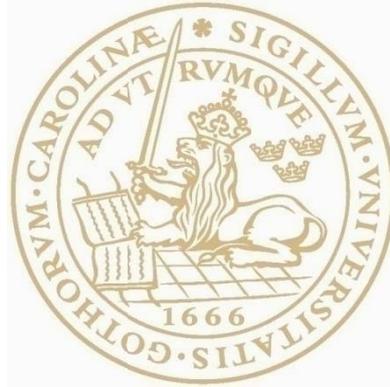


SCHOOL OF ECONOMICS AND MANAGEMENT
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MASTER THESIS

SUCCESS FACTORS IN EUROPEAN ENERGY MERGERS AND ACQUISITIONS AN EVENT STUDY

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Executive Summary

The European Energy industry is in transition. Over the past years the national energy markets of the European member states have been the subject of increasing liberalisation efforts of the European Commission (EC). The process of liberalising the electricity and gas markets started more than 10 years ago and the industry landscape has changed dramatically since that time. Through mergers and acquisitions (M&As) the energy industry has been reshaped to respond to technological and regulatory changes. The ambitious objective that, by 2020, 20% of the European Union's energy mix will be sourced from renewable energy, together with further deregulation efforts, will continue to impact energy deals in the future.

The main purpose of this thesis is to investigate the success factors of M&As in the European energy industry. Thus, the theoretical framework of this work covers both the structure of the European energy industry and the key success factors in M&As. In an event study analysis a total amount of 103 large-scale energy deals in the period between December 1996 and March 2008 are analysed. By conducting a comparative statics analysis and a follow-up cross-sectional regression analysis we are able to pinpoint significant factors that influence abnormal returns in the event window around the announcement day of the merger or acquisition, respectively. Both empirical approaches deliver consistent and significant results. Acquirers that have been highly active in previous M&As show significantly lower stock returns around the announcement day, showing that shareholders do not value a bidder's experience in large energy deals. We also find some empirical evidence for M&As of similarly sized entities to be more successful. Another major finding is that corporate transactions within a single, regulated market deliver significantly higher returns. At first glance this might be contrary to competitive theory that says that companies perform best in free markets without political intervention. We, on the other hand, argue that national governments support the creation of so-called national champions by either promoting national M&As or intervening in attempts of foreign energy companies that buy in domestic markets. This protection leads to significant higher returns of national and regulated energy M&As. We also find that the significance of results increases when the event window is enlarged. This shows that the uncertainty of a possible political intervention leads to slower adjustments of stock prices around announcement days.

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List of Abbreviations

AR	Abnormal Return
CAR	Cumulated Abnormal Return
CSR	Cross Sectional Regression
EC	European Commission
EPS	Earnings per Share
EU	European Union
EUR	Euro
IPO	Initial Public Offering
M&A	Merger and Acquisition
M/B	Market-to-Book
NPV	Net Present Value
OLS	Ordinary Least Squares
PT	Power Transmission
PD	Power Distribution
PR	Power Retailing
ROE	Return on Equity
USD	US Dollar

1. Introduction

1.1. Problem Background

The electricity markets in Europe faced a strong phase of liberalisation in the last decade. Since 2007, all European consumers are able to choose their electricity supplier. The consequence of liberalisation is a notable reduction in regulations and diminished national boundaries within the EU. The change of market regulations, therefore, has increased the need for electric utilities to strengthen their market position, not only against domestic competitors, but also international players within this sector. This altering situation has resulted in a significant boost in mergers and acquisitions (M&As) among electric utilities, especially across countries (Sheldon, 2008). Cross-border mergers can be seen as a strategy to gain important weight at a European level before the liberalization is fully implemented or as a strategic securitization of fossil resources for generation. National M&A activity with respect to deregulation can be explained as defensive measures against foreign hostile takeovers or as a strategy to increase bargaining power when it comes to negotiations with other enlarged European suppliers and competitors (Verde, 2008). In any case, a tendency of size increasing of European energy companies can be observed. In the first half of the current decade, the share of the top five electricity firms in the EU has risen from 49% to 58% (Green, 2006).

Another explanation for the increase in energy M&As can be found in the increase of cash liquidity of energy companies. Excess cash is invested in M&As rather than in generation, transmission, or even exploration activities. According to Verde (2008), this strategy better copes with the short-term interests of shareholders to the detriment of the real needs of the industry and customers, leading to insufficient investments in infrastructure in this high capital-intensive sector. Despite an increasing number in European electric utility mergers there are many relevant questions with respect to value creation that have remained unanswered yet. Do shareholders really appreciate energy M&As or make a distinction between various strategies that lead to M&As? Does empire building create value in the European energy industry? Does the reaction of shareholders depend on other factors than the announcement of the corporate transaction itself? Does the degree of regulation in a country impact the value that is created through a merger?

Liberalisation efforts will certainly continue due to the additional opening of the markets as strived by the EU (European Commission, 2008). Due to the permanently varying market situation it can be anticipated that the electricity sector will have many new upcoming M&As in the years to come. The considerable number of M&As which have been taking place in this

sector and the fact that there are many more to come open up the discussion to the subject of key factors that drive the success or failure of these kinds of transactions.

A substantial number of scientific articles in the area of key success factors in M&As has been published. Many of these studies focus on transactions in the financial area. There exists a lively debate, among both practitioners and academics, whether or not M&As create value for the acquiring party. Most of the relevant studies found great disparity of returns between targets and bidders where the majority of gains generally accrue to the target's shareholders due to a premium required to sell their shares, which is paid by the bidder. Hence, many empirical studies found zero or negative value creation for bidders in average. However, often there is variation in bidder returns around the mean observed with some transactions being more successful than others (Grill & Jaskow, 2007). These variations are dependent on underlying factors and the environment the transaction takes place. Key factors for successful M&As can for example vary depending on industry. In the banking sector, where most scientific research has been done, Beitel et al. (2004) find positive abnormal returns for acquirers with focus on domestic transactions, targets dealing with the same range of products and targets with high asset growth. Moeller et al. (2003) find significant economic benefit for smaller acquirers when investigating over 12.000 US acquisitions. Hence, the size of bidders and targets relatively to the deal itself can influence the extent to which value is created in an M&A.

As the European energy industry is unique in its size, structure and regulative environment, factors that lead to value creation in an M&A cannot be derived from other industries. So far no significant empirical research in energy M&As has been undertaken, making this thesis an important step to understand the mechanisms of transactions in the European energy industry.

1.2. Purpose and Contribution

Many electric utilities were already publicly listed and those that were not have undertaken an initial public offering (IPO) to satisfy the necessary capital demand for further expansion. In order to investigate the purpose of "What key factors drive the success for M&As in the European energy market", this study applies an event study methodology. In an event study researchers can measure the success of variables on the basis of abnormal stock returns around the announcement of the M&A. This allows the authors to test potential success factors and give them an idea about their magnitude for successful transactions.

Furthermore, the event study methodology contributes to the target groups of this thesis, namely the shareholders and the management of the acquiring company. The results give the management a good idea of the key factors when it comes to a potential acquisition. The findings of this study could be used by the management to support crucial decisions in this area. Shareholders receive valuable information enabling them to evaluate and to forecast the impact of an acquisition on their investment.

1.3. Thesis outline

Chapter 2 highlights the characteristics of the energy market in order to introduce the reader to the special characteristics of this branch. Special emphasis lies on structure, regulations and M&A processes in the electricity sector. Furthermore, this chapter presents a literature review about key success factors explaining M&A success. Initially, the discussion focuses on key success factors of different branches, and later narrows down to electric utilities.

Chapter 3 introduces the methodology and the data sample. This chapter starts with a discussion on event study methodologies and shows theory-based assumptions of this subject. This chapter explains the process of modelling abnormal returns, as well as the workings of comparative statics and cross sectional regressions.

Chapter 4 presents the results of the analysis of abnormal returns, comparative statics, and cross sectional regressions. The results of the comparative static analysis serve as a starting point for the regression analysis. The regression analysis then verifies the results of the comparative static analysis and highlights the interrelationship between different factors in the analyses.

Chapter 5 draws a final conclusion on the empirical results of this study. This chapter stresses the managerial implications in the area of M&As in the utility sector. Finally, suggestions for future research are provided.

2 Theoretical Framework

The following section introduces the European energy market and its distinctive features. Due to the unique characteristics of the good ‘electricity’ and different political approaches and influences, national energy markets in Europe have developed differently over time. Efforts on the part of the European Commission now focus more than ever on homogenising market structures and on promoting internal trade within member countries. Thus, the following part delivers essential insight so as to understand why corporate transactions in the European energy market have to be analysed with regard to their special characteristics. This chapter highlights recent examples of large-scale energy deals in Europe and visualises procedures and obstacles that lie within M&As in the energy sector. Furthermore, a literature review of general key success factors explaining M&A success is given and finally is narrowed down to specific electric utilities characteristics.

2.1. Characteristics of the Energy Market

2.1.1. Structure of the European Energy Industry

The European energy market has been in constant transition since the 1970s. Energy demand and supply has nearly tripled since then. From that time, former poor technological choices and performance, in addition to the energy crisis in 1974 and the resulting governmental interference, introduced an era of change. Before that, energy markets in Europe developed mostly within national boundaries as state-owned industries without competition (McGowan, 1994). Even today the transition of the energy market is far from being complete and within the old 15 EU member states plus Norway and Switzerland (EU15+2) there are still strong differences in market structure and regulation. The recent expansion of the European Union to 27 member states in the years 2004 and 2007 further increased the challenge of creating a competitive and market-orientated environment for energy. Parallel to that, the importance of energy in economic and social development is constantly increasing, raising not only questions and doubts from economic points of view, but also confronting each policy-maker with issues such as the future role of nuclear energy, pollution through fossil energy and the promotion of energy generated by renewable sources to fight the climate change (Hein, 2005).

When talking about the European energy market, two main segments can be identified - electricity and gas. The electricity industry further can be separated into power generation (PG), (high-voltage) power transmission (PT) and (low-voltage) power distribution (PD). Green (2006) states that a fourth segment was recently created in the phase of deregulation – power retailing (PR). Historically, these activities have been vertically integrated and mostly

operated as monopolies under governmental control and ownership. There is a high variation in the way electricity is generated in different European countries. Factors that influence the choice of fuel input and technology are often of geographic and geologic nature. Economic and political motives have become increasingly important over the years (McGowan, 1994). While coal was a primary input for electricity production in the first half of the 20th century, its diminishing availability in Europe and increasing environmental concerns led to a shift in fuel input. Gas became more important, and with the awareness of climate issues renewable energy is now the highest growing energy source in relative terms. Altogether conventional sources still accounted for around 68% of the total electricity production capacity in EU27 countries in 2006. All fossil resources are limited and their usage is tied to availability. Forecasts regarding the amount of time until oil, gas and coal are depleted vary. Assuming a proportional growing demand and no significant new discoveries of resources, oil and gas reserves will become exhausted within a much shorter time period than solid fossil fuels, such as coal (Hein, 2005). Nevertheless, solid fossil fuels are often seen as environmentally problematic and the discussion about which energy sources will play dominant roles in the future is still ongoing.

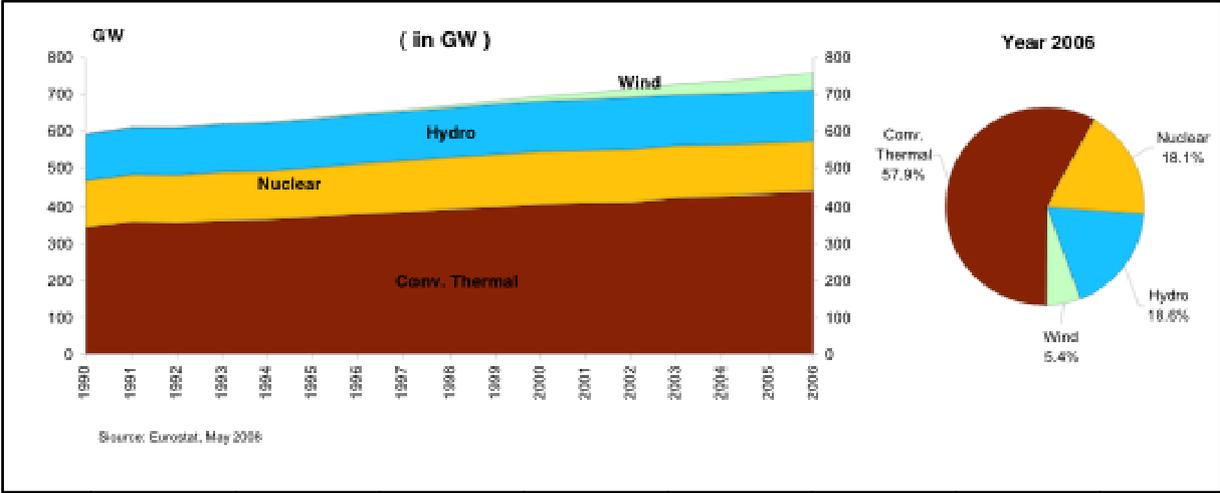


Figure 1: Electricity Production Capacity EU 27 (taken from European Commission, 2008)

A feature of electricity that differentiates the good from other commodities is that electricity can hardly be stored over time and thus has to be produced at the time of demand. Furthermore, supply and demand is changing hourly with daily peaks and falls (Hira & Amaya, 2003). Gas, on the other hand, is a rather conventional commodity although its pricing is not necessarily linked directly to supply and demand but rather to changes in the dominating crude oil price.

Although the two goods are different, gas and electricity markets are becoming increasingly linked. Technological innovations and increasing environmental awareness of the fact that electricity generated with gas is "cleaner" than the one generated with other fossil fuels led to an increasing share of gas for power generation. Nevertheless, the gas and electricity industries were historically facing a different development and still continue to be treated separately with respect to regulation and liberalization of markets (Hira & Amaya, 2003). Compared to electricity, the commodity gas can be stored over time. Whereas electricity is transported via high voltage grids, most gas is transported via pipelines. Building up a pipeline is more expensive; hence up front capital investments for entering gas markets are higher. Moreover, the nature of the gas business is riskier since extraction is tied to available resources and the success of exploration of new gas fields cannot be predicted. Unlike electricity, gas as a good can be used in several areas, such as generation of electricity, heating and, of increasing importance, transportation. The relationship between gas and electricity is as connected as it is separate – gas serves as an input good (complementary) but also competes against electricity (substitutional), depending on the area.

Key EU technology challenges to meet the 2020 targets (from European Commission, 2007):

- Make second-generation biofuels competitive alternatives to fossil fuels, while respecting sustainability of their production*
- Enable commercial use of technologies for CO2 capture, transport and storage through demonstration at industrial scale, including system efficiency and advanced research*
- Double the power generation capacity of the largest wind turbines, with offshore wind as the lead application*
- Demonstrate commercial readiness of large-scale Photovoltaic (PV) and Concentrated Solar Power (CSP)*
- Enable a single, smart European electricity grid able to accommodate the massive integration of renewable and decentralized energy sources*
- Bring to mass market more efficient energy conversion and end-use devices and systems, in buildings, transport and industry, such as poly-generation and fuel cells*
- Maintain competitiveness in emission technologies, together with long-term waste management solutions*

2.1.2. Deregulation

The EU significantly depends on external energy sources to satisfy the demand for electricity. In 2001, around 50% of the European energy needs were imported with a further increasing trend. This growing dependence on third parties in such a critical area together with the increasing pressure to fight climate change, European energy policy was and is changing dramatically (Roggenkamp, Redgwell, Del Guayo, & Roenne, 2007). Furthermore, the pattern of energy consumption and production varies strongly between the EU15+2, and even more significantly since the two expansions in 2004 and 2007 (Hein, 2005). Despite the variations in structure the energy innovation process, from initial conception to market penetration, shows significant weaknesses in nearly all markets. With the current structures the European energy sector will not meet its self-inflicted goals to reduce greenhouse gas emissions by 20% and to ensure that 20% of the energy produced comes from renewable sources, such as wind, photovoltaics, hydro energy or biofuels (European Commission, 2007). In order to achieve these targets, renewable energy has to be further developed to reach competitive production prices, i.e. grid parity. However, a single member state cannot cope with this expensive and protracted process independently. Other major global energy markets, e.g. the United States, Japan, and, increasingly, emerging markets such as India and China, are confronted with similar issues but face less difficulties to coordinate innovation efforts since their market structures are less complex. To understand why the European energy market is unique in its structure and regulative environment focus now turns to European policies and the level of integration of energy markets within Europe.

The European Commission focuses on both electricity and gas in its efforts in deregulating and liberalizing the European energy sector. Thus, when talking about deregulation of European energy markets, gas and electricity always come hand in hand but also display strong differences in the degree of deregulation. According to Hira & Amaya (2003) one of the most interesting facts is that the regulatory context for increasingly linked markets of gas and electricity are still unlinked and that, in general, electricity deregulation is well ahead of gas deregulation and privatization. Since just a few years ago, legal milestones in the deregulation of the two markets have been achieved. In 2003, the first joint Gas and Electricity Directive marked a new phase of deregulation; further to this, the Electricity Regulation and the Gas Regulation, in 2003 and 2006 respectively, came into force with focus on cross-border trade, market access, and the security of supply. Both directives implied a binding deadline of 1 July 2007 for the opening of the member states' gas and electricity markets. At the beginning of 2007, the European Commission (EC) released the communiqué

'An Energy Policy for Europe' and for the first time defined the upcoming challenges that lie within the deregulation of the European gas and electricity markets: sustainability, security of supply, and competitiveness (Roggenkamp, Redgwell, Del Guayo, & Roenne, 2007).

In April 2008, the European Commission published a report about the progress in creating the internal gas and electricity market (European Commission, 2008). It states that from a legal perspective all European consumers are now able to choose their supplier of electricity and gas freely and thus benefit from competition. Nevertheless, great obstacles can still be found in transnational trade of energy. Here, network capacities are often the crucial bottleneck that limits the scale of transnational trade. According to the EC's report, five of the EU27 member states have an interconnection capacity that is below 10% of the total installed capacity. In another ten member states the interconnection capacity is greater than 10% but smaller than 30%. However, it is not only capacities that limit transnational trade, legal differences across member states still remain a barrier to network integration to this day. The high number of legal regulators and policy makers is often counter-productive. According to the report, multiple regulators and authorities in a single country are likely to increase incoherence. A clear regulatory supervision of wholesale and retail markets is hardly evident in any of the member states. An issue which is reviewed by the EC report and that is of great interest for this thesis is the impact of M&A activity on the competitive environment. The EC report pinpoints a continuing tendency towards consolidation and concentration alongside highly concentrated national markets. Although deregulation efforts aim at heterogeneous and integrated markets, the report does not take into account implicit negative effects of M&A activities on competition as long as the new entities emerging from M&A act on a real competitive basis.

The European Commission has called for 'ownership unbundling' in integrated companies. Unbundling vertically integrated companies shall foster new investments in grids and enable third party access to networks. According to a speech from Neelie Kroes, the European Commissioner for Competition Policy, fully unbundled operators have clearer incentives for investments. He states that separation reduces the cost of capital for network businesses that benefit from low-risk and stable returns. A more diverse market would protect the EU against any potential dominance from external suppliers and thus improve security of supply (Kroes, 2007).

It can be concluded that although the liberalization and deregulation of European energy markets gained speed in the past decade, there are still many obstacles to overcome. Obstacles

that can create opportunities to new market entrants and to energy companies that want to expand, reduce or consolidate their business focus. In his speech in November 2006 to the Royal Society in London, the Director General for Competition of the European Commission, Philip Lowe, names five main issues in the process of creating integrated markets that have to be addressed in the future:

1. Too much market concentration
2. New entrants are still largely foreclosed from the markets
3. Very little cross-border integration
4. Lack of transparency
5. Lack of confidence that prices on spot and forward wholesale markets are the result of fair competition

While the first four issues have already been discussed, pricing and energy trading will now be addressed.

2.1.3. European Energy Exchanges

Although the empirical analysis of this paper does not include energy exchanges as bidders since exchanges are not energy companies per se, it is crucial to analyse the energy exchange sector to deepen understanding of price setting mechanisms and to argue for or against specific factors that could, or might not, influence value creation of a corporate transaction. Before European efforts of deregulating the national gas and electricity markets gained momentum in the new millennium, there was solely a single energy exchange in Europe. In 2005, Europe already had 12 exchange platforms. In March 2008 there were 16 exchanges forming a highly fragmented energy exchange sector. Many countries have developed 'national' exchanges with products tailored to domestic demands and local energy market requirements. The enforcement of emissions trade will create even more diversified platforms in the future. Due to the complex nature of energy as a good, trading electricity, gas or one of their derivatives is also highly complex. Thus, trading mechanisms of energy exchanges differ somewhat from normal trading platforms (Wilcox, 2008). The high number of exchanges does not only lead to market fragmentation, but also to fragmented trading liquidity; hence the disparity in energy pricing. This contradicts the EU commission efforts to foster a more competitive energy environment, and in light of recent EEX-Powernext merger plans consolidation is on its way. For small-scale utilities the consolidation will not necessarily be beneficial. As Wilcox (2008) points out, investment banks have raised concerns that consolidation of energy exchanges will increase pricing power and use it for market

protection rather than for market liberalization. So far this has not been proved empirically. According to an article published by the Financial Times, the correlation of wholesale energy prices on different European exchanges increased from 2000 to 2007 (Janzing, 2008).

Consequently, the increase in number of European energy exchanges should not be linked to the efforts in deregulating markets. Increasing market power of single multinational utilities with access to multiple exchanges can still occur and can decrease efficiency.

“A platform, however well it is marketed, will not introduce trading if there is no perceived need to trade. The problem with mainland Europe’s gas market is two-fold; first the level of competition (...) is poor after almost five years since the commencement of deregulation and, secondly, mainland European gas prices are largely indexed to oil (...).” (Wilcox, 2008, p.9)

It is important to state that energy exchanges can be a powerful tool to help a market in its development but can never be responsible to establish a market from the start. As it is stated by Wilcox (2005), exchanges serve a purpose but only if there is a market to serve.

2.1.4. Energy M&As in Europe

In recent years global M&A activity in the energy sector steadily increased with Europe accounting for a significant amount of total deals (Sheldon, 2008). Energy companies have shown increasing activity on financial and capital markets with many resulting M&As among national or foreign competitors (Verde, 2008). A reason for the increase in M&A activity is the increase of cash liquidity of energy companies and the race to broaden their geographic range, product range or simply market power before the completion of liberalisation. With neither a single effective pan-European market place for energy nor reduced national government intervention, M&A deals in the European energy sector have unique features and can be neither compared to another sector nor region. According to Sheldon (2008) the biggest influence on past deal volume and structure is considered to be the EU’s efforts in privatizing and liberalizing markets. Hence, potential deregulating activities, most probably the previously discussed network unbundling, could create another upturn in European energy M&As. A Datamonitor report from 2006 forecasts that future cross-border energy M&As are very likely to be regional-transnational, i.e. deals involving neighbouring countries. Verde (2008) states that next to this trend the geographic trend of energy deals shows a second dynamic towards the establishment of so called “national champions”.

Becker-Blaese et al. (2007) find similar results in a study analyzing M&A activity as a response to the deregulation of the US electric power industry in the 1990s. They conclude

that many investor-owned electric utilities responded to changes in technology and regulatory frameworks by acquiring other utilities. Their findings also show that there are differences in value creation for bidder companies between corporate transactions within or across geographic areas in the US, and the strategic focuses of a transaction. They find negative net present value (NPV) merger coefficients appearing on M&As that diversify into gas and or across state lines.

Interestingly, Burns et al. (1998) found empirical evidence in the US energy market showing that corporate diversification has different effects on the financial performance of utility companies rather than on the performance of other unregulated industries. They conclude that related diversification could actually increase value for utilities. As discussed earlier, these results cannot be compared to the European sector, especially due to the high number of European regulators, the exchange network and governmental stakes in protectionism. In the US, dual-fuel utilities are supported by a precise and defined regulatory framework, at both state and federal level, and thus implications on European diversification effects cannot be drawn. Nevertheless, certain features of a deal could have significant influence on value creation or destruction and deregulation in general increases M&A activity. For European energy markets in particular deregulation efforts lead to a restructuring of single markets, which is partly done through corporate transactions.

The second geographic trend mentioned, i.e. the creation of national champions, is contrary to the previously discussed deregulation efforts of the EU and is instead supported by interventions of the respective governments. For instance, both the Spanish and the French governments have heavily intervened in the M&A process of Gas Natural/Endesa in Spain and Gaz de France/Suez in France in order to protect the targets from foreign takeovers. By issuing ad-hoc regulations, legal dispositions, or unprofitable conditions, other competitors such as the German E.ON AG or the Italian Enel S.A. were forced to resign during the bidding process. Verde (2008) puts forward a possible reason for national intervention: the energy sector is a sensible industry in which the state wants to keep a significant share for the general interest of the nation. From a trade policy perspective national intervention is simply granting aid to domestic firms to outperform competitors in the bidding process. Whether this behaviour supports the market development or not, affected domestic bidders still benefit as a result. This also shows how difficult it is to liberalise fragmented European markets when national players keep trying to maintain national sovereignty.

In the late 1990s many US utilities entered the European market by acquiring major stakes in European utilities. According to Haar and Jones (2008) US M&A activity in the electricity sector peaked in 1998 and 1999 with 55% of all deals by value and 46% by number being in Europe. During this time American companies anticipated market opportunities through liberalisation and privatisation but also underestimated the time needed for markets to open up. Although there were good reasons to invest in European utilities at the time, US firms misread the process of liberalisation and did not grasp the impact of regional differences and the efforts of national governments to keep control of the energy sectors. Many of the former bidders then followed an exit strategy in recent years and as a result European bidders dominate more recent M&A activities once again (Haar & Jones, 2008). Many US based firms simply underestimated the complexity of regulation and market structure. Particularly in the last two years, corporate transactions came to a preliminary peak in deal volume with only slight future decline in sight (Sheldon, 2008). Transnational deals between major national players reshaped the European energy industry in a short time and large-scale intra-national deals created the new national champions. This development and modern protectionism from respective governments makes M&As in the energy business different from other industries of comparable size (Schwartz, 2007). Whereas many market participants complain about governments' stakes in corporate transactions and their drive to protect their domestic industry, politicians usually find broad acceptance when supporting domestic companies. However, the unbundling efforts and policy changes, i.e. forcing the divestiture of network assets from vertically integrated companies, currently create a new boom in energy deal making. With our empirical study we will analyse these oppositional factors further.

2.2. Key Success factors explaining M&A success

The subject of mergers and acquisitions has been widely discussed by academic researchers to date. Specifically, the question of shareholder value creation due to M&A has often been the focus of empirical research. In this area, most scientific research can be found for the financial sector. With respect to the purpose of this study, namely the identification of factors that lead to a successful transaction and increased shareholder value, researchers have published several academic papers. In the following section, literature dealing with the identification of variables for successful M&As is presented. This part is followed by a discussion regarding factors applicable for the research subject of this thesis - the energy sector.

2.2.1. Literature review

It is commonly known that the success of M&A may result through synergies of two merged companies which face a higher value combined rather than if they were operated separately. In order to attain economic value for the firm, the transaction should have certain preconditions, which increase the probability of a successful deal and subsequently increase shareholder value. As mentioned earlier, the literature mostly provides investigations into M&A key success factors for the financial sector. Beitel et al. (2004) tests 10 possible key success factors for European bank M&A, taken from 13 variables with explanatory power in prior research. However, this section discusses key factors analyzed in Beitel et al. (2004), combined with results from other academic research to provide a general idea of success factors in the area of M&A. To be consistent with the goal of this thesis, a great deal of the literature review focuses on bidder returns. Beitel et al. (2004) only investigate the impact of M&A for shareholders in the banking sector and, in addition, only identify a few factors as being actually success driving. Nevertheless, the close link to this study can be encouraged due to its thorough allocation of key success factors with potential relevance to other industries.

One variable tested by Beitel et al. (2004) is the *product focus* of a transaction. The researchers measure this variable by taking the ratio of net income of the targets in relation to their total operating income. A high share of interest income indicates a target which is more concentrated on the banking sector and therefore leads to a more product-focused transaction on the part of the bidding bank. The researchers confirm their expectations in their study that bidding banks are more successful in focused transactions. Further research by DeLong (2001) analyses M&A effects for US banks and finds positive effects for the combined entity of the target and bidder when increased product/activity focus of the transaction was given.

A second variable measured by Beitel et al. (2004) is the *geographic focus* of a transaction. They choose a binary dummy variable in order to reflect whether the bidder deals with a domestic or a cross-border transaction. The researchers hypothesize that domestic transactions result in higher synergies than cross-border deals. According to Beitel et al. (2004) domestic focus leads to higher value creation and will be more rewarded by the market. The researchers' comparative static analysis highlights the geographic focus as a significant success driver for the bidder. Nevertheless, in their cross-sectional regression this variable loses its significant impact on bidder returns. Other studies give no clear tendency for the geographic focus as success driver. Dewenter (1994) provides evidence from the US chemical

and retail industry and shows that shareholder wealth gains are not statistically higher in foreign transactions. On the other hand, Markides & Ittner (1994) investigate the effects for 276 US international acquisitions and show significant positive abnormal returns generated by cross-border acquisitions. They emphasize that the value creation does not only result from cross-border transactions. Instead, value creation effects come from a function of different features, such as the acquisition (e.g. industry), the acquiring firm (e.g. its current profitability and international experience) and the nature of macroeconomic environment (e.g. regulations on tax).

Furthermore, Beitel et al. (2004) see the *relative asset size of a target in relation to bidder* as a potential key success factor. Based on prior research, they assume that a smaller target would be less difficult to acquire but would generate smaller scale effects. Therefore they consider an optimal acquisition where the size results in positive value creation but is still manageable. The researchers find no significant results for the bidder in their comparative statics with respect to M&A success and consequently do not include this variable for further testing in their cross-sectional regression analysis. Moeller et al. (2003) find significant economic benefit for smaller acquirers when investigating over 12.000 US acquisitions. With announcement of an acquisition, smaller firms show generally higher positive abnormal returns than larger firms. Moreover, compared to smaller acquirers, large-scale bidders show negative abnormal returns when announcing the takeovers of public firms. The researchers explain the lower economic benefit for bigger firms with the fact that these firms offer larger acquisition premiums than smaller firms.

For *target asset growth* Beitel et al. (2004) use total assets of a target and measure the growth of this item during the year prior to the announcement. They believe that acquiring a fast growing firm will encourage the bidder's growth and can therefore be seen as a success factor. From an individual point of view, their study points out significantly higher excess returns when bidders acquire faster growing targets. However, when considering several independent variables simultaneously, the factor target growth loses its significant impact on positive bidder returns. This result is consistent with Wall & Gup (1998), who study the M&A success for US-Banks. The researchers cannot find any significant correlation between the targets' asset growth and abnormal bidder returns.

Another key success factor mentioned by Beitel et al. (2004) is the *risk reduction potential* of a transaction. The researchers obtain the variable by measuring the correlation coefficient of the returns from the market, bidder and the target during the estimation period of the event

study. According to the researchers a low correlation coefficient indicates a high-risk reduction/diversification potential. They motivate this by smoothing effects of the earnings volatility and providing more certainty in the company's stock return. However, Beitel et al. are aware of the conglomerate discount due to shareholder preferences of "pure play" investments. Their empirical findings indicate that high diversification potential of a transaction has a negative impact on the value creation for the bidding banks. Similar results were found earlier by Walker (2000), who investigates the strategic objectives and their implications for stock market returns of the acquirer. By doing this, he finds unfavourable stock market performance for diversification strategies that might potentially overlap. The researcher discusses decreasing growth opportunities for acquiring firms with overlapping strategies after the takeover in relation to firms that diversify without overlapping strategies. In contrast, Lepetit et al. (2004) examine Bank M&As in 13 European markets, where they find positive and significant abnormal returns for cross-product diversification in their event study.

The *profit efficiency* of a transaction is measured by Beitel et al. (2004) as the ratio of target and bidder's return on equity (ROE). A low ratio implies that the bidder has higher profitability than the target. The researchers assume a more successful transaction if the bidder shows a higher profitability than its target. Beitel et al. (2004) argue that transactions become more successful when bidders may be able to transfer their management skills to the target company. A share of knowledge would lead to positive implications for the target assets and generate efficiency potentials for the bidder after the acquisition of the target. However, the empirical results do not provide significant results with respect to profit efficiency. In a similar study Houston & Ryngaert (1994) analyze the abnormal returns of 153 US bank merger announcements between 1985 and 1991. They find that the market shows more positive reactions to M&A announcements when the acquirer has exhibited a high profitability in the past. To conclude, the researchers "...suggest that banks with good track records are perceived as more likely to engage in acquisitions that are value-increasing, even if the target bank already has a strong performance record" (Houston & Ryngaert, 1994, S. 1157).

A further potential success factor is *cost efficiency*. Beitel et al. (2004) use a relative cost-to-income ratio as well as a relative cost-to-asset ratio as a proxy for cost efficiency. The hypothesis for success is similar to the aforementioned efficiency figure. Bidders create more value with superior large cost efficiency compared to their targets and therefore tend to be

more successful. Their study also shows that M&As of targets with lower cost efficiency than the respective bidders create significant value when using the cost-to-asset ratio. Nevertheless, the result for the relative cost-to-income ratio indicates no significant impact on the stock returns of the bidder. As a result the researchers conclude the market values superior cost efficiencies of the bidder. Similar results are presented by Koetter (2008) who investigates a low transfer of cost management skills from the acquirer to the target of bank transactions in Germany. However, he could not find statistically significant results with respect to cost efficiency differentials between bidder and target and the success of those mergers.

Beitel et al. (2004) employ three different measures in order to capture the *target's market performance*. The researchers expect to obtain significant knowledge about the management quality of the target by looking at its earnings per share (EPS), the market-to-book ratio (M/B-ratio) and the target's stock performance compared to that of its peer-group. They presume similar transfers of management skills as for the efficiency factor previously mentioned. Transferring superior management expertise of the bidder to the poorly managed target should lead to more successful transactions and therefore value creation. However, the empirical outcome shows no significant influence of the EPS at all. The M/B-ratio of the target has a positive impact on the transaction, which is contradictory to the assumption of favourable low management skills of the target. Beitel et al. observe significant value creation when taking the low stock market performance of the target as an indicator for bad management performance. This is consistent with DeLong (2001) who finds, in a study on bank mergers, that poor performance of the target prior to the announcement has positive effects on the value creation of a merger once the event has been announced.

To measure the potential success factor *transaction experience* of the bidder Beitel et al. (2004) consider the bidder's frequency of prior M&As. The researchers expect more experienced bidders to be able to exploit more value from M&As. In their study bidders with five or more large-scale transactions within a period of 15 years are considered as experienced. The results of the analysis indicate no significant influence on the M&A success. Dikova et al. (2006) examine the impact of the bidders' prior M&A experience on the outcome of the M&A process in the business service industry. They find that previous experience with similar completed mergers has a strong positive influence on the likelihood of merger completion. On the other hand, once a certain level of experience is exceeded, the likelihood that M&A events will be completed decreases significantly. Dikova et al. (2006)

argue that the initial positive effects of experience with completed mergers turn into a growing number of M&A abandonments when there are higher levels of M&A experience.

The last potential success factor tested by Beitel et al. (2004) is the *method of payment*. They use a cash-ratio of a transaction, where a cash-ratio of 100% would indicate a fully cash-paid transaction. The researchers expect deals with high cash-ratios to be more favourable for bidders and therefore more value creating. On the other hand, low cash-ratios should lead to negative impacts on the bidders' stock performance. This is consistent with the theory put forward by Myers & Majluf (1984) who investigate equity offerings and share swaps that reduce the companies' stock prices if the market believes in insider information of the management. Bidders who believe that their stocks are overvalued prefer to offer own stocks as payment, while the belief in undervaluation causes more attraction to pay via cash. This behaviour might be noticed by market participants and consequently leads to adverse reactions on the market (Myers & Majluf, 1984). However, Beitel et al. show that bidder returns are somewhat higher when settled by stock payments. According to the researchers, one reason is a lack of efficiency on capital markets in Europe. This result is contrary to other empirical studies such as that by Draper & Paudyal (1999), who show that different payment methods have different effects on the shareholder wealth of a bidding firm. They do not explore any significant excess returns for the bidder shares when cash payment occurs. On the other hand, stock payments result in adverse market reactions around the announcement date.

2.2.2. Factors applicable for Energy sector

The previous section provides an overview of potential success factors for successful M&As. Most of the research presented above has a strong focus on M&As in the financial sector. In order to approach the purpose of this thesis it is therefore necessary to specify potential key success drivers that can be applied and tested in the energy market.

The first potential success factor appropriate for this study is the *product focus*. This potential success factor, as discussed in the previous section, should be adjusted to a more strategic perspective. It seems reasonable to consider a more *strategic focus* when looking at the particular characteristics of the energy sector. As seen in section 2.1.1 the products are limited to electricity and gas. A more important question arises asking for the integration of the acquired utilities into one of the four phases of electric supply. The literature provides several discussions about vertical integration efficiencies in the area of electric utilities. Kwoka (2000), for example, investigates the economies of vertical integration in the US electric utility sector. He found that cost savings are substantial for utilities with high vertical

integration. Moreover, utilities that are nearly fully vertically integrated obtain the largest cost savings. Also of interest in the energy sector is the impact of acquisitions by electric utilities focusing on renewable energy. Decreasing conventional resources and new developments in regulations regarding environmental issues, such as climate change, have recently put more importance on this kind of energy source. Bidders could benefit from the acquisition of targets dealing with renewable resources since they will remain very important in the future (Stephen & Ross, 2005).

A second potentially important factor in the utility sector is the *geographic focus*. The question whether domestic suppliers ought to either concentrate on the domestic market or to get involved in transnational business is of high importance with respect to the ongoing liberalisation of electricity markets. Then again, Leggio & Lien (2000) do not find positive abnormal returns when investigating merger announcements of 73 publicly traded utility companies upon expanding their businesses into new geographic areas. Nevertheless, their study focuses on mergers that had taken place between 1983 and 1996 and on market conditions which might have changed due to ongoing liberalisation.

Additionally, this study investigates the *relative transaction value in relation to asset size* of the bidder. This factor is slightly altered from the success factor discussed in the previous section. The variable is linked to the transaction value instead of to the asset value of the target, since many targets are not publicly listed and therefore do not provide readily available financial data. However, it can be assumed that the transaction value will be an important factor for the success of any transaction. The hypothesis is similar to transaction volume in other branches. The ideal mix of low complexity with high scale effects drives success in M&As (Beitel, Schiereck, & Wahrenburg, 2004).

Another potential success factor applicable to the energy sector is the *profit efficiency* of the bidder. This factor, expressed as the return on investment, might be able to reflect highly skilled management that has the ability to improve the performance of the acquired asset and to create synergies for the newly created entity (Beitel, Schiereck, & Wahrenburg, 2004). Indeed, this also seems suitable for the energy sector where electricity companies have developed into very complex corporations requiring more highly skilled management.

Similar arguments remain as regards to the factor *bidder experience*. Electric utilities have been showing increased activity in M&As (Sheldon, 2008). As discussed in chapter 2.2.1 experience in successfully completed M&As may indicate a well-established acquisition

selection and strategy by the management and promise ongoing success in future acquisitions (Dikova & Sahib, 2006). Therefore, it is of high interest to observe whether prior successfully completed acquisitions lead to optimistic market assumptions on successful integration processes and thus positive abnormal returns.

The *method of payment* should also be the subject of investigations in the utility sector. In this case, the argument is in line with the discussion in section 2.2.1. Shareholders might prefer cash payments that strengthen their understanding that the management would not have inside information, such as that regarding an overvaluation of the bidder company (Beitel, Schiereck, & Wahrenburg, 2004).

An additional potential success factor, namely *market regulation*, can be found in a study by Campa & Hernando (2004). The researchers examine the shareholder value creation by M&A announcements in the European Union over a 3-year period. By looking at different countries and industries within the EU they find that M&A announcements in industries that operate in a regulated environment or that are exposed to significant government control generate lower value than in less regulated industries. Market regulation becomes even more significant when two firms from different countries in the euro zone are involved in M&As. In an earlier study, Dnes & Seaton (1999) compare stock-market returns of regional electricity companies with general stock market returns in the UK in order to test for abnormal returns due to regulatory events. They find that shareholders, and also consumers, can benefit from different regulatory events. However, the overall impact of the regulatory-package shows no consistent pattern. In their study, Leggio & Lien (2000) recognize that market regulations can have an outstanding effect on the success of acquisitions. They investigate the market reactions of merger announcements in regulated environments and find significant negative returns for electric utilities when merging with other utilities. They argue that this is the “...*result of operating in a regulated environment with the regulatory approval requirements, the frequency with which increasing market share mergers are disallowed...*” (Leggio & Lien, 2000, p.84). Consequently, mergers in less regulated markets can be more easily processed and therefore are expected to be more appealing for shareholders.

In this section the discussion of key success factors in the energy market disregards four potential success factors. This study does not include target asset growth, target performance, risk reduction potential, and cost efficiency. These factors have to be neglected due to a lack of readily available data. The data resources used could provide neither appropriate data to

measure the cost efficiency of the bidder nor public information of required information from non-listed companies.

3. Methodology and Data

Chapter 3 introduces the methodology and data sample applied in this study. The section starts with a discussion on the benefits and drawbacks of the event study methodology. Furthermore, underlying theoretical assumptions are pointed out. The chapter then presents the data sample followed by a discussion of the event window. More information on the applied variables is provided. Finally, important information on the modelling of abnormal returns as well as on comparative statics and cross sectional regression analysis is given.

3.1. Using Event Study Methodology

3.1.1. Benefits of event studies compared to other methodologies

Academic researchers have employed several methodologies to measure M&A success. Event studies use financial market data in order to measure the impact of a specific event, i.e. M&A on the firm's value. The majority of scientific literature considers event studies as superior to accounting-based methodologies or surveys when measuring successful M&A transactions. The usefulness of event studies comes from the fact that asset prices instantly absorb the impact of an event, assuming rationality in the market (Campbell, Lo, & MacKinlay, 1997).

When applying an event study the user first defines the event of interest, in this case the announcement of the merger or acquisition. Then, the specific period over which the examination of the certain firm's stock prices will take place needs to be determined. This event window is used to compute the differences between actual stock returns and returns that are predicted for this period (normal returns). If the differences (abnormal returns) show statistic significance it can be concluded that the event under investigation does impact the stock returns of the company and therefore sufficiently reflects the reaction by the participants of the stock market (Ebneeth & Theuvsen, 2007).

Many researchers outline a number of supplementary strengths of event studies. Lubatkin & Shrieves (1986), for example, consider stock prices as a superior measurement for successful transactions because of their ability to measure the direct effect on the value of the stockholder. They state that when looking at stock prices the investigation is not limited to specific performance indicators such as growth rates or profit ratios. They go on to point out that, assuming efficient capital markets, security prices reflect all relevant information with respect to the performance of the company. MacKinlay (1997) highlights the immediate reflection in the firm's stock price when an event occurs. This enables the researcher to use relatively limited time periods to measure the impact of an economic event on the firm. In

contrast, accounting-based methods for M&A success require considerable longer periods of time for observations (MacKinlay, 1997). Moreover, unlike event studies, accounting data relies on historical performance and therefore does not reflect expectations of future performance. Accounting figures are difficult to assign for M&A success since these numbers are usually highly aggregated and therefore hard to isolate for a certain event (Montgomery & Wilson, 1986). When an event study is applied stock prices are usually readily available for all publicly traded firms. Publicly listed firms are subject to objective reporting, which provides all market participants with reliable and verified information. Using stock price data from publicly listed companies avoids unclear results in M&A success measurements in the form of subjective assessment. Indeed, many researchers observe a high exposure due to managerial bias when measuring M&A performance with surveys such as ‘managers’ subjective assessment’ (Lubatkin & Shrieves, 1983).

3.1.2. Drawback of event study methodology

Scientific articles identify many advantages of event studies. Nevertheless, it is crucial to point out potential drawbacks that may result when using this method. Though the investigation of purely public listed companies shows an improvement in key performance measurement, it also implies significant limitations in cases where the subject of investigations is not publicly listed (Schoenberg, 2006). Montgomery & Wilson (1986) run through biases in the event methodology due to its distinct characteristic as an ex-ante measure. Consequently, observed stock prices might not represent correct expectations, i.e. in future cash flow generation. If, for instance, the expectations of the merger and acquisition pole apart before and after the announcement date, the observed behaviour may not give the correct indication of future performance (Montgomery & Wilson, 1986).

In addition, security price movements, observed in the event window, can reflect actions different from the event of investigation. This problem becomes more likely when the event window in which cumulated abnormal returns (CAR) are measured increases. In the context of the appropriateness of time periods, event studies have a strong dependency on the accurate choice of the event period. Even small deviations to the relevant time period can lead to imprecise results (Lubatkin & Shrieves, 1983). MacKinlay (1997), who sees difficulties in always defining the exact event date, comes to similar conclusions. He later recommends handling this problem by expanding the event window to two days rather than solely focusing on the announcement day. An incorrect choice of the benchmark market index, when using

the market model, might have adverse impacts on the normal returns and subsequently lead to misleading abnormal returns in the event window (Gregory, 1997).

3.2. Assumptions and Theoretical Basis

In order to draw meaningful and reliable conclusions from event studies the hypothesis relies on three important assumptions. Market efficiency is one of the fundamental assumptions for event studies. Market efficiency assumes that all relevant information available on the market will immediately be reflected in the stock price. This condition is a prerequisite for calculating meaningful abnormal returns in the actual period of the bidding announcement. However, McWilliams & Siegel (1997) interpret the fact that many researchers use an event window with a respectably long period as an indication for their scepticism in market efficiency. They argue that an event such as an acquisition is more likely to reveal information over a longer period. Information concerning the acquirer's evaluation of the target and potential competitors for the acquisition will not always be very apparent on the day of a bidder announcement.

An additional requirement for valid event studies is the assumption of unanticipated events. Information concerning the M&A transaction should not be previously known by the market. Thus, the release of M&A announcements in the financial press is the first source of information for market participants. Abnormal returns in an event study should be based on the changes due to stock market reactions to new information. If market participants have anticipated the upcoming event, abnormal stock price movements would partly take place before the actual event (McWilliams & Siegel, 1997).

Another theoretical condition is the ruling out of confounding effects. The theory of confounding effects reveals an important assumption for the validity of event studies. Confounding effects can emerge when the stock price of the company becomes exposed by firm-related events during the event window. Microeconomic factors that can potentially impact the stock price are events such as announcements of dividend payments or profit expectations. Macroeconomic events such as unexpected changes of the interest rate on the part of the central bank can also have an impact on the firm's stock price. Consequently, researchers have to carefully consider the risk of adjacent effects resulting from other events and, if given, isolate those from the effects of the research event. Confounding effects are more likely to occur with the extension of the event window. Therefore, when conducting an event study, researchers who choose a relative short event window will be able to identify

confounding effects more easily and increase the validity of their results (Ebneht & Theuvsen, 2007).

3.3. Data sample

The primary data used in this study are daily stock returns gathered from 36 publicly listed electric- or multi-utilities, respectively. The entire sample includes a total of 103 M&As and covers the time period from December 1996 to March 2008. Although this industry has been showing a lot more M&A transactions in the last decades this limited sample size results from the following restrictions:

1. The transaction was announced between December 1996 and March 2008.
2. The exact announcement date can be clearly identified (see further discussion in section 3.5)
3. The acquiring firm is publicly traded at least 180 days before the announcement date and the return is readily available.
4. The bidder company has its core business in the electric utility sector with its location in Europe. (See the geographic distribution in appendix)
5. The value of the transaction exceeds USD 100 million in order to reach sufficient attention on the capital market.
6. All required information is publicly disclosed.
7. No confounding effects in the relevant period, i.e. announcement of other M&As.
8. The announcement has to be finalized through an actual M&A transaction.

This thesis relies on several data sources. Thomson Financial DataStream serves as the primary source for daily stock returns and for the market index data. For the analysis of the abnormal returns this study employs the Dow Jones STOXX® 600 *Utilities Index* as a proxy. This index contains the largest electric utility companies of Europe and therefore seems to be suitable as a market index. Further information, such as the bidders' asset value and return on equity, was also gathered from DataStream. The announcement dates of transactions were primarily retrieved from ad hoc messages found on the relevant companies' webpages. Additional validation for the choice of the right announcement date was obtained from economic-related newspapers, e.g. Financial Times. If data could not be extracted from one of the aforementioned sources the announcement date was gathered from Reuters 3000Xtra. M&A transactions are only selected in cases where the announcement information is in line

with all available sources of information.¹ Reuters also enables the collection of relevant information for key figures, such as transaction value, method of payment, purpose of transaction, number of previous transactions of the bidder, and origin of bidder and target. Moreover, an industry report about electricity deregulation as well as country specific online research served as primary data source for the market regulation in the countries of the transaction parties (ABS Energy Research, 2003). An overview of the identified transactions can be found in figure 2. The 103 investigated M&A announcements count for a total transaction value of ca. USD 222 billion, which leads to an average transaction volume of USD 2.15 billion.

	Number of Transactions	Geographic Focus			Strategic Focus				Method of Payment	
		national	transnational	outside EU	horizontal	vertical	renewables	other	cash	shares*
1996	1	0	1	0				1	1	
1997	1	1	0	0		1			1	
1998	5	4	0	1	5				2	3
1999	10	4	0	6	9	1			9	1
2000	16	8	3	5	11	2		3	13**	2
2001	14	7	5	2	12	1		1	14	
2002	8	4	3	1	7	1			7	1
2003	6	2	3	1	5		1		6	
2004	9	4	2	3	8			1	8	1
2005	11	8	2	1	9	1	1		9**	1
2006	10	2	2	6	7	2	1		9	1
2007	10	3	4	3	7		3		10	
2008*	2	1	1	0			2		2	
Total	103	48	26	29	80	9	8	6	91	10

* min 50% of transaction value was paid in shares

** one transaction neglected due to unclear information

2008 includes all acquisitions until March

Figure 2: Data Sample Overview

It is worth noting that the number of transactions has been at a significantly higher level since 1999. An explanation for the rise of M&As could be the rising deregulation in this industry sector. Most announcements have taken place at a national level. However, increasing transnational M&As have become more attractive since 1999 and may have also been caused by increasing deregulation.² Most transaction announcements have a horizontal purpose, which may be explained by the fact that most electric utilities already employ a vertical network philosophy in their business.

In a critical review of the data sample one can particularly highlight the degree of deregulation as a potential Achilles heel. It is rather difficult to obtain information about the regulatory environment in certain countries. Additionally, the degree of deregulation may have changed over time and would therefore not be entirely reflected by a snap shot analysis as has been done in this thesis. The events were checked for confounding effects with respect

¹ For further discussion see chapter 3.4.1

² A geographical overview on a country specific perspective can be found in the appendix.

to parallel M&A announcements and major regulatory events for the electricity sector, though smaller confounding effects with impact on company stock prices might have been overlooked. Nevertheless, the thorough collection of data should be sufficient to provide meaningful results with regards to success-driving key factors.

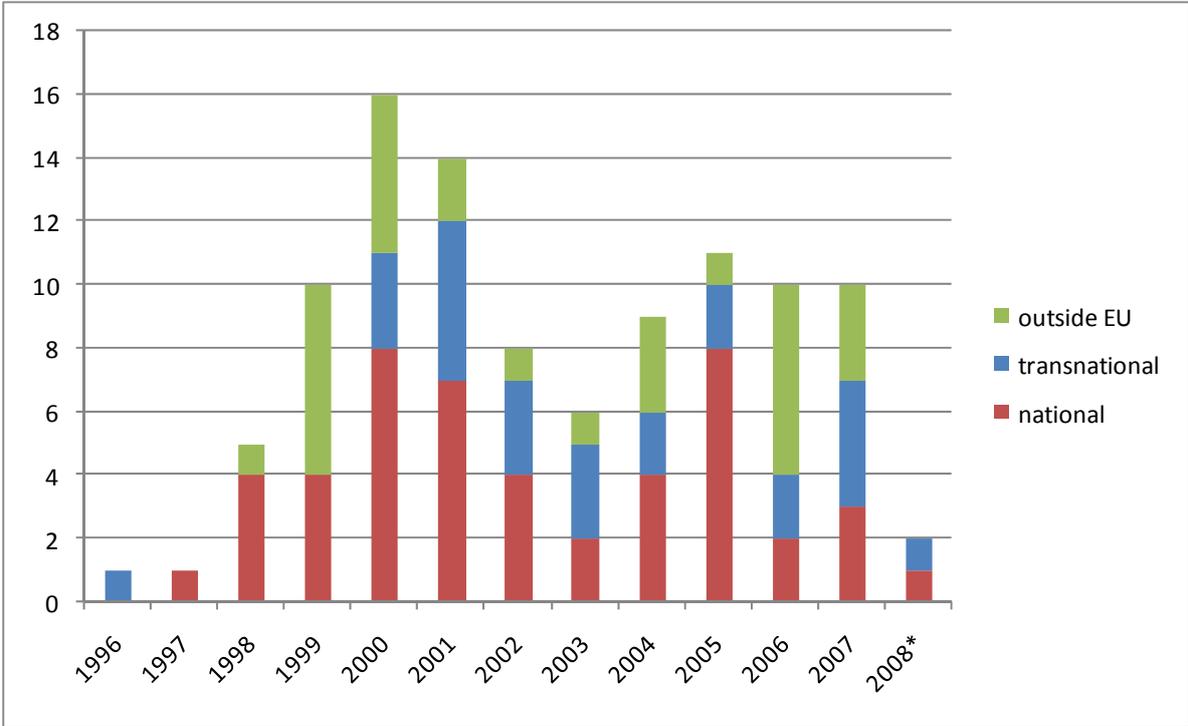


Figure 3: Geographic Focus of European Energy M&As

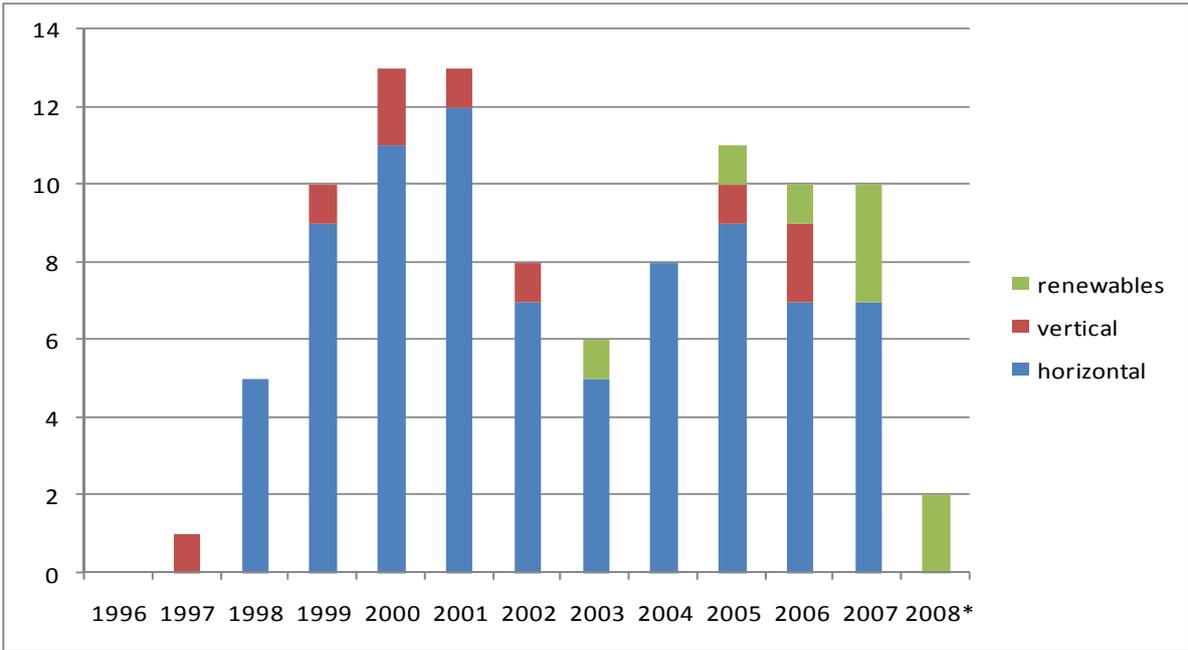


Figure 4: Strategic Focus of European Energy M&As

3.4. Event and Event Windows

3.4.1. Event definition

Using an event study methodology relies on two assumptions. The first assumption is market efficiency meaning that all available information is captured in current stock prices. In other words, a change in stock prices reflects changes in available information and this can only be caused by unanticipated events, such as changes in economic policy, corporate legislation, ad-hoc information, restructuring announcements and so forth (Chan-Lau, 2002).

The second assumption is a correct pricing model to finally measure significant impacts of newly released information to shareholders. The day a corporate transaction is announced to the public by the bidder is crucial for this event study and is defined as the announcement day $t=0$. As previously discussed, transactions were only included when several sources (financial dailies, Reuter's M&A database, corporate ad hoc news sections) stated the same announcement day. However, due to the nature of large-scale transactions there might be rumours among traders and shareholders even prior to the event, or discussions about a possible political influence sparked after the event. For this reason this study analyses abnormal returns in different time frames, i.e. event windows.

3.4.2. Event windows

Around the announcement day $t=0$ the range of the event window is defined from $t = T_1 + 1$ to T_2 . Consequently, the estimation window for normal returns is typically defined from $t = T_0$ to $t = T_1$. The length of the event window is defined as L_2 . This thesis uses a constant estimation window of $L_1 = 180$ days. As discussed earlier, the length of the event window is typically larger than the event day itself in order to capture the effects around the announcement day. Thus, three different event windows are used, covering 20 days, 10 days, and 3 days prior to and after the event, respectively. Effects on the announcement day itself are also taken into consideration, so as to capture all different effects and even be able to compare differences between different time frames. Expanding or shortening event windows can change the level of abnormal returns but, if there is no correlation between pre-event leakage and the type of merger, there should be no impact on the relationship among different types of transactions. DeLong (2001) states that a common result is that longer event windows can result in the decreasing significance of abnormal returns due to increasing volatility over time. Since a constant estimation window but variable event windows are used, the gap between the estimation window and the event window influence neither the estimators

nor the calculation of the abnormal returns. Since it is assumed that returns occurring during this gap can be caused by the event itself the exclusion of the returns is rational.

Event window and estimation window should also not overlap so that the estimators of the market model are not influenced by the returns in the event window (MacKinlay, 1997). Thus, the total data sample ranges from 200 days previous to the event to 20 days following the event.

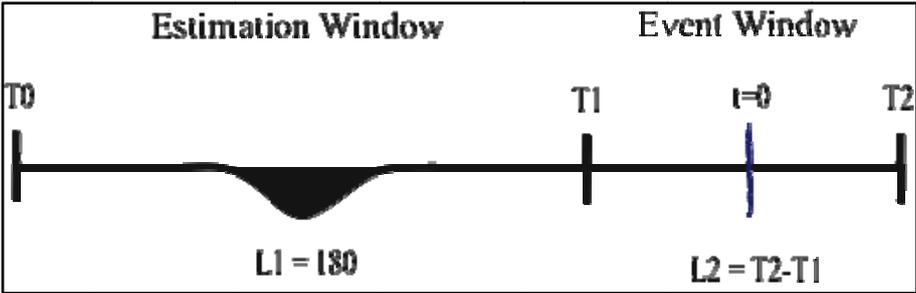


Figure 5: Definition of Event Window

3.5. Modelling Abnormal Returns

In order to find abnormal returns caused by an event, normal returns have to firstly be estimated. In event study theory there are two main approaches to model and measure normal and abnormal returns – the constant mean model and the market model. In the constant mean model the normal returns for the event window are simply estimated by using the mean of the returns in the estimation window as normal returns. The market model approach uses an ordinary least squares (OLS) regression to estimate the model parameters α_j and β_j for each stock j , using the $N=180$ observations in the estimation window. Expected returns for the event window are subsequently calculated as follows (Beitel, Schiereck, & Wahrenburg, 2004):

$$\hat{R}_{j,t} = \hat{\alpha}_j + \hat{\beta}_j R_t^M$$

The log differences of the Dow Jones STOXX® 600 *Utilities Index*, which covers all major European utilities and weights them according to their market capitalization, are used as market returns (Delaney & Wamuziri, 2004). Many event study analyses use a rather broad index as a market proxy and, as a result, the market model does not deliver superior results when compared to the constant mean model. Campbell et al. (1997) argue that the market model represents a potential improvement compared to the constant mean model by removing the portion of the returns that is related to the variation in the market’s returns. Consequently, if a market proxy that is closer correlated to the firm’s stock price movements is used,

explanatory power of the results can be increased. Other models that could be suitable for an event study are factor models with multiple proxies. In practice, gains from more sophisticated models are limited since the explanatory power of factors beyond the market factor is generally small. Hence, the market model is the most appropriate choice for the purpose of this thesis.

Non-synchronous trading is neglected in estimations that might bias the estimators due to serial dependence, especially in the case of illiquid stocks. However, Brown and Warner (1985) found no significant misspecification of the OLS estimators when not taking into account non-synchronous trading. Since only highly liquid stocks with an average bidder's asset size of USD 38.5bn are used and the results are based on those of Brown and Warner (1985), non-synchronous trading effects can be neglected in the estimation.

Abnormal returns (AR) are calculated as the difference between the actual stock returns and the estimated normal returns and are defined as the disturbance term of the market model calculated on and out of the sample basis (MacKinlay, 1997):

$$AR_{j,t} = R_{j,t} - \hat{R}_{j,t}$$

with

$$\overline{AR}_t = \frac{1}{N} \sum_{j=1}^N AR_{j,t}$$

where $R_{j,t}$ is the stock return measured as the first difference in the log of the stock price (Delaney & Wamuziri, 2004). For large L_1 the variance of the sample aggregated abnormal returns can be defined as

$$\text{var}(\overline{AR}_t) = \frac{1}{N^2} \sum_{j=1}^N \sigma_{\varepsilon,j}^2$$

Cumulated abnormal returns (CAR) for any interval L_2 are calculated as³

$$CAR_j(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{j,t}$$

$$\overline{CAR}(t_1, t_2) = \frac{1}{N} \sum_{j=1}^N CAR_j(t_1, t_2)$$

$$\text{var}(\overline{CAR}(t_1, t_2)) = \sum_{t=t_1}^{t_2} \text{var}(\overline{AR}_t)$$

³ As mentioned earlier, the sample variance increases with L_2

To test for significance the null hypothesis is derived using the z-value that is based on the sample variance of CAR divided by the square root of the number of observations as a proxy for the unknown and unbiased standard deviation σ_ε (MacKinlay, 1997).

$$z = \frac{\overline{CAR}(t_1, t_2)}{\frac{\sqrt{\text{var}(\overline{CAR}(t_1, t_2))}}{\sqrt{N}}}$$

According to Brown and Warner (1985) non-normality of daily returns has no clear impact on event studies. Although the measured daily abnormal returns are also non-normal, they suggest that the mean excess return in a cross-section of stocks converges to normality with increasing sample size.

A further applicable test that examines whether two different types of mergers are significantly different is the mean difference test used by DeLong (2001). It divides the difference of the two means of the samples a and b by a control for the CAR-variances and the sample sizes and finally delivers the t -statistic which is distributed as a Student-t under the null hypothesis that there is no difference in abnormal returns among the two groups:

$$t = \frac{\overline{CAR}_a - \overline{CAR}_b}{\sqrt{\frac{\text{var}(\overline{CAR}_a)}{N_a} + \frac{\text{var}(\overline{CAR}_b)}{N_b}}}$$

3.6. Definitions of Variables

Besides testing the significance of CARs, this study also shows a possible impact of the discussed drivers of M&A success as compared with the respective abnormal returns in order to find which factors might increase shareholder value and which factors lower the probability of a transaction's success. Possible influencing factors for energy related corporate transactions were discussed in chapter 2 and are further specified in figure 6 for use in the empirical analysis.

Name of Variable	Definition
Relative transaction value	Transaction value at announcement (USD) divided by the asset size of the bidder (1 year prior announcement).
Method of payment	Cash payment ratio of 100% compared with cash payment ratio of 50 % or smaller.
Bidder experience	Binary dummy variable: 0 for less than five large-scale transaction in 10 years history and 1 for five or more large-scale transaction in 10 years history.
Profit efficiency	Return on Equity of the bidder 1 year prior announcement.
Transnational	Binary dummy variable: 0 for domestic transaction and 1 for cross-border transactions.
Deregulated target	Binary dummy variable: 0 for targets in countries with strong regulated electricity market and 1 for targets in countries with less regulated electricity market.
Deregulated bidder	Binary dummy variable: 0 for bidders in countries with strong regulated electricity market and 1 for bidders in countries with less regulated electricity market.
Regulated national	Binary dummy variable: 1 for M&As in single countries with strong regulated electricity market and domestic acquisition and 0 for M&As in single countries with less regulated electricity market and/or cross-border transactions.
Strategic focus	Distinguishes between acquisitions into horizontal business, horizontal but renewables and vertical business.

Figure 6: Definition of Variables

3.7. Comparative Statics

In this study comparative statics is used to determine whether the discussed drivers of M&A success have significant explanatory power. In this approach all 103 transactions are ranked according to the value of a particular variable and compare the CAR values of all event windows of the top 30 transactions with the CAR values of the bottom 30 transactions. The individual CARs are tested for significance the same test statistic and method are used to compute the z value as described in chapter 3.5, this time only testing the top and bottom values for significance. Thus, a sample variance with a lower sample size is used with potential non-normality issues. Using the complete sample variance might, on the other hand, bias the tests for top and bottom values even more. Furthermore, a mean-difference test is applied to test whether differences in the particular driver lead to statistically different results in value creation. In the case of binominal drivers (dummy variables) all zero-value variable transactions are tested against all one-value variable transactions (Beitel, Schiereck, & Wahrenburg, 2004). In the mean-difference test of the strategic purpose dummy variables *horizontal*, *horizontal into renewables*, *vertical*, the first two dummies are combined and tested against the *vertical* variable since the test only allows for one variable against another.

3.8. Cross-sectional Regression

The last part of the empirical model applies weighted ordinary least squares (OLS) cross-sectional regressions to further analyse the direction and size of the variables' impacts on the abnormal returns. Whereas comparative statics and the sub-sample statistics indicate trends in the AR, a regression allows testing for explanatory power, i.e. the regression coefficient, and the size of the coefficient of the independent variable. As a last step, multiple regressions are applied in order to create a joint model with increased explanatory power in order to predict market reactions for M&A announcements in the energy sector.

Firstly, a stand-alone regression is run for each of the 8 variables and checked for explanatory power (adj. R^2) and significance (t -test). The 'transnational' and 'deregulated' factors are then analysed more specifically and tested to see whether transactions within a single regulated country to create national champions tend to increase or decrease the bidder's shareholder value. In this field, theoretical assumptions are ambiguous. Finally, a regression with all variables that had significant influence in the stand-alone regressions is modelled. The explanatory power is of great interest since with a high regression coefficient stock price movements of buyers may then be partially predicted.

4. Empirical Results

The data sample of this study contains 103 observations. First, the cumulated abnormal returns of the entire sample with respect to bidder returns are calculated. The calculation then serves as basis for a subsequent comparative statics analysis. Comparative statics helps to determine whether the drivers of M&A success, chosen in this study, have explanatory power. Finally, the cross sectional regression analysis investigates the explanatory power of several variables at the same time.

4.1. Results of the abnormal return analysis

The CARs are calculated by using the market model. The study calculates CARs for the time period window of [-3; +3], [-10; +10] and [-20; +20] days. In addition, the thesis identifies the excess return on the announcement day. While 34% of the sample observations for the announcement date have negative abnormal returns, the analysis shows 51%, 50%, and 53% negative CARs for the event windows [-3; +3], [-10; +10], and [-20; +20] respectively (see overview in Appendix). Although all event windows indicate slightly positive or negative CARs for the acquirer, the results also illustrate a moderate number of significant negative abnormal returns for most of the event windows. Therefore, it is worth noting that throughout every event window each significant cumulated abnormal return is negative.⁴ This result is consistent with previous event studies discussed in this thesis. In different studies the bidder shareholders typically bear negative abnormal returns. In this particular study, the event window [-20; +20] shows 33 abnormal returns greater than -3% whereas many of them even exceed -10%. However, the number and size of abnormal returns decreases with smaller event windows. This outcome could indicate that the effect of acquisitions will not be immediately reflected in stock prices but is rather incorporated in a longer period. The nature for longer processing of stock price changes can be due to uncertain outcomes of legal regulations in the acquisition procedure. After the bidder's announcement of an acquisition, shareholders might still be expecting obstacles from a legal perspective. On the other hand, a broader event window also poses the risk of distorted abnormal stock returns due to noise on the market, i.e. rumours about significant regulatory changes.

The event window of [-3; +3] still has 20 observations with negative abnormal returns larger than -3%. Surprisingly, only two negative abnormal returns in observations are found for the announcement date itself. Again, this can be explained by the theory that the bidder faces difficulties in the permission of the acquisition due to the demand by authorities for sound

⁴ Significant abnormal return are acknowledged in this study when CAR > or < than 3 % or -3% respectively.

competition or governmental restrictions in the target's country. Issues in identifying the exact announcement date can deteriorate the results of abnormal returns on the announcement day.

Electric utilities can have declared interest for an acquisition via purchasing a certain share of the target before publishing the actual announcement. This would imply a significant change in the stock price separately from the actual announcement day. However, the findings of a considerable amount of negative abnormal returns and only marginal positive abnormal returns in this study is consistent with findings from similar research in the area of CARs in M&A announcements.

4.2. Results of comparative statics

This study uses comparative statics to determine whether identified drivers have explanatory power when it comes to M&A transactions in the energy market. All drivers analysed below have been retrieved from the literature review in section 2.2. Although the event window [-20; +20] shows the highest number of negative returns it is assumed that this event window harbours the danger of abnormal returns due to effects other than the actual announcement. Therefore, most meaningful results of the analysis can be expected when focussing on CARs of a [-3; +3] and [-10; +10] days event window (see figure 7 for a detailed overview of all variables).

The variable *relative transaction value* shows a bidder's average asset size of USD 70.6bn in the top 30 fragment. The average transaction value at announcement is USD 262mn resulting in an average ratio of 0,005. The bidder's average size in the bottom 30 fragment is USD 21.9bn with a transaction value of USD 5.7bn causing a much higher average ratio of 0,405. The [-3; +3] event window shows marginal higher excess returns in the case of higher relative transaction value (bottom 30). However, the abnormal returns are not significant in this fragment. The [-10; +10] period also indicates that a higher relative transaction value creates more value for bidder shareholders. Moreover, the low ratio generates negative CARs, while a higher ratio generates positive excess returns with significance at the 5% level. This can be an indicator for shareholder preference to acquire targets with already well-established infrastructure. Since the business with electricity demands an extraordinary amount of assets, an acquisition of big targets can save costs in building new generators, power plants or electricity networks. Yet, the mean difference of the top and bottom CARs is not significant in both event windows. That leads to the final assumption that this variable does not have a significant impact on returns from an isolated perspective.

Variable	Top 30				Bottom 30				Difference	
	N	Average	Std. Dev.	CAR [-3, +3]	N	Average	Std. Dev.	CAR [-3, +3]	Mean difference (%)	P-Value
Relative Transaction Value	30	0,0050	0,0030	0,0000	30	0,4052	0,4022	0,0039	-0,39%	0,4789
Method of Payment	91	'1'	N/A	0,0027	10	'0'	N/A	-0,0050	-0,39%	0,3113
Bidder experience	66	'1'	N/A	0,0057*	37	'0'	N/A	-0,0063	1,20%	0,0728
Profit efficiency	30	29,30%	0,1416	-0,0002	30	6,49%	0,0777	0,0052	-0,54%	0,2576
Transnational	47	'1'	N/A	0,0049	56	'0'	N/A	-0,0016	0,65%	0,1644
Deregulated Target	38	'1'	N/A	0,0018	65	'0'	N/A	0,0012	0,06%	0,4646
Deregulated bidder	32	'1'	N/A	0,0073	71	'0'	N/A	-0,0013	0,86%	0,1278
Regulated national	10	'0'	N/A	0,0201**	93	'1'	N/A	-0,0006	2,07%	0,0464
		Horizontal				Renewables			1) Difference	
	N	Average	Std. Dev.	CAR [-3, +3]	N	Average	Std. Dev.	CAR [-3, +3]	Mean difference	P-Value
Strategic focus	77	N/A	N/A	0,0014	8	N/A	N/A	0,0116	0,0061	0,2401
		Vertical								
	N	Average	Std. Dev.	CAR [-3, +3]						
	9	N/A	N/A	-0,0038						

Variable	Top 30				Bottom 30				Difference	
	N	Average	Std. Dev.	CAR [-10, +10]	N	Average	Std. Dev.	CAR [-10, +10]	Mean difference	P-Value
Relative Transaction Value	30	0,0050	0,0030	-0,0234***	30	0,4052	0,4022	0,0190**	-4,24%	0,2818
Method of Payment	91	'1'	N/A	-0,0050	10	'0'	N/A	0,0198	-2,48%	0,1044
Bidder experience	66	'1'	N/A	0,0133**	37	'0'	N/A	-0,0316***	4,50%	0,0000
Profit efficiency	30	29,30%	0,1416	-0,0030	30	6,49%	0,0777	-0,0101	0,71%	0,3235
Transnational	47	'1'	N/A	0,0006	56	'0'	N/A	-0,0056	0,62%	0,2875
Deregulated Target	38	'1'	N/A	-0,0013	65	'0'	N/A	-0,0036	0,23%	0,4222
Deregulated bidder	32	'1'	N/A	0,0006	71	'0'	N/A	-0,0043	0,50%	0,3514
Regulated national	10	'0'	N/A	0,0360**	93	'1'	N/A	-0,0069	4,30%	0,0061
		Horizontal				Renewables			1) Difference	
	N	Average	Std. Dev.	CAR [-10, +10]	N	Average	Std. Dev.	CAR [-10, +10]	Mean difference	P-Value
Strategic focus	77	N/A	N/A	-0,0002	8	N/A	N/A	-0,0084	0,0300	0,0995
		Vertical								
	N	Average	Std. Dev.	CAR [-10, +10]						
	9	N/A	N/A	-0,0310*						

* = significant at the 10% level; ** = significant at the 5% level; *** = significant at the 1% level
1) The mean difference is calculated as CAR (horizontal and renewables) - CAR (vertical)

Figure 7: Results Comparative Statics

This study employs a dummy variable to test the *method of payment*. While the top fragment consists of 91 observations with cash payments, the bottom fragment comprises only 10 acquisitions in which cash did not become part of the deal or just obtained a minor role in the transaction. This exceptionally high number of cash payments can be seen as an indicator for a high amount of excess cash among electric utilities. Though in many academic articles payment with stocks leads to adverse reactions on the market, the result of this study does not indicate a clear impact of the payment method. The [-3; +3] event window shows small positive cumulated abnormal returns for cash payments but marginal negative excess returns for payments made mainly with stocks. On the other hand, the period [-10; +10] indicates opposite results in the form of negative CARs for cash payments and positive abnormal returns for acquisitions mainly financed via stock swaps. However, the mean difference in both event windows does not have any significance. It seems that neither cash payments nor stock swaps in this business segment send noteworthy signals to the capital market. Moreover, this result clearly opposes the theory by Myers & Majluf (1984), who believe in corresponding market reactions according to the method of payment. The insignificance of

this variable leads to the conclusion that in this business market participants pay little attention to the kind of payment and instead see other variables as of higher importance for a successful acquisition.

A dummy variable is employed to test the impact of *bidder experience* on the M&A success for electric utilities in Europe. The top fragment contains 66 companies with less than 5 prior large-scale transactions within a 10-year history. The bottom fragment includes 37 bidders with less than 5 previous transactions. The results show that less experienced utilities have positive excess returns while utilities with more experience show negative CARs in a [-3; +3] event window. While the top fragment is significant at a 10% level, the bottom fragment was measured without any significance. However, the mean difference is significant at the 10% level. The period [-10; +10] confirms the results from the shorter event window. In this time frame the results become even more significant. The CARs are larger in the top as well as in the bottom fragment with significance at the 5% and 10% level, respectively. The mean difference supports the clear distinction between experienced and less experienced electric utilities by stating significance at the 1% level. The empirical results are consistent with Dikova et al. (2006) who also see positive effects by less experienced companies. The number of M&A abandonments increases with higher levels of M&A experience. For the theory of increasing abandonment by more experience, one could argue that national laws restrict the success of high experienced electric utilities. Electricity markets in Europe still have many provisions of national law in place to protect consumers and to guarantee a well-functioned electric power supply. It may be assumed that experienced utilities with 5 or more large-scale acquisitions have built up a remarkable position in the market. Therefore, authorities tend to reject additional acquisitions and refer to the maintenance of sound competition in the electricity market. Significant results within the [-10; +10] event window could be motivated by the fact that the magnitude of political resistance will be noticed after a slightly longer period of time. Another point of view is the limited capacity of integration. A high number of prior acquisitions can certainly cause difficulties when it comes to a subsequent takeover. An acquisition requires organisational changes and a revision of company structure and procedures in a definite period of time. If an electric utility moves forward by too high a number of acquisitions in a very short time window, the integration process might potentially be impaired.

The analysis of the variable *profit efficiency* includes, in the top fragment, the 30 most efficient bidders of this sample in which the average profit efficiency lies at 29.30%. The 30

least efficient acquirers in the bottom fragment show an average efficiency ratio of 6.49%. Interestingly, the top fragment indicates negative excess returns in both event windows. The bottom fragment, however, shows conflicting results. While excess returns in the short event window are positive, they tend to be negative in the broader window. These results are contrary to the studies discussed in section 2.2.1 where Houston & Ryngaert (1994) and Beitel et al. (2004) investigate positive reactions in the market to M&A announcements when the acquirer has exhibited a high profitability in the past. However, in this analysis high profitability does not seem to be a relevant M&A success factor for electric utilities. This is also supported by the insignificance in the mean difference of both event windows. Thus, it can be concluded that profit efficiency is not a criterion for market participants to evaluate the success of the bidders' acquisition.

The *transnational* variable is used to find an answer to the impact of a geographic focus for M&A success. This factor distinguishes between, in the form of a dummy variable, 45.6% national and 54.4% cross-border transactions. Previous studies show mixed results on whether domestic or cross-border transactions are more beneficial. On the one hand, Beitel et al. (2004) see domestic acquisitions, due to higher synergies, as being better rewarded by the market. On the other hand, Markides & Ittner (1994) investigate positive abnormal returns generated by cross-border transactions. However, the outcome of this study indicates a tendency towards more successful national transactions. Both [-3; +3] and [-10; +10] event windows show marginal positive excess returns for national transactions. Consistent with this result, the outcome for transnational acquisitions is negative in both event windows. Nevertheless, no significant results can be found either in the fragments or in the mean difference test of this variable. It can be assumed that this variable puts little importance on the shareholder value from an isolated perspective. Positive excess returns seem to be more likely if the electric utilities use synergies in their domestic market.

The next variable, i.e. *deregulated target*, is derived from the key success factor market regulation. Focus is put on M&A announcements where the target is located in a deregulated environment. The sample contains 36.9% targets situated in a strongly regulated environment, while 63.1% are located in less regulated countries. The shorter event window shows slightly positive excess returns for both targets in regulated and less regulated countries. On the other hand, the [-10; +10] event window shows opposite results. Here, the CARs for regulated and less regulated countries are somewhat negative. This inconsistency is even more deteriorated by non-significance in both mean differences of this variable. The outcome of the [-10; +10]

event window might slightly support the result of Campa & Hernando (2004) who investigate lower generation of values for industries in government controlled and regulated environments than in less regulated industries. However, it can be concluded that from an isolated perspective the degree of regulation in the target country has little effect on shareholder values.

The variable *deregulated bidder* is similar to the aforementioned variable. However, in this case, the test focuses on the degree of regulated environment in the bidder market. The top fragment contains 31.1% observations indicating a regulated bidder market. The remaining 68.9% forms the bottom fragment and specifies a less regulated environment in the bidders' country. Both event windows show similar results. While the test shows a tendency for positive abnormal returns in regulated bidder markets, deregulated bidder markets result in negative excess returns. The findings are contrary to the results of Campa & Hernando (2004) who identify more value creation in less regulated industries. The tendency for more value creation in regulated environments is comparable to some of the outcomes in the previous test. Although no significant results could be found when testing this variable, the test shows a small tendency towards value creating acquisitions. If bidder markets are more regulated, the outcome does not identify this classification as important for the success of M&As.

The next variable *regulated national* separates M&As in single regulated markets from those in less regulated markets or across countries. The top fragment contains 9.7% national transactions in highly regulated countries. On the other hand, the bottom fragment has 90.3% indicating a significant predominance of M&As located in lower regulated countries and/or cross-border acquisitions. The analysis presents positive significant excess returns for the top fragment, regulated national, in both event windows. Further consistency can be seen in the level of significance, which is at a 5% level in both periods. The bottom fragments in both event windows show negative CARs but neither of them has any significance. The mean difference test indicates significance on a 5% level for the [-3; +3] time frame and on a 1% level for the [-10; +10] event window. The result of this analysis leads to the assumptions that it is more rewarding for the acquirer to conduct acquisitions in a regulated and national environment. This result is contradictory to the theory by Leggio & Lien (2000) who find significant negative returns for electric utilities when merging with other utilities in regulated countries. They argue that mergers in less regulated markets are easier to be processed, thereby implying higher benefit for shareholders. However, supportive arguments come from Verde (2008) who sees domestic acquisitions as an enhancement of the position of national

champion, which causes regulatory protection and minimizes potential restrictive actions from the EC or the national government. Furthermore, the benefit of national acquisition is encouraged by Campa & Hernando (2004) who find that market regulation becomes even more significant when two firms from different countries in the euro zone are involved in M&As. As a final conclusion this study supports the theory that markets reward national M&As of bidders and targets in regulated environments.

Finally, the comparative static analysis investigates the impact of the *strategic focus* on CARs. In order to test the strategic focus, three different fragments are created. The first fragment, i.e. *horizontal*, contains 77 observations and represents the majority of the sample. The second fragment encloses 8 acquisitions where the target's main business focus is on *renewable* energy. The third fragment has 9 observations, which focus on acquisitions in a *vertical* business. The results of this analysis are rather mixed. The [-3; +3] event window has positive excess returns on a horizontal and renewable focus but negative CARs from vertical orientated acquisitions. However, none of the results, including the mean difference test⁵, have significant results. The [-10; +10] event window shows negative excess returns throughout all three fragments where the result of the vertical fragment has the only significance at a 10% level. Also, the mean difference as a result of horizontal and renewable minus vertical CARs shows significance at the 10% level. Although the results are mostly insignificant, the tendency of value destruction in the case of vertical acquisitions can be concluded. Therefore, strategic focus is not a key success factor.

4.3. Cross Sectional Regression

The last part of the analysis presents and discusses the empirical results from the OLS regressions that were performed to test for further significance, size of the impact, and explanatory power. It leads to insights about the mechanisms by which a merger or acquisition in the European energy sector influence the bidder's stock returns. Surprisingly, many event studies conclude with the results from the comparative statics and only a few studies continue by using cross-sectional regressions to derive further indications. However, as Beitel et al. (2004) state, comparative statics only allows testing for one driver of M&A success or failure at a time. With the following cross-sectional regressions the effects of multiple variables are measured simultaneously.

⁵ The mean difference is calculated as CAR (horizontal and renewable) – CAR (vertical)

Before measuring multivariate effects, partial regressions for each variable are conducted. In contrast to the paper of Beitel et al. (2004) where the researchers use only variables that have been significant in the comparative statics analysis, this thesis runs initial regressions for all presented variables and further focuses on significant variables at the second stage. The 7-day event-window [-3; +3] is used at first in order to be in line with the common research approach, i.e. to use a rather small event window assuming a small leakage. Although many studies use even shorter time frames the nature of energy deals and circulating press rumours prior to the announcement day justify a slightly larger event window. Thus, the event window is expanded even further in the later part of this chapter to see if results are consistent with the shorter window or if even more effects can be captured with a 21-day event window [-10; +10]. Regressions on the transnational and regulation variables are run to see if returns from M&As within single regulated markets differ from cross-border M&As and/or from returns in deregulated markets to see how shareholders value the creation of national champions. In a last multivariate regression, all prior significant variables from the partial regressions are taken to form a model with increased explanatory power and remaining significant coefficients. See figure 8 for detailed results from all regressions.

Nevertheless, one has to be careful in interpreting the results gained from the CSR approach. As Campbell et al. (1997) state, abnormal returns in event windows will be related to firm characteristics and other variables not only through the valuation effects of the very event itself but also through relations between the used variables and the extent to which the event had already been participated. If, for example, a low profit efficiency of the bidder is a sign for investors that the respective company will target a transaction in the future, then the relation between the variable and the valuation effect can be hidden since this leads to price changes outside the event window. This means that variables that are not significant in the regression can influence the value of an M&A since they influence the investors' expectations regarding the likelihood that such an event may occur. On the other hand, significant variables in the regression are unlikely to become insignificant due to anticipation effects. Thus, focus once again lies on variables that are significant at least at the 90% level.

4.3.1. CAR[-3;+3] results

In this event window abnormal returns from M&As are significantly influenced by geographic factors, the bidder's experience and whether markets are regulated or deregulated. Although the transnational variable has no significant influence on returns, significant results arise when splitting the variable into national transactions and transnational transactions within and outside the EU. Abnormal returns are more negative when the transaction is *transnational* but inside the EU. Over the 7-day period abnormal returns of European cross-border M&As are on average 1.35% lower than for national M&As within Europe. Non-EU transactions lead to comparably less negative abnormal returns with a coefficient that is close to zero. The regression also has a relatively high adj. R^2 of 17.9%. This interesting result could be explained by the fact that European energy markets are still not fully integrated and open for capital movement. The discussed example of the Endesa merger and the implicit bureaucracy issues could be seen as representative obstacles still remaining in the liberalisation process within the EU.

Another factor that significantly influences abnormal returns in the 7-day event window is the *bidder experience*. Here, abnormal returns of bidders with a track record of at least 5 other large-scale transactions within 10 years before the transaction are on average 1.21% lower than for bidders without previous experience. The adj. R^2 is relatively high at 17.3%. Thus, the market does not value prior transactions positively and investors tend to doubt whether too many large-scale transactions would be beneficial for the bidder's performance.

Deregulation only influences abnormal returns significantly in target markets. Abnormal returns are significantly lower when the targeted company is located in a deregulated market. However, the value is quite low at -0.06% and can therefore be neglected. A relatively interesting result comes about with the introduction of the dummy variable *regulated & national*: abnormal returns of M&As within a single regulated market are on average 2.07% higher than in other markets. The adj. R^2 is at 18.3% and therefore the second highest of all regressions in the 7-day event window. Thus, investors tend to appreciate the creation of national champions with regulatory protection and do not expect losses due to regulatory measures from the EC or the national government.

4.3.2. CAR[-10;+10] results

When the event window is expanded to a size of 21 days the regressions show fairly similar and consistent results. In general, significance as well as explanatory power increases. When conducting the partial regressions *profit efficiency*, *bidder experience*, *relative transaction*

value, *deregulated target*, and *regulated & national* are all significant at a 95% level. The *profit efficiency* coefficient is negative but very close to zero, thus only having little impact on returns despite high significance. *Bidder experience*, on the other hand, tends to impact CARs rather strongly with companies performing 4.5% worse than others on M&As if they had as many as or more than five previous large-scale transactions. This is consistent with the findings of previous regressions in this thesis and the comparative statics; however, this time explanatory power is very strong with an adj. R^2 of 38.2%. This is the highest result found in all of the partial regressions.

The variable *relative transaction value* also has a very strong impact on CAR[-10; +10]. Although insignificant for the 7-day event window regression, the relative size of the target compared to the bidder is now significant at a 99% level and has the highest coefficient with 0.0627. The adj. R^2 is very high at 30.60%. This result is in line with the prior empirical findings of Moeller et al. (2003), i.e. the higher the transaction value or the lower the size of the bidder, respectively, the higher the expected CAR of the transaction. In conclusion, only transactions of rather equally large companies bring substantial new value to shareholders whereas small scale M&As with transaction values considerably below the bidder's market value being less beneficial. Becker-Blaese et al. (2007) come to contrary results with a significant but negative coefficient for the transaction value and with a negative coefficient for the bidder size of US energy M&As. The difference in results also maintains that investors appreciate the creation of national champions within the EU since in that theory companies with similar size form a new dominant national entity.⁶ The rationales behind this are that the liberalisation efforts provide incentives to create bigger players better able to survive in a widened and more competitive environment, as well as the need to reach a critical mass to achieve some efficiencies and economies of scale in deregulated energy markets (Verde, 2008).

Similar to the 7-day event window, abnormal returns in *deregulated target* markets are lower. However, for the 21-day event window the significance of the variable falls below the 90% hurdle with a p-value of 0.84. On the other hand, the variable becomes significant at a 95% level when it is combined with the *deregulated acquirer* variable. The adj. R^2 values of the regressions containing the three variables are lower than for the 7-day event window.

⁶ Both *transnational* and *transnational inside EU* coefficients are negative (but not significant) for both event windows and thus do not contradict the theory of national champions.

The *regulated & national* variable coefficient increases with higher significance compared to the smaller event window. CARs are on average 4.30% higher when M&As take place in single regulated markets compared to other M&As. The adj. R^2 is comparably strong at 22.5%. This also supports the theory that investors appreciate the creation of national champions. Thus, the empirical results of the partial regressions are fairly consistent when the size of the event window is increased and therefore support the validity of the conclusions.

The multivariate regression on CAR[-10; +10] with all significant variables from the partial regressions further shows consistency in coefficients and an extremely high explanatory power. The *non-EU transactions* dummy is further included since its p-value is just slightly below the 90% threshold when conducting the partial regression. All coefficients keep their sign and all but the profit efficiency variable (which had a coefficient close to zero in the partial regression anyway) remain highly significant. The previously insignificant *non-EU transactions* variable becomes significant at a 90% level. The adj. R^2 is 50.7%, which is very high compared to other event studies in that area.

Compared to other event studies on abnormal returns through corporate transactions, the results of the regressions in this thesis are strong in significance and explanatory power. In their attempt to explain M&A success in European banks, Beitel et al. (2004) found that only three out of nine analysed variables were constantly significantly influencing bidder-CARs. The highest calculated adj. R^2 for their combined regression on CAR[-1; +1] that included all variables was at 19.8% and lower than the adj. R^2 for this thesis' final regressions on CAR[-3; +3] and CAR[-10; +10], respectively, that only contained the significant variables. DeLong et al. (2001) estimate two regressions with adj. R^2 values of 18.4% and 14.9%, respectively. For energy M&As in the US, Becker-Blaese et al. (2007) also find only three factors to be significantly influential on bidder-CAR[-1; +1]: strategic focus, bidder size and relative size. A regression combining all 15 variables resulted in an adjusted R^2 of 19.1%.

With this very strong result and explanatory power, stock market reaction to M&A announcements of European energy companies can be at least partly forecasted. This can be essentially useful for both managers and shareholders to analyse growth opportunities on the one hand and to judge and approve energy M&As on the other hand.

5. Conclusion

5.1. Summary

This thesis has investigated the success factors that influence large-scale mergers and acquisitions in the European energy sector. In the theoretical framework the structure of the European energy sector is discussed with special regards to the deregulation efforts of the European Commission and the transformation from former national single markets towards a single integrated marketplace in Europe. It is pinpointed that, even today, with a track record of intensive deregulation efforts, markets are still far away from being integrated and fully competitive. By giving an example of national influence and governmental intervention in the recent Endesa merger, it is shown that national governments still try to protect domestic companies and industries. In contrast to similar studies in other industries this thesis has therefore included the degree of regulation in the empirical analysis and has also paid particular attention to the interplay of cross-country/national M&As and the degree of regulation.

In the empirical analysis the common approach of event- study analysis is used to measure the effect of an M&A announcement on the value of the acquiring firm. A comparative statics analysis and a cross-sectional regression are successfully employed to firstly examine individual factors and secondly to create a regression model that includes all significant factors and delivers high explanatory power. This procedure is applied to different event windows, indicating that CARs become generally more negative when the event window is expanded. The significance and explanatory power of the regressions also become more important with a larger event window. Although the common approach to such a study opts for event windows that are as short as possible (since market efficiency generally leads to instant adjustments), this thesis argues that due to the complexity of energy deals and the uncertainty of whether governments might intervene, larger M&A event windows are applicable in this study. The regulatory features and strong interest of governments lead to uncertainty and stock price adjustments beyond the announcement day.

The empirical results of both comparative statics and regression analysis are consistent and deliver similar and significant results. Compared to other empirical studies on M&A success factors the results of this thesis deliver relatively high explanatory power. This increase in explanatory power might be caused by the use of an industry-based index as market proxy. The final regression model can be used by shareholders and managers of the acquiring firm, i.e. our target group, to predict and explain effects on stock returns around announcement

days. Transactions of equal size lead to higher bidder returns. Investors do not appreciate a higher frequency of large-scale M&As of a single acquirer and thus the variable *bidder experience* leads to significantly lower CARs assuming everything else to be equal. The most interesting result is found when regulation and the geographic scope of the transactions are combined. This thesis shows that the degree of regulation can actually lead to increased positive abnormal returns of a corporate transaction should this transaction take place within a single country. Despite the strong liberalisation efforts of the EU, investors appreciate the protective environment of a single country. We call this the national champion effect.

5.2. Market Outlook and Future Research

Energy companies have been increasingly active on financial and capital markets over the past years. The efforts to deregulate European markets to create an integrated single energy market for Europe forced many companies to restructure and reshape corporate strategies. Since markets are far away from being fully competitive and integrated these efforts will remain in the near future. However, the current global financial turmoil will also have adverse effects on the energy sector and reduce the amount and volume of energy deals in the coming years. According to a recent article in the Financial Times, the deal volume in Europe is likely to decrease by 30% in the next 5 years due to higher financing costs. At the same time energy exchanges and energy pricing become a crucial sign of how integrated markets really are. This thesis has shown that there was a strong increase in the number of exchanges in recent years, which led to increased price correlation across different exchanges.

This paper is, as far as can be told, the first one to intensively analyse the success factors of European energy mergers with respect to deregulation efforts of the EU. Moreover, the national champions effect could be proven as a significant success factor in M&As. The results of this thesis should be used to conduct future empirical studies on whether deregulated energy markets deliver the results intended by the authorities. A successive analysis should also focus on pricing anomalies across countries and exchanges and their impact on corporate performance. Due to the technological change, the challenge of climate change and the efforts of the European Commission to deregulate markets, the European energy business cannot be compared to other industries. Since this thesis only covered event windows with a length up to 21 days around the announcement day, future research should investigate long-run stock performance of energy companies and related M&As.

Appendix

I: Geographical Distribution

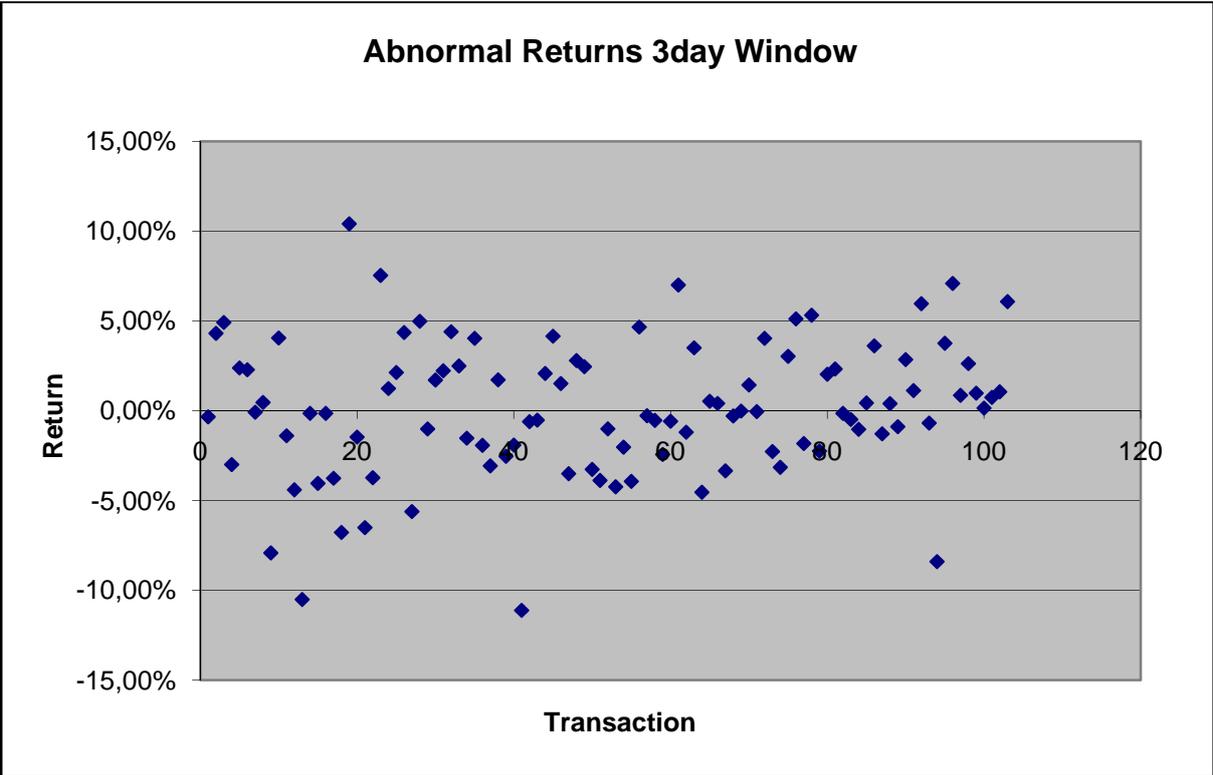
Target country	Geographical Distribution										Total
	Country of bidder (EU-15)										
	AU	FI	FR	GE	IT	NL	NO	PO	ES	UK	
AU	2			1							3
BE			1							1	2
BU				1							1
CA			1							2	3
CH								1	2		3
CO									1		1
FI		1		1							2
FR			4						2		6
GE			2	13							15
IN										1	1
IR										1	1
IT					7				3		10
ME									2		2
NI									1		1
NO							1				1
PO								1	1		2
RO					2						2
RU		1			1						2
SL					1						1
SA									1		1
ES				1	2			1	5		9
SE		1									1
SW				1							1
TU	1					1					2
UK				5					1	14	20
US			2	1						7	10
Total	3	3	10	24	13	1	1	3	19	26	103

Legend: AU = Austria, BE = Belgium, BU = Bulgaria, CA = Canada, CH = Chile, CO = Colombia, FI = Finland, FR = France, GE = Germany, IN = India, IR = Ireland, IT = Italy, ME = Mexico, NL = Netherlands, NI = Nicaragua, NO = Norway, PO = Portugal, RO = Romania, RU = Russian Federation, SL = Slovakia, SA = South Africa, ES = Spain, SE = Sweden, SW = Switzerland, TU = Turkey, UK = United Kingdom, US = USA

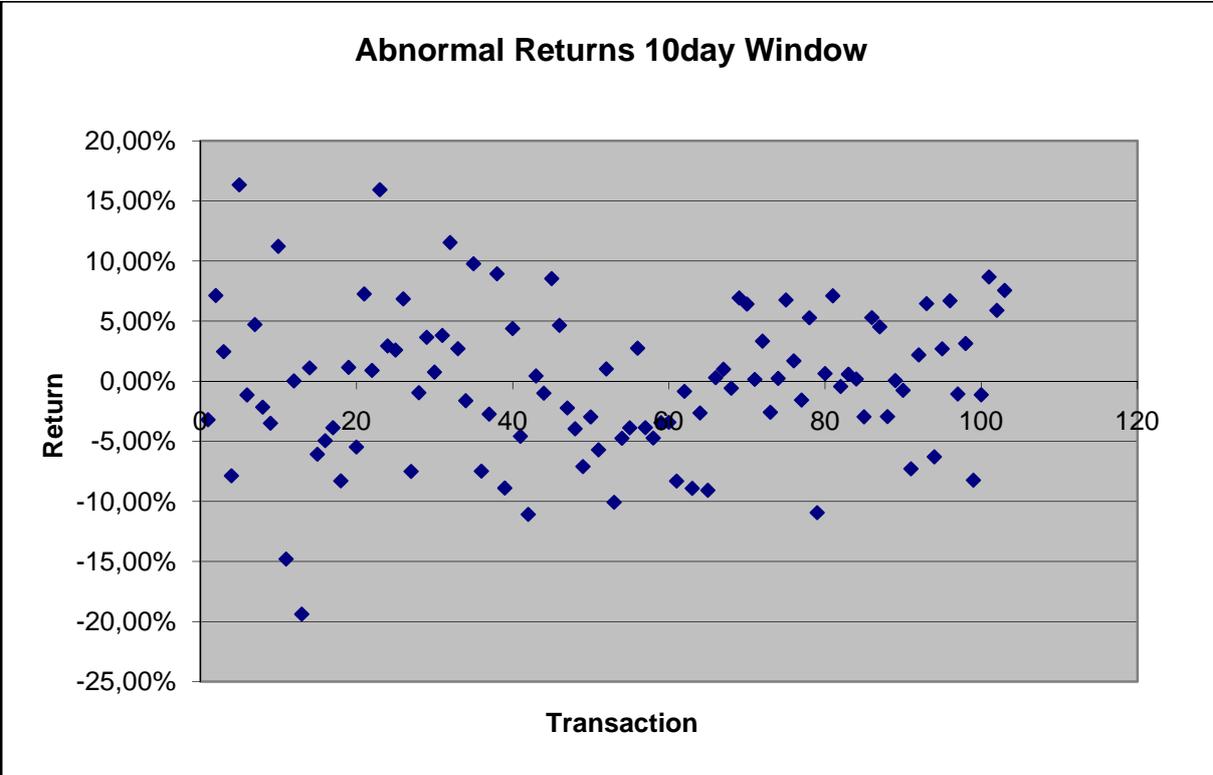
II: Overview Abnormal Returns

Event Window	CAR in %	Positive	Negative
{0}	0,12%	44	59
[-3;+3]	-0,08%	48	55
[-10;+10]	-0,86%	49	54
[-20;+20]	-1,79%	50	53

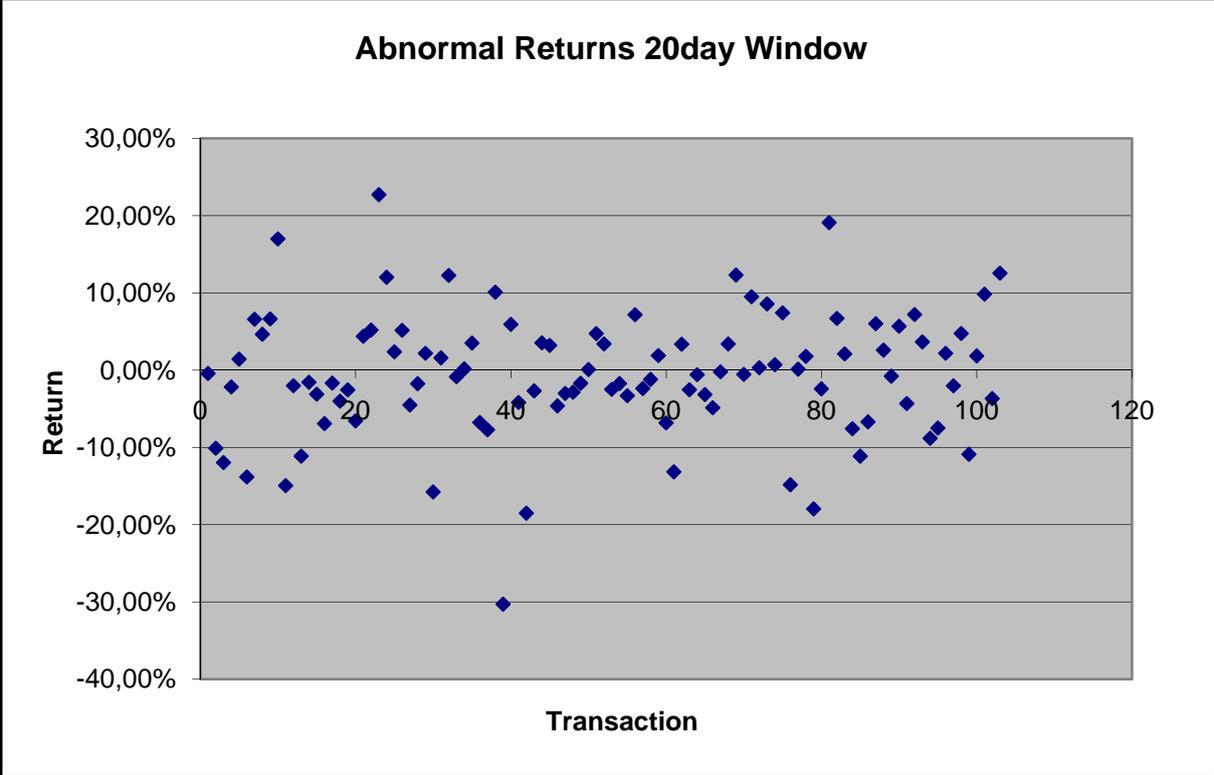
III: Overview Abnormal Returns plotted (3 day Event Window).



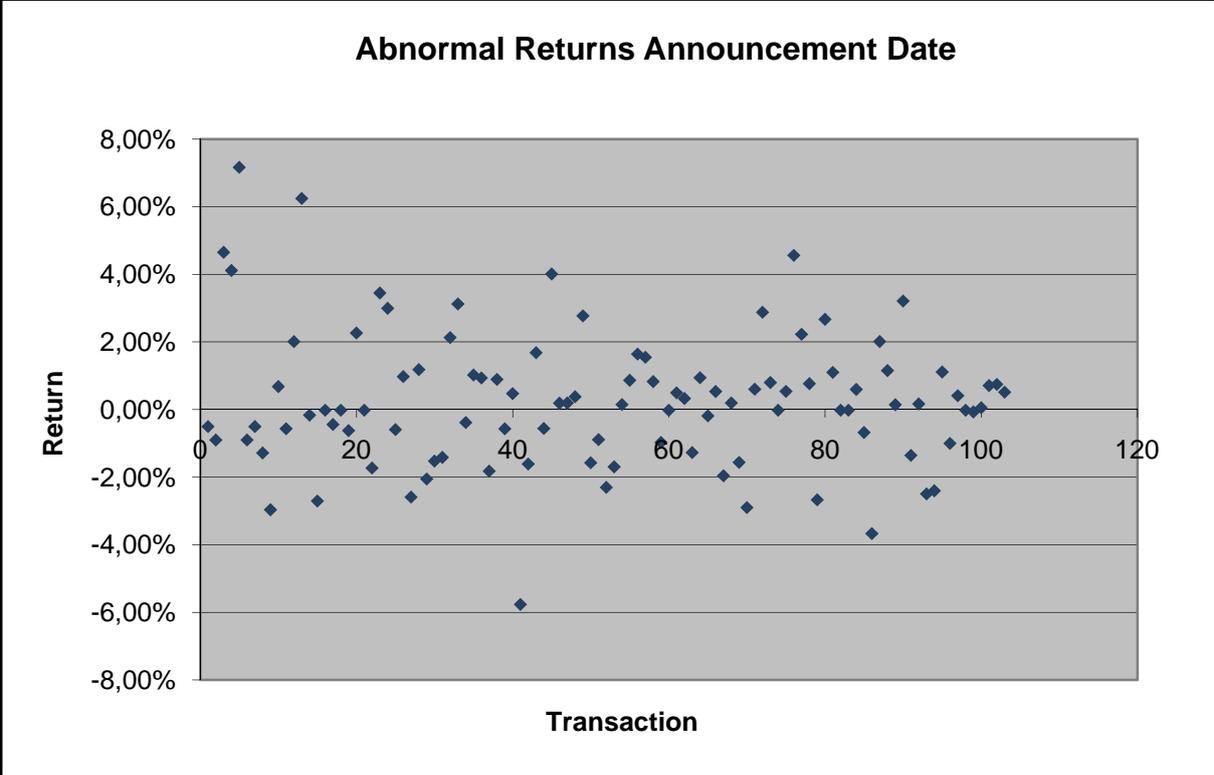
IV: Overview Abnormal Returns plotted (10 day Event Window).



V: Overview Abnormal Returns plotted (20 day Event Window).



VI: Overview Abnormal Returns plotted (Announcement Date)



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