universität wien

MASTERARBEIT

Titel der Masterarbeit

„Clustering of M&A types by industries“

Verfasserin

Dagmar Šimončičová, BSc

angestrebter akademischer Grad

Master of Science (MSc)

Wien, 2012

Studienkennzahl lt. Studienblatt:	A 066 914
Studienrichtung lt. Studienblatt:	Masterstudium Internationale Betriebswirtschaft
Betreuer:	Ao. Univ.-Prof. Mag. Dr. Josef Windsperger

Table of contents

1. Introduction and Research Problem 3

2. General introduction: Definitions and Motives of M&A 5

2.1. Introduction to M&A activity 5
2.2. General definitions 6
2.3. Motives for mergers and acquisitions 10

3. M&A Waves and Merger Waves Theories 19

3.1. M&A waves 19
3.2. Merger waves theories 23

4. M&A Regulation in the European Union 28

5. Literature Review and Hypotheses Development 32

5.1. Relevant literature 32
5.2. Hypotheses 37

6. Empirical Analysis 43

6.1. Data 43
6.2. Results 60
6.3. Discussion 84

7. Conclusion 86

References 88

Appendix 97

List of Tables 118

List of Figures 118

Abstract 119

Curriculum Vitae 121

1. Introduction and Research Problem

Mergers and acquisitions have been a viable part of corporate strategy over the last years. The amount of M&A activity is rising over time, especially in recent periods, whereas the deals occur all over the world and in all industry sectors. With the raising popularity and importance of these transactions among the firms the vast research has been dedicated to examine and find general and common determinants of the M&A activity. Although the literature covered up many aspects of M&A there are still gaps in the research which can be filled in. Hence the aim of this master thesis is to examine one of the previously not sufficiently researched aspects; the different M&A types with respect to their clustering to industries.

Within this master thesis, the theoretical foundations of M&A will be presented, focusing on the merger waves and theories explaining them. In course of that, the main objective is to detect one of the facts accompanying M&A; the clustering of M&A types by industries. Although this fact seems to be well-known in the existing literature there is a little effort to find possible explanations of this phenomenon and link it to different M&A types namely horizontal, vertical and conglomerate types. As a consequence of this lack in exploration the research problem of this thesis was formulated. The problem is associated with two main research questions. The first research questions aims at proving of the fact of industries' clustering in M&A activity also in different types of transactions and hence it is phrased as "Do the different M&A types cluster by specific industries?". Since according to the previous findings in literature the overall M&A activity is clustering by industries it can be assumed that this matter will hold also for horizontal, vertical and conglomerate M&A. The verification of the first question naturally leads to the effort of finding possible determinants why some industries experience more horizontal deals while in others vertical or conglomerate type prevails. Theoretical background suggests that this is linked with common features or conditions in specific industries. Therefore the second research question has to be answered: "Which characteristics of industries have effect on the occurrence of the specific M&A types". The main concern is laid on the industry-level rather than on firm-level research on the contrary to the majority of the previous literature. This enables the formulation of general implications for M&A activity with respect to different merger types.

The thesis is divided into two major sections. The first one focuses on general information and theoretical background of M&A in order to gain insight when different merger

types are carried out and how they are linked to industries' characteristics. Hence, the theoretical section embodies the basis for the research problem's analysis. Firstly, the identification of different M&A types is presented; namely horizontal, vertical and conglomerate M&A. Each type is motivated by different aspects which are discussed in detail. Secondly, the major merger waves are described and the underlying theories explaining them are introduced. Shortly the M&A regulation in the European Union is presented since the research is made on merger data from the EU. Finally, the theoretical section is completed with the overview of relevant literature and hypotheses development which is associated with different available economic theories such as transaction-cost theory or mentioned merger waves theories. Directly connected with this part is the second section of the thesis which demonstrates the empirical analysis and its results. The research is made on merger cases in the EU in time period from 1990 till 2000 through appropriate statistical methods in order to extend the analysis beyond the previously deeply examined US cases. The emphasis is laid on the examination if the theoretical framework and the formulated hypotheses are supported by presented results and if the general implications can be developed. Furthermore, the research questions will be answered.

The purpose of the thesis is to bring some additional insight into M&A activity. Despite some methodical difficulties the research aspires to introduce new reliable aspects of different merger types what might constitute the direction of further empirical analysis.

2. General introduction: Definitions and Motives of M&A

2.1. Introduction to M&A activity

Mergers and acquisitions have been viable option of corporate strategy for a long time. Meanwhile M&A have become more popular and therefore an extensive research has been made on this topic in numerous management disciplines. It includes various aspects like reasons for M&A, value creation by M&A, merger waves, post-acquisition integration and even cultural dynamics of M&A. However there is still room for finding new unexplored subjects and further research.

The M&A activity has recently started to increase again after the substantial decline caused by economic turmoil in 2008 and the value of worldwide M&A totaled $2.6 trillion in 2011[1]. The most active target industries were energy and power sector (accounted for almost 20%), financials and materials sectors (each accounted for 13%) followed by industrials and real estate sectors (each scored 9%)[2]. These findings are proving two facts about mergers: the fluctuation of merger activity suggests that there are the merger waves and merger activity tend to cluster by industry sector.

Although M&A can be very advantageous both for the acquiring and target firm in terms of improved financial performance through economy of scale and positive effect on stock return there is a need for regulation from the side of the government to avoid increased market concentration leading to decreased price competition. While developed countries have their own processes in regulating M&A (e.g. in the US approvals from Federal Trade Commission and the Department of Justice are needed[3], in the EU regulation is provided by European Commission Merger Regulation[4]) the developing and emerging countries are facing difficulties with setting up the effective merger control. In the time of increased amount of cross-border mergers and raising contribution of merger deals in these countries there is essential need for international cooperation between competition authorities to ensure an effective review of these transactions (i.e. an initiative from OECD by organizing policy roundtables on cross-border merger control[5]).

[1] Thomson Reuters, "Merger and Acquisitions Review Full Year 2011", p.1
[2] Thomson Reuters, "Merger and Acquisition Review Full Year 2011", p.2
[3] Gersdorff, Bacon (2009), p.2
[4] http://ec.europa.eu/competition/mergers/legislation/regulations.html, accessed on 2.5.2012
[5] OECD, Policy Roundtables, Cross-Border Merger Control: Challenges for Developing and Emerging Economies 2011

2.2. General definitions

In the beginning it is important to clearly define terms which will be used through this work. First of all, it is needed to understand what are mergers and acquisitions and how they can be divided according to their characteristics. The essence is that "at the core of M&A is the buying and selling of corporate assets in order to achieve one or more strategic objectives"[6]. The terms mergers and acquisitions are used interchangeably although they have different meaning in narrow sense. A straightforward definition of *merger* says that it is "any transaction that forms one economic unit from two or more previous ones"[7] but the more precise definition that enables easier distinction from acquisitions takes in account four important aspects; these are that "neither company is portrayed as the acquirer or the acquired, both parties participate in establishing the management structure of the combined business, both companies are sufficiently similar in size that one does not dominate the other when combined and all or most of the consideration involves a share swap rather than a cash payment"[8]. However "pure" mergers are rare and one example is the merger between two pharmaceuticals firms SmithKline Beecham and Glaxo Wellcome in 2000. On the other hand *acquisition* "is the purchase of one organization by another"[9]. This purchase can involve target's stocks or business operations and its assets[10]. In connection with acquisition two terms describing the engaging companies are used: acquiring or bidder company and target company. The acquirer is a company which buys the other firm, the target. It is notable that often in empirical research these terms are used interchangeably and also the most relevant database of Thomson Financials Worldwide M&A records all corporate transactions of at least 5% of the ownership of a company over the total value of $1 million till year 1992 afterwards it records deals of any value. It involves not just M&A deals but also other transactions such as stock swaps, leveraged buyouts, tender offers etc[11]. The DOME database which is used in the empirical part for research covers all types of transactions too; such as majority ownership, joint ventures due to the competition regulation rules by the European Commission. Further, in this work terms merger, acquisition or M&A will be used interchangeably with no emphasis on the strict definition if not stated otherwise.

[6] Stowell (2010), p.63
[7] Weston et al. (1990), p.4
[8] Coyle (2000), p.3
[9] Alao (2010), p.555
[10] Coyle (2000), p.4
[11] http://www.alacra.com/partners/partner.asp?content=Thomson+Financial+Mergers+%26+Acquisitions&database=%2Falacra%2Fhelp%2Fsdc2%2Ehtm, accessed on 2.5.2012

There are several criteria according to which M&A can be classified. The following table represents the different types of M&A in accordance with their characteristics.

Distinguishing feature	Types of M&A
Relationship between firms	• Horizontal • Vertical • Conglomerate • (Concentric) • (Congeneric)
Mood of the bid	• Friendly • Hostile
Presence on stock market	• Private • Public
Form of financing	• Cash-financed • Stock-financed
Nationality of firms	• Domestic • Cross-border

Table 1: Types of M&A

Distinguishing between different types of M&A is in many cases straightforward. Friendly acquisition differs from hostile takeover in target's management approval. When target's management approves the bid and cooperates with acquirer in the way it recommends its shareholders to accept bidder's proposition. On the other hand, in case of hostile takeover target management is unwilling to sell the company or it has not knowledge about the bid. In these cases target's management can exercise strategies against takeover such as golden parachutes, crown jewels or poison pills. It can be argued that friendly bids are primarily driven by synergy gains and on the other hand, hostile bids are undertaken in order to discipline the underperforming target management[12]. The amount of hostile bids is decreased from 1980s to 1990s (14.3% to 4%)[13] but hostile takeover activity peaked again in 2007 when it generated 12% of total deal volume globally[14].

[12] Morck et al. (1988), pp.101-102
[13] Andrade et al. (2001), p.106
[14] Capaldo et al. (2007), p.1

According to the presence on the stock market it can be distinguished between private and public M&A. Private transaction takes place when target and bidder are not listed on any public stock market. On the other hand, public deal occurs when both firms are listed on stock market which is often the case[15]. Further M&A can be financed either by cash or stock. Stock-financed deal is a transaction when bidder company exchanges its stock for target shareholder's stock, i.e. target shareholders become shareholders in bidder firm. These two types of acquisitions have different impact on value creation. Through short event study where the average abnormal stock return at merger announcement is used as a proxy for value creation or destruction it was found for the acquirer's side there are negative abnormal returns of -1.5% when financed through stock and in the case of cash-financed deal there is positive effect of 0.4%. Also target shareholders are better off with cash-financed transaction; 20% compared to 13% when financed with stock[16].

Considering nationality of firms when bidder and target companies are active in the same country deal can be classified as domestic and on the contrary when bidder is operating in different country than target it is a case of cross-border M&A. Although cross-border deals are much more complex and involve greater considerations by competition authorities they are becoming more popular due to consistent establishing of companies in the emerging markets in M&A activity. In 2010 they generate 40% of global M&A volume[17], a substantial increase from 20% in 2000 and 30% in 2005[18].

The most relevant differentiation is according to the relationship between firms in three main groups: horizontal, vertical and conglomerate M&A. Beyond them some authors also mention concentric type of deal which happens "between firms with highly similar production or distributional technologies"[19] and is centered on core competences such as marketing with the goal to use them properly or to develop new competences[20]. Further, some authors use the term congeneric merger which is defined as merger of firms in the same industry which do not have any customer or supplier relationship[21]. The three most spread terms can be viewed from more perspectives e.g. corporate strategy or industrial organization and there are different reasons for their realization.

[15] Gugler et al. (2012), p.11
[16] Andrade et al. (2001), p.111
[17] Cogman, Sivertsen (2011), p.1
[18] Capaldo et al. (2007), p.1
[19] Walter, Barney (1990), p.80
[20] Farschtschain (2012), p.6
[21] Brigham, Houston (2009), p.659

Horizontal merger can be defined as "a combination of two firms in the same line of business"[22] i.e. firms are in the same industry and at the same stage of production process. In narrow sense horizontal merger "occurs when firms in the same industry, producing identical or similar product and selling in the same geographical market, merge"[23]. The typical reasons for horizontal mergers are economies of scale, expanding of product portfolio and increase in market share. Industrial organization theory notes that horizontal merger raises concerns about rising concentration in market and subsequent increase in price which reduces the aggregate welfare. Important work of Williamson (1968) handles the issue of balancing reduction in competition and efficiency gain. It can be argued that firms engaging in merger are experiencing cost-savings which are contributing to efficiencies enlarging aggregate welfare. If the cost-savings are high enough to maintain the original price the aggregate welfare will be increased through merger. However, if the original price is increased the consumer surplus is reduced what leads to deadweight loss. Nonetheless it was showed that efficiency gain is often larger than reduction in consumer surplus[24] so it can be concluded that the existence of cost-savings is offsetting the increase in price unless it is a large increase in price therefore antitrust authorities should consider this fact in a process of disallowing of merger[25]. Other important point from industrial organization theory is the "merger paradox" which claims that it is unprofitable for firms to engage in mergers and this is showed on basic economic model. It is only beneficial to participate in merger if the more than 80% of the firms collude[26] what will legitimately raise antitrust concern. However, if the are substantial cost-savings either in variable costs or fixed costs merger can be profitable for engaging firms. This suggests there might be other reasons for mergers than just cost-savings.

Vertical merger "occurs when a firm producing an intermediate (or a factor of production) mergers with a firm producing the final good that uses this intermediate good, or when two companies who have a potential buyer-seller relationship prior to a merger merge"[27]. This type of merger is mainly motivated by economies of vertical integration which is characterized by facilitation of coordination and administration since a company merges either with supplier or a customer. Extreme vertical integration is not profitable (e.g. airline merges with food company to facilitate distribution of food to its clients and employers in the planes).

[22] Brealey et al. (2006), p.871
[23] Shy (1995), p.173
[24] Williamson (1968), p.21
[25] Williamson (1968), p.34
[26] Salant et al. (1983), p.193
[27] Shy (1995), p.174

An alternative to vertical merger is outsourcing which is nowadays very popular[28]. According to industrial organization theory vertical integration prevents double marginalization what improves market efficiency. Double marginalization can be described as a situation where the manufacturer produces product which it sells to retailer at wholesale price. Consequently the retailer sells this product to the customer at the retail price. Since both manufacturer and retailer want to make profit the customer pays inefficient price due to double margin over the real cost of product. When the manufacturer and the retailer merge due to the incentive to increase their joint profit[29] also consumers are better off since they pay lower price. However, vertical merger might not be efficient because of the facilitation of price discrimination or foreclosure i.e. when a firm refuses to supply or buy from non-merged rivals.

Conglomerate merger can be defined broadly as a merger that "involves companies in unrelated lines of businesses"[30]. It can be also differentiated between various types of conglomerate mergers according to Federal Trade Commission. The first one, product extension, happens when the acquiring and acquired firms are functionally related in production or distribution. Market extension merger involves companies that produce the same products but sell them in different geographical markets. The last conglomerate merger type is other conglomerate which occurs when firms are essentially unrelated in products they produce and distribute. This type of merger occurred mostly in 1960s and 1970s and nowadays they are not so popular. Possible reasons for conglomerate merger are protection of organization-specific human capital, entrenchment or because of strict antitrust policies against horizontal and vertical mergers[31]. Although this type of merger raises the lowest antitrust concern the profitability and performance are not improved as they would be through horizontal and vertical mergers[32].

2.3. Motives for mergers and acquisitions

After general overview of types of mergers it is important to mention the most important motivation factors for M&A activity to better understand the process of decision to engage in this transaction and which mode the companies choose. Although there are reasons for mergers which are rational and support the improvement of performance of merging firms there are also cases when firms pursue M&A because of disputable motives. It is important that firms can

[28] Brealey et al. (2006), p.874
[29] Church, Ware (2000), p.686
[30] Brealey et al. (2006), p.871
[31] Matsusaka (1993), p.358
[32] Lubatkin (1987), p.47

distinguish between them and correctly decide how to proceed in order to act in accordance with interests of firm and its shareholders.

The reasons why firms engage in M&A are numerous and they vary over time. Table 2 lists some of the most important motives which are divided according to their rationality into two broad groups, rational motives and dubious motives. Each motive is mentioned and grouped by logic which stands behind these motives. Then each motive is discussed in detail and it is explained what their objectives are.

2.3.1. Rational motives for M&A

Firstly, the motives which can be classified as rational are discussed. Motive can be considered as rational when its objective is to contribute to an increase in firm's performance and the preservation of shareholders' interests. There must be a good intention from managers and also actual enhancement after realization of transaction. These motives can be induced both by efficiency considerations (i.e. to enhance the efficiency of the merged company) and also by external forces like the firm's environment and its competitors.

Operating synergy

Generally, synergy can be defined as a fact that the combination of two (or more) companies creates enhanced company's functioning resulting in increase of shareholders' value what can not be reached independently by each company. There are several types of synergies such as operating, financial, cost or revenue synergy. The first two of them are mentioned but they are also interconnected with other two types and they can not be considered as independent entities.

Operating synergy results from the way how the company is operated. The main sources are economies of scale, economies of scope, economies of vertical integration and complementary resources.

To economies of scale is referred in the case of the merger when firms can profit from shared production, central services, distribution and other operations of firms. When firms share their production they can decrease their overall average costs by the spreading of fixed costs over the shared production facility[33]. Fixed costs include salaries, insurance, lease payments, interest expenses and others. Due to the nature of economies of scale it is one of the most natural goals

[33] DePamphilis (2012), p.5

of horizontal merger where firms producing the same product share their operations more efficiently.

Rational motives	Operating synergy • Economies of scale • Economies of scope • Economies of vertical integration • Complementary resources Financial synergy • Lower cost of capital • Surplus funds • Tax considerations Eliminating inefficiencies • Mismanagement	*Induced by efficiency considerations*
	Market power Strategic realignment • Technological change • Regulatory and political change	*Induced by external forces*
Dubious motives	Diversification Increasing EPS Lower financial costs Misvaluation Buying undervalued assets	*Induced by considerations from financial perspective*
	Process outcome Empire building Hubris Managerialism	*Induced by management*

Table 2: Overview of motives for M&A

Economies of scope refer to a strategy when two firms combine in order to use their specific set of skills, know-how or an asset to produce multiple product lines in the merged firm more efficiently than separately[34]. This suggests that it can be one of the reasons for vertical merger but it depends on how much the products are related or not. The example of firm which is

[34] DePamphilis (2012), pp.5-6

regularly engaging in acquisitions in order to benefit from economies of scope is Protector & Gamble which shares market development organizations and business services for the broad range of products[35]. Its product portfolio ranges from cosmetics, pharmaceuticals, food to small electrical appliances[36] suggesting the previous undertaking of several vertical or even conglomerate acquisitions.

Economies of vertical integration are in some extent related to economies of scope. This term on the contrary to economies of scope do not take in account the different products but the relationship between the combining firms. Economies of vertical integration are a synergy flowing from facilitation of coordination and administration when a firm decides to merge either with its supplier or customer[37]. This type of synergy is used by the firms engaging in vertical mergers.

Complementary resources are resources which enrich each other i.e. it is beneficial to combine these different resources in order to reach an improvement that can not be achieved by possessing only one of these resources. One good example of exploitation of complementary resources can be seen in the combination of small and big firm whereas small firm can have unique business idea or product but it does not have sufficient funds for realization or production and on the other hand, big firm has enough resources to provide production and other well-developed business services[38]. This type of synergy can be utilized both in horizontal and vertical M&A.

Financial synergy

The second broad group of synergies is financial synergies which include the lower cost of capital, surplus funds and tax considerations. These types of synergies on the contrary to operating synergies do not consider improvement in operations of firms but the enhancement in financial situation and subsequent benefits for the combined firm.

The positive effect of M&A is a lower cost of capital of combined firm. Cost of capital is a minimum return that should be promised to investors and lenders in order to receive capital for company from them. The cost of capital can be reduced "if the merged firms have cash flows that do not move up and down in tandem, realize financial economies of scale from lower

[35] http://www.pg.com/en_US/company/global_structure_operations/corporate_structure.shtml, accessed on 18.5.2012
[36] http://www.pg.com/en_US/brands/all_brands.shtml, accessed on 18.5.2012
[37] Brealey et al. (2006), p.874
[38] Brealey et al. (2006), p.875

securities issuance and transactions costs"[39]. This type of synergy is not bounded to any specific type of merger.

The special case of financial synergy is when one firm possesses surplus funds. Especially mature firms have a substantial amount of cash but they do not have enough investment opportunities. They have two options how to exploit this excess cash. The first one is to please its shareholders through paying them dividends or engaging in share repurchases. The second option is to redeploy their capital by undertaking mergers financed by cash to ensure them a future growth[40] (i.e. acquire a firm which have a plenty of investment opportunities and a great potential for growth). This motive is driven by free cash flow theory i.e. cash is used in an efficient way preventing managers to use them in the inefficient way such as empire building. The mature and the growing firms can be located in the same industry then horizontal merger is possible. However, if the whole industry is mature it is inevitable for a firm to engage in a vertical or conglomerate merger in order to reach the growth.

Companies should also not forget about taxes when they are complementing M&A. The combined firm can mainly profit from tax loss carry forwards (i.e. if the firm realizes loss in one year it can carry the loss in some extent to the next years to reduce tax base and pay less taxes). This can be achieved when one firm acquires a firm with accumulated losses and the combined firm can use them to offset future generated profits[41]. The second consideration is the tax shield, i.e. tax benefit when firm has a debt that decreases its profit and therefore taxes paid. In this case, the combined firm can benefit from an increased leverage. To this result comes when a very profitable firm which is at the same time highly taxed overtakes a lowly profitable firm which pays fewer taxes. Hence it is advantageous to acquire a competitor which is less successful than the acquirer as it is in a case of horizontal acquisition.

Eliminating inefficiencies

The last motive which is induced by efficiency considerations is to eliminate inefficiencies. This is closely associated with the fact that managers often do not act in accordance with shareholders' interests. This problem is called agency problem and it is related to the fact when managers do not own shares of the company or just small fraction of shares. In this case they do not act as agents of shareholders as they are supposed but they pursue their own interests such as keeping their job and enjoying of the job benefits. This can lead even to empire-

[39] DePamphilis (2012), p.7
[40] Brealey et al. (2006), p.875
[41] DePamphilis (2011), p.12

building, seeking of prestige and dysfunctional organization. However, shareholders try to control management and threaten them with firing when their interests are not followed. Therefore managers are motivated to increase growth of the firm and they may be prone to overinvest. Overinvestment problem says that managers cause their firm to grow beyond the optimal size since they undertake investments with negative net present value[42]. In this case, acquisition can be efficient way how to replace underperforming target management. Hence, the threat of takeover is often motivation for managers to act as agents of shareholders.

The next subgroup of rational motives which do not result from operation of firm but they are induced by external environment therefore the firm have to adapt to the situation. The consideration is directed on competitors and the aim is to gain a greater market power. This is based on the fact that the firms merge to gain a greater market power what allows them to set higher prices that were not possible if the market was competitive. The aim is to get monopoly power. Although it is plausible why firms pursue this strategy the well-functioning antitrust authorities do not allow such practices. This motive mostly drives horizontal mergers, i.e. the firm merges with its competitor to increase market power, but in some cases it can also induce conglomerate mergers. This is the case when conglomerate acquisition employs these activities; (1) when a firm uses profits generated in one market to secure market share in other market, (2) limiting a competition in more than one market simultaneously e.g. through tacit collusion with competitors, (3) deterrence of potential entrants from the markets where firm is active[43].

Secondly, the firm has to consider also changes in its environment such as technological or regulatory change and adapt to them in order to stay competitive. This approach is called strategic realignment. Technological change drives today's global market. There is a continuous innovation that produces new products and industries. Firms have to adapt quickly in order to stay on the market. One of the options how to manage survival is to acquire other firms in order to increase market share or to diversify its operations (i.e. all types of mergers are viable). One example of technological change is the emergence of digital camera technology. Kodak failed to adapt to the new situation in the beginning of year 2012[44]. However, its competitor Fujifilm pursued a successful strategy of diversification through acquisitions and today besides selling films it offers a wide range of solutions like imaging solutions (e.g. electronic imaging and photofinishing equipment, information solutions (e.g. medical systems and optical devices) and

[42] Jensen (1986), p.323
[43] Trautwein (1990), p.286
[44] http://dealbook.nytimes.com/2012/01/19/eastman-kodak-files-for-bankruptcy/, accessed on 19.5.2012

document solutions (segment operated by Xerox)[45]. Further, the firm has to consider regulatory and political change which influences all the firms in the market. When a government carries out deregulation affected firms are facing stimulated competition and are motivated to increase their market share through acquisitions. This can even lead to merger waves as it will be discussed later in this work. In this context it is also important to mention industry consolidation since deregulation can trigger overcapacity in the concerned industry. Mergers are efficient solution in this case when there too many firms and too much capacity in the industry[46]. Deregulation can drive all types of mergers (i.e. horizontal, vertical or conglomerate) it depends on how extensive this deregulation is.

2.3.2. Dubious motives for M&A

Besides rational motives for M&A there are also some dubious motives. The management of the firm can defend their reasoning why they undertake merger but although they may believe in correctness of them usually these mergers do not lead to the increased performance of the combined firm. These motives can be mainly induced by management or tried to be justified by financial perspective.

The firms often try to justify their acquisitions by diversification. Diversification indeed decreases risk but the question remains if this reduction of risk is a sufficient gain for a company. It is often more costly and more difficult to diversify for the firm than for the stockholders[47]. Especially unrelated diversification, i.e. diversification in new lines of businesses mainly through conglomerate mergers, is pursued by management because of poor motives (e.g. reduction of the risk of their human capital, to assure continuation of the business or entering new lines of business in hope for improvement when facing poor performance) and reduces the shareholders' welfare[48]. Investors also do not consider these mergers as beneficial but riskier because the management might fail to manage the combined firm when it does not have enough experiences[49]. Further, related diversification brings more positive returns than unrelated diversification[50] suggesting that horizontal mergers brings more economies of scale and other cost-savings than conglomerate mergers. This fact advocates the need for more focused firms which can be more efficient in easier alignment of incentives for management and preventing

[45] http://www.fujifilm.com/about/profile/business_fields/, accessed on 19.5.2012
[46] Brealey et al. (2006), p.876
[47] Brealey et al. (2006), p.877
[48] Morck et al. (1990), pp.32-33
[49] DePamphilis (2012), p.9
[50] Singh, Montogomery (1987), p.383

building of empires. Trend of focused firms can be seen in the rise of acquisitions in the same industry through time[51].

Managers often justify their pursuing of acquisitions by increase in earnings per share (EPS). There may be the increase in EPS by the combined firm but it is not reached by real gain such as financial synergy or cost-savings. Indeed, there is no economic benefit meaning that the firms are worth exactly the same together as they were apart which is suggested by falling price-to-earnings (P/E) ratio. The earnings growth can be achieved through the purchase of slowly growing firms with low P/E ratio but it is important to be aware that it is not real growth from capital investment or improved profitability[52].

If two firms combine there are no additional cash flows but their overall debt capacity is increased and therefore they have lower issue costs of debt. In well-functioning bond market they may borrow at lower interest rates but this is not always valid. However there is no net gain in merger; the merger increases bond value (or reduce interest payment) but this is caused only by the reduced value of stockholder option to default. Therefore the merger will deliver gain only in the case when the firms are in financial distress and financial distress is costly[53]. In this case the aggregate risk is lower and value of equity is increased.

In capital market often happens that some firms possess private information about overvalued or undervalued shares. Managers try to take advantage of this information when deciding about acquisition. Misvaluation theory refers to "the efforts of bidders to profit by buying undervalued targets for cash at a price below fundamental value, or by paying equity for targets that, even if overvalued, are less overvalued than the bidder"[54]. Therefore if bidder's shares are overvalued it is less costly to buy target's shares when financed by stock. The dilution of ownership of acquirer's shareholders is also less vigorous what is important for acquisition's approval from the shareholders since the shares represent claims on the firm's earnings[55]. However, the estimation of the volume of the firm's own overvalued shares might be too optimistic and the merger might not be accompanied with other synergies which are necessary for the combined firm's long-term high performance. Hence the misvaluation motive is often not justifiable since the post-acquisition stock price performance of such motivated acquisitions declines with the time[56].

[51] Andrade et al. (2001), p.106
[52] Brealey et al. (2006), p.878
[53] Brealey et al. (2006), p.880
[54] Dong et al. (2006), p.726
[55] DePamphilis (2012), p.12
[56] Petmezas (2009), p.68

Another dubious motive tried to be justified by financial considerations is the buying of undervalued assets. The q-ratio in the case of acquisition is the market value of the acquirer's stock relative to the replacement cost of its assets[57]. The firm should undertake an acquisition in the case when it is costly for it to buy (or build) the asset and there is a firm with low q-ratio (q-ratio is less than 1, i.e. market value is less than it would cost to replace the assets)[58]. However, this benefit accrues from the initial cost-saving in the merger but without any other synergy the long-term performance of the combined firm may decline.

The second subgroup of dubious motives comprises of motives which are induced by management from wrong intentions. These are the process outcome, empire building, hubris and managerialism. Process outcome theory refers to the repeated strategy of managers to acquire firms without consideration of all matters. Since the managers have a limited information processing capabilities (i.e. they do not evaluate all the possibilities, simplify the decision process) and they are vulnerable to slip into organizational routines (i.e. they repeat the in the past successful actions without consideration of new conditions)[59] they often engage in mergers only because they have experienced this type of transaction in the past without any actual synergy. Therefore these mergers often fail to reach the desired performance.

The managers of the firm often engage in empire building what is closely related to agency problems theory. Since the managers are not the owners of the firm their incentives are different from shareholders' ones. Managers seek for the growth of the firm to enjoy more perquisites and possibly higher income without consideration if the growth is desired. Therefore they acquire other firms in order to reach the growth but also in this case without any other synergy between merging firms the transaction does not deliver any value to the shareholders.

Secondly, there are other manager's selfish reasons why they undertake acquisitions besides the empire building. It is related to the fact that companies leave its conduction to the planning and management of professional mangers, called managerialism. Although managers possess the necessary knowledge and experiences they still might follow their own interests such as prestige, increase in their salary or preservation of their job. However, managers are under constant pressure to maintain or even increase the share price and this pressure becomes stronger as the firm is growing so managers undertake large acquisitions which might be value-destroying[60].

[57] Tobin (1969), p.21
[58] DePamphilis (2012), p.11
[59] Trautwein (1990), pp.288-289
[60] DePamphilis (2012), p.11

Finally, the last dubious motive is hubris and the "winner's curse". Managers tend to be too self-confident if they have experienced successful acquisitions in the past. Managers bidding a target may overestimate positive effects flowing from the merger and want to finish the deal at all costs. Managers overpay for target especially in the situation where there are more bidders. They do not want to give up or admit the loss because of their hubris. The winner can after the finishing of the deal realize that he overpaid and feels a remorse so called "winner's curse"[61]. Although the bidding process is started because of the right motives it is important to realize when the competition is driving the price up and let the deal go.

3. M&A Waves and Merger Waves Theories

3.1. M&A waves

In the literature were identified various reasons for merger waves, from which four main theories evolved. In this section the major merger waves will be mentioned and afterwards the theories explaining the merger activity will be discussed.

In the history of business world there were many mergers and acquisition and in some periods even waves of this activity were identified, i.e. period of the high amount of such deals or high transaction volumes caused by M&A in comparison to other quiet periods. In following paragraphs the major M&A waves are listed and their characteristics are discussed.

3.1.1. The first wave (1898-1904): "Great merger wave"

The first merger wave, which is also called "great merger wave", was preceded by technological and organizational innovations, the depression period of the 1980s, new incorporation legislation and the developing of New York Stock Exchange to the effective market for securities[62]. Although the Sherman Anti-Trust Act came into enforcement in 1890 and should have prevented monopolization its real enforcement proved to be difficult[63] and many of mergers aimed at the increase in the market power even through monopoly rather than on economies of scale. Horizontal consolidation affected mostly primary metals, transportation and mining industries[64]. For example, U.S. Steel achieved from 1892 till 1908 33.75% of industry's capacity through M&A[65] and became one of the biggest companies. The end of the wave came in

[61] DePamphilis (2012), p.10
[62] O'Brien (1988), p.639
[63] http://legal-dictionary.thefreedictionary.com/Sherman+Anti-Trust+Act, accessed on 21.5.2012
[64] DePamphilis (2012), p.14
[65] Stigler (1950), p.30

1904 when the equity market crashed and because of the Northern Securities Case when Theodore Roosevelt (that time's American president) prosecuted the railroad merger and made antitrust laws more powerful[66].

3.1.2. The second wave (1916-1929): Merger for oligopoly

After the Sherman Act gained stronger authority and addition of other antitrust laws such as Clayton Act in 1914 monopoly became heavily outlawed and the firms instead of seeking of monopoly creation engaged in acquisitions leading to oligopoly (i.e. lower market share than it was the case in the first wave)[67] or in vertical integration. These strategies should prevent antitrust issues and focused on expansion through economies of scale. The second wave was ended by the 1929's stock market crash and subsequent economy depression[68].

3.1.3. The third wave (1965-1969): Diversification wave

The Second World War and economic depression delayed the new merger wave until 1960s. In 1950 the Celler-Kefauver Act amended former Clayton Act and specified that also an acquisition of assets in target firm was against antitrust laws along with the acquisition of the stock in competing company if the overall competition was reduced. Further it clarified that also vertical mergers should face the same antitrust restrictions as horizontal mergers[69]. The acquisitions in this period were characterized by unrelated diversification, i.e. conglomerate M&A. This was partly caused by the Celler-Kefauver Act that disabled acquisitions in the same industry hence the companies were forced to diversify in unrelated businesses to avoid antitrust concerns[70]. Although the strict antitrust policy was unique in the US other countries like the UK, Canada, Germany and France experienced conglomerate transactions suggesting there are other reasons why these deals happened[71]. Firstly, the firms looked for the growth and pursued acquisitions in order to increase their EPS, high P/E ratio firms bought low P/E ratio firms without consideration of the relatedness[72]. Secondly, in the time of less developed external capital markets (e.g. the market for risky debt was illiquid) the companies counted on their own internal capital market i.e. efficient allocation of funds to the divisions of the firm therefore it was beneficial to broadly diversify the firm to enable cross-subsidization[73]. Finally, managers due to the agency problem pursue their own interests and with large free cash flow in 1960s they

[66] http://ehistory.osu.edu/osu/mmh/1912/trusts/NorthernSecurities.cfm, accessed on 21.5.2012
[67] Stigler (1950), p.31
[68] Sudarsanam (2003), p.15
[69] Hunt (2009), p.550
[70] Shleifer, Vishny (1991), p.52
[71] Matsusaka (1996), pp.292-293
[72] DePamphilis (2012), p.14
[73] Hubbard, Palia (1999), pp.1132-1133

undertook unrelated diversification[74] in order to reduce their personal risk and to entrench themselves[75]. The third wave was ended by oil crisis in 1973 and following economic slowdown[76].

3.1.4. The fourth wave (1981-1989): The return to specialization

After conglomerate M&A in 1960s failed to reach improved performance it was inevitable that the change came in merger activity. Antitrust authorities liberalized their attitude and the mergers within the same industry stopped to be vastly prosecuted[77]. This leaded to reversion of the conglomerate M&A. Either the managers realized their faults and divested their unrelated businesses in order to concentrate on its own core business or this role was handled by hostile raiders[78]. Further the increase in the effectiveness of the external market (e.g. creation of junk bond market) and the rise of the leverage buyouts (LBO) as the efficient device to control agency problem of managers, since the debt has disciplinary function, contributed to the amount of the M&A. LBO, i.e. the purchase of the firm primarily with debt in order to convert public company to the private held one[79], became very popular in this period but in the next period they disappeared[80].

The other novelty in this period was the rise of foreign acquirers (e.g. Europe or Canada) of the US companies. They "were motivated by the size of the market, limited restrictions on takeovers, the sophistication of the US technology, and the weakness of the dollar against major foreign currencies."[81] Due to the bankruptcies of LBO and the collapse of the junk bond market the merger wave came to the end[82].

3.1.5. The fifth wave (1993-2000): Wave of mega mergers

The fifth wave differed from the previous wave in many aspects. Due the positive trend on the capital market, innovative technological changes, globalization, industry consolidation and continuing deregulation the number of deals and also the value of them rose substantially. Further M&A became more financed by stock (i.e. the amount of the LBO decreased); they continued to be undertaken in the same industries and became less hostile[83]. The hostility decreased, since the managers accepted the shareholder view of the company, and they

[74] Shleifer, Vishny (1991), p.57
[75] Shleifer, Vishny (1991), p.52
[76] Sudarsanam (2003), p.16
[77] Schleifer, Vishny (1991), p.53
[78] Shleifer, Vishny (1991), p.55
[79] DePamphilis (2012), p.15
[80] Holmstrom, Kaplan (2001), p.125
[81] DePamphilis (2012), p.15
[82] Holmstrom, Kaplan (2001), p.132
[83] Andrade et al. (2001), p.106

restructure the company willingly. The reasons for this change were the emergence of other corporate governance mechanism such as managers' equity-based compensation, stock option plan, closer monitoring by shareholders and the board and the shareholder activism[84]. The part of the acquisitions was motivated by misvaluation when the overvalued firms bought less valued targets without considering other essential synergies[85] what leaded to the substantial losses for the acquirer's shareholders[86]. The end of the wave was caused by the equity market collapse in 2000.

3.1.6. The sixth wave (2003-2007)

The last wave was driven by low interest rates, rising stock market and the increase in the importance of the global economy[87]. The wave was characterized by steady growth of the cross border and private equity financed acquisitions till the peak in 2007 according to Thomson Reuters. The debt financing was again popular; the use of loan obligations or mortgage-backed securities increased[88]. The wave was ended by the worldwide financial crisis in 2008 caused by housing bubble and the loss of bank solvency.

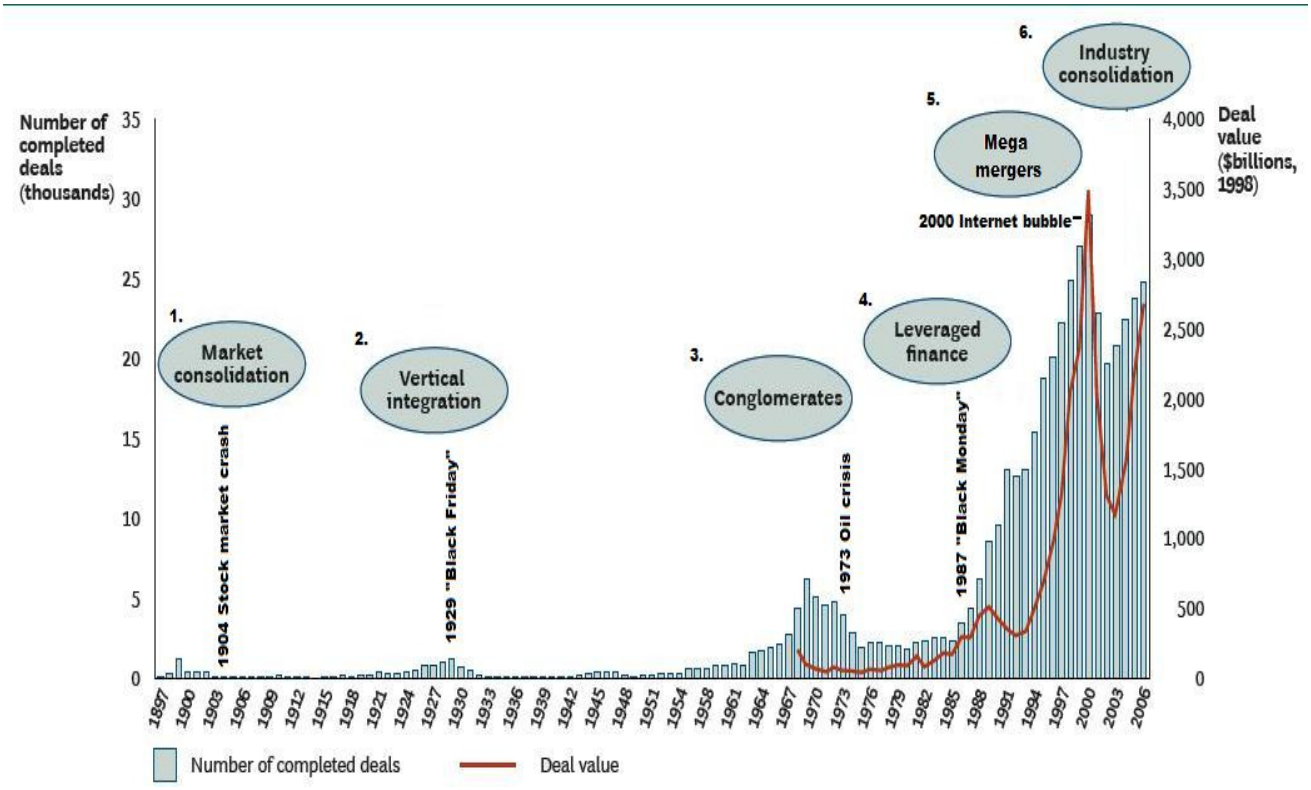

Figure 1: The major merger waves[89]

[84] Holmstrom, Kaplan (2001), pp.133-134
[85] Shleifer, Vishny (2003), pp.307-308
[86] Moeller et al. (2005), p.758
[87] DePamphilis (2012), p.19
[88] DePamphilis (2012), p.15
[89] Based on Boston Consulting Group (2007) p.9 with own additional information

3.1.7. Summary of M&A waves

In the Figure 1 the major merger waves from the early 1900s till 2006 are depictured with respective amount of deals eventually the deal value and also the events which ended the waves are showed. The last wave is missing the last year and the end event i.e. the worldwide financial crisis in the figure. Afterwards in Table 3 the major waves are summarized according to the most prevailing types during the wave and the major motives causing them.

Time Period	Type of M&A Activity	Driving Motives
1898-1904	Horizontal mergers	• Marker power
1916-1929	Vertical mergers	• Operating synergies
1965-1969	Conglomerate mergers	• Unrelated diversification • Increasing of EPS • Managerialism
1981-1989	Horizontal mergers LBO Hostile mergers	• Operating synergies • Mismanagement
1993-2000	Stock-financed mergers Less hostile mergers	• Regulatory change • Technological change • Misvaluation
2003-2007	Cross-border mergers Horizontal mergers Private-equity financed mergers	• Operating synergies • Financial synergies

Table 3: Summary of M&A waves

3.2. Merger waves theories

The literature evolved several theories of explaining the merger waves. They are based on different assumptions and showed that there are several determinants of M&A activity. The most important theories are discussed and in the end they are summarized by one empirical study that concludes which theory have the largest explanatory power.

3.2.1. The q-theory of mergers

Jovanovic and Rousseau (2002a) argue that there are two distinct used-capital markets. One is for used equipment and structures (e.g. when firm A buys a machine from firm B) and second for bundled used-capital i.e. M&A market (e.g. when firm A buys a firm B and gets all firm A's capital). The trading volume in these two markets is correlated, especially during the merger waves in the 80s and 90s[90]. The results support the Q-theory[91] (i.e. the firm investment should rise with its Q[92]); Q has higher impact on M&A investment than on direct purchase of used-capital (coefficient of 2.2 compared to coefficient of 0.75)[93]. Further, the merger waves are being explained through reallocation waves. M&A activity should rise when the inter-firm dispersion of Q is high and high-Q firms should acquire low-Q firms in order to lower the differences among firms. This was confirmed on the relationship between dispersion of Q and the acquisitions where the correlation was detected.

In later work, the impact of new technology is examined. When a firm faces a new technology it has two options to cope with this situation; it can either reorganize internally (e.g. retrain its workers, refit its buildings and equipment) or it can reorganize externally if it fails to reorganize internally. External reorganization can take either a form of liquidation (exit) or takeover. This reallocation process enables quick economic-wide spreading of a new technology[94]. Two main findings ensue from comparison of percentages of stock market value of total reallocation, entry-and-exit and merger targets. The first one is that each merger wave was accompanied by a rise in entry-and-exit because in time of technological shock both external reorganization forms are used[95]. Further it is proved that exits lead mergers, especially in electrification era. The second finding is that mergers have grown relative to exit strategy from 1980s to 1990s because market values have risen due to increased importance of teamwork and organization capital and there were more suitable merger targets on the stock market[96]. Two major technological changes which have influenced the majority of sectors; electrification and internal combustion (1890-1930) and information technology (1970-2002) which are fitting the model at most meaning they have led to mergers as the best reallocation type of transferring assets towards the more efficient firms[97]. Moreover there was a rise in average market-to-book

[90] Jovanovic and Rousseau (2002a), pp.1-2
[91] Tobin (1969), p.21 defines q as „the value of capital relative to its replacement cost"
[92] Jovanovic and Rousseau (2002a), p.1
[93] Jovanovic and Rousseau (2002a), p.8
[94] Jovanovic and Rousseau (2002b), p.1
[95] Jovanovic and Rousseau (2002b), p.3
[96] Jovanovic and Rousseau (2004), p.18
[97] Jovanovic and Rousseau (2004), p.25

ratios for all firms, acquirers and exit/target firms during the IT period[98] leading to the assumption that technology change positively influences the stock market. Finally, through simulation was proved that in the case of prohibition of mergers or absence of equity markets the reallocation wave prolongs itself substantially[99] suggesting that merger is the efficient way of reorganization.

3.2.2. The industry shock theory

Harford (2005) suggests that merger waves occur as a result of economic motivation for merger transactions (i.e. high asset values induced by a specific industry shock) and relatively low transaction costs (i.e. increase in capital liquidity and reduction in financial constraints)[100].

The research was made on merger or tender-offer bids from Thomson Financial's Securities Data Company (SDC) between 1981 and 2001 with a transaction value of at least $50 million[101]. Industry sector was assigned according to connecting SIC code with Fama and French's classification. The sample was divided into two periods 1980s and 1990s and merger waves were determined as 24-months. The wave was observed when the highest 24-months concentration of bids in specific industry exceeds the simulated empirical distribution (the 95th percentile); there were 35 waves from 28 industries[102]. The paper does not distinguish between horizontal and vertical mergers it takes in account all merger transactions only making difference in counting of occurrence of industries sectors. In the case of vertical merger it counts merger activity both in bidder's and target's industry and in the case of horizontal merger it counts only as one occurrence in specific industry[103].

The impact on the beginning of merger waves was proven on several variables. The industry median market-to-book ratio by itself has some explanatory power to predict merger wave however a model which takes in account the capital liquidity (measured by the commercial and industrial loan rate spread as proxy for low capital liquidity), a deregulatory event (years that were preceded by a major deregulatory event) and economic shock (constructed as the first principal component of these seven economic shock's variables: net income, asset turnover, R&D, capital expenditures, employee growth, return on assets and sales growth) has notably

[98] Jovanovic and Rousseau (2004), p.16
[99] Jovanovic and Rousseau (2004), p.20
[100] Harford (2005), p.530
[101] Harford (2005), p.536
[102] Harford (2005), p.537
[103] Harford (2005), p.537 notes

higher explanatory power and eventual addition of market-to-book to model has only marginal impact on correlation with merger wave[104].

Further, there was found strong correlation between the fraction of bids in industries undergoing industry-specific waves and the total number of merger transactions[105] suggesting that when a majority of firms is exposed to economic shocks at an industry level at time of high capital liquidity an aggregate merger wave occurs[106].

3.2.3. The managerial discretion theory

The managerial discretion theory assumes principal- agent problem between managers and shareholders of the firm. Managers are responsible for managing firms and their income is often tied to growth of the firm or to the size of the firm what can lead to so-called empire building of managers. The managers who are maximizing only their utility and do not act in interest of shareholders are constrained by the threat of takeover nevertheless they undertake value destroying mergers.

Especially in the time of stock market boom the degree of optimism is raising and growth through mergers even conglomerate mergers is welcome. Managers can engage in more wealth-destroying mergers since the decline in its share price would be only modest in comparison to normal conditions on the market. Many studies found weak or negative effects of mergers on profitability and negative returns to acquirer's shareholders over long post merger window what was mainly prevalent in the conglomerate merger wave in 1960s and in stock market boom in 1990s[107].

3.2.4. The overvalued shares theory

The overvalued shares theory falls under behavioral theory of corporate finance which perceives corporate policies such as acquisitions as a response to market mispricing. Shleifer and Vishny (2003) constructed theory of merger waves which happen as a consequence of increased number of overvalued firms in stock market boom. Managers of an overvalued firm follow interests of its shareholders when they engage in acquisition because in that way the firm realizes lower long-run negative stock returns (when acquisition is not undertaken market adapts its expectations about incorrect valuation and the share price falls sharply). Target's managers agree to stock merger despite long-term unprofitable outcomes for its shareholders seeing that

[104] Harford (2005), p.546
[105] Harford (2005), p.548
[106] Harford (2005), p.549
[107] Gugler et al. (2012), pp.3-4

target shareholders can gain in short-run when they sell the shares they obtained from bidder. This transaction is very convenient for shareholders who want to cash out. Second reason for accepting the bid offer is that target management is fairly paid through stock options, severance pay or keeping targets managers in top positions making their equity more valuable in long-run[108].

On the other hand, Rhodes-Kropf and Viswanathan (2004) indicates other reason why target are willing to agree to merger offer. Targets have only private information about its own value and are aware of the fact that there may be misvaluation due to a firm-specific and market-wide component. Due to this fact target wants to evaluate the synergies flowing from merger and on the basis of positive assessment it accepts an offer. The first step is to filter out market-wide misvaluation effect and then accessing of synergies follows. In the period of high overvaluation in the market there is higher estimation error associated with the synergy therefore a target may underestimate the shared component of misvaluation and consequently overestimate the synergy effect[109]. Other interesting implication is that "within-sector mergers are more likely to occur in overvalued sectors than in undervalued sectors. Furthermore, on average, overvalued sectors will purchase firms in relatively undervalued sectors."[110] This may suggest that vertical mergers (or conglomerate mergers) will occur more often between overvalued and undervalued sectors.

When testing the overvalued shares theory it is important to determine a measure for overvaluation. Usually ratios of market to book value of equity are used as in Rhodes-Kropf et al. (2005). Market to book ratio can be decomposed into two parts i.e. market to value and value to book where the first part measures misvaluation. Therefore it is crucial to measure also value e.g. with sector-level, cross-sectional regressions of firm-level market equities[111]. Determination of overvaluation by researchers indicates that also capital market can identify overvalued firms what can lead to a subsequent adjustment in valuation.

3.2.5. Summary of merger theories

Empirical testing of the theories of merger waves came to different results supporting various theories. One of the most recent study, Gugler et al. (2012), tested all theories on both listed and unlisted companies. On the one hand, the q-theory of mergers and industry shocks theory would have the same impact on both types of firms (i.e. both will experience merger waves) and on other hand, the behavioral theories (managerial discretion theory and overvalued

[108] Shleifer, Vishny (2003), p.303
[109] Rhodes-Kropf, Viswanathan (2004), p.2687
[110] Rhodes-Kropf, Viswanathan (2004), p.2703
[111] Rhodes-Kropf et al. (2005), p.563

shares theory) will only influence the listed companies (i.e. merger activity of listed firms is positively associated with optimistic valuation on stock market, merger activity of unlisted firms is unrelated to stock market)[112]. There were found merger waves for listed firms in all three areas tested (US, UK and Continental Europe) although in different time periods (US from 1996 till 2000, UK from 1995 till 2001, Continental Europe from 1999 till 2001) and there was no evidence of merger waves of unlisted firms in any area[113]. This evidence supports the soundness of behavioral theories what is also proved by testing impact of the weighted average of P/E on merger activity measured by the assets acquired relative to the acquirer's total assets. There was found a negative effect of weighted average of P/E for unlisted firms and a positive effect with greater significance for listed companies (also predicted by behavioral theories)[114].

The further evidence is provided by Rhodes-Kropf et al. (2005) supporting behavioral theories. It was found that acquirers are priced higher than targets whereas large market to book ratio of equity is highly attributable to firm-specific error by acquirers suggesting that acquirers are more misvalued and also overvalued. These firms tend to buy less overvalued firms what supports behavioral theories[115]. Testing q-theory by means of effect of Q dispersion suggests that it can explain some of merger activity. However, when the sample is divided into two groups, low valuation and high valuation periods, the effect of Q dispersion is significant only in low valuation period. This fact leads to support of misvaluation theory instead of q-theory[116]. Further industry shocks theory was tested. The industry shocks theory can explain less of the merger activity at sector level than misvaluation theory (7% compared to 15%) and although 40% of the total dollar volume of merger activity happens during periods of economic shocks the highly overvalued bidders are responsible for 65% of merger activity[117]. Therefore behavioral theories have more explanatory power than other theories when examining merger waves.

4. M&A Regulation in the European Union

In the 1985, the European Commission came with the initiative of the development of Single European Market to sustain the economic expansion at the level of the American market. Afterwards in 1987 the Single European Act came into force and its main objective was to

[112] Gugler et al. (2012), pp.2-4
[113] Gugler et al. (2012), pp.7-8
[114] Gugler et al. (2012), p.9
[115] Rhodes-Kropf et al. (2005), p.563
[116] Rhodes-Kropf et al. (2005), p.598
[117] Rhodes-Kropf et al. (2005), p.599

gradually prepare legislation before the 1992's establishment of the single market[118]. The firms started to prepare themselves for the single market's arrival through the rising amount of cross-border mergers hence the effective regulation of mergers was needed[119]. In December 1989, the Council Regulation (EEC) Merger Control was passed and came into force in September 1990[120]. The European Commission intervenes in the cases of transactions which are defined as "concentration" in Article 3 of the Regulation 4064/89 and have a "Community dimension" as defined in Article 1. The concentration arises as defined in Article 3 where:

"(a) two or more previously independent undertakings merge, or

(b) one or more persons already controlling at least one undertaking, or

- one or more undertakings

acquire, whether by purchase of securities or assets, by contract or by any other means, direct or indirect control of the whole or parts of one or more other undertakings.

[...] The creation of a joint venture performing on a lasting basis all the functions of an autonomous economic entity, which does not give rise to coordination of the competitive behaviour of the parties amongst themselves or between them and the joint venture, shall constitute a concentration."

This means that mergers, acquisitions of control (fully or partially) and full-function joint ventures are subject to the overview of the Regulation when they are also exceedig the threshold of Community dimension which scope is defined in Article 1 and it is scored if:

„(a) the aggregate worldwide turnover of all the undertakings concerned is more than ECU[121] 5 000 million, and

(b) the aggregate Community-wide turnover of each of at least two of the undertakings concerned is more than ECU 250 million,

unless each of the undertakings concerned achieves more than two-thirds of its aggregate Community-wide turnover within one and the same Member State."

Through the implementation of the merger control on the European level the importance of national competition authorities was reduced. In June 1997, the regulation amending the

[118] http://europa.eu/abc/12lessons/lesson_6/index_en.htm, accessed on 5.6.2012
[119] Morgan (2001), p.451
[120] Council Regulation (EEC) No 4064/89 of 21 December on the control of concentration between undertakings.
[121] ECU (European Currency Unit) was replaced by Euro in 1999

previous one was passed and came into force in March 1998[122]. The important change was in the definition of Community dimension in that way there was added the second threshold to the previous one mentioned above, hence a concentration has a Community dimension when:

"(a) the combined aggregate worldwide turnover of all the undertakings concerned is more than EUR 2 500 million;

(b) in each of at least three Member States, the combined aggregate turnover of all the undertakings concerned is more than EUR 100 million;

(c) in each of at least three Member States included for the purpose of point (b), the aggregate turnover of each of at least two of the undertakings concerned is more than EUR 25 million; and

(d) the aggregate Community-wide turnover of each of at least two of the undertakings concerned is more than EUR 100 million;

unless each of the undertakings concerned achieves more than two-thirds of its aggregate Community-wide turnover within one and the same Member State."

This definition also includes the firms which are originally not from the Member states but their turnover is sufficiently high in the European Union. Therefore some of the transactions are subject to the other jurisdiction than just the European Commission Regulation. The well-known case of the combination of two US companies Generic Electric and Honeywell is the good example of different perception of the competition legislation's enforcement. The proposed merger was approved by the US authorities but was banned by the European Commission due to its establishment of dominant position in the market through vertical integration (i.e. the market strength of General Electric in the market for leasing service can be used to "leverage" market strength of Honeywell in the supplying of airlines) and bundling (i.e. General Electric could make the sale of its avionics and non-avionics products dependent on the buying of related Honeywell's engines)[123],[124].

Currently the Regulation from the year 2004 is in the force[125] where the process of examination of undertakings is described. Transactions which meet the definitions of concentrations and have a Community dimension are according to Article 4 obliged to notify to the Commission before their implementation. After the Commission has obtained complete notification it has 25 working days to decide if the transaction falls into the scope of the

[122] Council Regulation (EC) No 1310/97 of 30 June 1997

[123] http://www.euractiv.com/competition/ecj-gehoneywell-merger-ban-stands-commission-errors/article-150887, accessed on 5.6.2012

[124] Grant, Neven (2005), pp.597-598

[125] Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentration between undertakings

Regulation and whether it is compatible with the common market. The possible outcomes of this first phase are defined in Article 6 and they are summarized as followed:

- Art.6.1.a: the transaction does not fall in scope of the Regulation therefore it has not to be reviewed
- Art.6.1.b: the transaction falls in scope of the Regulation but it is compatible with the common market therefore no need for the review of the case
- Art.6.1.c: the transaction falls in scope of the Regulation and it raises serious doubts about compatibility with common market, followed by the initiation of proceedings
- Art.6.2: the transaction follows the modification in order to diminish doubts about compatibility with the common market

If the transaction falls into scope of the Article 6.1.c the decision shall be taken within 90 working days (Art.10.3) after the initiation of proceedings. At the end of this phase, the Commission can decide in the following ways as defined in Article 8:

- Art.8.1: the transaction is declared compatible since it would not significantly impede effective competition in the common market or in a substantial part of it as defined in Art.2.2
- Art.8.2: the transaction is declared compatible after the modification leading to the advanced effective competition
- Art.8.3: the transaction is declared incompatible with the common market since it would significantly impede effective competition in the common market as a result of the creation or strengthening of a dominant position as defined in Art.2.3

The investigation of the European Commission after 1990 concentrated on the prohibition of transactions which *create or strengthen a dominant position* as defined in Art.2.3 of the Regulation No 4064/89 and after 2004 on transactions which *significantly impede effective competition* as defined in Art.2.3 of the Regulation No 139/2004. This change should enable the challenge of mergers with multi-firm unilateral effects[126]. However, the amount of the initiated proceedings has not risen substantially after 2004. Further, from statistics of EC Merger Regulation till May 2012 can be seen that about 88% of all notified cases were compatible with the common market or out of scope of the Regulation. Only 55.5% of the cases in the second phase were declared compatible with commitments (i.e. modification is needed to be

[126] Bergman et al. (2010), p.10

undertaken). Finally, there were only 22 cases that were prohibited by the European Commission[127].

The effectiveness of merger control decision in the EU was assessed by Duso et al. (2011). They found out that the remedies in merger control decisions were increasingly used both in the EU and the US. However, from 2001 till 2003 the prohibitions have been intense in the US unlike in the EU[128]. The effectiveness of merger control is measured by the negative relationship between decision cumulative average abnormal returns (CAARs) and announcement CAARs which is induced by the assumption that anticompetitive returns (e.g. the increased market share) generated by merger around the merger announcement should be decreased by the authority decision. On the overall, remedies are only partially effective with the higher effectiveness when the anticompetitive concerns are not too severe and when they are applied in the first investigation phase rather than in the second one[129]. Interestingly, the probability of prohibition or the use of remedies is significantly negatively correlated when the one or both merging firms are from the US and on the contrary the probability of action significantly rises when there are vertical or conglomerate concerns, with the size of rival firms and when the firms operate in manufacturing[130].

The overview of the EC merger control showed that the need for regulation evolved with the time and the increased amount of M&A deals. The number of prohibited transactions persists low since there is the trend of deregulation and increasing trust for efficient markets. However, the efficiency of merger control stays uncertain and the increasing use of remedies may not be effective especially in the case of complex deals.

5. Literature Review and Hypotheses Development

5.1. Relevant literature

This section overviews the literature connected to the empirical research in this work with emphasis on the recent literature and points out the gaps in the standing M&A literature. The most important and interesting works are discussed in detail.

Firstly, the literature confirmed the industry clustering in the merger activity (Harford (2005), Andrade, Stafford (2004)) suggesting the specific industries constitute the majority of the

[127] See Appendix A: Statistics of EC Merger Regulation till May 2012
[128] Duso et al. (2011), p.981
[129] Duso et al. (2011), p.981
[130] Duso et al. (2011), p.992

M&A activity. For example, Mitchell, Mulherin (1996) lists which industries specifically were responsible for the takeover activity, the most active sectors during time period of 1993-1994 in the US were banking & finance, broadcasting & communications and leisure & entertainment[131]. However, the explanation of the M&A activity is supported rather by the broad industry shocks than by specific industry shocks such as deregulation, energy dependence, import vulnerability and R&D/sales when considering explanatory power[132]. The industry shocks, as the determinant of M&A activity, are also confirmed in other papers especially the ones trying to explain merger waves (Harford (2005), Andrade, Stafford (2004), Rhodes-Kropf et al. (2005)). Nevertheless, the research neglects the individual characteristics of industries as the measure of industry clustering or merger wave.

Secondly, the research seems to dispraise the various types of mergers, namely horizontal, vertical and conglomerate mergers. Often it is not distinguished among them (Harford (2005)) or there is simplified differentiation only between mergers within an industry and mergers between different industries (Andrade et al. (2001), Andrade, Stafford (2004), Bernile at al. (2007)) suggesting that to vertical and conglomerate mergers is not devoted enough consideration. The study of Fan, Goyal (2006) investigated vertical mergers and found that vertical merger activity was intense in 1980s and 1990s and leaded to positive wealth effects surpassing the conglomerate mergers along with being comparable to horizontal mergers[133]. Further, vertical mergers do not cluster in a specific set of industries but they are apparent in different individual industries such as medical and transportation equipment in 1990s[134].

Thirdly, the recent literature dedicates research to the specific industries and their M&A activity. Muehlfeld et al. (2011) showed that the majority of cases happened within food processing industry i.e. vastly characterization of industry by horizontal mergers leading to increasing concentration in this industry[135]. Rhéaume, Bhabra (2008) found that five traditional information industries (communications, publishing, computing, entertainment and electronics) engage more in related acquisitions i.e. horizontal M&A than unrelated acquisitions in contrary to the expectation that due to the technological uncertainty the unrelated M&A would dominate[136]. The most interesting results showed the study by Madura et al. (2012). They found that merger premiums are larger when industry is characterized by higher industry concentration,

[131] Mitchell, Mulherin (1996), p.195
[132] Mitchell, Mulherin (1996), p. 218
[133] Fan, Goyal (2006), p.877
[134] Fan, Goyal (2006), p.879
[135] Muehlfeld et al. (2011), p.470
[136] Rhéaume, Bhabra (2008), p.310

intensive research and development expenses and smaller dispersion of Tobin's q[137]. They looked also on the industries individually (namely banks, other financials, transportation and communications, retail trade, manufacturing, services and mining) and found out that merger premiums vary substantially across the industries for example mean premium for services was 41% and for mining only 28%[138]. Interestingly manufacturing industries, which scored the third best merger premium, were characterized by the largest amount of R&D and ranked the second in industry concentration confirming the positive impact of R&D and industry concentration on merger premiums.

Andrade et al. (2001) have made one of the most important and extensive empirical study about mergers. They focused on two facts; that mergers occur in waves and clustering by industry in merger activity. The research was made on the US based firms (both acquirer and target) which are listed on important American stock exchange markets (NYSE, AMEX and NASDAQ)[139]. The three major merger waves were confirmed; 1960s, 1980s and 1990s. In the 1960s there were far more deals than in 1980s but in dollar terms 1980s the deals were much bigger. The 1990s period was even more dramatic with large number of deals and large value[140]. Other interesting fact is that there is the rise in the share of horizontal mergers (defined at 2-digit SIC code) from 1970s till 1990s (from 29.9% to 47.8% out of all mergers)[141]. Clustering of industries was identified by assessment of top five industries ranked by merger value for each decade; in 1990s the most active industries were metal mining, media and telecommunication, banking, real estate and hotels. It is notable that most prevalent industries differ from decade to decade (especially in 1980s and 1990s)[142]. The existence of merger waves and their different composition in terms of industries suggest that merger activity may occur due to industry level shocks as technological shocks, supply shocks and deregulation. This fact was tested by means of identification of deregulation event. After determination of the industries having undergone deregulation the deregulation window was defined (three years before the event and six years after). The findings were consistent with clustering of industries where banking and telecommunications were deregulated and belonged to the most active industries in 1990s. The contribution of deregulated industries in total deal volume rose substantially after 1988 to the half of the deals and it remained higher than in period before this year[143].

[137] Madura et al. (2012), p.49
[138] Madura et al. (2012), p.53
[139] Andrade et al. (2001), p.104
[140] Andrade et al. (2001), p.105
[141] Andrade et al. (2001), p.106
[142] Andrade er al. (2001), p.107
[143] Andrade et al. (2001), p.108

The further study of Andrade and Stafford (2004) investigates the role of M&A and internal corporate investment at the industry and firm levels. The firm's intention to grow and expand can be facilitated by mergers or internal corporate investment and the firm should decide between these ways wisely by considering their net benefits[144]. Further, the mergers can have two roles; expansionary and contractionary. The expansion can take a form of industry-wide one when firms try to increase their size and scale. The contraction happens when mergers occur within one industry what leads to removed duplicate functions and rationalized operations. Therefore the research explores the occurrence of the both types of mergers over time and industries and also determinants of mergers and internal corporate investment[145]. The sample consists of mergers between CRPS-listed firms between 1970 and 1994 when controlling interest (more then 50%) of the firm is acquired[146]. The strong merger activity's clustering over the time of acquirer's industry was registered, 50% of the industry's merger activity occurred within 5 year sub-period[147]. The clustering for internal capital investment was not proved. Results showed that mergers within an industry and diversifying mergers (i.e. merger between firms in different industries) are not correlated (i.e. they are different in their process and determinants) and particularly that own-industry mergers (i.e. horizontal mergers) affect the whole industry and they are induced by industry shocks and excess capacity[148]. Further, the acquirers in horizontal mergers are better performers (they have higher cash flows, higher q, more debt capacity) and these mergers have potential of the greatest gains[149]. The study confirms previous findings of positive effect of deregulation on merger activity and that mergers after 1990 are motivated by the expansion and optimism of industries' performance.

The industry-wide economic shocks are considered as one of the reasons for merging. Bernile et al. (2007) examined one of these shocks- how industry demand shock affects firms' strategic incentives to merge horizontally. The proposed model predicts that in two extreme periods, industry's expansion and industry's recession, the decision of the incumbents to merge does not have a great impact on entry decision of potential entrants therefore the incumbents decide to merge because of the increased post-merger profits. In the expansion potential entrants profit from high value of entry option and in the recession they have no incentive to enter regardless of the incumbents' decision to merge. On the other hand, in intermediate states the incumbents deter entry by not merging since a horizontal merger leads to the reduced

[144] Andrade, Stafford (2004), pp.1-2
[145] Andrade, Stafford (2004), p.2
[146] Andrade, Stafford (2004), p.4
[147] Andrade, Stafford (2004), p.8
[148] Andrade, Stafford (2004), p.16
[149] Andrade, Stafford (2004), p.28

competitiveness of industry, one of the incentives to enter for potential entrants. The empirical analysis on the US based deals from 1981 till 2004 showed that there were 12,269 horizontal mergers (both bidder and target operated in the same Fama-French industry[150]) in the sample[151], almost 58% of all completed mergers. As the most active industries appeared candy and soda, healthcare, shipbuilding and railroad equipment, coal and banking. The most active years were the years 1996, 1998, 1999 and 2000[152]. These findings confirm merger waves and industry clustering in merger activity. Furthermore, the results of empirical research affirmed the proposed model. The relation between merger intensities (dependent variable) and demand shocks measured by the median annual sales growth within the industry for each year (independent variable) is examined through regression to confirm U-shaped relationship, i.e. positive coefficient on squared sales growth and negative coefficient on sales growth[153]. On the sample of horizontal mergers the U-shaped relation is highly statistically significant and economically meaningful. On the other hand, conglomerate mergers (i.e. the difference between all completed mergers and horizontal mergers) are not influenced by the industry demand shocks[154]. Further, the relation is confirmed on the subsample of relatively concentrated industries measured both by high Herfindahl indexes and above-median number of firms (not confirmed on the subsample of competitive industries)[155]. To other interesting results belongs that deregulatory event has positive impact on horizontal merger intensity and negative influence on conglomerate mergers although these relations are not statistically significant and economic shock appears to have higher impact on relatively competitive industries than on concentrated industries acknowledged by increased coefficient and significance[156]. Overall, the evidence supports the view that firms engage more in horizontal mergers during periods of positive and negative demand shocks[157] and strategic motives are important by firm's decision to undergo merger[158]. However, this research distinguishes only between horizontal and conglomerate mergers and does not mention vertical mergers. It would be interesting to see the relation between vertical merger intensity and industry demand shock.

[150] Fama, French (1997)
[151] Bernile at al. (2007), p.23
[152] Bernile et al. (2007), p.44
[153] Bernile et al. (2007), p..27
[154] Bernile et al. (2007), p.28
[155] Bernile et al. (2007), p.29
[156] Bernile et al. (2007), p.46
[157] Bernile et al. (2007), p. 30
[158] Bernile et al. (2007), p. 31

5.2. Hypotheses

In this section the formulation of hypotheses connected to the research questions and the previous literature is presented. The research is constructed in order to answer question "Do the different M&A types cluster by specific industries?". The previous literature showed that there is evidence that merger activity clusters by industries (Harford (2005); Andrade, Stafford (2004)) but less consideration was dedicated to the fact if they cluster also according to the M&A types i.e. if horizontal (or vertical or conglomerate) M&A are characterized by specific industries. It is assumed that clustering will be confirmed also in the relationship to the different merger types therefore the second important question is "Which characteristics of industries have effect on the occurrence of specific M&A types?". This question is connected to motives of merger activity and also theories of merger waves. From that the four important industry characteristics are explored in connection with the existing theory: overvaluation of assets, asset specificity, industry deregulation and industry concentration. Hypotheses cover all types of M&A in order to fill in a gap in literature with consistent research. In the end the control hypothesis, which is not connected to the industry characteristics, is formulated in order to see if there can be also other determinants of M&A types besides industries' characteristics.

The empirical research in this thesis covers the fifth wave which was mainly characterized by mega deals all over the world not just in the US. The M&A activity was motivated particularly by deregulation trend, technological changes and the positive situation on the capital market. In order to confirm if these motives really were present for the researched sample are formulated various hypotheses. Generally, the dominance of horizontal mergers over vertical and conglomerate mergers is to be expected and their ratio will rise over the years as it was documented in Andrade et al. (2001)[159]. This is also influenced by the fact that horizontal mergers have the greatest potential to increase the performance of the combined firm either through the operating synergies and the reaping of the larger market share. Vertical mergers can manage to achieve synergies of vertical integration since the firms avoid the costly negotiations regarding their supplier-buyer contracts. Conglomerate mergers are motivated by the diversification and risk reduction which are not always the most advantageous motives and the potential for the growth of combined firm is constrained. This discussion leads to the first hypothesis:

[159] Andrade et al. (2001), p.106

Hypothesis 1: Horizontal mergers will occur most frequently, then vertical mergers will follow and finally conglomerate mergers will occur least often. Sub hypothesis 1a: The occurrence of horizontal mergers will rise over the years.

One of the most reliable theories explaining the merger waves the overvalued shares theory (Shleifer, Vishny (2003), Rhodes-Kropf, Viswanathan (2004), Rhodes-Kropf et al. (2005)) suggests that in the time of the optimism in the stock market the amount of M&A is increasing. The managers of overvalued firms tend to engage in acquisitions to benefit from the positive situation. Target firms have to access the misvaluation due the positive market situation and the possible synergy flowing out of the merger in the decision process of accepting the offer. Further, the M&A between firms in the same industry tend to occur more in overvalued sectors and M&A between firms in different industries will be characterized by the acquirer from overvalued sector and target from relatively undervalued sector[160]. This means that horizontal mergers should occur more often in overvalued sectors and on the other hand, vertical and conglomerate mergers should occur between overvalued and undervalued sectors. However, the misvaluation can be considered as the dubious motive for M&A since there could come to the overestimation of the own stock's overvaluation and subsequent lower performance of the combined firm than anticipated. Especially, in the case of conglomerate merger there might be higher estimation error since it happens between two unrelated firms and they do not posses enough information about each other. Therefore, the positive development on the capital market should be not the only motive justifying the deal and other considerations should be taken in account. From the discussion in this paragraph the consequent hypothesis can be specified:

Hypothesis 2: Horizontal mergers will occur more often in the overvalued sectors than in the undervalued sectors. Sub hypothesis 2a: Vertical and conglomerate mergers will occur more often between the overvalued and undervalued sectors.

According to the transaction cost approach (Coase (1937), Williamson (1971)) the firm has to face different transaction costs when it does not provide inputs within the firm. Obtaining of the goods and service through the market can be costly due to searching and information costs (i.e. to find the firm to deal with and determine on which terms it wants deal), negotiation and bargaining costs; the costs of formulating of the contract and afterwards enforcement costs[161]. Further the contracts might consist of restrictive limits which need to be followed and the

[160] Rhodes-Kropf, Viswanathan (2004), p.2703
[161] Coase (1960), p.15

supplier desires the long-term contracts due to risk avoidance what may be not beneficial for the acquirer since he will lose some of the flexibility[162]. Therefore it is natural that the firms want to engage in vertical integration i.e. organize internally not only because of operating synergies but also the external market might not be efficient due to the transactional costs[163]. This is especially true when the firm deals with highly specific assets and it is harder to find the trustable supplier who will be willing to invest in specialized capital and sustain the long-term relationship[164]. In the case of high asset specificity it is very beneficial for the firm to organize internally because of the accessibility of economies of scale[165]. The expediency of vertical integration increases when both firms engaging in the transaction rely on specific assets. As the measure for the asset specificity the amount of the research and development (R&D) can be used and it should have a positive influence on vertical integration[166]. Shelanski and Klein (1995) lists also other empirical studies which used R&D as the proxy for the asset specificity and other possible measures such as complexity, worker-specific knowledge or physical proximity[167]. Following this thinking when vertical M&A are considered as the proxy for vertical integration the following hypothesis can be formulated:

Hypothesis 3: The occurrence of vertical mergers will be higher if acquirer or target is R&D intensive. Sub hypothesis 3a: The even higher occurrence of vertical mergers will be observable if the both acquirer and target are R&D intensive.

One of the theories explaining the merger waves lists deregulation as the main determinant of them. Harford (2005) found out positive and strongly significant influence of deregulation on the beginning of the wave along with economic shock and capital liquidity[168]. Empirical study was made on the US mergers but similar results can be expected for the European ones. Further, Andrade and Stafford (2004) confirmed the positive effect of deregulation on merger activity. The main motive driving the firms is the strategic realignment to the regulatory change i.e. the external motivation and we could see this driving force mainly during the fifth wave from 1993 till 2000 and also by the last wave since there is the trend to continuous deregulation; in the EU it is the move to the Single Market also supported by competition policy. The important was also the transfer from the third wave to the fourth wave.

[162] Coase (1937), p.391
[163] Williamson (1971), p.112
[164] Williamson (1979), p.240-241
[165] Williamson (1979), p.252
[166] Levy (1985), p.439
[167] Shelanski, Klein (1995), p.338
[168] Harford (2005), p.547

The third wave was characterized by the large amount of conglomerate M&A due to the strict antitrust regulation and less developed external markets. On the contrary, the fourth wave was characterized by the relaxation of the antitrust policies and the evolution of efficient capital markets what leaded to the divestitures in conglomerate mergers and the return to specialization, i.e. horizontal mergers. Therefore the deregulation can be held also as the main factor of the transfer from diversification to the specialization. Further, in the previous study it was found that deregulation event has positive impact on occurrence of horizontal mergers but not on the conglomerate mergers[169]. The following consistent hypothesis can be formulated:

Hypothesis 4: The occurrence of mergers will increase in the affected industries after deregulatory event. Sub hypothesis 4a: The occurrence of horizontal mergers will increase more than the occurrence of conglomerate mergers in the affected industries after deregulatory event.

One of the important drivers for the mergers is the need for the market power. With that is connected the concentration on the market which is indeed the result of the allocation of market power. Firstly, the market power is in some extent motive for horizontal mergers. This was the case in the first wave and leaded to increased concentration on the market. Also it raised antitrust concerns what leads us to the assumption that it is easier for firms to engage in horizontal mergers in the competitive markets because they can increase their market share without competition authorities' action. On the other hand, if the vertical or conglomerate mergers are motivated by the increase in the market power there must be one important presumption in order to properly achieve it, the concentration on the market. If these types were undertaken in the competitive market there would be not substantial effect on their market power; in order to reach the market they have to be rather pursued in oligopolistically structured market[170] i.e. less competitive markets. There are also other reasons why in less competitive market it is better to engage in vertical mergers. Firstly, it is the possibility of the market foreclosure which leads to the increased market share of the engaging firms and subsequently augmented profits. Basically, it means if two suppliers merge and they decide to supply inputs only to its downstream division there is less competition prevailing for the rest of the suppliers and they can increase their prices. For downstream firms the prices of inputs are increase hence their costs are augmented and they are forced to increase their prices for the final consumers. The merged company does not face the increased input prices and therefore they can increase their market share on the final market by sustaining the lower prices what in the end effect means they

[169] Bernile et al. (2007), p.46
[170] Stewart et al. (1984), p.297

have higher profits than non-merging firms[171]. This positive effect of market foreclosure is even more positive when the original setting on the market is less-competitive. Further, if the downstream firms are perfect substitutes i.e. market concentration is low and the upstream firms engage in the monopoly or there is only one supplier i.e. high market concentration the vertical integration leads to the maximized profits. This holds because the integrated upstream and downstream firm forecloses the rest of the downstream firms which are forced to leave market and the remaining firm yields the whole profit[172] (vice versa it holds that vertical integration occurs from the more competitive upstream firms to less competitive downstream firms[173]). Therefore the vertical integration is more advantageous if it takes place between less competitive firms and highly competitive firms. This discussion leads to the following hypothesis:

Hypothesis 5: The occurrence of the vertical and conglomerate mergers will be higher than occurrence of the horizontal mergers if they will be undertaken between less competitive industries. Sub hypothesis 5a: The occurrence of vertical mergers will be even higher if these mergers will be undertaken between less competitive and more competitive industries.

Each type of merger is characterized by the different level of industry relatedness due to the combination of engaging industries. Horizontal mergers occur within the same industry therefore the acquirer and the target posses the same industry characteristics[174]. However, vertical and conglomerate mergers are undertaken between different industries and their characteristics might differ. Although these differences, which constitute the unrelated diversification, decrease the performance of the combined firm this negative outcome can be mitigated by the reaching of economies of scope. The economies of scope are likely to be largest when they occur between R&D intensive firms[175]. Further, conglomerate mergers are more motivated by diversification and risk reduction than by market power motive as it is the case of horizontal mergers hence the occurrence of conglomerate mergers might not depend on the relatedness of industry concentration[176]. This reasoning holds for the vertical[177] and conglomerate mergers but since the conglomerate mergers are characterized by higher level of unrelated diversification and are motivated by less rational motives there should be a difference between these two types of mergers. Conglomerate deals should be undertaken between firms

[171] Ordover et al. (1990), pp.127-128
[172] DeFontenay, Gans (2005), p.557
[173] DeFontenay, Gans (2005), p.545
[174] Stewart et al. (1984), p.302
[175] Stewart et al. (1984), p.298
[176] Stewart et al. (1984), p.304
[177] See Hypothesis 3 and 5

characterized by the higher differences in underlying industry characteristics than the vertical mergers especially when regarding the level of asset specificity. On the other hand, since vertical mergers should occur more often between high and low concentration industries conglomerate mergers should follow this pattern less often (same reasoning is applied to level of valuation). Concluding from the discussion the following hypothesis can be formulated:

Hypothesis 6: Conglomerate mergers will occur between firms with greater level of difference in industry characteristics in terms of R&D intensity than vertical mergers. Sub hypothesis 6a: Conglomerate mergers will occur more often between the industries with comparable level of concentration and valuation.

The following paragraph discusses the relationship between the type of M&A and the type of strategic combination according to the degree of integration and control. The firms engage in various deals in order to reach the desired level of control and integration. For example, when the low level of control or integration is needed to increase the performance the firms engage in minority ownership, on the other hand sometimes the full integration is necessary then the majority ownership is applied. Generally, it can be stated that if the firm wants to maximize the gain from merger, when there is benefit from realizing the synergy and the price is right, it should acquire the whole target[178]. However sometimes partial acquisitions can be more beneficial than full acquisitions, especially in the case if the acquisition price is too high and the realized synergies are low[179]. Horizontal transactions have the greatest potential for realizing the synergies; net wealth gains are significantly higher for related mergers rather than for conglomerate mergers[180]. This suggests that since horizontal mergers produce more synergies there will be higher incentive to engage in full acquisitions although the acquisition price is high. Further vertical and conglomerate mergers are connected with higher coordination costs due to the substantial differences between merging firms therefore it is beneficial for them to engage in partial acquisitions which do not require the costly full integration. The specific consideration is connected with joint ventures suggesting that horizontal JVs are synergy orientated[181] and vertical JVs are oriented as complexity and uncertainty avoiding[182]. Vertical JVs have significantly higher positive valuation effects than horizontal JVs (but only 2.02% when

[178] Roy (1985), p.16
[179] Roy (1985), p.20
[180] Nail et al. (1998), p.100
[181] Johnson, Houston (2000), p.71
[182] Johnson, Houston (2000), p.72

measured by mean excess return)[183]. Finally, the greater the asset specificity it is more beneficial for firms to underwrite the full contract[184] suggesting the positive relationship between R&D intensive industries and the type of strategic combination. This discussion is concentrating on the possible relationship between the type of merger and the type of strategic combination. Its aim is to control the other effects besides the impact of the industry characteristics on the type of merger. The following hypotheses can be formulated:

Hypothesis 7: The highly integrated type of deals will be more characterized by horizontal M&A and on the other hand, the less integrated type of deals will be more characterized by vertical and conglomerate M&A. Sub hypothesis 7a: There will be more vertical JVs than other types of JVs. Sub hypothesis 7b: The industries with highly specific assets will engage more in the highly integrated type of deal.

Theoretical part of the thesis was closed by formulating hypotheses. In the empirical part the data will be described and how the hypotheses were measured. Afterwards the results of the research will be presented and the hypotheses will be confirmed or rejected with subsequent discussion of implications on the M&A activity and further research.

6. Empirical Analysis

6.1. Data

For the research the data from the public domain DOME Database were used. The acronym DOME stands for Database on Mergers in Europe compiled at the Kiel Institute for World Economics. Its current version consists of merger cases under examination by the European Commission since 1990 until December 31st, 2000. The database includes various information about 1515 cases like the date of the announcement, information about acquiring company, target and the selling company as well as the transaction value (if disclosed). The other important information is classification of deal (majority ownership, joint venture, minority ownership and pure merger) since all these deals leaded to indirect control of the company and were notified at the European Commission as merger cases. Furthermore some notes are also

[183] Johnson, Houston (2000), p.78
[184] Williamson (1979), p.252

given like methods of payment, the further development after the merger and possible reasons for the transaction as additional information[185].

The European Union controls and regulates mergers through the European Commission Directorate-General for Competition. Not all business cases are reviewed by the European Commission, only merger cases exceeding specific threshold i.e. Community dimension need to be notified and then examined by the control organ (see the section of M&A regulation in the EU). The regulation leads to the fact that in the merger database the large transaction mergers are over-represented however these undertakings are one of the most important cases with strong effect on the market. The second consideration about data is that sample consists mainly of companies from large European countries although the acquirers companies are also from the US and Switzerland[186]. On the other hand, this enables the exploring of the undertakings in the same environment avoiding the differences in the way of doing business.

In the research it was focused on information about buyer and target companies, especially in which sectors they are/were operating. Many cases involved more than one acquiring company; in this case industry sectors for all acquirers were taken in account in defining the type of merger. DOME database has taken information on sectors of concerned companies either from the European Commission or the Worldscope database which compiles annual report data of large corporations to provide coherent information about their business and key financial ratios. However, companies, which do not exist as an independent legal unit, are removed from Worldscope database[187] therefore there were some merger cases in the DOME database where the sector information about buyer and target companies was missing. In these cases I used various internet sources with help of the company name to find out the sector of its business. As additional information the classification of deal (majority ownership, joint venture etc) was observed to examine if this characteristics has some impact on occurrence of horizontal, vertical and conglomerate undertakings between companies.

The first step was to determine the type of M&A (i.e. horizontal, vertical and conglomerate type) for each case. In the literature it is often used the simplified distinguishing between these types when horizontal M&A is held as the principal type and other transactions are not further differentiated into vertical and conglomerate types. For example, Andrade et al. (2001) defined own industry deals (i.e. both parties are operating in the same industry defined at

[185] http://www.ifw-kiel.de/academy/data-bases/dome_e/database-on-mergers-in-europe-dome/ accessed on 24.2.2012
[186] Hammermann, Kleinert (2004), p.8
[187] Hammermann, Kleinert (2004), p.5

2-digit SIC code level[188]) and Bernile et al. (2007) distinguished between horizontal merger (i.e. the bidder and target are operating in the same Fama-French[189] industry[190]) and conglomerate merger (i.e. other deals). The identification of vertical M&A type seems to be the most problematic. Fan, Goyal (2006) constructed the framework measuring vertical integration through input-output linkages. For each pair of industries *i* and *j*, the dollar value of industry *i*'s output required to produce one dollar's worth of industry *j*'s output was computed, afterwards the same calculation was made conversely (i.e. industry *i*'s input requirement of industry *j*'s output) and the maximum of these coefficients was taken as the opportunity measure for vertical integration between the pair of industries[191]. Mergers were classified as vertical if this opportunity coefficient was greater than 5% respectively 1%[192]. Alternatively, vertical relationship can be classified subjectively on the basis of the accessible information and the nature of the firms as it was done in Johnson, Houston (2000). In the research the similar principles to input-output linkages were used. Horizontal merger was observed when both acquirer and target were from the same industry and if there were more acquiring companies all of them had to correspond to target's industry. For the detecting vertical merger the symmetric input-output table at basic prices including domestic output and imports for the year 2000 in the Euro area compiled at Eurostat was used[193] including classification of sector data used in DOME database to the right NACE category used by Eurostat. The data from 2000 were used for the whole sample since data from the previous years are not accessible but this relationship between industries is assumed to be stable over time and regions (i.e. table for the European Union 27 member states showed similar relationship without great differences at the selected cutoff). Vertical linkage between industries *A* and *B* was detected if the input of industry *A* contributed more than 5% to the total input of products needed for production of industry *B* (the same is valid vice versa i.e. if industry *A* utilizes in its production input of industry *B* counting for more than 5% of total inputs needed). Some of the industries have many vertical linkages such as construction (vertical linkages with 25 other sectors) or business service (vertical linkages with 13 other sectors). On the contrary, some industries have a small potential for engaging in vertical merger and they concentrate on business within its own industry such as agriculture and wood

[188] Andrade et al. (2001), pp. 106-107
[189] Fama, French (1997), pp. 179-181
[190] Bernile et al. (2007), pp. 22-23
[191] Fan, Goyal (2006), p.881
[192] Fan, Goyal (2006), p.882
[193] http://epp.eurostat.ec.europa.eu/portal/page/portal/esa95_supply_use_input_tables/data/workbooks, accessed on 5.3.2012

sectors which have vertical linkages only with 2 other sectors[194]. The vertical merger occurred if it encompasses firms in sectors with vertical linkage and if there were more acquirers all of the firms have to incorporate vertical linkages among them (i.e. firm A's industry has to be vertical integrated with firm B and C's industry and at the same time firm B's industry must be vertical related to firm C's industry). Lastly, all other deals, which are not classified as horizontal or vertical, are categorized as conglomerate M&A. Special category in classifying the type of deal constituted three sectors: conglomerate, holding and investment holding. The main characteristics of firms involved in these sectors is that they encompass different firms possibly from different industries therefore the special regard has to be paid to categorization of such deals. In the case of deal occurrence between these specific sectors, also in the case of simultaneous appearing of more than one of these sectors in the case of the deal with more acquirers, and other sector or sectors these cases are classified as vertical deals (in the case of the deal with more acquirers all other sectors must be vertical related to be classified as vertical M&A). However, these deals could be also categorized as horizontal if conglomerate or holding encompasses a firm in the same industry like the combining firm (due to the high amount of these deals it is not possible to check each deal individually).

The next consideration in the research was paid to the calculation of occurrences of individual industries according to the type of M&A. Horizontal mergers involved the firms in one industry hence for each case of horizontal deal one occurrence for the appertaining industry was scored. In the case of vertical or conglomerate merger the firms are operating in different industries. When transaction was made between two firms for both firm's industries the one occurrence was scored. In the case of deal with more acquirers for each different industry one occurrence was counted e.g. if two acquirers were operating in the same industry the occurrence for this industry was calculated only once. This way both acquirer's and target's industries were taken into account and for each case the assignment of specific industry to particular type of M&A was reached.

The data about characteristics of industries in order to test the formulated hypotheses were collected from various sources. This part constituted the most difficult one since the most of data are collected on the firm-level and there is less information on industry-level which is important in order to form conclusions for M&A types' characterization by industries. The further problem represented the accessibility of data e.g. for specific time period or the lack of

[194] See Appendix B.1.

collecting of needed data by the European Union. Hence in the research it was attempted to use the most appropriate data occasionally with applying of the simplifying assumptions.

The first step was to determine the overvalued and undervalued sectors. The conventional measure for misvaluation is market-to-book ratio (M/B) and it was used in Rhodes-Kropf et al. (2005) or in Harford (2005). Market-to-book ratio, also called price-to-book ratio (PBV), is calculated by dividing the market value of equity by the book value of equity. If PBV is less than one it means that a firm is trading for less than its book value. This suggests that a firm is undervalued what can lead to two conclusions of investors, either the firm represents a good investment opportunity or there is fundamentally something wrong with the firm. Further the higher PBV means that the firm is more overvalued. When deciding which firm to acquire it is important to look on its individual valuation and performance but also how it is doing in comparison to its competitors and industry in which it is operating. Individual information about the firm can be taken from its annual report, financial statement or specialized business sites dedicated to investment research (e.g. Bloomberg). Information on industry-level is usually formed by computing the industry averages by taking into account individual firm information of firms operating in industry. Source of various valuation measures on industry-level is calculated and publicized by Aswath Damodaran, Professor of Finance at the Stern School of Business at New York University who wrote important books on equity valuation and corporate finance[195]. The data are updated regularly and they are available for several markets such as the US, Europe and Japan. For the US market there are recent data sets and also data from previous years. Unfortunately, for the European market there are data on industry-level only for recent period therefore for calculation of industry average of PBV the data on firm-level from year 2002 (the oldest available data set for European market) was taken[196]. Firstly, calculation required the matching of industry sectors used by Damodaran to industries used in DOME database. Damodaran used more specific sectors in comparison to DOME database therefore often industry defined by DOME database included more industries defined by Damodaran e.g. chemicals industry included Damodaran's chemicals-diversified, chemicals-fibers, chemicals-other and chemicals-specialty sectors. Secondly, since the data set provided data on individual firms the industry average needed to be calculated. By computing the industry average it is important to take into account the relative firm size to other firms in industry therefore as the proxy for firm size its sales was used (the information was included in the data set) since it is one

[195] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/biomission.html, accessed on 29.6.2012
[196] http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html, source of data sets, accessed on 26.6.2012

of the most common measures for firm size which is not biased by accounting manipulation[197]. Afterwards the weighted average of PBV per industry when considering firm size was calculated:

$$PBV_{industry} = \sum_{i=1}^{n} \frac{Sales_i}{\sum_{i=1}^{n} Sales_i} \times PBV_i$$

for n firms i belonging to specific industry

After calculating the industry averages for year 2002 they were compared to actual averages for European market from year 2011. The values are similar for the majority of industries and show significant medium correlation (further if the values are distributed to five categories more than 50% of industries are in the same category for two periods) although Wilcoxon signed-ranks test[198] proved that values for time periods are significantly different from each other, PBV average was significantly higher (Mdn= 1.76) in year 2002 than in year 2011 (Mdn= 1.58), T= 657.5, p< .05, r= -0.28[199]. However, the difference in medians is not very high and effect size is only medium. The significant difference can be caused by the more exact calculation of industry averages of PBV in year 2002 by looking on individual firms (for year 2011 industries averages were available) and the fact in year 2002 industries were more overvalued on the overall than in 2011. The table with PBV for each industry can be seen in Appendix B.2. and in Table 4 can be seen the classification of industries according to their PBV in 2002.

[197] Hirschley (2009), p.410
[198] Normality test did not prove the assumption of normal distributed data, Kolmogorov-Smirnov test showed that PBV average in year 2011, D= 0.16, p< .001, and PBV average in year 2002, D= 0.15, p< .01, were both significantly non-normal therefore non-parametric equivalent to paired-sample t-test Wilcoxon signed-ranked test was used to test the differences between PBV in year 2002 and 2011
[199] The underlying SPSS output can be seen in Appendix C.1.

Industries categories according to their valuation				
Undervalued	**Low overvalued**	**Low-medium overvalued**	**Medium overvalued**	**Highly overvalued**
PBV ≤ 1	*1<PBV≤2*	*2<PBV≤3*	*3<PBV≤4*	*PBV>4*
agriculture airline detergent business investment holding mining wood	automobile aviation banking catering trade chemicals construction defence distribution distribution durables distribution non-durables electronics electronics/IT Hardware finance furniture health / computers industrial machinery insurance oil packaging paper plastics primary metal industries real estate recycling retail stone, clay, glass etc telecommunication travel utilities	apparel and fabric products business services computers consultancy engineering entertainment environmental reclamation industrial manufacturing measuring instruments etc optics post publishing service transportation waste management	cosmetics food leather non-food retail software tobacco transport equipment	advertising health pharmaceuticals renting textile

Table 4: Categories of industries according to their EU PBV 2002

The next firm characteristic is its R&D intensity which can be held as the proxy for asset specificity[200]. On the firm-level it can be measured by ratio of R&D expenditures to sales i.e. the higher ratio means that the firm possesses more specific assets. On the industry-level the OECD classification according to technological intensity can be used. This classification takes into account direct and indirect R&D intensity. Direct R&D intensity measures production of technology i.e. the ratio of R&D expenditures to value added or production and indirect R&D intensity measures use of technology i.e. the ratio of R&D expenditures plus technology embodied in intermediates and capital goods to production[201]. Sectoral classification for

[200] See Hypothesis 3.
[201] OECD, STI Scoreboard 2003, p.146

manufacturing industries distinguishes four groups: 1.) high technology, 2.) medium-high technology, 3.) medium-low technology and 4.) low technology. The list of industries classified according to technological intensity updated in 2001 can be seen in Appendix B.3.. However, this classification overviews only manufacturing industries and there are also service sectors which use high technology intensively. Therefore OECD lists also "knowledge-intensive" services sectors since its introduction in 2001 STI Scoreboard. This classification similarly takes into account direct and indirect R&D expenditures and additionally to manufacturing industries workforce skills. The listed knowledge intensive sectors are post and telecommunications, finance and insurance and business activities not including real estate. Alternatively, for some countries education and health sectors are added[202,203]. The knowledge intensive industries are considered as one of the R&D intensive industries in the research since workforce skills represents highly specific asset of firms. After matching industries classification used by OECD (ISIC Rev.3) to industries used in DOME database the list of industries according to the R&D intensity was created as it can be seen in Table 5.

Technology level	Industries
Low-technology	Apparel and fabric products, textile, leather Food, tobacco Furniture Industrial manufacturing Paper, publishing, wood Recycling
Medium-low technology	Oil Plastics Primary metal industries Stone, clay, glass and concrete products
Medium-high technology	Automobile Electronics, electronics/IT hardware Chemicals, cosmetics, detergent business Industrial machinery Transport equipment
High technology	Aviation Pharmaceuticals Computers Telecommunications Measuring instruments, photographic goods, clocks; optics
Knowledge-intensive	Finance, insurance, banking Business services, service, consultancy, engineering, software, renting Post, health

Table 5: OECD classification based on R&D intensity adapted to DOME industries

[202] OECD, STI Scoreboard 2003, p.140
[203] See Appendix B.4.

The next step is to identify the deregulation events in the European Union in specific industries and their corresponding years of implementation. The European Union in attempt of unification of member states' markets into single European market in order to increase competitiveness of the whole union has been gradually introducing directions aimed on consolidation of individual laws. These directions influenced mainly industries which were protected by national laws and their competitiveness was restricted. As the main deregulated industries in the EU during 1990s were identified air transport, banking, insurance, telecommunications and utilities. In the US, almost the same industries were deregulated although the years of implementation of deregulation are different[204]. The reason for incremental differences between the US and European deregulation policies is that the EU is attempting to align its own policies with the US ones in order to sustain the competitiveness of the European firms vis-à-vis the US firms. In the next paragraphs the deregulation of different sectors is discussed in details and afterwards the Table 6 summarizes the deregulation events.

Air transport was gradually liberalized as the response to the US airline deregulation in 1970s in order to increase competitiveness of the European airlines towards the US airlines. The deregulation proceeded through three packages of regulations. The first package applicable since 1988 was aimed mainly on limitation of strict competition rules implied by Article 85 of EC Treaty which prohibits all agreements between undertakings affecting trade between member states. As the result agreements between air transport firms objecting at achieving technical improvements and cooperation were allowed[205]. The second package came into force in 1990 aimed primarily on air fares liberalization[206] and market access[207]. The first two packages contributed only incrementally to the promotion of competition therefore the third most important package was adopted in 1992 and implemented in 1993. Firstly, the transparent and non-discriminatory rules for obtaining license for air carriers within the EU was formulated with allowance to operate air carriers without obligation to own their own aircraft[208]. The second regulation aimed on provision of market access for European-based air carriers within the EU and before 1997 member states shall authorize cabotage traffic rights and shall not discriminate the air carriers from other member states[209]. Finally, the third regulation aimed on free setting of air fares by air carriers operating within the EU[210]. These regulations contributed to the creation

[204] Andrade et al. (2001), p.108
[205] Council Regulation (EEC) No 3975/87 Art.2
[206] Council Regulation (EEC) No 2342/90
[207] Council Regulation (EEC) No 2343/90
[208] Council Regulation (EEC) No 2407/92 Art.8
[209] Council Regulation (EEC) No 2408/92 Art.3
[210] Council Regulation (EEC) No 2409/92 Art.5

of single market for air transport removing the national rules by the year 1997 and enhanced international competitiveness of European air transport industry. Deregulation of air transport shall have the great impact on merger activity of airline industry after 1993 and afterwards in 1997.

Telecommunications industry was mainly operated as state monopoly in Europe till 1980s and was monitored on the member state level. The liberalization of telecommunications was inevitable in Europe in order to ensure competitiveness of Europe towards the US which had opened up some of its markets a decade ago. The first step to liberalization constituted the adoption of the "1987 Green Paper" by the European Commission which aim was the strengthening of European telecommunications through regulatory adjustments and the achieving of the Single market[211]. The actual deregulation was reached by the series of Commission Directives. In 1988, the first directive abolished special or exclusive rights granted by member state in terminal equipment market[212] in order to ensure the profiting from the technological advances through a free choice for customer. The subsequent directives prescribed the opening-up of different telecommunications markets: data services by the end of the year 1992[213], satellite communications by 1994[214], mobile communications by 1996[215] and voice telephony services by 1998[216]. The deregulation enabled full competition in telecommunications' markets and the creation of the single market by the beginning of the year 1998.

Banking sector was also deregulated as the part of transformation to the single European market. The single market requires free movement of capital which was based on three principles set by the 1985 White Paper: harmonization of rules (e.g. authorization and financial supervision), mutual recognition among regulatory authorities from different member states and home country control (i.e. supervising of the financial institution by its member state of origin)[217]. The first step to actual deregulation of banking sector was provided by the First Banking Directive of 1977 (this Directive comprises also other credit institutions such as insurance institutions) which aim was to eliminate differences between laws of member states. The important aspects of the directive were the principle of non-discrimination i.e. bank wishing to operate in one member state and having the head office in other member state shall underlie

[211] Green Paper (1987), p.2
[212] Commission Directive 88/301/EEC, Art.2
[213] Commission Directive 90/388/EEC, Art.3
[214] Commission Directive 94/46/EC, Art.2
[215] Commission Directive 96/2/EC, Art.1
[216] Commission Directive 96/19/EC, Art.1
[217] White Paper (1985), pp.27-28

the same authorization process as home-based banks[218] and the host-country supervision i.e. member state grants authorization to banks when underlying conditions are complied[219] and monitors the liquidity and solvency of banks[220]. However, the directive was not sufficient and banking sector remained highly regulated and had small potential for competitiveness. The more important was the Second Banking Directive of 1989 which objective was the granting of a single license recognized through the EU. Banks were not longer a subject to host-country supervision and the principle of home country control was introduced i.e. the supervision of banks is the responsibility of home country authorities[221]. The directive came into force in 1990 and its provisions (e.g. own funds and solvency ratio of credit institutions) have to be followed latest by the beginning of the year 1993[222]. The liberalization brought along with deregulated interest rates and removed capital controls by member states regulatory environment promoting free entry of foreign banks and competition in the industry[223]. The deregulation accommodated the base for the increased M&A activity in banking sector.

Insurance sector was gradually liberalized on the basis of the major EU principles i.e. the freedom of movement of capital, the freedom of establishment and the freedom of movement of services[224] through three generations of insurance directives. The first generation of insurance directives was issued in 1970s and enabled the European-based insurance firms to expand into member state's market with only permission of local authority. The second generations of directives came into force in 1988 and 1990 and the European firms gained permission to operate in member state without having to establish its own branch there. However, many restrictions persisted and directives were insufficient to establish free movement of services[225]. The most important deregulation was reached by the third generation of insurance directives. This was provided by Council Directive 92/49/EEC of 18 June 1992 on the coordination of laws, regulations and administrative provisions relating to direct insurance and Council Directive 92/96/EEC of 10 November 1992 on the coordination of laws, regulations and administrative provisions relating to direct life insurance which came into force in July 1994. The main aim of these directives was to decrease state intervention to minimum through three principles: the single European license (i.e. the European based insurer can operate within the EU on the base of

[218] First Council Directive 77/780/EEC, Art.9
[219] First Council Directive 77/780/EEC, Art.3
[220] First Council Directive 77/780/EEC, Art.6
[221] Second Council Directive 89/646/EEC, Art.13
[222] Second Council Directive 89/646/EEC , Art.24
[223] Chen (2007), p.364
[224] Sterzynski (2003), p.42
[225] Sterzynski (2003), p.43

authorization in the home member state without additional permissions of host country[226]), the home country control (i.e. the financial supervision of the insurer is the sole responsibility of its home member state[227]) and the solvency supervision (i.e. the previous substantive supervision was replaced by solvency supervision[228] including verification of state of solvency, of the establishment of technical provisions and of the assets covering the insurers[229]). As the main deregulatory event in insurance industry can be held these directives and they should be followed by the increased M&A activity in this sector.

One of objectives of single market was to establish single internal market in energy in the EU, specifically in the electricity sector. The main aim was to reduce costs, maintain competition, increase of security and quality of electricity supply in order to guarantee optimal energy supply for all citizens of the EU[230]. The second important objective was to eliminate substantial price discrimination among consumers through the EU through transparency. Therefore the first phase of deregulation of electricity sector was implemented by two directives in 1991. The first one was focused on the improvement of gas and electricity prices charged to industrial end-users which shall be reached by improved transparency i.e. the publication of the price systems and consumer consumption categories[231]. The consumers could freely choose between different energy sources and different suppliers in order to ensure themselves acceptable prices paid for energy. The second directive obliged member states to facilitate transit of electricity between high-voltage grids based on non-discriminatory conditions[232]. The second phase of deregulation was crucial to ensure deregulation by member states in order to establish internal energy market providing the reinforcement of security of electricity supply the competitiveness of the European economy[233]. In 1997 firstly, the generation of electricity was deregulated by allowing of new entrants to construct new generating capacity on non-discriminatory base when member state authorizes them or chooses them through tendering process[234]. Afterwards transmission and distribution of electricity was gradually deregulated by taking in account the extent of share of electricity consumed. In 1999, the electricity market affecting consumers with consumption more than 40 GWh per year was opened, in 2000 the threshold was decreased to 20 GWh per year and finally in 2003, it was decreased to 9 GWh per

[226] Council Directive 92/49/EEC Art.4, Art.5
[227] Council Directive 92/49/EEC Art.9
[228] Sterzynski (2003), p.44
[229] Council Directive 92/49/EEC Art.9
[230] Council Directive 90/547/EEC
[231] Council Directive 90/377/EEC
[232] Council Directive 90/547/EEC, Art.1
[233] Directive 96/92/EC
[234] Directive 96/92/EC, Art.4

year[235]. By year 2000, 30% of the electricity market was opened up[236] what constituted a possibility of the increase of M&A activity in utility sector. The deregulation of energy sector is planned to progress till 2014[237].

Industry deregulated	Deregulating directives and regulations	Year of implementation
Air transport	Council Regulation 2407/92 Council Regulation 2408/92 Council Regulation 2409/92	1993 and 1997
Telecommunications	Commission Directive 88/301 Commission Directive 90/388 Commission Directive 94/46 Commission Directive 96/2 Commission Directive 96/19	 1992 1994 1996 1998
Banking	Second Council Directive 89/646	1993
Insurance	Commission Directive 92/49 Commission Directive 92/96	1994
Utilities	Directive 96/92	1999

Table 6: Overview of deregulated industries

Typical measures for the concentration of industries developed in industrial organization theory are Herfindahl-Hirschman index (HHI) and concentration ratios[238]. HHI is the sum of the squares of market shares (s_i) of all firms i in the industry:

$$\mathrm{HHI} = \sum_{i=1}^{N} s_i^2$$

HHI's values vary between 0 and 1, where 0 stands for perfect competition and 1 stands for monopoly hence the more close to 1 means the more concentrated industry. The measure takes into account both the absolute number of firms in the industry and the size distribution of firms. HHI is mainly used by the US merger guidelines where it is scaled by 10,000 since the market shares are calculated as percentages. Alternatively, the concentration ratios are used as the

[235] Directive 96/92/EC, Art.19(2)
[236] http://www.world-nuclear.org/sym/2000/whitwill.htm, accessed on 6.7.2012
[237] http://ec.europa.eu/energy/gas_electricity/index_en.htm, accessed on 6.7.2012
[238] Church, Ware (2000), p.429

measure for the concentration of industries. The concentration ratio is calculated as the sum of the market shares of the largest *m* firms (when firms are ordered by market share s_i in descending order):

$$CR_m = \sum_{i=1}^{m} s_i$$

Usually, four-firm concentration ratio (CR_4) or eight-firm concentration ratio (CR_8) are used in praxis (virtually all numbers of firms can be used). The concentration ratios do not take into account the variation of firm size i.e. industry with equal sized firms can have the same CR_4 as industry with the excessively largest firm.

In the US the concentration ratios as well as HHI are published by Economic Census[239] every 5 years. However, there is no such census for the firms in the European market hence alternative sources for these data were used. Industrial organization theory predicts the relationship between industrial concentration and the size of the market i.e. if the size of the market is increased e.g. due to elimination of trade barriers the number of entrants will rise, the competition will become fiercer and concentration will be lower. Further, Shaked and Sutton (1987) explored the relationship between the level of endogenous fixed costs (R&D and advertising) and industrial concentration. There are two main implications of the models proposed in the paper. Firstly, an increase in the market size by industries producing homogenous products will lead to a fragmented industry (less concentrated industry) where the market shares of firms are decreased[240]. Secondly, an increase in the size of the market by industries producing higher quality products (vertically differentiated products) will not lead to a fragmented industry but to a concentrated industry with higher fixed costs driving better quality of products[241]. These propositions were tested empirically and confirmed by Robinson, Chiang (1996) and Lyons et al. (2001). The work of Lyons et al. (2001) brought the great insight in the relationship of concentration and the level of endogenous fixed costs and was used as the base for the identification of the level of industry concentration. They distinguish between two types of industries similarly as Schmalensee (1992): *type 1* industries which produce homogenous products and *type 2* industries for which are important endogenous fixed costs (R&D and advertising). Further, they defined three categories for *type 2* industries: *type 2A* industries engaging greatly in advertising and not R&D, *type 2R* industries engaging in R&D but not in

[239] http://www.census.gov/econ/concentration.html#, accessed on 8.7.2012
[240] Shaked, Sutton (1987), p.134
[241] Shaked, Sutton (1987), p.140

advertising and *type 2AR* industries which are both advertising and R&D intensive[242]. The higher concentration levels are predicted to be observed when moving from industry type 1 to 2A to 2R and 2AR. The proposition was tested on the European manufacturing firms and afterwards compared to the US firms and firms from Big 4 (Germany, France, the UK and Italy). It was proved on all geographic levels (despite the differences in means among them) that concentration measured by mean CR_4 is rising from industry type 1 to 2A to 2R and 2AR[243] leading to classification of industry concentration levels. Type 1 industries are classified as industries with low concentration, type 2A are industries with low-medium concentration, type 2R industries are characterized by medium concentration and the highest concentration is provable for type 2AR industries. The overview of industries classified according to types[244] is transformed for the industries used in the research[245]. For the selected manufacturing industries the data from the US 1997 Economic Census were collected, specifically HHI and CR_4[246] and the corresponding mean CR_4 (arithmetic average) for different types of industries were calculated and compared to the European data which are taken from Lyons et al. (2001). In Table 7, the comparison of the mean CR4 in the Europe and the US showed only little differences proving the earlier findings that the concentration industry levels for different industries tend to be similar across various countries[247]. Further, it was looked on the most concentrated EU industries in 1987 as found in Davies, Lyons (1996). The industries belonging to the 20 most concentrated EU industries measured by CR_5 are labeled as MC in Table 8. Overall, the most concentrated industries corresponded to industries classified as high concentration industries omitting only pharmaceuticals (labeled as **MC**). Three of medium concentrated industries (aviation, electronics and chemicals) belonged to most concentrated industries what can be caused by different concentration measures CR_4 contrary to CR_5. Surprisingly, tobacco sector which is classified as having low-medium concentration was among the most concentrated industries (labeled as ***MC***) and CR_4 value from the US also suggests high concentration therefore it was not considered in calculation of mean CR_4 for the US data. In the research, the classification of industry concentration levels are used and alternatively they will be corrected (industries labeled MC will be allocated to high concentration group of industries) by taking into account findings in Davies, Lyons (1996) to see if the correction will have a positive effect on confirming the hypotheses.

[242] Lyons et al. (2001), p.4
[243] Lyons et al. (2001), p.12
[244] Lyons et al. (2001), pp. 21-22
[245] See Table 8
[246] Source: http://www.census.gov/econ/concentration.html#, accessed on 8.7.2012
[247] Sutton (1991), p.111

Industry type	Concentration level	European mean CR_4	US mean CR_4
Type 1	Low concentration	12,2	12,49
Type 2A	Low-medium concentration	18	18,23
Type 2R	Medium concentration	28,3	26,54
Type 2AR	High concentration	40	48,54

Table 7: The comparison of the mean CR_4

Industry	Type	Concentration level	US concentration 1997		Correction
			HHI	CR_4	
furniture	type 1	low concentration	55,5	11,2	
leather	type 1	low concentration	167,2	19	
paper	type 1	low concentration	173,3	18,5	
plastics	type 1	low concentration	30,2	8,2	
primary metal industries	type 1	low concentration	97,4	13,8	
publishing	type 1	low concentration	38,4	9,6	
stone, clay, glass and concrete products	type 1	low concentration	52,1	9,1	
wood	type 1	low concentration	52,7	10,5	
apparel and fabric products	type 2A	low-medium concentration	100,6	17,6	
food	type 2A	low-medium concentration	91	14,3	
textile	type 2A	low-medium concentration	186,2	22,8	
tobacco	type 2A	low-medium concentration	no data	89	***MC***
aviation	type 2R	medium concentration	1638,9	62,3	MC
electronics	type 2R	medium concentration	105,9	14,8	MC
chemicals	type 2R	medium concentration	76,6	11,9	MC
industrial machinery	type 2R	medium concentration	89,4	13,5	
industrial manufacturing	type 2R	medium concentration	89,4	13,5	
measuring instruments, photographic goods, clocks	type 2R	medium concentration	137,5	16,3	
mining	type 2R	medium concentration	no data	no data	
telecommunication	type 2R	medium concentration	no data	31,9	
transport equipment	type 2R	medium concentration	563,3	37,9	
automobile	type 2AR	high concentration	2505,8	82,4	**MC**
computers	type 2AR	high concentration	464,9	37	**MC**
detergent business	type 2AR	high concentration	1618,6	65,6	**MC**
optics	type 2AR	high concentration	263,2	25,4	**MC**
pharmaceuticals	type 2AR	high concentration	446,3	32,3	

Table 8: Classification of industries according to concentration level

From the DOME database were collected data about classification of deal for each case. There were identified seven types: joint control, majority control, sole control, joint venture, minority ownership, majority ownership and merger. These combinations differ in the degree of integration and control e.g. minority ownership suggests the acquisition of less than 50% of shares in the firm leading to lower control as in the case of majority ownership where more than 50% of shares are acquired. The deals can be ordered by the degree of control and integration from joint ventures, which are formed for specific project and firms stay independent, to mergers which require full integration of firms. The Figure 2 shows the sequence of strategic combinations.

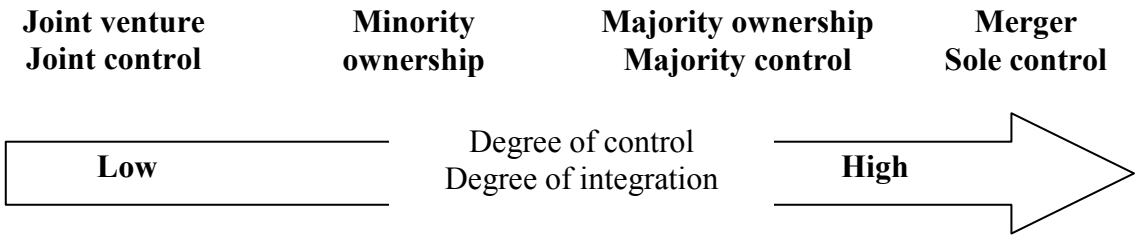

Figure 2: Sequence of strategic combinations

After collecting all data about merger cases and industries' characteristics the appropriate statistical tests in SPSS were executed to test the formulated hypotheses[248]. The emphasis was laid on the relationship between specific industries' characteristics and the occurrence of types of mergers (i.e. horizontal, vertical and conglomerate mergers). Most of data were categorical; either nominal as in the case of type of merger or ordinal when the data can be ranked in order as in the case of level of technology and only PBV represents metric data. Therefore mostly chi-square test was used since the formulated hypotheses did not require to form and test complex model. Table 9 lists the variables used in the research and their description. For testing the relationship between acquirers and targets (required by some formulated sub hypotheses) the same information about target's industry characteristics (i.e. level of technology, concentration, PBV and PBV category) was collected.

Variable	Description	Scale
Sector	Industry in which acquirer or target was/is operating	Nominal
TypeMerger	Type of merger (horizontal, vertical or conglomerate)	Nominal
Classification	Classification of deal (joint venture, minority ownership, majority ownership, merger)	Ordinal
Year	Year of deal (from 1990 to 2000)	Ordinal
Technology	Technology level of industry (low-technology, medium-low-technology, medium-high-technology, knowledge-intensive, high-technology)	Ordinal
Concentration	Concentration of industry (low, low-medium, medium and high concentration)	Ordinal
PBV	Average PBV of industry in 2002	Metric
PBV_category	Category of industry according to its EU PBV 2002 (undervalued; low, low-medium, medium, highly overvalued)	Ordinal

Table 9: Overview of variables used in the research

[248] The help of Field (2005) was used by choosing the statistical tests and reporting the results

6.2. Results

This section represents the most important part of this thesis i.e. the presentation of empirical research's results. The emphasis is laid on the testing of formulated hypotheses in order to draw conclusions about an influence of industry's characteristics on the engaging in specific type of M&A.

In the beginning, it was essential to answer the first research question "Do the different M&A types cluster by specific industry?". The question was tested by chi square test between variables sector and merger type. On overall, there were 70 different industry sectors engaging in M&A (together 2215 cases). However, some of industries did not undertake enough M&A in order to fulfill assumptions of chi square test i.e. the expected frequencies should be greater than 5. Therefore industries with less and equal 15 occurrences (since there were three categories of merger types) were excluded by this test. On overall, 33 industries were excluded accounting for 154 cases. The highly significant result of chi square statistics proved that there is an association between industry sector and type of merger. The medium association (computed by Cramer's statistics 0.344 at $p< .001$) suggests that there is different pattern in characterization of industry by merger type looking on different sectors. Therefore the first research question can be answered positively i.e. different M&A types cluster by specific industries and more formally, there was a significant association between type of merger and industry sector χ^2 (70)= 487.056, $p< .001$[249].

On overall, the most active industries in M&A deals (measured by total count of occurrences by sector) are banking, telecommunications, chemicals, automobile and electronics. The result is similar to Andrade et al. (2001) where telecommunications and banking also belonged to the most active industries in M&A activity. From Table 10 it can be seen that telecommunications, chemicals and automobile sectors are mainly characterized by horizontal type of mergers. On the other hand, electronics is mostly characterized by conglomerate mergers and banking is almost evenly split into all three M&A types.

Further, according to contingency table the industries are characterized by different M&A types and top five industries for each merger type are identified (measured by the percentage of merger type within sector, i.e. the percentage of total occurrences recorded by industry appertaining to the individual merger type[250]) and can be seen in Table 11. Industries conglomerate and investment holding are not considered in table since due to the calculation of

[249] Contingency table and the underlying SPSS output can be seen in Appendix C.2.
[250] Alternatively, it can be measured by sector's percentage within type of merger. However, in this case mostly the most active industries appear in all three types of merger.

occurrences they are mostly classed as vertical mergers (more than 80% of their occurrences are assigned to vertical merger type). In general, it can be pointed out that services industries are more characterized by vertical mergers (e.g. real estate, software and finance) and on the other hand, industries from primary sector of economy and manufacturing are more characterized by horizontal mergers (e.g. food; paper; stone, clay, glass and concrete products and primary metal industries). Interestingly, finance sector is mainly characterized by vertical and conglomerate mergers and only incrementally by horizontal deals. This can be caused by the fact that firms in finance sector are engaging in mergers as an intermediation for financing a merger deal between other industries.

Sector		Horizontal	Vertical	Conglomerate	Total
banking	Count	62	52	45	159
	% within sector	39%	32.7%	28.3%	100%
	% within type of merger	7.4%	8.2%	7.7%	7.7%
telecommunications	Count	73	37	40	150
	% within sector	48.7%	24.7%	26.7%	100%
	% within type of merger	8.7%	5.8%	6.8%	7.3%
chemicals	Count	57	43	30	130
	% within sector	43.8%	33.1%	23.1%	100%
	% within type of merger	6.8%	6.8%	5.1%	6.3%
automobile	Count	53	17	43	113
	% within sector	46.9%	15%	38.1%	100%
	% within type of merger	6.3%	2.7%	7.3%	5.5%
electronics	Count	31	31	46	108
	% within sector	28.7%	28.7%	42.6%	100%
	% within type of merger	3.7%	4.9%	7.8%	5.2%

Table 10: Overview of most active industries in M&A

Horizontal type	Vertical type	Conglomerate type
1. Food (73.2%)	1. Real estate (61.1%)	1. Transport equipment (66.7%)
2. Paper (69%)	2. Software (50%)	2. Engineering (55.6%)
3. Insurance (66.7%)	3. Finance (42.2%)	3. Distribution durables (51.7%)
4. Stone, clay, glass and concrete products (61.3%)	4. Defense (41.7%)	4. Finance (48.4%)
5. Primary metal industries (60.6%)	5. Plastics (39.4%)	5. Service (45.5%)

Table 11: Top five industries in categories of merger types

Furthermore, the testing of formulated hypotheses is presented. The main aim of testing is answering of the second research question „Which characteristics of industries have effect on the

occurrence of specific M&A types?“. Through confirming (or rejecting) of hypotheses the better understanding of industry characterization by merger types will be enabled.

Hypothesis 1: *Horizontal mergers will occur most frequently, then vertical mergers will follow and finally conglomerate mergers will occur least often.*

The first hypothesis aims at demonstrating how often specific merger types occur in general and how they grow over time. From 1990 till 2000 there were 1488 deals (initial 1515 cases recorded in DOME database were reduced by cases which did not enable classifying of industry) from which there were 884 horizontal, 332 vertical and 272 conglomerate transactions. On overall, horizontal deals accounted for almost 60% followed by vertical mergers accounting for 22.3% and at least often occurred conglomerate mergers accounting for 18.3%. Therefore hypothesis 1 is confirmed.

Sub hypothesis 1a: *The occurrence of horizontal mergers will rise over the years.*

Over the years, total number of M&A has risen from 9 deals in 1990 to its peak 390 deals in year 2000. All three merger type grew almost steadily through years as it can be seen in Figure 3. Number of horizontal deals decreased only in two cases, in year 1993 and 1999. On the other hand, conglomerate deals remained almost at the same level of activity since 1994 till 1997 and afterwards their occurrence rose dramatically in 2000. Occurrences of vertical mergers seem to follow almost the same pattern as occurrences of horizontal deals (there was a strong positive correlation between number of occurrences of vertical and horizontal transactions over years, r= 0.945 at p< .001).

In order to correctly consider the growth of number of horizontal deals over the years it is important to look besides absolute numbers on relative percentages of occurrences in comparison to other merger types. Over time period, the percentage of horizontal merger within year always dominated vertical and conglomerate deals, fluctuating from the highest share 79.7% in year 1992 to the lowest one 49.5% in 2000. However, it can not be argumented that the ratio of horizontal transactions over other two merger types is constantly rising over the years. Interestingly, the percentage of vertical type in year fluctuates arround 21% and the percentage of conglomerate type fluctuated arround 17% in time period 1994-1999. Major change happened in the peak year 2000 when the ratio of horizontal mergers decreased by almost 10% and the ratio of vertical and conglomerate deals increased (by vertical type about 3% and by conglomerate type about 6%). The possible explanation of changed situation in 2000 is the great growth of M&A deals‘ amount in order to exploit the positive situation on the market wihout

necessary consideration by choosing the most advantageous type of merger. In Table 12 the evolution of absolute and relative occurrence of different merger types can be seen.

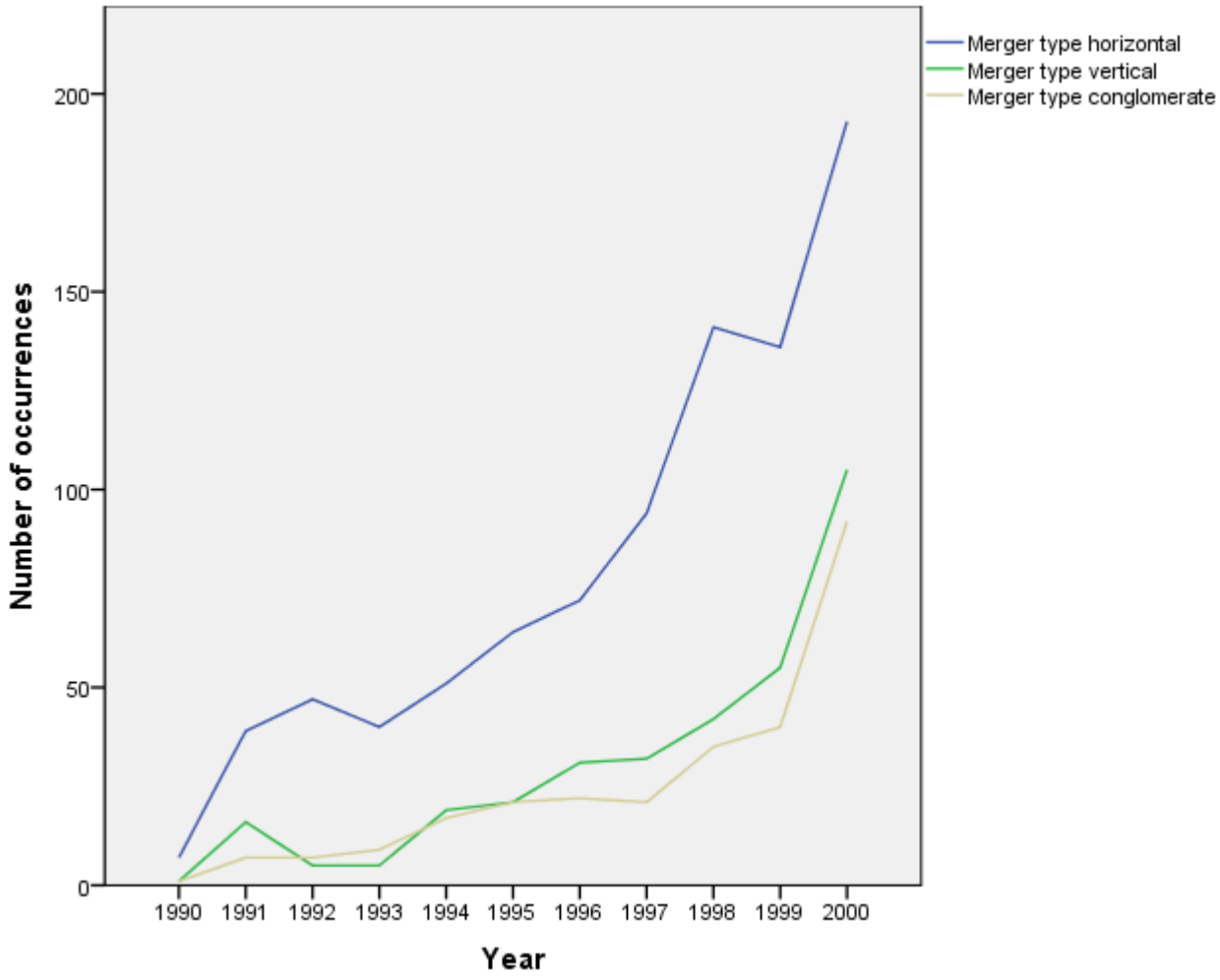

Figure 3: Graph of different merger type occurrences over years

Sub hypothesis 1a can be partly confirmed. Looking on the absolute number of occurrences by horizontal mergers there can be seen a steady growth over time period. However, the amount of mergers (all types) was rising over the years not only the amount of horizontal deals. Looking on the percentage of occurrences within individual years by horizontal deals it can be concluded that the ratio of horizontal mergers over other merger types fluctuated and was not steadily rising. However, horizontal mergers dominated other two merger types through all researched years.

Year * Merger type Crosstabulation

			Merger type			
			horizontal	vertical	conglomerate	Total
Year	1990	Count	7	1	1	9
		% within Year	77,8%	11,1%	11,1%	100,0%
	1991	Count	39	16	7	62
		% within Year	62,9%	25,8%	11,3%	100,0%
	1992	Count	47	5	7	59
		% within Year	79,7%	8,5%	11,9%	100,0%
	1993	Count	40	5	9	54
		% within Year	74,1%	9,3%	16,7%	100,0%
	1994	Count	51	19	17	87
		% within Year	58,6%	21,8%	19,5%	100,0%
	1995	Count	64	21	21	106
		% within Year	60,4%	19,8%	19,8%	100,0%
	1996	Count	72	31	22	125
		% within Year	57,6%	24,8%	17,6%	100,0%
	1997	Count	94	32	21	147
		% within Year	63,9%	21,8%	14,3%	100,0%
	1998	Count	141	42	35	218
		% within Year	64,7%	19,3%	16,1%	100,0%
	1999	Count	136	55	40	231
		% within Year	58,9%	23,8%	17,3%	100,0%
	2000	Count	193	105	92	390
		% within Year	49,5%	26,9%	23,6%	100,0%
Total		Count	884	332	272	1488
		% within Year	59,4%	22,3%	18,3%	100,0%

Table 12: Occurrence of merger types over time period 1990-2000

Hypothesis 2: *Horizontal mergers will occur more often in the overvalued sectors than in the undervalued sectors.*

The valuation of sectors is provided in the research by two variables: PBV as value of average PBV of sector or valuation categories of sector. The first variable enables to compare the mean PBV of horizontal deals with other merger types. On the other hand, looking on the relationship between valuation categories of sectors and merger types will show the relative occurrence of horizontal deals within undervalued and overvalued sectors.

Generally, the industries with PBV lower than 1 are considered as undervalued and with PBV higher than 1 as overvalued. There are only a few undervalued sectors in comparison to the overvalued ones however the level of overvaluation differs for individual industries[251]. Looking on Table 13 it can be seen that horizontal deals occur at least often (measured by percentage

[251] See Table 4

within category of valuation) in undervalued sectors, only 18.5% compared to vertical type accounting for 60% and conglomerate deals accounting for 21.5%. For overvalued sectors, horizontal deals accounted for 43.19% what represents 24.69% growth compared to undervalued sectors. Furthermore, within all categories of overvalued sectors horizontal deals represented the highest share of occurrences. The share of horizontal deals fluctuated only little (on average by 6%) in categories of overvalued sectors and for medium overvalued industries horizontal transactions dominated other two merger types; they accounted for 51.1%. Interestingly, the industry mostly characterized by horizontal deals, the food industry, is assigned to medium-high overvalued category what confirms the second hypothesis (other industries from top five characterized by horizontal mergers are in low-overvalued category; this does not contradict the second hypothesis since they all are overvalued though only lowly). It is notable that most mergers happened in low-overvalued category. This is caused by the high amount of industries assigned to this category and also that all of the most active industries are in this category (i.e. banking, telecommunication, chemicals, automobile and electronics). Hence it does not make sense to look on the percentages of different valuation categories within merger type because of highly unevenly distributed sectors. In order to overcome this problem the relationship between average PBV (continuous data) and merger type was examined.

The examination of relationship between PBV and merger type was done by comparing means of each merger type through the Kruskal-Wallis test since PBV does not represent a normal distributed data (Kolmogorov-Smirnov test showed for all merger types that they are different from normal at $p < .001$). Firstly, average PBV was significantly affected by merger type ($H(2) = 12.96$, $p < .01$). Mann-Whitney tests were used as post-hoc test to compare different merger types. A Bonferroni correction was applied (since there were made two comparisons to horizontal type: firstly compared to vertical type, secondly compared to conglomerate type; the critical value of significance is .05/2= .025) and all effects are reported at a .025 level of significance. It appeared that PBV was not significantly different by vertical type compared to horizontal type ($U = 252396.00$, $r = -.04$). However, PBV was significantly higher by conglomerate type when compared to horizontal type ($U = 254329.50$, $r = -.06$) however the effect size is very small[252].

[252] SPSS output can be seen in Appendix C.3.

Category of valuation * Type of merger Crosstabulation

			Type of merger			
			horizontal	vertical	conglomerate	Total
Category of valuation	undervalued	Count	25	81	29	135
		% within Category of valuation	18,5%	60,0%	21,5%	100,0%
		% within Type of merger	2,8%	13,4%	4,6%	6,4%
	low overvalued	Count	659	394	443	1496
		% within Category of valuation	44,1%	26,3%	29,6%	100,0%
		% within Type of merger	75,1%	65,0%	70,8%	70,9%
	low-medium overvalued	Count	100	90	94	284
		% within Category of valuation	35,2%	31,7%	33,1%	100,0%
		% within Type of merger	11,4%	14,9%	15,0%	13,5%
	medium overvalued	Count	68	24	41	133
		% within Category of valuation	51,1%	18,0%	30,8%	100,0%
		% within Type of merger	7,7%	4,0%	6,5%	6,3%
	highly overvalued	Count	26	17	19	62
		% within Category of valuation	41,9%	27,4%	30,6%	100,0%
		% within Type of merger	3,0%	2,8%	3,0%	2,9%
Total		Count	878	606	626	2110
		% within Category of valuation	41,6%	28,7%	29,7%	100,0%
		% within Type of merger	100,0%	100,0%	100,0%	100,0%

Table 13: Cross-table of merger type and valuation category of sectors

However, looking on the relationship between PBV and type of merger does not show if horizontal mergers occur more often between overvalued sectors than undervalued sectors. Test indicated that there are differences between PBV across different merger types and especially between horizontal and conglomerate mergers. This suggests that conglomerate mergers occur more often between more overvalued sectors what will be also discussed by the next sub hypothesis.

From the previous presentation of results it can be concluded that looking on relationship between categories of industry valuation and merger type confirmed that horizontal mergers occur more often between overvalued than undervalued sectors in terms of absolute occurrences and also relative occurrence to other two merger types.

Sub hypothesis 2a: *Vertical and conglomerate mergers will occur more often between the overvalued and undervalued sectors.*

Table 13 in the previous discussion presented the share of different merger types in individual valuation categories of industries. Generally, the undervalued sectors were mostly characterized by vertical mergers (60%) followed by conglomerate deals (21.5%). The overvalued sectors were more characterized by horizontal mergers (43.2%), then by conglomerate mergers (30.2%) and finally by vertical ones (26.6%). However, this does not indicate if the vertical and conglomerate mergers occurred between undervalued and overvalued sectors. Therefore, the relationship between valuation categories of acquirer and target industry need to be examined (this was not needed by horizontal mergers since they occur between the same industries therefore between the same valuation categories). For simplification, into account are taken two combinations between industries: 1.) deal between undervalued acquirer (target) and overvalued target (acquirer) and 2.) deal between overvalued (undervalued) acquirer and overvalued (undervalued) target. Table 14 shows that if merger happens between undervalued and overvalued company it is much more characterized by vertical mergers 78.1% (measured by the percentage within combination of sectors) than by conglomerate mergers accounting for 21.9%. However, the majority of mergers happened between sectors which are the same in valuation (i.e. between two overvalued firms or between two undervalued firms what happened only in 6 cases); in the case of vertical merger it was 78.2% (measured by percentage within merger type) and by conglomerate mergers it was even higher 94%.

Merger type * Combination of sectors Crosstabulation

			Combination of sectors		
			undervalued x overvalued	overvalued x overvalued or undervalued x undervalued	Total
Merger type	vertical	Count	57	204	261
		% within Merger type	21,8%	78,2%	100,0%
		% within Combination of sectors	78,1%	44,9%	49,5%
	conglomerate	Count	16	250	266
		% within Merger type	6,0%	94,0%	100,0%
		% within Combination of sectors	21,9%	55,1%	50,5%
Total		Count	73	454	527
		% within Merger type	13,9%	86,1%	100,0%
		% within Combination of sectors	100,0%	100,0%	100,0%

Table 14: Cross-table between merger type and combination of sectors

Furthermore there was found a significant association between combination of sectors' valuation and whether merger was vertical or conglomerate $\chi^2(1) = 27.64$, $p < .001$. Besides the calculated odds ratio suggests that when deal happens between undervalued and overvalued firm it is 4.37 times more likely to be vertical merger than conglomerate merger[253].

From the results it can be concluded that only vertical mergers occur more often between undervalued and overvalued sectors what is confirmed mainly by the cross-table and the underlying statistics. Conglomerate mergers tend to happen mostly between overvalued firms what was confirmed by Table 14 and also by general numbers from the previous table where undervalued sectors were less characterized by conglomerate deals mainly in comparison to vertical mergers. Therefore the sub hypothesis 2a is confirmed only partly for vertical mergers.

Hypothesis 3: *The occurrence of vertical mergers will be higher if acquirer or target is R&D intensive.*

According to the third hypothesis R&D intensive industries should be more characterized by vertical mergers than other two merger types. The most R&D intensive industries according to OECD should be high technology industries. Furthermore knowledge-intensive industries represent industries with high specific asset, knowledge. Therefore these industries should show the highest share of vertical mergers in their occurrences. However, only two of these industries have the highest share of vertical mergers, these are software (50%) and business services (35.1%, however conglomerate mergers have the same share). Further, finance sector is the one of top five industries characterized by vertical mergers although the highest share in the occurrences of this industry has conglomerate merger type. For the majority of the high technology and knowledge-intensive industries vertical mergers scored the second highest share in occurrences although by aviation and computers vertical mergers occur at least often.

Besides looking on individual R&D intensive industries it is important to examine how the share of vertical mergers varies in different categories of industries' technology levels. According to Table 15 all industries' technology levels demonstrate the highest share of horizontal mergers (measured by percentage within technology). However, this is caused by the fact that horizontal deals occur at most often. Hence, it is important to look on vertical mergers alone and it can be seen that most of the vertical mergers happened in knowledge-intensive industries accounting for 36.3% of the overall amount of vertical mergers (measured by percentage within type of merger). The second highest share among vertical mergers belongs to

[253] See Appendix C.4.

medium-high technology industries (27.6%) followed by high technology industries (16.7%). This argument confirms the third hypothesis.

Technology * Type of merger Crosstabulation

			Type of merger			
			horizontal	vertical	conglomerate	Total
Technology	low-technology	Count	92	33	33	158
		% within Technology	58,2%	20,9%	20,9%	100,0%
		% within Type of merger	13,8%	8,0%	7,4%	10,3%
	medium-low-technology	Count	105	47	46	198
		% within Technology	53,0%	23,7%	23,2%	100,0%
		% within Type of merger	15,7%	11,4%	10,3%	13,0%
	medium-high-technology	Count	178	114	152	444
		% within Technology	40,1%	25,7%	34,2%	100,0%
		% within Type of merger	26,7%	27,6%	34,0%	29,1%
	knowledge-intensive	Count	164	150	142	456
		% within Technology	36,0%	32,9%	31,1%	100,0%
		% within Type of merger	24,6%	36,3%	31,8%	29,9%
	high-technology	Count	128	69	74	271
		% within Technology	47,2%	25,5%	27,3%	100,0%
		% within Type of merger	19,2%	16,7%	16,6%	17,7%
Total		Count	667	413	447	1527
		% within Technology	43,7%	27,0%	29,3%	100,0%
		% within Type of merger	100,0%	100,0%	100,0%	100,0%

Table 15: Cross-table of relationship between merger type and industry's technology level

Furthermore, since technology can be considered as ordinal variable through Kruskal-Wallis test can be examined if technology level differs by different merger types. It was found out that technology level is significantly affected by merger type, i.e. merger type indicates industry's technology level of engaging firm ($H(2)= 9.68$, $p< .01$). Mann-Whitney test were used to examine if vertical mergers indicate the higher level of technology of engaging firms in comparison to horizontal and conglomerate deals. A Bonferroni correction was applied so all effects are reported at a .025 significance level. It emerges that technology level of engaging firms was no different by vertical and conglomerate merger type ($U= 90174.5$, $r= -.02$). However, technology level of engaging firms was significantly higher by vertical mergers than by horizontal deals ($U= 124400.5$, $r= -.08$) although effect size is very small[254].

From the previous discussion of results it can be concluded that the most of vertical mergers occur in higher technology industries, i.e. knowledge-intensive, medium-high technology and high technology industries, which are at most R&D intensive. Furthermore, this

[254] SPSS output can be seen in Appendix C.5.

fact is strongly supported by positive effect of vertical mergers on technology level of engaging firms in comparison to horizontal mergers (through Kruskal-Wallis test) which occur at most often and seem to be dominating all categories of technology level by number of occurrences. It can be concluded that vertical mergers occur more often in R&D intensive industries what confirms the third hypothesis.

Sub hypothesis 3a: *The even higher occurrence of vertical mergers will be observable if the both acquirer and target are R&D intensive.*

Sub hypothesis 3a suggests that the majority of vertical mergers should happen between R&D intensive acquirer and target. The confirmation of this sub hypothesis will also support third hypothesis in the way that it validates the positive effect of R&D intensity on specific relationship of target and acquirer. The acquirer and target in this case are R&D intensive if they are industries with high technology level or they are knowledge-intensive (alternatively medium-high technology industries can be considered as R&D intensive however to gain stronger support of sub hypothesis only two categories are considered as R&D intensive). Therefore deals between high technology (knowledge-intensive) acquirer and target, and deal between high technology acquirer (target) and knowledge-intensive target (acquirer) are considered as combinations of R&D intensive industries. All other combinations comprise deals between R&D non-intensive industries and deals between R&D intensive and R&D non-intensive industries. Looking on Table 16 shows that 49.6% of vertical mergers (where by both acquirer and target the technology level is identifiable) are between R&D intensive industries. Interestingly, from these 69 occurrences 48 cases (69.6%) represent combination between knowledge-intensive acquirer and target (accounting for 34.5% of all vertical mergers, the highest share among all combinations when all categories of technology levels are analyzed). Furthermore, the comparison to conglomerate mergers shows that deals between R&D intensive acquirer and target happen more often by vertical merger type (49.6% compared to 24.3%). Also of all combinations between R&D intensive industries 67% are vertical mergers (when compared to conglomerate mergers, the comparison to horizontal mergers is not done since all of horizontal mergers occur between acquirer and target from same technology level category and the previous discussion confirmed that significantly higher technology level's industries are engaging in vertical mergers).

There was found a significant association between combination of R&D intensity of acquirer and target and whether merger was vertical or conglomerate $\chi^2(1) = 19.25$, $p < .001$. Besides the calculated odds ratio suggests that when deal happens between R&D intensive

acquirer and target it is 3.07 times more likely to be vertical merger than conglomerate merger[255].

Merger type * Combination of sectors Crosstabulation

			Combination of sectors		
			acquirer and target R&D intensive	other combinations	Total
Merger type	vertical	Count	69	70	139
		% within Merger type	49,6%	50,4%	100,0%
		% within Combination of sectors	67,0%	39,8%	49,8%
	conglomerate	Count	34	106	140
		% within Merger type	24,3%	75,7%	100,0%
		% within Combination of sectors	33,0%	60,2%	50,2%
Total		Count	103	176	279
		% within Merger type	36,9%	63,1%	100,0%
		% within Combination of sectors	100,0%	100,0%	100,0%

Table 16: Cross-table of relationship between merger type and combinations of R&D intensity

The previous discussion of results suggests there is positive effect on occurrence of vertical mergers when both acquirer and target are R&D intensive. This fact brings support also to the third hypothesis as well as to sub hypothesis 3a. Although, the percentage of vertical mergers when both acquirer and target are R&D intensive is less than 50% the high share of 49.6% is reached by only combinations between two levels of technology (i.e. 4 combinations of levels) in comparison to other combinations which are combinations between three levels of technology (i.e. 9 combinations of levels). Also deals between knowledge-intensive acquirer and target represent the highest share within vertical mergers (34.5%) and furthermore knowledge-intensive acquirer engage only in deals with knowledge-intensive or high technology target (when technology levels of acquirer and target are identifiable). Therefore it could be concluded that sub hypothesis 3a is confirmed and when both acquirer and target are R&D intensive the occurrence of vertical merger is highly probable.

Hypothesis 4: *The occurrence of mergers will increase in the affected industries after deregulatory event.*

In section Data of the thesis were identified the industries which were deregulated through the time period and the years when deregulatory event occurred (see Table 6). The

[255] SPSS output can be seen in Appendix C.6.

fourth hypothesis suggests that deregulatory event has a positive effect on number of occurrences. Table 17 lists the industries which were deregulated and the occurrence of mergers in these industries over the years. The deregulatory events per industry are labeled by grey cells in table 17. For comparison the progress of overall amount of mergers over the years is added. From table 17 it can be seen that occurrences for each deregulated industry fluctuate heavily[256] and only for telecommunications (after year 1998), airline (after year 1997 incremental increase) and utilities there can be stated a constant increase in occurrences (however, for utilities there is only one year after deregulatory event therefore this increase may not be reliable). For testing of discrete event's effect it is appropriate to compare the occurrences before event and after event through two-sample procedures such as t-test when data are normally distributed (for not normally distributed data Mann-Whitney U test is used). This will enable to see if the mean is significantly higher after deregulatory event. However, it is important to look if the increase is higher than the overall increase of mergers i.e. if the overall number of mergers is rising over the years the rise of occurrences after deregulatory event can be due to this fact and not due to the deregulatory event.

Year/sector	airline	banking	insurance	utilities	telecom.	all mergers
1990	0	1	1	0	0	9
1991	1	5	1	1	4	62
1992	3	4	5	0	**4**	59
1993	**0**	**9**	4	2	4	54
1994	0	7	**13**	7	**5**	87
1995	1	14	11	4	10	106
1996	2	8	11	6	**14**	125
1997	**4**	23	9	5	14	147
1998	5	25	21	12	**14**	218
1999	5	21	10	**8**	21	231
2000	5	42	19	18	60	390
Total	26	159	105	63	150	1488

Table 17: Occurrences over time period in deregulated industries

[256] See also Figure 4

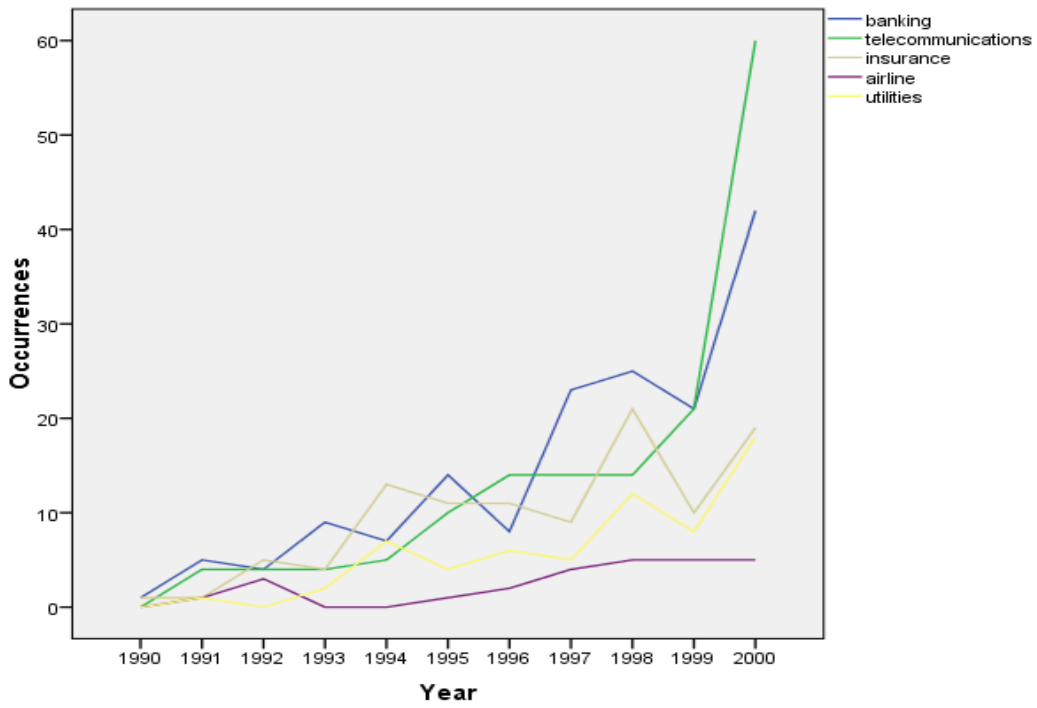

Figure 4: Occurrences over time period in deregulated industries

For testing the fourth hypothesis, it is inevitable to find out if after deregulatory event mean value has increased. In the beginning, the occurrences in deregulated industries were split into two sub-samples: before and after deregulatory event (sub-sample of before deregulatory event includes the year of deregulatory event). In industries with more deregulatory events were chosen specific years: for airline industry year 1997 was taken as the main deregulation event and for telecommunications two years were considered 1994 and 1996. Since sub-samples are too small to check reliably the normal distribution of their data non-parametric Mann-Whitney U test was used to compare means of two sub-samples. It can be predicted that mean of after deregulatory event's sub-sample will be higher than mean of before deregulatory event's sub-sample therefore it will be looked on one-tailed significance. For all deregulated industries besides utilities it was proved that mean after deregulation event is significantly higher than before deregulatory event. All statistics are summarized in Table 18 and underlying SPSS output can be seen in Appendix C.7.. Noticeably, industries airline and telecommunications (for both years) have higher mean after deregulation at higher significance level than banking and insurance ($p < .01$ compared to $p < .05$).

Further, it is important to check if the increase in occurrences after deregulation is notably high, i.e. compare the growth of overall amount of mergers to growth of occurrences in deregulated industries. This will prove that the increase in occurrences is not caused by the overall growth of mergers through time period. The comparison is made by the means of

estimation of average annual percent change after deregulation by both deregulated industry and overall number of mergers (alternatively it can be used by this test comparison of overall percent change after deregulation i.e. compare number of occurrences in the last year (2000) to the occurrences in year of deregulation; however between year 1999 and 2000 it came to immense growth of occurrences therefore this type of comparison might lead to overestimation of growth). The average annual percent change after deregulation is calculated as a geometric mean of percent changes in deregulated industries since year of deregulation till end year, calculation follows as:

$$average\ annual\ percent\ change\ after\ deregulation = \left(\sqrt[k-n]{\prod_{n=1}^{k} \frac{occurrences\ in\ year_{n+1}}{occurrences\ in\ year_{n}}} - 1 \right) * 100$$

where n is the year of deregulation

k is the end year (2000)

industry	**year**	Mdn_{before}	Mdn_{after}	U	p	r
Airline	1997	1	5	0.00	p< .01	- .75
Banking	1993	4.5	21	2.00	p<.05	- .68
Insurance	1994	4	11	4.00	p< .05	- .61
Utilities	1999	4.5	18	0.00	p> .05	- .48
Telecom.	1994	4	14	0.00	p< .01	- .84
	1996	4	17.5	1.00	p< .01	- .75

Table 18: Summary of statistics for deregulated industries[257]

Table 19 lists the average annual percent changes after deregulation in deregulated industries and the respective averages for number of all mergers. Only if the average annual percent change after deregulation is higher by deregulated industry than for all mergers for the same time period it can be assumed that the growth of occurrences is accountable to other fact (in this case deregulation) than just overall trend of increasing number of mergers. However, this was proved only by telecommunications for both years of deregulation. Other industries experienced lower average annual percentage increase in occurrences than the overall growth of mergers therefore it can not be argued that the occurrences after deregulation event have increased due to deregulation (utilities industry is not considered since in the previous test did not find that mean after deregulation is significantly higher than before deregulation).

It can be argued that only by telecommunication deregulation had a positive effect on the increase in occurrences. Since for other deregulated industries it can not be concluded that increase in mean after deregulation is accountable to deregulation rather to overall trend of increasing number of mergers the fourth hypothesis can be rejected.

[257] In table p is reported for one-tailed exact significance

Industry	Year	Average annual percent change after deregulation	
		Deregulated industry	All mergers
Airline	1997	7.72%	38.43%
Banking	1993	24.62%	32.64%
Insurance	1994	6.53%	28.41%
Telecommunications	1994	51.31%	28.41%
	1996	43.88%	32.9%

Table 19: Overview of average annual percent changes in deregulated industries

Sub hypothesis 4a: *The occurrence of horizontal mergers will increase more than the occurrence of conglomerate mergers in the affected industries after deregulatory event.*

The sub hypothesis 4a suggests that the share of horizontal mergers in occurrences of mergers in deregulated industries will be higher in after deregulation sub-sample than in before deregulation sub-sample. Further, this share will increase more than the share of conglomerate mergers in occurrences of mergers within industry (if the share of conglomerate will be higher in after deregulation sub-sample than in before deregulation sub-sample). From Table 20, it can be seen by all deregulated industries besides utilities and telecommunication (when 1994 is considered as the year of deregulation) that the share of horizontal mergers in the number of mergers is decreasing from period before deregulation to period after deregulation (measured by % within period). On the other hand, the share of conglomerate mergers increased from period before deregulation to period after deregulation by all industries besides utilities. In the case of telecommunications when 1994 is taken as the year of deregulation both the share of horizontal and conglomerate mergers increased from period before deregulation to period after deregulation; however the share of conglomerate mergers rose more (27.8% after deregulation compared to 17.6% before deregulation what accounts for difference of 10.2%) than the share of horizontal mergers (49.6% after deregulation compared to 41.2% what represents a difference of 8.4%). Therefore only for utilities industry it can be argued that occurrence of horizontal mergers increased more than for conglomerate mergers. However, for utilities there is only one year in after deregulation period therefore this fact is not plausible. Furthermore, chi square tests for all industries besides banking showed that there is no significant association between period and type of merger[258].

[258] See Appendix C.8.

Due to the discussed results it can be concluded that sub hypothesis 4a can be rejected since it was not proved that the occurrence of horizontal mergers increased more than the occurrence of conglomerate mergers after deregulatory event. The only exception was utilities industry but this fact does not support the sub hypothesis reliably.

Hypothesis 5: *The occurrence of the vertical and conglomerate mergers will be higher than occurrence of the horizontal mergers if they will be undertaken between less competitive industries.*

In the beginning of discussion of results it is important to state that as the concentration of industry increases the competitiveness of industry is decreasing. Therefore as the proxy for competitiveness the concentration of industry is used as it was already discussed in data section of this thesis. Looking on individual industries with high concentration it can be seen that they are mostly characterized by horizontal deals (when considering automobile, computers and pharmaceuticals industries). Only by automobile industry the share of horizontal mergers is less than 50% and the share of conglomerate mergers is fairly high (38.1% out of all mergers in automobile industry and 7.3% out of all conglomerate mergers what is the third highest share in the overall number of conglomerate mergers). However, looking on relationship of merger types and categories of industries' concentration will bring more insight of occurrence's trend**.**

Table 21 presents how occurrences are distributed over categories of industry's concentration and merger types. Noticeably, the highest share within each merger type is accounted to medium concentration industries which may be caused by the fact that three out of top five active industries in mergers are in this category namely electronics, chemicals and telecommunication. Industries with high concentration represent the second highest share out of conglomerate mergers accounting for 20.8% (measured by % within type of merger) and the third highest share out of horizontal and vertical mergers; accounting for 19.2% by horizontal deals and 13.3% by vertical deals. This fact suggests that conglomerate mergers will be at most characterized by less competitive industries (more concentrated industries).

Since concentration of industries can be ranked from the lowest to the highest one, through the Kruskal-Wallis and Mann-Whitney tests can be examined if vertical and conglomerate mergers experienced higher mean in concentration of industries than horizontal mergers. It was found that concentration level is significantly affected by merger type, i.e. merger type indicates industry's concentration of engaging firm ($H(2)= 6.70$, $p< .05$). Mann-Whitney tests were used to examine if vertical mergers and conglomerate mergers indicate the higher level of concentration of engaging firms in comparison to horizontal deals. A Bonferroni

Merger type * Period * Industry Crosstabulation

Industry				Period: before deregulation	Period: after deregulation	Total
airline	Merger type	horizontal	Count	8	4	12
			% within Merger type	66,7%	33,3%	100,0%
			% within Period	72,7%	26,7%	46,2%
		vertical	Count	2	6	8
			% within Merger type	25,0%	75,0%	100,0%
			% within Period	18,2%	40,0%	30,8%
		conglomerate	Count	1	5	6
			% within Merger type	16,7%	83,3%	100,0%
			% within Period	9,1%	33,3%	23,1%
banking	Merger type	horizontal	Count	15	47	62
			% within Merger type	24,2%	75,8%	100,0%
			% within Period	78,9%	33,6%	39,0%
		vertical	Count	1	51	52
			% within Merger type	1,9%	98,1%	100,0%
			% within Period	5,3%	36,4%	32,7%
		conglomerate	Count	3	42	45
			% within Merger type	6,7%	93,3%	100,0%
			% within Period	15,8%	30,0%	28,3%
insurance	Merger type	horizontal	Count	20	50	70
			% within Merger type	28,6%	71,4%	100,0%
			% within Period	83,3%	61,7%	66,7%
		vertical	Count	2	20	22
			% within Merger type	9,1%	90,9%	100,0%
			% within Period	8,3%	24,7%	21,0%
		conglomerate	Count	2	11	13
			% within Merger type	15,4%	84,6%	100,0%
			% within Period	8,3%	13,6%	12,4%
utilities	Merger type	horizontal	Count	21	10	31
			% within Merger type	67,7%	32,3%	100,0%
			% within Period	46,7%	55,6%	49,2%
		vertical	Count	7	2	9
			% within Merger type	77,8%	22,2%	100,0%
			% within Period	15,6%	11,1%	14,3%
		conglomerate	Count	17	6	23
			% within Merger type	73,9%	26,1%	100,0%
			% within Period	37,8%	33,3%	36,5%
telecommunication 1994	Merger type	horizontal	Count	7	66	73
			% within Merger type	9,6%	90,4%	100,0%
			% within Period	41,2%	49,6%	48,7%
		vertical	Count	7	30	37
			% within Merger type	18,9%	81,1%	100,0%
			% within Period	41,2%	22,6%	24,7%
		conglomerate	Count	3	37	40
			% within Merger type	7,5%	92,5%	100,0%
			% within Period	17,6%	27,8%	26,7%
telecommunication 1996	Merger type	horizontal	Count	22	51	73
			% within Merger type	30,1%	69,9%	100,0%
			% within Period	53,7%	46,8%	48,7%
		vertical	Count	12	25	37
			% within Merger type	32,4%	67,6%	100,0%
			% within Period	29,3%	22,9%	24,7%
		conglomerate	Count	7	33	40
			% within Merger type	17,5%	82,5%	100,0%
			% within Period	17,1%	30,3%	26,7%
Total	Merger type	horizontal	Count	93	228	321
			% within Merger type	29,0%	71,0%	100,0%
			% within Period	59,2%	46,0%	49,2%
		vertical	Count	31	134	165
			% within Merger type	18,8%	81,2%	100,0%
			% within Period	19,7%	27,0%	25,3%
		conglomerate	Count	33	134	167
			% within Merger type	19,8%	80,2%	100,0%
			% within Period	21,0%	27,0%	25,6%
	Total		Count	157	496	653
			% within Merger type	24,0%	76,0%	100,0%
			% within Period	100,0%	100,0%	100,0%

Table 20: Cross-table of deregulated industries

correction was applied so all effects are reported at a .025 significance level. It emerges that concentration level of engaging firms was significantly higher by vertical (U= 124400.5, r= -.08) and conglomerate type (U= 136996.00, r= -.07) when compared to horizontal type although effect size is small. Further, the highest mean of concentration was reached by conglomerate mergers[259].

Concentration * Type of merger Crosstabulation

			Type of merger			
			horizontal	vertical	conglomerate	Total
Concentration	low concentration	Count	106	48	47	201
		% within Concentration	52,7%	23,9%	23,4%	100,0%
		% within Type of merger	22,4%	19,3%	16,0%	19,8%
	low-medium concentration	Count	55	13	19	87
		% within Concentration	63,2%	14,9%	21,8%	100,0%
		% within Type of merger	11,6%	5,2%	6,5%	8,6%
	medium concentration	Count	222	155	166	543
		% within Concentration	40,9%	28,5%	30,6%	100,0%
		% within Type of merger	46,8%	62,2%	56,7%	53,4%
	high concentration	Count	91	33	61	185
		% within Concentration	49,2%	17,8%	33,0%	100,0%
		% within Type of merger	19,2%	13,3%	20,8%	18,2%
Total		Count	474	249	293	1016
		% within Concentration	46,7%	24,5%	28,8%	100,0%
		% within Type of merger	100,0%	100,0%	100,0%	100,0%

Table 21: Cross-table of relationship of merger type and concentration of industry

The previous discussion showed that out of vertical and conglomerate mergers the majority of them happened in high concentration and medium concentration industries (75.5% out of vertical deals, 77.5% out of conglomerate and out of horizontal only 66%). The comparison of concentration's means by merger types brought more support to the fifth hypothesis. It was confirmed that by conglomerate and vertical mergers it can be predicted that level of concentration of engaging firms will be higher than by horizontal deals. Therefore it can be concluded that the fifth hypothesis was confirmed and occurrence of vertical and conglomerate mergers is higher than occurrence of horizontal mergers when merger is undertaken between less competitive industries[260].

[259] SPSS output can be seen in Appendix C.9.

[260] Alternatively as discussed in Data section of the thesis some of industries according to Davies, Lyons (1996) can be classified as the most concentrated although they were not in high concentration category. If correction is undertaken, i.e. industries tobacco, aviation, electronics and chemicals are added to high concentration category, the mean for horizontal deals stayed the lowest although two of top five most active industries are assigned to high concentration category. The only difference to not corrected data was that mean of horizontal deals in comparison to vertical type was not significantly different. Nevertheless, hypothesis 5 can be partly confirmed for conglomerate mergers, i.e. they occur more often than horizontal mergers in less competitive industries.

Sub hypothesis 5a: *The occurrence of vertical mergers will be even higher if these mergers will be undertaken between less competitive and more competitive industries.*

Looking on combination of concentration levels of acquirer and target will bring more insight if vertical mergers occur more often between acquirer and target with different level of concentration or with the same level. As less competitive industries are defined industries with high and medium concentration and as more competitive industries are defined industries with low and low-medium concentration. There are two combinations of acquirer and target possible: combination of less competitive acquirer (target) and more competitive target (acquirer) and combination of acquirer and target with the same level of competitiveness (i.e. both acquirer and target are more competitive or less competitive). The aim is to find if there are differences in occurrence of vertical mergers across these combinations and if this difference is significantly unlike to conglomerate mergers.

Merger type * Combination of sectors Crosstabulation

			Combination of sectors		
			less competitive x more competitive	same level of competitiveness	Total
Merger type	vertical	Count	11	61	72
		% within Merger type	15,3%	84,7%	100,0%
		% within Combination of sectors	42,3%	53,0%	51,1%
	conglomerate	Count	15	54	69
		% within Merger type	21,7%	78,3%	100,0%
		% within Combination of sectors	57,7%	47,0%	48,9%
Total		Count	26	115	141
		% within Merger type	18,4%	81,6%	100,0%
		% within Combination of sectors	100,0%	100,0%	100,0%

Table 22: Cross-table of sector combinations of competitiveness and merger type

Table 22 presents the relationship of combination of sectors and merger types. It can be seen that only small fraction of vertical mergers occur between less and more competitive acquirer and target, 15.3% compared to 84.7% representing combination between acquirer and target of the same level of competitiveness (measured by % within merger type). The same situation can be observed by conglomerate mergers although there is slightly higher share of combination between less and more competitive industries out of overall number of conglomerate mergers (21.7%). However, this difference is not significantly high enough; the chi square test proved

that there is no significant association between combination of less and more competitive acquirer and target and whether merger was vertical or conglomerate[261].

The previous discussion of results showed that the occurrence of vertical mergers is higher if they are undertaken between acquirer and target with same level of competitiveness (out of this combination 90% happen between less competitive acquirer and target). The same tendency is observed by conglomerate mergers although almost 60% of combination between less and more competitive acquirer and target are conglomerate mergers. This leads us to rejection of sub hypothesis 5a.

Hypothesis 6: *Conglomerate mergers will occur between firms with greater level of difference in industry characteristics mergers in terms of R&D intensity than vertical.*

Vertical mergers occur more often if both acquirer and target are R&D intensive. On the contrary, by conglomerate mergers it can be predicted that level of R&D intensity will be different by acquirer and target i.e. there will be greater difference in this industry characteristics than by vertical mergers. In the discussion of results of sub hypothesis 3a it was showed that only 24.3% out of conglomerate mergers happened between R&D intensive acquirer and target. Furthermore, there was found a significant association between combination of R&D intensity of acquirer and target and whether merger was vertical or conglomerate $\chi^2(1) = 19.25$, $p < .001$. Besides the calculated odds ratio suggests that when deal happens between acquirer and target with different level of technology or between two low technology industries (accounting only for 28.3% out of other combination) it is 3.07 times more likely to be conglomerate merger than vertical merger. Therefore it can be concluded that conglomerate mergers occur between firms with greater level of difference in R&D intensity than vertical and the sixth hypothesis can be confirmed.

Sub hypothesis 6a: *Conglomerate mergers will occur more often between the industries with comparable level of concentration and valuation.*

Vertical mergers are predicted to happen between acquirer and target with different level of concentration and valuation. On the other hand, conglomerate mergers should occur more often between industries with comparable level of concentration and valuation. From discussion of sub hypothesis 5a it was showed that 78.3% out of conglomerate mergers are between acquirer and target with same level of concentration. This fact supports sub hypothesis 6a although the level of concentration of acquirer and target seems to be not significantly different for vertical and conglomerate mergers. Looking on the previous discussion of sub hypothesis 2a

[261] See Appendix C.10.

showed that 94% out of conglomerate mergers happen between industries with same level of valuation. This represents the great share and furthermore it was found a significant association between valuation combination of sectors and whether merger was vertical or conglomerate $\chi^2(1) = 27.64$, $p < .001$. Besides the calculated odds ratio suggests that when deal happens between acquirer and target with the same level of valuation it is 4.37 times more likely to be conglomerate merger than vertical merger. This fact strongly supports the formulated hypothesis and it can be concluded that sub hypothesis 6a was confirmed.

Hypothesis 7: *The highly integrated type of deals will be more characterized by horizontal M&A and on the other hand, the less integrated type of deals will be more characterized by vertical and conglomerate M&A.*

In the previous data section of this thesis it was argued that classification of deal can be ordered from the less integrated to the highly integrated deals. As highly integrated deals can be defined mergers, majority ownership and control by acquisitions. On the other, less integrated deals are joint venture (control) and minority ownership. Table 23 presents how occurrences of merger types are allocated across different classification of deals. It can be seen that the share of horizontal mergers within categories of classification is increasing from the lowest to the highest integrated type, 27.3% by joint ventures to 66.7% by mergers (measured by % within classification of deal). The most out of horizontal mergers were majority ownership (control) deals accounting for 64.7% (measured by % within merger type). On the other hand, the majority of conglomerate mergers were joint ventures accounting for 55.7% and the majority of vertical mergers were majority ownerships (48.6%) closely followed by joint ventures (47.5%). These results suggests that mean of integration will be higher by horizontal mergers than by vertical and conglomerate mergers and since the integration by deals can be ranked this can be proved through Kruskal-Wallis and Mann-Whitney tests.

Through Kruskal-Wallis test it was found out that integration level of deal is significantly affected by merger type, i.e. merger type indicates type of deal in terms of integration ($H(2) = 122.24$, $p < .001$). Mann-Whitney tests were used to examine if horizontal M&A are deals with higher level of integration in comparison to vertical and conglomerate M&A. A Bonferroni correction was applied so all effects are reported at a .025 significance level. It emerges that integration level of deal was significantly higher by horizontal type when compared to vertical type ($U = 232333.5$, $r = -.192$) and conglomerate type ($U = 194566.0$, $r = -.274$). By comparison of horizontal and conglomerate the effect size is medium what makes the higher mean of integration by horizontal deal more reliable fact. Further, the highest mean of integration was

reached by horizontal deals, followed by vertical deals and the lowest mean of integration was by conglomerate deals[262].

Classification of deal * Type of merger Crosstabulation

			Type of merger			
			horizontal	vertical	conglomerate	Total
Classification of deal	joint venture, joint control	Count	251	317	350	918
		% within Classification of deal	27,3%	34,5%	38,1%	100,0%
		% within Type of merger	29,0%	47,5%	55,7%	42,5%
	minority ownership	Count	38	24	31	93
		% within Classification of deal	40,9%	25,8%	33,3%	100,0%
		% within Type of merger	4,4%	3,6%	4,9%	4,3%
	majority ownership, majority control	Count	560	324	241	1125
		% within Classification of deal	49,8%	28,8%	21,4%	100,0%
		% within Type of merger	64,7%	48,6%	38,4%	52,1%
	merger, sole control	Count	16	2	6	24
		% within Classification of deal	66,7%	8,3%	25,0%	100,0%
		% within Type of merger	1,8%	0,3%	1,0%	1,1%
Total		Count	865	667	628	2160
		% within Classification of deal	40,0%	30,9%	29,1%	100,0%
		% within Type of merger	100,0%	100,0%	100,0%	100,0%

Table 23: Cross-table of classification of deal and merger type

Both cross-table and comparison of integration's means among merger types suggests that highly integrated types of deals are more likely to be horizontal type than vertical and conglomerate types. Therefore it can be concluded that the seventh hypothesis is confirmed.

Sub hypothesis 7a: *There will be more vertical JVs than other types of JVs.*

From Table 23 it can be seen out of joint ventures 34.5% are vertical type. Although this is higher share than the share of horizontal type, 38.1% of joint ventures are conglomerate type what represents the highest share within joint ventures. Therefore it can be concluded that sub hypothesis 7a can be rejected.

Sub hypothesis 7b: *The industries with highly specific assets will engage more in the highly integrated type of deal.*

[262] See SPSS output in Appendix C.11.

In the beginning of results' discussion for this sub hypothesis clarification of definitions will be presented. As industries with highly specific assets are defined industries with high level of technology and knowledge-intensive industries. On the other hand, industries with lowly specific assets are industries with all other levels of technology i.e. low, low-medium and medium-high technology. As highly integrated type of deals are considered mergers and majority ownerships and as deals with low integration level are defined joint ventures and minority ownerships. Table 24 presents how technology level interacts with integration of deal. It can be seen that industries with highly specific assets engage more in highly integrated deals however the difference to lowly integrated deals is only small, 50.8% compared to 49.2% (measured by % within asset specificity). Similarly, industries with lowly specific asset engage more in highly integrated deals (58.4%) but this share is higher than by industries with high specific assets. Furthermore, there was found a significant association between asset specificity and whether deal was highly or lowly integrated $\chi^2(1) = 8.578$, $p < .01$[263]. However, the calculated odds ratio suggests the opposite tendency than predicted it is 1.36 more likely to expect less integrated deal when engaging firm possesses highly specific assets. This odds ratio is rather small therefore it can not be reliably predicted that asset specificity will suggests the level of deal integration; the association between variables is not substantial.

Integration level * Asset specificity Crosstabulation

			Asset specificity		
			highly specific	lowly specific	Total
Integration level	high	Count	361	455	816
		% within Integration level	44,2%	55,8%	100,0%
		% within Asset specificity	50,8%	58,4%	54,8%
	low	Count	349	324	673
		% within Integration level	51,9%	48,1%	100,0%
		% within Asset specificity	49,2%	41,6%	45,2%
Total		Count	710	779	1489
		% within Integration level	47,7%	52,3%	100,0%
		% within Asset specificity	100,0%	100,0%	100,0%

Table 24: Cross-table of integration level and asset specificity of industry

From the previous discussion it can be argued that industry with highly specific assets is predicted to engage in lowly integrated deal more often than industry with lowly specific assets although this association is not substantial. This represents the contradiction to the predicted relationship therefore the sub hypothesis 7b can be rejected.

[263] See Appendix C.12.

6.3. Discussion

After presentation of results and analysis of hypotheses the discussion will summarize and interpret the findings. As predicted it was found out that different M&A types cluster by industries i.e. industries experience more deals of one type than other. The aim was to examine which industry's characteristics have influence on occurrence of specific merger type. Most of the formulated hypotheses were confirmed therefore general implications can be made. On the other hand, some of hypotheses were rejected therefore possible reasons for rejection will be discussed.

The results showed the highest share of horizontal mergers in overall amount of deals over time period from 1990 till 2000 accounting for 60%. This is similar to findings in Andrade et al. (2001) where for period from 1990 till 1998 the share of 47.8% was reached by horizontal mergers. The higher share found in this research might be due to the different time period and consistent growth of horizontal deals' number. Sub hypothesis 1a was confirmed only on absolute occurrences not on the share of horizontal mergers over the years. It is natural that the share of horizontal mergers fluctuates from year to year therefore to detect increasing share of horizontal mergers within overall number of deals it will be inevitable to look on the longer time period than one year as it was done in Andrade et al. (2001) where the increasing share of horizontal mergers was detected from decade to decade.

Hypothesis 2 and sub hypothesis 2a have dealt with valuation of sectors. Notably, conglomerate mergers tend to occur at most in more overvalued sectors what was affirmed by the highest mean of PBV and this difference was significant to horizontal type. Furthermore, sub hypothesis 2a (deals should occur more often between undervalued and overvalued sectors) was confirmed only for vertical mergers and not for conglomerate mergers. Although vertical and conglomerate mergers are somehow similar and they are pursued from different reasons than horizontal mergers conglomerate mergers are at most often pursued from irrational motives and therefore they often differ from rationales developed for vertical deals; this fact can be seen also at confirmed hypothesis 6 and sub hypothesis 6a which have dealt with this reasoning.

Hypothesis 3 and sub hypothesis 3a have dealt with asset specificity measured by R&D intensity. Both of them were confirmed (although mean technology level by vertical deals was significantly different only to mean of horizontal deals) what suggests that vertical mergers are at most appropriate for industries with highly specific assets especially when both acquirer and target possess these assets. Interestingly, it was found that knowledge-intensive industries engage in deals only with other knowledge-intensive or high technology industries.

From one of the merger wave theories, the industry shock wave theory, hypothesis 4 and sub hypothesis 4a were formulated. However, they were both rejected therefore it can be argued that deregulation had no effect on increase in merger cases in most of the deregulated industries. The possible reasons for the absenting effect might be that deregulation was not substantial to motivate firms to engage in mergers or the effect might show after longer period than the examined in this research. Furthermore, the overall situation on the market and other factors might have greater effect than deregulation on mergers.

Hypothesis 5 and sub hypothesis 5a have dealt with competitiveness of industries. Vertical and conglomerate mergers tend to occur more often in less competitive industries than horizontal mergers (difference in means was significant). However, sub hypothesis 5a was rejected and it was found that vertical mergers occur more often between acquirer and target with same level of competitiveness than with different levels. This might be caused by the fact that firms engaging in vertical merger follow the rationale that they can reach higher market power only in less competitive markets but they do not realize that also when acquirer or target is more competitive the same positive effect can be reached with less competition authorities' concerns.

Hypothesis 7 was sort of control hypothesis to examine if other factors have influence on occurrence of specific types of mergers than just industry's characteristics. It was found out that highly integrated deals such as mergers and majority ownerships tend to be horizontal type and on the other hand, less integrated deals such as joint ventures and minority ownerships tend to be more vertical and conglomerate types. Besides conglomerate mergers are characterized by the least integrated types on overall. Furthermore, sub hypothesis 7a was rejected there were more conglomerate than vertical joint ventures. This might be caused by the fact that conglomerate mergers are associated with fewer benefits for engaging firms and higher risk of failure therefore it is rational to choose joint venture for them because the integration in this deal is low and they can break the cooperation easily when the wished results are not achieved. Sub hypothesis 7b was also rejected and it was found there is no strong association between asset specificity and level of integration of deal what might be caused by the fact that there are other more important factors influencing choice of deal by industries with specific assets than level of integration.

To conclude the summary of situations when to expect different M&A types is presented. Horizontal mergers are to be expected more in overvalued sectors than undervalued sectors, in more competitive industries, in industries with less specific assets and they are mostly undertaken in form of highly integrated deals such as mergers and majority ownerships. Vertical type of deal is to be expected when industry possesses highly specific assets especially when both acquirer and target possess these assets, in less competitive industries and if the acquirer

and target are operating in industries with different levels of valuation i.e. between overvalued and undervalued sectors. Conglomerate type is to be expected in the least competitive industries especially when acquirer and target have comparable level of competitiveness, if acquirer and target are both in overvalued sectors, if acquirer and target are on different level of asset specificity and they tend to be done through the least integrated deals especially joint ventures.

Looking on top five industries characterized by each type of merger confirms the previous implications. This is especially valid for industries characterized by horizontal deals, four of them are either at low technology or medium-low technology levels, they are all more competitive industries and all of them are overvalued although only lowly. By industries characterized by vertical mergers two of them are knowledge-intensive (software and finance) what confirms asset specificity rationale. Industries characterized by conglomerate mergers show the highest level of valuation since engineering and service are in low-medium overvalued category. Interestingly, three of top five industries characterized by conglomerate mergers are knowledge-intensive (engineering, finance and service).

7. Conclusion

The aim of this thesis was to present and test empirically new aspect in M&A activity-clustering of different M&A types by industries. A theoretical introduction consisted of defining different merger types, the underlying motivation factors and overview of merger waves. Further, the relevant literature dealing with various M&A aspects is discussed in order to formulate hypotheses for the research. The subsequent testing of the merger cases notified to the European Union brought insight how industries' characteristics affect the choice of the right merger type.

The results of the research were in accordance with findings in Gugler et al. (2012) and Rhodes-Kropf et al. (2005) which showed that behavioral merger wave theories such as the overvalued shares theory have greater explanatory power than other theories, q-theory and industry shock theory. The confirmation of hypothesis 2 dealing with valuation of sectors supported the overvalued shares theory of merger waves and on the other hand, the rejection of hypothesis 4 dealing with deregulation confirmed that industry shock theory is less reliable.

Further, transaction cost theory and the underlying rationales especially the cases when a firm deals with highly specific assets as discussed in Williamson (1979) were confirmed to have effect on M&A activity, vertical deals are in the case of highly specific assets the most appropriate type of merger to choose. Additionally, it was confirmed that conglomerate deals are

undertaken from almost the same reasons as the vertical transactions but they deviate more from the formulated rationales what suggests that they have the lowest potential for the increased performance of the combined firm and are followed from the least rational motives such as diversification and risk reduction.

The further research is necessary in order to support the here presented results. The deviations in findings are possible to detect and they might lead to reconsiderations of the implications. The most interesting comparison would be to the US merger cases in order to identify the possible differences on these two M&A markets. Furthermore, the more accurate measurements of industries' characteristics might contribute to the reliability of the results.

In the end, it can be concluded that the research successfully answered two formulated research questions and confirmed the clustering of different M&A types by industries along with the great effect of industries' characteristics on this relationship.

References

Alao R.O. (2010): "Mergers and Acquisitions (M&As) in the Nigerian banking industry: An advocate of three mega banks", European Journal of Social Sciences 15: 554-563

Andrade G., Mitchell M., Stafford E. (2001): "New Evidence and Perspectives on Mergers", The Journal of Economic Perspectives 15: 103-120

Andrade G., Stafford E. (2004): "Investigating the economic role of mergers", Journal of Corporate Finance 10: 1-36

Bergman M.A., Coate M.B., Jakobsson M., Ulrick S.W. (2010): "Merger control in the European Union and the United States: Just the facts", SSRN working paper series, URL: http://ssrn.com/abstract=1565026

Bernile G., Lyandres E., Zhdanov A. (2007): "A Theory of Strategic Mergers", Presented at 2006 European Finance Association Annual Meeting, 2006 Lone Star Finance Symposium, 2007 Utah Winter Finance Conference, 2007 Texas Finance Festival, 2007 Western Finance Association Annual Meeting, and 2007 Stanford Institute for Theoretical Economics Summer Workshop, newer version in forthcoming Review of Finance, URL: http://www.stanford.edu/group/SITE/archive/SITE_2007/segment_4/zhdanov_mergers_may_2007.pdf

Boston Consulting Group (2007): "The brave new world of M&A. How to create value from mergers and acquisitions", URL: http://giddy.org/appliedfinance/ufkl/Brave_New_World_MA_Aug_2007.pdf

Brealey R.A., Myers S.C., Allen F. (2006): "Principles of Corporate Finance", McGraw-Hill/Irwin, New York

Brigham E.F., Houston J.F. (2009): "Fundamentals of Financial Management", South-Western Cengage Learning, Mason OH

Capaldo A., Dobbs R., Suonio H. (2007): "Deal making in 2007: Is the M&A boom over?", McKinsey Quarterly, p.1 URL: https://www.mckinseyquarterly.com/Corporate_Finance/Capital_Management/Deal_making_in_2007_Is_the_MA_boom_over_2088

Chen X. (2007): "Banking deregulation and credit risk: Evidence from the EU", Journal of Financial Stability 2: 356-390

Church J., Ware R. (2000): "Industrial organization: A strategic approach", McGraw-Hill, Boston

Coase R.H. (1937): "The nature of the firm", Economica 4: 386-405

Coase R.H. (1960): “The problem of social cost”, Journal of Law and Economics 3: 1-44
Cogman D., Sivertsen C.B. (2011): “A return to deal making in 2010“, McKinsey Quarterly, p.1 URL: https://www.mckinseyquarterly.com/Corporate_Finance/M_A/A_return_to_deal_making_in_2010_2727
Commission Directive 88/301/EEC of 16 May 1988 on competition in the markets in telecommunications terminal equipment, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31988L0301:EN:HTML
Commission Directive 90/388/EEC of 28 June 1990 on competition in the markets for telecommunications services, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31990L0388:EN:HTML
Commission Directive 94/46/EC of 13 October 1994 amending Directive 88/301/EEC and Directive 90/388/EEC in particular with regard to satellite communications, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31994L0046:EN:HTML
Commission Directive 96/19/EC of 13 March 1996 amending Directive 90/388/EEC with regard to the implementation of full competition in telecommunications markets, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0019:EN:HTML
Commission Directive 96/2/EC of 16 January 1996 amending Directive 90/388/EEC with regard to mobile and personal communications, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0002:EN:HTML
Council Directive 90/377/EEC of 29 June 1990 concerning a Community procedure to improve the transparency of gas and electricity prices charged to industrial end-users, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31990L0377:en:HTML
Council Directive 90/547/EEC of 29 October 1990 on the transit of electricity through transmission grids, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31990L0547:EN:HTML
Council Directive 92/49/EEC of 18 June 1992 on the coordination of laws, regulations and administrative provisions relating to direct insurance other than life insurance, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0049:EN:HTML
Council Directive 92/96/EEC of 10 November 1992 on the coordination of laws, regulations and administrative provisions relating to direct life insurance, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0096:EN:HTML
Council Regulation (EC) No 1310/97 of 30 June of 1997, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31997R1310:EN:HTML

Council Regulation (EC) No 139/2004 of 20 January 2004 on the control of concentrations between undertakings, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:024:0001:0022:en:PDF
Council Regulation (EEC) No 2342/90 of 24 July 1990 on fares for scheduled air services, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31990R2342:EN:HTML
Council Regulation (EEC) No 2343/90 of 24 July 1990 on access for air carriers to scheduled intra-Community air service routes and on the sharing of passenger capacity between air carriers on scheduled air services between Member States, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31990R2343:EN:HTML
Council Regulation (EEC) No 2407/92 of 23 July 1992 on licensing of air carriers, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992R2407:EN:HTML
Council Regulation (EEC) No 2408/92 of 23 July 1992 on access for Community air carriers to intra-Community air routes, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992R2408:EN:HTML
Council Regulation (EEC) No 2409/92 of 23 July 1992 on fares and rates for air services, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992R2409:EN:HTML
Council Regulation (EEC) No 3975/87 of 14 December 1987 laying down the procedure for the application of the rules on competition to undertakings in the air transport sector, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31987R3975:EN:HTML
Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989R4064:EN:HTML
Coyle B. (2000): “Mergers and Acquisitions”, Glenlake Publishing Company
Davies S., Lyons B. (1996): “Industrial organization in the European Union: Structure, strategy and the competitive mechanism”, Clarendon Press, Oxford
DeFontenay C.C., Gans J.S. (2005): „Vertical integration in the presence of upstream competition”, The RAND Journal of Economics 36: 544-572
DePamphilis D.M. (2012): “Mergers, acquisitions, and other restructuring activities”, Academic Press, Amsterdam
Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0092:EN:HTML
Dong M., Hirshleifer D., Richardson S., Teoh S.H. (2006): “Does investor misvaluation drive the takeover market?”, Journal of Finance 61: 725-762

Duso T., Gugler K., Yurtoglu B.B. (2011): “How effective is European merger control?”, European Economic Review 55: 980-1006

Fan J.P.H., Goyal V.K. (2006): “On the patterns and wealth effects of vertical mergers”, The Journal of Business 79: 877-902

Farschtschian F. (2012): “The Reality of M & A Governance: Transforming Board Practice for Success”, Springer-Verlag Berlin Heidelberg, Berlin

Field A. (2005): “Discovering statistics using SPSS”, SAGE Publications, London

First Council Directive 77/780/EEC of 12 December 1977 on the coordination of the laws, regulations and administrative provisions relating to the taking up and pursuit of the business of credit institutions, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31977L0780:EN:HTML

Gersdorff N., Bacon F. (2009): “U.S. Mergers and Acquisitions: A test of market efficiency”, Journal of Finance and Accountancy 1: 1-8

Grant J., Neven D.J. (2005): “The attempted merger between General Electric and Honeywell: A case of transatlantic conflict”, Journal of Competition Law and Economics 1: 595-633

Green Paper (1987) on the development of the common market for telecommunications services and equipment, Communication by the Commission COM(87) 290, URL: http://ec.europa.eu/green-papers/pdf/green_paper_telecom_services__common_market_com_87_290.pdf

Gugler K., Mueller D.C., Weichselbaumer M. (2012): “The determinants of merger waves: An international perspective“, International Journal of Industrial Organization 30: 1-15

Hammermann F., Kleinert J. (2004): “DOME- Database On Mergers in Europe“, Kiel Institute for World Economics

Harford J. (2005): “What drives merger waves?”, Journal of Financial Economics 77: 529-560

Hirschey M. (2009): “Managerial Economics”, South-Western Cengage Learning, Mason OH

Holmstrom B., Kaplan S.N. (2001): „Corporate Governance and merger activity in the United States: Making sense of the 1980s and 1990s”, The Journal of Economic Perspectives 15: 121-144

Hubbard R.G., Palia D. (1999): “A reexamination of the conglomerate merger wave in the 1960s: An internal capital markets view”, The Journal of Finance 54: 1131-1152

Hunt P.A. (2009): “Structuring Mergers & Acquisitions: A Guide to Creating Shareholder Value”, Wolters Kluwer, Austin

Jensen M.C. (1986): “Agency costs of free cash flow, corporate finance, and takeovers”, The American Economic Review 76: 323-329

Johnson S.A., Houston M.B. (2000): “A reexamination of the motives and gains in joint ventures”, The Journal of Financial and Quantitative Analysis 35: 67-85

Jovanovic B., Rousseau P.L. (2002a): “The Q-theory of mergers”, American Economic Review Papers and Proceedings, 198–204 May

Jovanovic B., Rousseau P.L. (2002b): “Mergers as Reallocation”, Working Paper No. 9277, National Bureau of Economic Research, Cambridge MA

Jovanovic B., Rousseau P.L. (2004): “Mergers as Reallocation”, extension of previous version, unpublished manuscript, source: http://www.nyu.edu/econ/user/jovanovi/wave-60.pdf

Levy D.T. (1985): “The transactions cost approach to vertical integration: An empirical examination”, The Review of Economics and Statistics 67: 438-445

Lubatkin M. (1987): “Merger strategies and stockholder value”, Strategic Management Journal 8: 39-53

Lyons B., Matraves C., Moffatt P. (2001): “Industrial concentration and market integration in the European Union”, Economica 68: 1-26

Madura J., Ngo T., Viale A.M. (2012): “Why do merger premiums vary across industries and over time?”, The Quarterly Review of Economics and Finance 52: 49-62

Matsusaka J.G. (1993): “Takeover motives during the conglomerate merger wave”, The RAND Journal of Economics 24: 357-379

Matsusaka J.G. (1996): “Did tough antitrust enforcement cause the diversification of American corporations?”, The Journal of Financial and Quantitative Analysis 31: 283-294

Mitchell M.L., Mulherin J.H. (1996): “The impact of industry shocks on takeover and restructuring activity”, Journal of Financial Economics 41: 193-229

Moeller S.B., Schlingemann F.P., Stulz R.M. (2005): „Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave”, The Journal of Finance 60: 757-782

Morck R., Shleifer A., Vishny R.W. (1988): “Characteristics of targets of hostile and friendly takeovers”, in: A. J. Auerbach (ed.), Corporate Takeovers: Causes and Consequences, University of Chicago Press, Chicago

Morck R., Shleifer A., Vishny R.W. (1990): “Do managerial objectives drive bad acquisitions?”, The Journal of Finance 45: 31-48

Morgan E.J. (2001): “A decade of EC merger control”, International Journal of the Economics of Business 8: 451-473

Muehlfeld K., Weitzel U., Witteloostuijn A. (2011): „Mergers and acquisitions in the global food processing industry in 1986-2006”, Food Policy 36: 466-479

Nail L.A., Megginson W.L., Maquieira C. (1998): “How stock-swap mergers affect shareholder (and bondholder) wealth: More evidence of the value of corporate “focus””, Journal of Applied Corporate Finance 11: 95-106

O’Brien A.P. (1988): “Factory size, economies of scale, and the Great Merger Wave of 1898-1902”, The Journal of Economic History 48: 639-649

OECD, Policy Roundtables, Cross-border merger control: Challenges for developing and emerging economies 2011; source: http://www.oecd.org/dataoecd/14/55/50114086.pdf

OECD, STI Scoreboard 2001, URL:
http://www1.oecd.org/dac/ictcd/docs/otherdocs/OtherOECD_STI_scoreboard.pdf

OECD, STI Scoreboard 2003

Ordover J.A., Saloner G., Salop S.C. (1990): “Equilibrium vertical foreclosure”, The American Economic Review 80: 127-142

Petmezas D. (2009): “What drives acquisitions? Market valuation and bidder performance”, Journal of Multinational Financial Management 19: 54-74

Rhéaume L., Bhabra H.S. (2008): “Value creation in information-based industries through convergence: A study of U.S. mergers and acquisitions between 1993 and 2005”, Information & Management 45: 304-311

Rhodes-Kropf M., Robinson D.T., Viswanathan S. (2005): “Valuation waves and merger activity: The empirical evidence”, Journal of Financial Economics 77: 561-603

Rhodes-Kropf M., Viswanathan S. (2004): „Market Valuation and Merger Waves”, The Journal of Finance 59: 2685-2718

Robinson W.T., Chiang J. (1996): “Are Sutton’s predictions robust?: Empirical insight into advertising, R&D, and concentration”, The Journal of Industrial Economics 44: 389-408

Roy A. (1985): “Partial acquisition strategies for business combinations”, Financial Management 14: 16-23

Salant S.W., Switzer S., Reynolds R.J. (1983): “Losses from horizontal merger: The effects of an exogenous change in industry structure on Cournot-Nash equilibrium”, The Quarterly Journal of Economics 98: 185-199

Schmalensee R. (1992): “Sunk cost and market structure: A review article”, The Journal of Industrial Economics 40: 125-134

Second Council Directive 89/646/EEC of 15 December 1989 on the coordination of laws, regulations and administrative provisions relating to the taking up and pursuit of the business of credit institutions and amending Directive 77/780/EEC, URL: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31989L0646:EN:HTML

Shaked A., Sutton J. (1987): "Product differentiation and industrial structure", The Journal of Industrial Economics 36: 131-146

Shelanski H.A., Klein P.G. (1995): „Empirical research in transaction cost economics: A review and assessment", Journal of Law, Economics & Organization 11: 335-361

Shleifer A., Vishny R.W. (1991): „Takeovers in the 60's and the 80's: Evidence and implications", Strategic Management Journal 12: 51-59

Shleifer A., Vishny R.W. (2003): „Stock market driven acquisitions", Journal of Financial Economics 70: 295-311

Shy O. (1995): "Industrial Organization: Theory and application", MIT Press, Cambridge MA

Singh H., Montgomery C.A. (1987): "Corporate acquisition strategies and economic performance", Strategic Management Journal 8: 377-386

Sterzynski M. (2003): "The European single insurance market: Overview and impact of liberalization and deregulation processes", Belgian Acturial Bulletin 3: 42-49

Stewart J.F., Harris R.S., Carleton W.T. (1984): "The role of market structure in merger behavior", The Journal of Industrial Economics 32: 293-312

Stigler G.J. (1950): "Monopoly and oligopoly by merger", The American Economic Review 40: 23-34

Stowell D. (2010): "An introduction to investment banks, hedge funds, and private equity", Academic Press, First Edition

Sudarsanam P.S. (2003): "Creating Value from Mergers and Acquisitions: The Challenges: An Integrated and International Perspective", Prentice Hall, Harlow

Sutton J. (1991): "Sunk costs and market structure: Price competition, advertising, and evolution of concentration", MIT Press, Cambridge Mass.

Thomson Reuters, "Mergers and Acquisition Review Full Year 2011", pp.1-22; source: http://dmi.thomsonreuters.com/Content/Files/4Q11_MA_Financial_Advisory_Review.pdf

Tobin J. (1969): "A general equilibrium approach to monetary theory", Journal of Money, Credit and Banking 1: 15-29

Trautwein F. (1990): "Merger motives and merger prescriptions", Strategic Management Journal 11: 283-295

Walter G.A., Barney J.B. (1990): "Management objectives in mergers and acquisitions", Strategic Management Journal 11: 79-86

Weston J.F., Chung K.S., Hoag S.E. (1990): „Mergers, restructuring and corporate control", Prentice Hall

White Paper (1985) on completing the internal market, Communication by the Commission COM(85) 310, URL:
http://europa.eu/documents/comm/white_papers/pdf/com1985_0310_f_en.pdf

Williamson O.E. (1968): "Economies as an antitrust defense: The welfare tradeoffs", The American Economic Review 58: 18-36

Williamson O.E. (1971): "The vertical integration of production: Market failure considerations", The American Economic Review 61: 112-123

Williamson O.E. (1979): "Transaction-cost economics: The governance of contractual relations", Journal of Law and Economics 22: 233-261

Web References

The European Commission websites:
http://ec.europa.eu/competition/mergers/legislation/regulations.html, accessed on 2.5.2012
http://ec.europa.eu/energy/gas_electricity/index_en.htm, accessed on 6.7.2012

The EU websites:
http://europa.eu/abc/12lessons/lesson_6/index_en.htm, accessed on 5.6.2012
http://www.euractiv.com/competition/ecj-gehoneywell-merger-ban-stands-commission-errors/article-150887, accessed on 5.6.2012

The Eurostat website:
http://epp.eurostat.ec.europa.eu/portal/page/portal/esa95_supply_use_input_tables/data/workbooks, accessed on 5.3.2012

Kiel Institute of World Economics website:
http://www.ifw-kiel.de/academy/data-bases/dome_e/database-on-mergers-in-europe-dome/ accessed on 24.2.2012

The European Utility Deregulation:
http://www.world-nuclear.org/sym/2000/whitwill.htm, accessed on 6.7.2012

Thomson Financial M&A Database website:
http://www.alacra.com/partners/partner.asp?content=Thomson+Financial+Mergers+%26+Acquisitions&database=%2Falacra%2Fhelp%2Fsdc2%2Ehtm, accessed on 2.5.2012

The US Census website:
http://www.census.gov/econ/concentration.html#, accessed on 8.7.2012

The US antitrust legislation websites:
http://legal-dictionary.thefreedictionary.com/Sherman+Anti-Trust+Act, accessed on 21.5.2012
http://ehistory.osu.edu/osu/mmh/1912/trusts/NorthernSecurities.cfm, accessed on 21.5.2012

Protector & Gamble websites:
http://www.pg.com/en_US/company/global_structure_operations/corporate_structure.shtml, accessed on 18.5.2012

http://www.pg.com/en_US/brands/all_brands.shtml, accessed on 18.5.2012

Fujifilm website:
http://www.fujifilm.com/about/profile/business_fields/, accessed on 19.5.2012

The NY Times website:
http://dealbook.nytimes.com/2012/01/19/eastman-kodak-files-for-bankruptcy/, accessed on 19.5.2012

Damodar website:
http://pages.stern.nyu.edu/~adamodar/New_Home_Page/biomission.html, accessed on 29.6.2012
http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html, source of data sets, accessed on 26.6.2012

Appendix

Appendix A: Statistics of EC Merger Regulation till May 2012

21 September 1990 to 31 May 2012

I.) NOTIFICATIONS

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	May 12	Total
Number of notified cases	11	64	59	59	95	110	131	168	224	276	330	335	277	211	247	313	356	402	347	259	274	309	119	4976
Cases withdrawn - Phase 1	0	0	3	1	6	4	5	9	5	7	8	8	3	0	3	6	7	5	10	6	4	9	2	111
Cases withdrawn - Phase 2	0	0	0	1	0	0	1	0	4	5	5	4	1	0	2	3	2	2	3	2	0	1	1	37

II.) REFERRALS

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	May 12	Total
Art 4(4) request (Form RS)															2	14	13	5	9	8	6	10	9	76
Art 4(4) referral to Member State															2	11	13	5	9	6	7	10	4	67
Art 4(4) partial referral to Member State															0	0	0	1	0	0	0	1	0	2
Art 4(4) refusal of referral															0	0	0	0	0	0	0	0	0	0
Art 4(5) request (Form RS)															20	28	38	51	23	23	26	18	9	236
Art 4(5) referral accepted															16	24	39	50	22	25	24	17	9	226
Art 4(5) refusal of referral															2	0	0	2	0	0	1	0	1	6
Art 22 request	0	0	0	1	0	1	1	1	0	0	0	0	2	1	1	4	4	3	2	1	3	1	1	27
Art 22(3) referral (Art 22. 4 taken in conjunction with article 6 or 8 under Reg. 4064\89)	0	0	0	1	0	1	1	1	0	0	0	0	2	1	1	3	3	2	3	1	2	2	0	24
Art 22(3) refusal of referral																1	1	0	0	0	1	0	0	3
Art 9 request	0	1	1	1	1	0	3	7	4	9	4	9	8	10	4	7	6	3	5	3	11	2	2	101
Art 9.3 partial referral to Member State	0	0	1	0	1	0	0	6	3	2	3	6	7	1	1	3	1	1	2	0	3	0	1	42
Art 9.3 full referral	0	0	0	1	0	0	3	1	1	3	2	1	4	8	2	3	1	1	2	1	4	2	0	40
Art 9.3 refusal of referral	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	0	1	1	0	0	6

III.) FIRST PHASE DECISIONS

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	May 12	Total
Art 6.1 (a) out of scope Merger Regulation	2	5	9	4	5	9	6	4	4	1	1	1	1	0	0	0	0	0	0	0	0	0	0	52
Art 6.1 (b) compatible	5	47	43	49	78	90	109	118	196	225	278	299	238	203	220	276	323	368	307	225	253	299	82	4331
Art 6.1(b) compatible, under simplified procedure (figures included in 6.1(b) compatible above)	0	0	0	0	0	0	0	0	0	0	41	141	103	110	138	169	211	238	190	143	143	191	56	1731
Art 6.1 (b) in conjunction with Art 6.2 (compatible w. commitments)	0	3	4	0	2	3	0	2	12	16	26	11	10	11	12	15	13	18	19	13	14	5	3	212

IV.) PHASE II PROCEEDINGS INITIATED

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	May 12	Total
Art 6.1 (c)	0	6	4	4	6	7	6	11	11	20	18	21	7	9	8	10	13	15	10	5	4	8	5	208

V.) SECOND PHASE DECISIONS

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	May 12	Total
Art 8.1 compatible (8.2 under Reg. 4064/89)	0	1	1	1	2	2	1	1	3	0	3	5	2	2	2	2	4	5	9	0	1	4	0	51
Art 8.2 compatible with commitments	0	3	3	2	2	3	3	7	4	7	12	9	5	6	4	3	6	4	5	3	2	1	2	96
Art 8.3 prohibition	0	1	0	0	1	2	3	1	2	1	2	5	0	0	1	0	0	1	0	0	0	1	1	22
Art 8.4 restore effective competition	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4

VI.) OTHER DECISIONS

	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	May 12	Total
Art 6.3 decision revoked	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Art 8.6 decision revoked	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Art 14 decision imposing fines	0	0	0	0	0	0	0	0	1	4	1	0	1	0	1	0	0	0	0	1	0	0	0	9
Art 7.3 derogation from suspension (7.4 under Reg. 4064/89)	1	1	2	3	3	2	4	5	13	7	4	7	14	8	10	6	2	3	6	5	1	3	0	110
Art 21	0	0	0	0	0	1	0	1	0	1	1	0	1	0	0	0	2	1	0	0	0	0	0	8

Source: http://ec.europa.eu/competition/mergers/statistics.pdf, accessed on 6.6.2012, regularly updated

Appendix B: Additional information to Data section

Appendix B.1.: Table of vertical linkages between industries 1/2

Sector	Vertical linkages: Number of vertical related sectors, specific sectors	
advertising	2	business service, service
agriculture	2	food, health
airline	11	aviation, business services, distribution, distribution durables and non-durables, engineering, oil, service, transport equipment, transportation, travel
apparel and fabric products	5	furniture, leather, non-food retail, retail, textile
automobile	10	electronics, furniture, industrial machinery/manufacturing, measuring instruments etc, non-food retail, optics, plastics, primary metals, renting
aviation	5	airline, defence, measuring instruments etc, optics, transport equipment
banking	7	business services, construction, consultancy, finance, insurance, real estate, service
business services	13	advertising, airline, banking, computers, construction, consultancy, engineering, entertainment, finance, publishing, real estate, service, telecommunication
catering trade	5	food, health, real estate, retail, travel
chemicals	10	cosmetics, detergents, health, mining, oil, pharmaceuticals, plastics, primary metals, stone clay etc, utilities
computers	9	business services, consultancy, electronics/IT hardware, engineering, finance, post, service, software, telecommunications
conglomerate		
construction	25	banking, business services, defence, distribution durables/non-durables, electronics, engineering, finance, furniture, industrial machinery/manufacturing, mining, (non-food) retail, oil, packaging, plastics, primary metals, real estate, renting, service, stone clay etc, waste management, wood
consultancy	5	banking, business services, computers, finance, service
cosmetics	1	chemicals
defence	10	aviation, construction, food, industrial machinery, post, real estate, telecommunication, transport equipment, utilities, waste management
detergent business	1	chemicals
distribution	5	airline, construction, food, transportation, travel
distribution durables	4	airline, construction, transportation, travel
distribution non-durables	6	airline, construction, food, transportation, travel, (non-food) retail
electronics	6	automobile, construction, electronics/IT hardware, industrial machinery, primary metals, telecommunication
electronics/IT Hardware	2	computers, electronics
engineering	7	airline, business services, computers, construction, service, software, telecommunication
entertainment	3	publishing, business services, service
environmental reclamation	1	utilities
finance	9	banking, business services, computers, construction, consultancy, insurance, post, real estate, service, telecommunication
food	9	agriculture, catering, defence, distribution (non-durables), paper, plastics, retail, tobacco
furniture	6	apparel and fabric products, automobile, construction, leather, textile, wood
health	8	agriculture, catering, chemicals, measuring instruments etc, (non-food) retail, optics, pharmaceuticals
holding		
industrial machinery	10	automobile, construction, defence, electronics, industrial manufacturing, measuring instruments etc, optics, plastics, primary metals, renting
industrial manufacturing	4	industrial machinery, automobile, construction, primary metals

Appendix B.1.: Table of vertical linkages between industries 2/2

Sector	Vertical linkages: Number of vertical related sectors, specific sectors	
insurance	3	banking, finance, real estate
investment holding		
leather	4	apparel and fabric products, furniture, retail, textile
measuring instruments,	6	automobile, aviation, health, industrial machinery, optics, telecommunication, transport equipment
photographic goods, clocks		
mining	4	construction, chemicals, oil, stone clay etc
non-food retail	9	apparel and fabric products, automobile, construction, distribution non-durables, health, post, real estate, telecommunication, textile
oil	6	airline, construction, chemicals, mining, stone clay etc, utilities
optics	7	automobile, aviation, health, industrial machinery, measuring instruments etc, telecommunication, transport equipment
packaging	2	construction, paper
paper	3	food, packaging, publishing
pharmaceuticals	2	chemicals, health
plastics	5	automobile, construction, food, chemicals, industrial machinery
post	7	computers, defence, finance, (non-food) retail, telecommunication, transportation
primary metal industries	6	automobile, construction, electronics, chemicals, industrial machinery/manufacturing
publishing	4	business services, entertainment, paper, service
real estate	10	banking, business services, catering, construction, defence, finance, insurance, (non-food) retail, service
recycling	2	utilities, waste management
renting	3	automobile, construction, industrial machinery
retail	11	apparel and fabric products, catering, construction, distribution non-durables, food, health, leather, post, real estate, telecommunication, textile
service	13	advertising,airline,banking, business service, computers, construction, consultancy, engineering,entertainment,finance,publishing,real estate,telecommunication
software	2	computers, engineering
stone, clay, glass and concrete products	4	construction, chemicals, mining, oil
telecommunication	12	business services, computers, defence, electronics, engineering, finance, (non-food) retail, post, service, measuring instruments etc, optics
textile	5	apparel and fabric products, furniture, leather, (non-food) retail
tobacco	1	food
transport equipment	5	airline, aviation, defence, measuring instruments etc, optics
transportation	6	airline, distribution durables/non-durables, post, travel
travel	6	airline, distribution durables/non-durables, transportation
utilities	6	defence, environmental reclamation, chemicals, oil, recycling, waste management
waste management	4	construction, defence, recycling, utilities
wood	2	construction, furniture

Appendix B.2.: Overview of industries with corresponding PBV (adapted from various data sets available on http://pages.stern.nyu.edu/~adamodar/New_Home_Page/data.html)

Industry	PBV		
	EU 2002	EU 2011	US 1999
advertising	4,64	1,39	8,11
agriculture	0,96	1,11	n/a
airline	0,80	0,78	2,34
apparel and fabric products	2,37	2,05	2,52
automobile	1,36	1,13	2,58
automobile (food)	n/a	n/a	n/a
automobile conglomerate	n/a	n/a	n/a
aviation	1,58	1,63	2,53
banking	1,06	0,5	2,94
business services	2,15	2,98	3,02
catering trade	1,64	1,11	n/a
chemicals	1,66	1,59	4,38
computers	2,43	2,18	9,65
conglomerate	n/a	n/a	n/a
construction	1,34	1,23	1,70
consultancy	2,62	2,98	n/a
cosmetics	3,85	1,97	9,81
defence	1,58	1,63	2,53
detergent business	0,61	1,97	n/a
distribution	1,37	1,29	1,96
distribution durables	1,37	1,29	1,96
distribution non-durables	1,37	1,29	1,96
electronics	1,80	1,79	4,06
electronics/IT Hardware	1,80	1,79	4,06
engineering	2,76	1,05	n/a
entertainment	2,36	1,61	3,74
environmental reclamation	2,21	2,01	4,62
finance	1,58	0,69	3,67
food	3,02	2,42	3,31
furniture	1,14	1,35	3,19
health	4,41	2,07	n/a
health / computers	1,86	1,3	n/a
holding	n/a	n/a	n/a
industrial machinery	1,68	2,32	2,61
industrial manufacturing	2,02	2,94	n/a
insurance	1,24	0,74	2,63
investment holding	0,84	1,21	1,23
leather	3,50	2,05	2,93
measuring instruments, etc	2,82	3,53	3,93
mining	0,84	1,42	1,98
non-food retail	3,73	3,89	n/a
oil	1,73	1,43	2,69
optics	2,81	3,24	n/a
packaging	1,56	1,02	2,57
paper	1,42	0,71	2,01
pharmaceuticals	4,34	2,9	10,86
plastics	1,93	2,04	n/a
post	2,15	1,45	n/a
primary metal industries	1,31	1,57	2,99
publishing	2,41	1,75	5,68
real estate	1,11	0,93	n/a
recycling	1,03	2,01	n/a
renting	4,55	1,84	n/a
retail	1,56	1,28	5,04
service	2,15	2,98	3,02
software	3,51	3,25	11,81
stone, clay, glass etc	1,04	1,23	2,85
telecommunication	1,31	1,45	6,12
textile	4,81	2,05	1,51
tobacco	3,84	5,2	7,13
transport equipment	3,93	1,29	1,96
transportation	2,15	1,29	1,96
travel	1,23	1,29	1,96
utilities	1,57	1,59	2,31
waste management	2,51	2,01	n/a
wood	0,82	0,71	2,01

Appendix B.3.: OECD classification of manufacturing industries according to technological intensity: 1991-1997

	ISIC Rev. 3
High-technology industries	
Aircraft and spacecraft	353
Pharmaceuticals	2423
Office, accounting and computing machinery	30
Radio, television and communications equipment	32
Medical, precision and optical instruments	33
Medium-high-technology industries	
Electrical machinery and apparatus, n.e.c.	31
Motor vehicles, trailers and semi-trailers	34
Chemicals excluding pharmaceuticals	24 excl. 2423
Railroad equipment and transport equipment, n.e.c.	352 + 359
Machinery and equipment, n.e.c.	29
Medium-low-technology industries	
Coke, refined petroleum products and nuclear fuel	23
Rubber and plastic products	25
Other non-metallic mineral products	26
Building and repairing of ships and boats	351
Basic metals	27
Fabricated metal products, except machinery and equipment	28
Low-technology industries	
Manufacturing, n.e.c. and recycling	36-37
Wood, pulp, paper, paper products, printing and publishing	20-22
Food products, beverages and tobacco	15-16
Textiles, textile products, leather and footwear	17-19
Total manufacturing	15-37

Source: OECD, ANBERD and STAN databases, May 2001.

Appendix B.4.: OECD classification of knowledge intensive industries

	ISIC Rev.3
1. Post and telecommunications	64
2. Finance and insurance	65-67
3. Business activities (not including real estate)	71-74
4. Education and health sectors (alternatively for some countries)	

Source: OECD, STI Scoreboard 2003, p.140

Appendix C: SPSS outputs

Appendix C.1.: SPSS output for PBV averages in year 2002 and 2011

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
PBV_2002	,146	62	,002	,896	62	,000
PBV_2011	,163	62	,000	,888	62	,000

a. Lilliefors Significance Correction

Wilcoxon signed ranked test

Ranks

		N	Mean Rank	Sum of Ranks
PBV_2011 - PBV_2002	Negative Ranks	39[a]	33,22	1295,50
	Positive Ranks	23[b]	28,59	657,50
	Ties	0[c]		
	Total	62		

a. PBV_2011 < PBV_2002

b. PBV_2011 > PBV_2002

c. PBV_2011 = PBV_2002

Test Statistics[a]

	PBV_2011 - PBV_2002
Z	-2,237[b]
Asymp. Sig. (2-tailed)	,025

a. Wilcoxon Signed Ranks Test

b. Based on positive ranks.

Appendix C.2.: SPSS output for relationship between industry sector and merger type

Chi-Square Tests

				Monte Carlo Sig. (2-sided)			Monte Carlo Sig. (1-sided)		
					99% Confidence Interval			99% Confidence Interval	
	Value	df	Asymp. Sig. (2-sided)	Sig.	Lower Bound	Upper Bound	Sig.	Lower Bound	Upper Bound
Pearson Chi-Square	487,068[a]	70	,000	,000[b]	,000	,000			
Likelihood Ratio	505,603	70	,000	,000[b]	,000	,000			
Fisher's Exact Test	489,708			,000[b]	,000	,000			
Linear-by-Linear Association	5,376[c]	1	,020	,023[b]	,019	,027	,011[b]	,008	,014
N of Valid Cases	2061								

a. 2 cells (1,9%) have expected count less than 5. The minimum expected count is 4,56.

b. Based on 10000 sampled tables with starting seed 303130861.

c. The standardized statistic is -2,319.

Symmetric Measures

				Monte Carlo Sig.		
					99% Confidence Interval	
		Value	Approx. Sig.	Sig.	Lower Bound	Upper Bound
Nominal by Nominal	Phi	,486	,000	,000[c]	,000	,000
	Cramer's V	,344	,000	,000[c]	,000	,000
	Contingency Coefficient	,437	,000	,000[c]	,000	,000
N of Valid Cases		2061				

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

c. Based on 10000 sampled tables with starting seed 303130861.

Sector * Type of merger Crosstabulation

			Type of merger			
			horizontal	vertical	conglomerate	Total
Sector	agriculture	Count	4	5	7	16
		Expected Count	6,5	4,9	4,6	16,0
		% within Sector	25,0%	31,2%	43,8%	100,0%
		% within Type of merger	0,5%	0,8%	1,2%	0,8%
		% of Total	0,2%	0,2%	0,3%	0,8%
	airline	Count	12	8	6	26
		Expected Count	10,6	8,0	7,4	26,0
		% within Sector	46,2%	30,8%	23,1%	100,0%
		% within Type of merger	1,4%	1,3%	1,0%	1,3%
		% of Total	0,6%	0,4%	0,3%	1,3%
	automobile	Count	53	17	43	113
		Expected Count	46,1	34,7	32,2	113,0
		% within Sector	46,9%	15,0%	38,1%	100,0%
		% within Type of merger	6,3%	2,7%	7,3%	5,5%
		% of Total	2,6%	0,8%	2,1%	5,5%
	aviation	Count	17	15	16	48
		Expected Count	19,6	14,7	13,7	48,0
		% within Sector	35,4%	31,2%	33,3%	100,0%
		% within Type of merger	2,0%	2,4%	2,7%	2,3%
		% of Total	0,8%	0,7%	0,8%	2,3%
	banking	Count	62	52	45	159
		Expected Count	64,8	48,8	45,4	159,0
		% within Sector	39,0%	32,7%	28,3%	100,0%
		% within Type of merger	7,4%	8,2%	7,7%	7,7%
		% of Total	3,0%	2,5%	2,2%	7,7%
	business services	Count	11	13	13	37
		Expected Count	15,1	11,4	10,6	37,0
		% within Sector	29,7%	35,1%	35,1%	100,0%
		% within Type of merger	1,3%	2,1%	2,2%	1,8%
		% of Total	0,5%	0,6%	0,6%	1,8%
	chemicals	Count	57	43	30	130
		Expected Count	53,0	39,9	37,1	130,0
		% within Sector	43,8%	33,1%	23,1%	100,0%
		% within Type of merger	6,8%	6,8%	5,1%	6,3%
		% of Total	2,8%	2,1%	1,5%	6,3%
	computers	Count	14	6	7	27
		Expected Count	11,0	8,3	7,7	27,0
		% within Sector	51,9%	22,2%	25,9%	100,0%
		% within Type of merger	1,7%	0,9%	1,2%	1,3%
		% of Total	0,7%	0,3%	0,3%	1,3%
	conglomerate	Count	3	68	11	82
		Expected Count	33,4	25,2	23,4	82,0
		% within Sector	3,7%	82,9%	13,4%	100,0%
		% within Type of merger	0,4%	10,7%	1,9%	4,0%
		% of Total	0,1%	3,3%	0,5%	4,0%
	construction	Count	15	16	13	44
		Expected Count	17,9	13,5	12,6	44,0
		% within Sector	34,1%	36,4%	29,5%	100,0%
		% within Type of merger	1,8%	2,5%	2,2%	2,1%
		% of Total	0,7%	0,8%	0,6%	2,1%
	defence	Count	5	10	9	24
		Expected Count	9,8	7,4	6,8	24,0
		% within Sector	20,8%	41,7%	37,5%	100,0%
		% within Type of merger	0,6%	1,6%	1,5%	1,2%
		% of Total	0,2%	0,5%	0,4%	1,2%
	distribution durables	Count	9	5	15	29
		Expected Count	11,8	8,9	8,3	29,0
		% within Sector	31,0%	17,2%	51,7%	100,0%
		% within Type of merger	1,1%	0,8%	2,6%	1,4%
		% of Total	0,4%	0,2%	0,7%	1,4%
	electronics	Count	31	31	46	108
		Expected Count	44,0	33,2	30,8	108,0
		% within Sector	28,7%	28,7%	42,6%	100,0%
		% within Type of merger	3,7%	4,9%	7,8%	5,2%
		% of Total	1,5%	1,5%	2,2%	5,2%

Sector * Type of merger Crosstabulation

		Type of merger			
		horizontal	vertical	conglomerate	Total
engineering	Count	5	7	15	27
	Expected Count	11,0	8,3	7,7	27,0
	% within Sector	18,5%	25,9%	55,6%	100,0%
	% within Type of merger	0,6%	1,1%	2,6%	1,3%
	% of Total	0,2%	0,3%	0,7%	1,3%
entertainment	Count	33	14	17	64
	Expected Count	26,1	19,7	18,3	64,0
	% within Sector	51,6%	21,9%	26,6%	100,0%
	% within Type of merger	3,9%	2,2%	2,9%	3,1%
	% of Total	1,6%	0,7%	0,8%	3,1%
finance	Count	6	27	31	64
	Expected Count	26,1	19,7	18,3	64,0
	% within Sector	9,4%	42,2%	48,4%	100,0%
	% within Type of merger	0,7%	4,3%	5,3%	3,1%
	% of Total	0,3%	1,3%	1,5%	3,1%
food	Count	52	9	10	71
	Expected Count	28,9	21,8	20,3	71,0
	% within Sector	73,2%	12,7%	14,1%	100,0%
	% within Type of merger	6,2%	1,4%	1,7%	3,4%
	% of Total	2,5%	0,4%	0,5%	3,4%
industrial machinery	Count	29	19	13	61
	Expected Count	24,9	18,7	17,4	61,0
	% within Sector	47,5%	31,1%	21,3%	100,0%
	% within Type of merger	3,5%	3,0%	2,2%	3,0%
	% of Total	1,4%	0,9%	0,6%	3,0%
insurance	Count	70	22	13	105
	Expected Count	42,8	32,2	30,0	105,0
	% within Sector	66,7%	21,0%	12,4%	100,0%
	% within Type of merger	8,3%	3,5%	2,2%	5,1%
	% of Total	3,4%	1,1%	0,6%	5,1%
investment holding	Count	0	62	12	74
	Expected Count	30,2	22,7	21,1	74,0
	% within Sector	0,0%	83,8%	16,2%	100,0%
	% within Type of merger	0,0%	9,8%	2,0%	3,6%
	% of Total	0,0%	3,0%	0,6%	3,6%
oil	Count	36	16	11	63
	Expected Count	25,7	19,3	18,0	63,0
	% within Sector	57,1%	25,4%	17,5%	100,0%
	% within Type of merger	4,3%	2,5%	1,9%	3,1%
	% of Total	1,7%	0,8%	0,5%	3,1%
packaging	Count	7	5	9	21
	Expected Count	8,6	6,4	6,0	21,0
	% within Sector	33,3%	23,8%	42,9%	100,0%
	% within Type of merger	0,8%	0,8%	1,5%	1,0%
	% of Total	0,3%	0,2%	0,4%	1,0%
paper	Count	29	9	4	42
	Expected Count	17,1	12,9	12,0	42,0
	% within Sector	69,0%	21,4%	9,5%	100,0%
	% within Type of merger	3,5%	1,4%	0,7%	2,0%
	% of Total	1,4%	0,4%	0,2%	2,0%
pharmaceuticals	Count	24	10	8	42
	Expected Count	17,1	12,9	12,0	42,0
	% within Sector	57,1%	23,8%	19,0%	100,0%
	% within Type of merger	2,9%	1,6%	1,4%	2,0%
	% of Total	1,2%	0,5%	0,4%	2,0%
plastics	Count	7	13	13	33
	Expected Count	13,4	10,1	9,4	33,0
	% within Sector	21,2%	39,4%	39,4%	100,0%
	% within Type of merger	0,8%	2,1%	2,2%	1,6%
	% of Total	0,3%	0,6%	0,6%	1,6%
primary metal industries	Count	43	10	18	71
	Expected Count	28,9	21,8	20,3	71,0
	% within Sector	60,6%	14,1%	25,4%	100,0%
	% within Type of merger	5,1%	1,6%	3,1%	3,4%
	% of Total	2,1%	0,5%	0,9%	3,4%

Sector * Type of merger Crosstabulation

			Type of merger			
			horizontal	vertical	conglomerate	Total
	real estate	Count	1	11	6	18
		Expected Count	7,3	5,5	5,1	18,0
		% within Sector	5,6%	61,1%	33,3%	100,0%
		% within Type of merger	0,1%	1,7%	1,0%	0,9%
		% of Total	0,0%	0,5%	0,3%	0,9%
	retail	Count	35	6	16	57
		Expected Count	23,2	17,5	16,3	57,0
		% within Sector	61,4%	10,5%	28,1%	100,0%
		% within Type of merger	4,2%	0,9%	2,7%	2,8%
		% of Total	1,7%	0,3%	0,8%	2,8%
	service	Count	4	8	10	22
		Expected Count	9,0	6,8	6,3	22,0
		% within Sector	18,2%	36,4%	45,5%	100,0%
		% within Type of merger	0,5%	1,3%	1,7%	1,1%
		% of Total	0,2%	0,4%	0,5%	1,1%
	software	Count	2	11	9	22
		Expected Count	9,0	6,8	6,3	22,0
		% within Sector	9,1%	50,0%	40,9%	100,0%
		% within Type of merger	0,2%	1,7%	1,5%	1,1%
		% of Total	0,1%	0,5%	0,4%	1,1%
	stone, clay, glass and concrete products	Count	19	8	4	31
		Expected Count	12,6	9,5	8,8	31,0
		% within Sector	61,3%	25,8%	12,9%	100,0%
		% within Type of merger	2,3%	1,3%	0,7%	1,5%
		% of Total	0,9%	0,4%	0,2%	1,5%
	telecommunication	Count	73	37	40	150
		Expected Count	61,1	46,1	42,8	150,0
		% within Sector	48,7%	24,7%	26,7%	100,0%
		% within Type of merger	8,7%	5,8%	6,8%	7,3%
		% of Total	3,5%	1,8%	1,9%	7,3%
	transport equipment	Count	6	3	18	27
		Expected Count	11,0	8,3	7,7	27,0
		% within Sector	22,2%	11,1%	66,7%	100,0%
		% within Type of merger	0,7%	0,5%	3,1%	1,3%
		% of Total	0,3%	0,1%	0,9%	1,3%
	transportation	Count	22	22	17	61
		Expected Count	24,9	18,7	17,4	61,0
		% within Sector	36,1%	36,1%	27,9%	100,0%
		% within Type of merger	2,6%	3,5%	2,9%	3,0%
		% of Total	1,1%	1,1%	0,8%	3,0%
	travel	Count	13	6	10	29
		Expected Count	11,8	8,9	8,3	29,0
		% within Sector	44,8%	20,7%	34,5%	100,0%
		% within Type of merger	1,5%	0,9%	1,7%	1,4%
		% of Total	0,6%	0,3%	0,5%	1,4%
	utilities	Count	31	9	23	63
		Expected Count	25,7	19,3	18,0	63,0
		% within Sector	49,2%	14,3%	36,5%	100,0%
		% within Type of merger	3,7%	1,4%	3,9%	3,1%
		% of Total	1,5%	0,4%	1,1%	3,1%
Total		Count	840	633	588	2061
		Expected Count	840,0	633,0	588,0	2061,0
		% within Sector	40,8%	30,7%	28,5%	100,0%
		% within Type of merger	100,0%	100,0%	100,0%	100,0%
		% of Total	40,8%	30,7%	28,5%	100,0%

Table 25: Contingency table[264]

[264] In larger contingency tables is acceptable to have up to 20% of expected frequencies below 5. However, if industry sector agriculture with 16 occurrences is excluded in order to eliminate cells with expected count less than 5 the chi square remains highly significant only its value decreases (χ^2 (68)= 484.664, p< .001).

Appendix C.3.: SPSS output for Hypothesis 2

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Type of merger	Statistic	df	Sig.	Statistic	df	Sig.
PBV	horizontal	,236	878	,000	,782	878	,000
	vertical	,188	606	,000	,817	606	,000
	conglomerate	,236	626	,000	,798	626	,000

a. Lilliefors Significance Correction

Kruskal-Wallis test

Ranks

	Type of merger	N	Mean Rank
PBV	horizontal	878	1047,70
	vertical	606	998,21
	conglomerate	626	1121,90
	Total	2110	

Test Statistics[a,b]

			PBV
Chi-Square			12,963
df			2
Asymp. Sig.			,002
Monte Carlo Sig.	Sig.		,002[c]
	99% Confidence Interval	Lower Bound	,001
		Upper Bound	,002

a. Kruskal Wallis Test

b. Grouping Variable: Type of merger

c. Based on 10000 sampled tables with starting seed 1421288173.

Mann-Whitney tests

Test Statistics[a]

			PBV
Mann-Whitney U			252396,000
Wilcoxon W			436317,000
Z			-1,682
Asymp. Sig. (2-tailed)			,092
Monte Carlo Sig. (2-tailed)	Sig.		,094[b]
	99% Confidence Interval	Lower Bound	,087
		Upper Bound	,102
Monte Carlo Sig. (1-tailed)	Sig.		,049[b]
	99% Confidence Interval	Lower Bound	,043
		Upper Bound	,054

Horizontal vs. vertical type

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 677935123.

Test Statistics[a]

			PBV
Mann-Whitney U			254329,500
Wilcoxon W			640210,500
Z			-2,470
Asymp. Sig. (2-tailed)			,014
Monte Carlo Sig. (2-tailed)	Sig.		,014[b]
	99% Confidence Interval	Lower Bound	,011
		Upper Bound	,017
Monte Carlo Sig. (1-tailed)	Sig.		,007[b]
	99% Confidence Interval	Lower Bound	,005
		Upper Bound	,009

Horizontal vs. conglomerate type

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 1122541128.

Appendix C.4.: SPSS output for Sub hypothesis 2a

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	27,643[a]	1	,000	,000	,000	
Continuity Correction[b]	26,333	1	,000			
Likelihood Ratio	29,044	1	,000	,000	,000	
Fisher's Exact Test				,000	,000	
Linear-by-Linear Association	27,591[c]	1	,000	,000	,000	,000
N of Valid Cases	527					

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 36,15.

b. Computed only for a 2x2 table

c. The standardized statistic is 5,253.

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Merger type (vertical / conglomerate)	4,366	2,433	7,833
For cohort Combination of sectors = undervalued x overvalued	3,631	2,142	6,153
For cohort Combination of sectors = overvalued x overvalued or undervalued x undervalued	,832	,775	,893
N of Valid Cases	527		

Appendix C.5.: SPSS output for hypothesis 3

Kruskal-Wallis test

Ranks

	Type of merger	N	Mean Rank
Technology	horizontal	667	725,90
	vertical	413	801,45
	conglomerate	447	786,25
	Total	1527	

Test Statistics[a,b]

			Technology
Chi-Square			9,679
df			2
Asymp. Sig.			,008
Monte Carlo Sig.	Sig.		,009[c]
	99% Confidence Interval	Lower Bound	,006
		Upper Bound	,011

a. Kruskal Wallis Test

b. Grouping Variable: Type of merger

c. Based on 10000 sampled tables with starting seed 1039640005.

Mann-Whitney tests

Ranks

	Type of merger	N	Mean Rank	Sum of Ranks
Technology	horizontal	667	520,51	347178,50
	vertical	413	572,79	236561,50
	Total	1080		

Test Statistics[a]

			Technology
Mann-Whitney U			124400,500
Wilcoxon W			347178,500
Z			-2,753
Asymp. Sig. (2-tailed)			,006
Monte Carlo Sig. (2-tailed)	Sig.		,006[b]
	99% Confidence Interval	Lower Bound	,004
		Upper Bound	,008
Monte Carlo Sig. (1-tailed)	Sig.		,003[b]
	99% Confidence Interval	Lower Bound	,001
		Upper Bound	,004

Vertical vs. horizontal merger type

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 407952326.

Ranks

	Type of merger	N	Mean Rank	Sum of Ranks
Technology	vertical	413	435,66	179927,50
	conglomerate	447	425,73	190302,50
	Total	860		

Test Statistics[a]

			Technology
Mann-Whitney U			90174,500
Wilcoxon W			190302,500
Z			-,609
Asymp. Sig. (2-tailed)			,543
Monte Carlo Sig. (2-tailed)	Sig.		,538[b]
	99% Confidence Interval	Lower Bound	,525
		Upper Bound	,551
Monte Carlo Sig. (1-tailed)	Sig.		,264[b]
	99% Confidence Interval	Lower Bound	,253
		Upper Bound	,276

Vertical vs. conglomerate merger type

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 1249518874.

Appendix C.6.: SPSS output for Sub hypothesis 3a

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	19,254[a]	1	,000	,000	,000	
Continuity Correction[b]	18,180	1	,000			
Likelihood Ratio	19,546	1	,000	,000	,000	
Fisher's Exact Test				,000	,000	
Linear-by-Linear Association	19,184[c]	1	,000	,000	,000	,000
N of Valid Cases	279					

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 51,32.

b. Computed only for a 2x2 table

c. The standardized statistic is 4,380.

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Merger type (vertical / conglomerate)	3,073	1,846	5,116
For cohort Combination of sectors = acquirer and target R&D intensive	2,044	1,459	2,863
For cohort Combination of sectors = other combinations	,665	,550	,804
N of Valid Cases	279		

Appendix C.7.: SPSS output for Hypothesis 4

Ranks

	before and after deregulatory event	N	Mean Rank	Sum of Ranks
airline	before	8	4,50	36,00
	after 1997	3	10,00	30,00
	Total	11		

Test Statistics[a]

	airline
Mann-Whitney U	,000
Wilcoxon W	36,000
Z	-2,501
Asymp. Sig. (2-tailed)	,012
Exact Sig. [2*(1-tailed Sig.)]	,012[b]
Exact Sig. (2-tailed)	,012
Exact Sig. (1-tailed)	,006
Point Probability	,006

a. Grouping Variable: before and after deregulatory event

b. Not corrected for ties.

Ranks

	before and after deregulatory event	N	Mean Rank	Sum of Ranks
banking	before	4	3,00	12,00
	after 1993	7	7,71	54,00
	Total	11		

Test Statistics[a]

	banking
Mann-Whitney U	2,000
Wilcoxon W	12,000
Z	-2,268
Asymp. Sig. (2-tailed)	,023
Exact Sig. [2*(1-tailed Sig.)]	,024[b]
Exact Sig. (2-tailed)	,024
Exact Sig. (1-tailed)	,012
Point Probability	,006

a. Grouping Variable: before and after deregulatory event

b. Not corrected for ties.

Ranks

	before and after deregulatory event	N	Mean Rank	Sum of Ranks
insurance	before	5	3,80	19,00
	after 1994	6	7,83	47,00
	Total	11		

Test Statistics[a]

	insurance
Mann-Whitney U	4,000
Wilcoxon W	19,000
Z	-2,018
Asymp. Sig. (2-tailed)	,044
Exact Sig. [2*(1-tailed Sig.)]	,052[b]
Exact Sig. (2-tailed)	,043
Exact Sig. (1-tailed)	,019
Point Probability	,002

a. Grouping Variable: before and after deregulatory event

b. Not corrected for ties.

Ranks

	before and after deregulatory event	N	Mean Rank	Sum of Ranks
telecommunications	before	7	4,14	29,00
	after 1996	4	9,25	37,00
	Total	11		

Test Statistics[a]

	telecommunications
Mann-Whitney U	1,000
Wilcoxon W	29,000
Z	-2,503
Asymp. Sig. (2-tailed)	,012
Exact Sig. [2*(1-tailed Sig.)]	,012[b]
Exact Sig. (2-tailed)	,012
Exact Sig. (1-tailed)	,009
Point Probability	,009

a. Grouping Variable: before and after deregulatory event

b. Not corrected for ties.

Ranks

	before and after deregulatory event	N	Mean Rank	Sum of Ranks
telecommunications	before	5	3,00	15,00
	after 1994	6	8,50	51,00
	Total	11		

Test Statistics[a]

	telecommunications
Mann-Whitney U	,000
Wilcoxon W	15,000
Z	-2,790
Asymp. Sig. (2-tailed)	,005
Exact Sig. [2*(1-tailed Sig.)]	,004[b]
Exact Sig. (2-tailed)	,004
Exact Sig. (1-tailed)	,002
Point Probability	,002

a. Grouping Variable: before and after deregulatory event

b. Not corrected for ties.

Ranks

	before and after deregulatory event	N	Mean Rank	Sum of Ranks
utilities	before	10	5,50	55,00
	after 1999	1	11,00	11,00
	Total	11		

Test Statistics[a]

	utilities
Mann-Whitney U	,000
Wilcoxon W	55,000
Z	-1,585
Asymp. Sig. (2-tailed)	,113
Exact Sig. [2*(1-tailed Sig.)]	,182[b]
Exact Sig. (2-tailed)	,091
Exact Sig. (1-tailed)	,091
Point Probability	,091

a. Grouping Variable: before and after deregulatory event

b. Not corrected for ties.

Appendix C.8.: SPSS output for Sub hypothesis 4a

Chi-Square Tests

Industry		Value	df	Asymp. Sig. (2-sided)
airline	Pearson Chi-Square	5,515[d]	2	,063
	Likelihood Ratio	5,745	2	,057
	Fisher's Exact Test	5,110		
	Linear-by-Linear Association	4,719[e]	1	,030
	N of Valid Cases	26		
banking	Pearson Chi-Square	14,996[f]	2	,001
	Likelihood Ratio	15,827	2	,000
	Fisher's Exact Test	14,359		
	Linear-by-Linear Association	8,923[g]	1	,003
	N of Valid Cases	159		
insurance	Pearson Chi-Square	4,072[h]	2	,131
	Likelihood Ratio	4,560	2	,102
	Fisher's Exact Test	3,815		
	Linear-by-Linear Association	2,667[i]	1	,102
	N of Valid Cases	105		
utilities	Pearson Chi-Square	,454[j]	2	,797
	Likelihood Ratio	,459	2	,795
	Fisher's Exact Test	,432		
	Linear-by-Linear Association	,267[k]	1	,605
	N of Valid Cases	63		
telecommunication 1994	Pearson Chi-Square	2,925[l]	2	,232
	Likelihood Ratio	2,694	2	,260
	Fisher's Exact Test	2,694		
	Linear-by-Linear Association	,006[m]	1	,937
	N of Valid Cases	150		
telecommunication 1996	Pearson Chi-Square	2,721[n]	2	,257
	Likelihood Ratio	2,884	2	,236
	Fisher's Exact Test	2,767		
	Linear-by-Linear Association	1,691[o]	1	,193
	N of Valid Cases	150		

d. 4 cells (66,7%) have expected count less than 5. The minimum expected count is 2,54.

e. The standardized statistic is 2,172.

f. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 5,38.

g. The standardized statistic is 2,987.

h. 1 cells (16,7%) have expected count less than 5. The minimum expected count is 2,97.

i. The standardized statistic is 1,633.

j. 1 cells (16,7%) have expected count less than 5. The minimum expected count is 2,57.

k. The standardized statistic is -,517.

l. 2 cells (33,3%) have expected count less than 5. The minimum expected count is 4,19.

m. The standardized statistic is ,079.

n. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 10,11.

o. The standardized statistic is 1,301.

Appendix C.9.: SPSS output for Hypothesis 5
Kruskal-Wallis test

Ranks

	Type of merger	N	Mean Rank
Concentration	horizontal	474	490,69
	vertical	249	503,31
	conglomerate	293	541,73
	Total	1016	

Test Statistics[a,b]

			Concentration
Chi-Square			6,701
df			2
Asymp. Sig.			,035
Monte Carlo Sig.	Sig.		,036[c]
	99% Confidence Interval	Lower Bound	,031
		Upper Bound	,041

a. Kruskal Wallis Test

b. Grouping Variable: Type of merger

c. Based on 10000 sampled tables with starting seed 1868416634.

Mann-Whitney tests

Ranks

	Type of merger	N	Mean Rank	Sum of Ranks
Technology	horizontal	667	539,39	359774,00
	conglomerate	447	584,52	261281,00
	Total	1114		

Test Statistics[a]

			Technology
Mann-Whitney U			136996,000
Wilcoxon W			359774,000
Z			-2,363
Asymp. Sig. (2-tailed)			,018
Monte Carlo Sig. (2-tailed)	Sig.		,018[b]
	99% Confidence Interval	Lower Bound	,014
		Upper Bound	,021
Monte Carlo Sig. (1-tailed)	Sig.		,009[b]
	99% Confidence Interval	Lower Bound	,007
		Upper Bound	,012

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 1671251878.

Ranks

	Type of merger	N	Mean Rank	Sum of Ranks
Technology	horizontal	667	520,51	347178,50
	vertical	413	572,79	236561,50
	Total	1080		

Test Statistics[a]

			Technology
Mann-Whitney U			124400,500
Wilcoxon W			347178,500
Z			-2,753
Asymp. Sig. (2-tailed)			,006
Monte Carlo Sig. (2-tailed)	Sig.		,007[b]
	99% Confidence Interval	Lower Bound	,004
		Upper Bound	,009
Monte Carlo Sig. (1-tailed)	Sig.		,004[b]
	99% Confidence Interval	Lower Bound	,002
		Upper Bound	,006

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 375482358.

Appendix C.10.: SPSS output for Sub hypothesis 5a

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	,978[a]	1	,323	,387	,220	
Continuity Correction[b]	,596	1	,440			
Likelihood Ratio	,980	1	,322	,387	,220	
Fisher's Exact Test				,387	,220	
Linear-by-Linear Association	,971[c]	1	,324	,387	,220	,106
N of Valid Cases	141					

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 12,72.

b. Computed only for a 2x2 table

c. The standardized statistic is -,985.

Appendix C.11.: SPSS output for Hypothesis 7
Kruskal-Wallis test

Ranks

	Type of merger	N	Mean Rank
Classification of deal	horizontal	865	1234,47
	vertical	667	1024,13
	conglomerate	628	928,29
	Total	2160	

Test Statistics[a,b]

			Classification of deal
Chi-Square			122,239
df			2
Asymp. Sig.			,000
Monte Carlo Sig.	Sig.		,000[c]
	99% Confidence Interval	Lower Bound	,000
		Upper Bound	,000

a. Kruskal Wallis Test

b. Grouping Variable: Type of merger

c. Based on 10000 sampled tables with starting seed 558843946.

Mann-Whitney tests

Ranks

	Type of merger	N	Mean Rank	Sum of Ranks
Classification of deal	horizontal	865	831,41	719166,50
	vertical	667	682,33	455111,50
	Total	1532		

Test Statistics[a]

			Classification of deal
Mann-Whitney U			232333,500
Wilcoxon W			455111,500
Z			-7,517
Asymp. Sig. (2-tailed)			,000
Monte Carlo Sig. (2-tailed)	Sig.		,000[b]
	99% Confidence Interval	Lower Bound	,000
		Upper Bound	,000
Monte Carlo Sig. (1-tailed)	Sig.		,000[b]
	99% Confidence Interval	Lower Bound	,000
		Upper Bound	,000

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 1979300790.

Ranks

	Type of merger	N	Mean Rank	Sum of Ranks
Classification of deal	horizontal	865	836,07	723199,00
	conglomerate	628	624,32	392072,00
	Total	1493		

Test Statistics[a]

			Classification of deal
Mann-Whitney U			194566,000
Wilcoxon W			392072,000
Z			-10,606
Asymp. Sig. (2-tailed)			,000
Monte Carlo Sig. (2-tailed)	Sig.		,000[b]
	99% Confidence Interval	Lower Bound	,000
		Upper Bound	,000
Monte Carlo Sig. (1-tailed)	Sig.		,000[b]
	99% Confidence Interval	Lower Bound	,000
		Upper Bound	,000

a. Grouping Variable: Type of merger

b. Based on 10000 sampled tables with starting seed 1222479940.

Appendix C.12.: SPSS output for Sub hypothesis 7b

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	8,578[a]	1	,003	,004	,002	
Continuity Correction[b]	8,275	1	,004			
Likelihood Ratio	8,583	1	,003	,004	,002	
Fisher's Exact Test				,004	,002	
Linear-by-Linear Association	8,572[c]	1	,003	,004	,002	,001
N of Valid Cases	1489					

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 320,91.

b. Computed only for a 2x2 table

c. The standardized statistic is -2,928.

List of Tables

Table 1: Types of M&A 7
Table 2: Overview of motives for M&A 12
Table 3: Summary of M&A waves 23
Table 4: Categories of industries according to their EU PBV 2002 49
Table 5: OECD classification based on R&D intensity adapted to DOME industries 50
Table 6: Overview of deregulated industries 55
Table 7: The comparison of the mean CR_4 58
Table 8: Classification of industries according to concentration level 58
Table 9: Overview of variables used in the research 59
Table 10: Overview of most active industries in M&A 61
Table 11: Top five industries in categories of merger types 61
Table 12: Occurrence of merger types over time period 1990-2000 64
Table 13: Cross-table of merger type and valuation category of sectors 66
Table 14: Cross-table between merger type and combination of sectors 67
Table 15: Cross-table of relationship between merger type and industry's technology level 69
Table 16: Cross-table of relationship between merger type and combinations of R&D intensity 71
Table 17: Occurrences over time period in deregulated industries 72
Table 18: Summary of statistics for deregulated industries 74
Table 19: Overview of average annual percent changes in deregulated industries 75
Table 20: Cross-table of deregulated industries 77
Table 21: Cross-table of relationship of merger type and concentration of industry 78
Table 22: Cross-table of sector combinations of competitiveness and merger type 79
Table 23: Cross-table of classification of deal and merger type 82
Table 24: Cross-table of integration level and asset specificity of industry 83
Table 25: Contingency table 105

List of Figures

Figure 1: The major merger waves 22
Figure 2: Sequence of strategic combinations 59
Figure 3: Graph of different merger type occurrences over years 63
Figure 4: Occurrences over time period in deregulated industries 73

Abstract

Firms are constantly seeking for a growth and improved performance; one of the options how to reach this goal is to engage in mergers and acquisitions. Indeed M&A activity is increasing all over the world and over the past years. Many aspects of M&A have been a concern of the vast research and there are still unexplored areas. This thesis contributes to the standing findings and aims at an extending of existing knowledge about M&A.

This paper consists of two main parts; the theoretical and the empirical part. The first one reviews the theoretical foundations of M&A activity, especially it defines the different merger types, motivation factors of M&A, summarizes the past merger waves and lists the merger waves theories. Furthermore, the relevant literature concerned with clustering of M&A activity by industries and the different merger types is reviewed. In accordance with the theory, the hypotheses for the research are formulated.

The empirical part deals mainly with the answering two research questions on merger cases notified to the European Commission from 1990 till 2000. Firstly, whether M&A types cluster by industries what was confirmed on the fact that some industries experience more horizontal deals while some are characterized mostly with vertical or conglomerate transactions. The second question aims at answering which industries' characteristics have the effect on the occurrence of specific merger type. The four main characteristics were reviewed; the valuation of industries, possession of specific assets, industry deregulation and the competitiveness of industry. Some of them can be validated as the good predictors in which type of merger the firm in the specific industry will rationally engage e.g. a firm with highly specific assets will undertake most probably vertical merger. Altogether, it can be argued that this paper brought more insight on M&A activity in terms of clustering and determinants of different merger types.

Abstract (Deutsch)

Firmen streben dauernd nach dem Wachstum und der verbesserten Leistung; eine von den Möglichkeiten, wie dieses Ziel zu erreichen, ist Fusionen und Übernahme durchzuführen. M&A Aktivität steigt tatsächlich weltweit und im Laufe der vergangen Jahre an. Viele Aspekte von M&A sind ein Teil von der gewaltigen Forschung geworden aber es gibt noch unerforschte Bereiche. Diese Magisterabeit trägt zu vorliegenden Feststellungen bei und erstrebt zu der Erweiterung von bestehenden M&A Kenntnissen.

Diese Arbeit besteht aus zwei Teilen; dem theoretischen und empirischen Teil. Der erste Teil stellt die theoretischen Grundlagen von M&A Aktivität zusammen, besonders die Definitionen von unterschiedlichen Arten von Fusionen, die Motive für M&A, die vergangenen M&A-Wellen und erfasst die Theorien von M&A-Wellen. Weiterhin ist die Übersicht der zuständigen Fachliteratur, die sich mit der Gruppierung von M&A Aktivität und verschiedenen Arten von M&A befasst, eingeführt. Gemäß der Theorie sind die Hypothesen für die Forschung aufgestellt.

Im empirischen Teil geht es hauptsächlich um die Beantwortung von zwei Forschungsfragen anhand M&A Fällen, die durch die Europäische Kommission von 1990 bis 2000 notifiziert wurden. Erstens, ob sich die Arten von M&A nach den Industriezweigen gruppieren und das bestätigt die Tatsache, dass einige Branchen mehrere horizontale Transaktionen durchführen, während andere von den vertikalen und konglomeraten Transaktionen gekennzeichnet sind. Die zweite Frage zielt auf die Beantwortung ab, welche Eigenschaften von Branchen einen Einfluss auf das Auftreten von bestimmter M&A Art haben. In der vorliegenden Arbeit wird der Überblick von vier spezifischen Eigenschaften eingeführt; die Bewertung von Branchen, der Besitz von speziellen Vermögenswerten, die Deregulierung von Industriezweigen und die Wettbewerbsfähigkeit von Branchen. Manche von ihnen sind als gute Prädiktoren von der Auswahl der M&A Art, die eine Firma vernünftigt durchführen wird, bestätigt z.B. eine Firma mit speziellen Vermögenswerten wird höchstwahrscheinlich eine vertikale Transaktion durchführen. Ingesamt kann es argumentiert werden, dass diese Arbeit einen wertvollen Einblick hinsichtlich der Gruppierung von M&A Aktivität und den Determinanten der verschiedenen Arten von M&A gebracht hat.

Curriculum Vitae

Dagmar Šimončičová, BSc
Jána Smreka 9
841 07 Bratislava
Tel: +421911 478 056
E-mail: dagmik@gmail.com

Education

2010-	Master studies of International Business Administration University of Vienna Majors: Corporate Finance, International Management
2006 – 2010	BSc in International Business Administration University of Vienna
Winter term 2009	Erasmus Exchange Programme EM Strasbourg Business School, France
1998 – 2006	Gymnázium Jána Papánka, Bratislava

Language course

2002 – 2006	Advanced English Course Language school by Gymnázium Jána Papánka, Bratislava

Work experience

June 2010 – April 2012 Part-time Job in Pricing Team, IBM Slovakia

August 2008 Administrative Part-time Job, OTP Bank

Languages

English, fluent	C2
German, fluent	C2
French, intermediate	B1
Russian, intermediate	B1
Slovak, native language	

Certificates: German language certificate *Sprachdiplom*

Computer Skills

Microsoft Office
Html, Java script
SPSS
SQL
Lotus Notes

Interests and skills

Literature, Languages
Creativity, Patience
Driving License