4214	-3.83		0.002085	* * *
21)	AINTNC		.6408	0.6765	6.86		0.000012	* * *
22)	AIATNC	-7	.8570	3.7419	-2.10		0.055842	*
25)	LANGCOR	-78	.8235	27.0399	-2.91		0.012054	* *
26)	MINSHARE		.3345	37.2964	3.01		0.010006	* *
27)	DISTANCE	0	.0026	0.0011	2.41	9	0.030960	* *
29)	CULTDIFF	-23	.5664	8.5293	-2.76	3	0.016133	* *
30)	PEFACDIF	-7	.3043	4.3726	-1.67	0	0.118716	
Mean	of dep. va	r.	-2.358	S.D. of d	dep. variabl	e	36.8	349
Error	Sum of Sq	(ESS)	3990.7879	Std Err d	of Resid. (s	gmahat)	17.52	209
Unadj	usted R-sq	uared	0.905	Adjusted	R-squared		0.7	774
F-sta	tistic (18	, 13)	6.89544	p-value i	for F()		0.0005	502
Durbi	n-Watson s	tat.	1.801	First-ord	der autocorr	. coeff	0.0	084
MODEL	SELECTION	STATISTICS						
SGMAS	Q	306.984	AIC	40	08.915 F	PE	489	9.255
HQ		545.652	SCHWARZ	97	76.318 S	HIBATA	272	2.808
GCV		755.652	RICE	unde	efined			

Excluding the constant, p-value was highest for variable 13 (ALI2NC)

## Appendix 11. Result of the 8. version of the modified combined regression model

	VARIABLE	COEFFICIENT	STDE	RROR 1	r stat 2 f	prob(t >	ר )
0)	const	-162.9904	43.	6757 -	-3.732	0.002232	* * *
6)	DRISK	2.5525	0.	9617	2.654	0.018871	* *
10)	DICE	-10.9793	3.	0857 -	-3.558	0.003150	* * *
11)	INDREL	0.8227	0.1	2072	3.970	0.001395	* * *
12)	ALI1NC	10.3639	15.	5986	0.664	0.517219	
14)	ALI3NC	-169.5637	43.	8105 -	-3.870	0.001698	* * *
15)	ALI4NC	723.9335	85.	7237	8.445	0.000001	* * *
17)	ALE2NC	5.7903	1.	4685	3.943	0.001472	* * *
18)	ALE3NC	25.3446	13.	3756	1.895	0.078956	*
19)	ALE4NC	-4.4726	1.	- 1185	-3.999	0.001319	* * *
20)	ARETNC	-17.2152	4.	6565 -	-3.697	0.002392	* * *
21)	AINTNC	4.8386	0.	7011	6.902	0.000007	* * *
22)	AIATNC	-6.4957	3.	8405 -	-1.691	0.112896	
25)	LANGCOR	-88.2524	27.	8137 -	-3.173	0.006775	* * *
26)	MINSHARE	125.7831	38.	2972	3.284	0.005428	* * *
27)	DISTANCE	0.0021		0011	1.923	0.075089	
29)	CULTDIFF	-28.0604	8.	4873 -	-3.306	0.005198	* * *
30)	PEFACDIF	-8.8647	4.	4925 -	-1.973	0.068546	*
Mean o	of dep. va	r2	.358 S.D.	of dep. vai	riable	36.8	349
Error	Sum of Sq	(ESS) 4774.	6449 Std 3	Err of Resid	d. (sgmahat)	18.40	574
Unadju	isted R-sq	uared 0	.887 Adju	sted R-squar	red	0.7	749
F-stat	tistic (17	, 14) 6.4	3665 p-va	lue for F()		0.000	525
Durbir	n-Watson s	tat. 1	.762 Firs	t-order auto	ocorr. coeff	0.0	)96
MODEL	SELECTION	STATISTICS					
SGMAS	2	341.046 AIC		459.592	FPE	532	2.884
HQ		604.033 SCH	WARZ	1048.19	SHIBATA	317	7.066
GCV		779.534 RIC	Έ	undefined			

MODEL 9: OLS estimates using the 32 observations 1-32 Dependent variable: ATBAHR

Excluding the constant, p-value was highest for variable 12 (ALI1NC)

Appendix 12. Correlation matrix of the independent variables with opposite foresign coefficient

				Corre	lations					
		ALI2NC	ALI4NC	ARETNC	AIATNC	LANGCOR	AINTNC	MINSHAR E	ALI1NC	ALI3NC
ALI2NC	Pearson Correlation	1,000	,657**	-,333	,474**	,236	-,628**	,250	,796**	-,07
	Sig. (2-tailed)	,	,000	,062	,006	,193	,000	,167	,000	,69
	Ν	32	32	32	32	32	32	32	32	33
ALI4NC	Pearson Correlation	,657**	1,000	,164	,392*	,217	-,739**	,253	,194	-,24
	Sig. (2-tailed)	,000	,	,370	,026	,233	,000	,162	,289	,180
	Ν	32	32	32	32	32	32	32	32	32
ARETNC	Pearson Correlation	-,333	,164	1,000	-,246	-,098	-,053	-,095	-,631**	-,63
	Sig. (2-tailed)	,062	,370	,	,174	,592	,774	,605	,000	,00
	Ν	32	32	32	32	32	32	32	32	33
AIATNC	Pearson Correlation	,474**	,392*	-,246	1,000	-,212	-,505**	-,123	,509**	-,13
	Sig. (2-tailed)	,006	,026	,174	,	,244	,003	,504	,003	,45
	Ν	32	32	32	32	32	32	32	32	32
LANGCOR	Pearson Correlation	,236	,217	-,098	-,212	1,000	-,114	,885**	,067	,219
	Sig. (2-tailed)	,193	,233	,592	,244	,	,533	,000	,714	,228
	Ν	32	32	32	32	32	32	32	32	3
AINTNC	Pearson Correlation	-,628**	-,739**	-,053	-,505**	-,114	1,000	-,160	-,319	,28
	Sig. (2-tailed)	,000	,000	,774	,003	,533	,	,382	,075	,114
	Ν	32	32	32	32	32	32	32	32	32
MINSHARE	Pearson Correlation	,250	,253	-,095	-,123	,885**	-,160	1,000	,058	,15
	Sig. (2-tailed)	,167	,162	,605	,504	,000	,382	,	,753	,390
	Ν	32	32	32	32	32	32	32	32	3
ALI1NC	Pearson Correlation	,796**	,194	-,631**	,509**	,067	-,319	,058	1,000	,21
	Sig. (2-tailed)	,000	,289	,000	,003	,714	,075	,753	,	,23
	Ν	32	32	32	32	32	32	32	32	33
ALI3NC	Pearson Correlation	-,072	-,243	-,637**	-,138	,219	,285	,157	,216	1,00
	Sig. (2-tailed)	,696	,180	,000	,453	,228	,114	,390	,235	
	N	32	32	32	32	32	32	32	32	3

\*\*. Correlation is significant at the 0.01 level (2-tailed).

 $^{\star}\cdot$  Correlation is significant at the 0.05 level (2-tailed).

Appendix 13. Compact disc with electronic data regarding to the thesis

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