5 A quantitative analysis of value creation in business combinations – in the European utility industry

In this chapter existing theories as well as the findings of prior empirical research on the topic of shareholder value creation in acquisitions and alliances are taken up and considered for the derivation of hypotheses concerning potential determinants of shareholder value creation in business combinations. The analysis of the determinants is performed on the basis of M&A transactions and alliances in the European utility industry; the hypotheses thus will be adjusted to the specifics of this industry.

Prior research on the creation of value through business combinations in the utilities sector has primarily focused on companies in the United States (e.g., Ray and Thompson, 1990; Berry, 2000; Aggarwal and Harper, 2002). No empirical studies to date have considered the value implications of alliances from an investor's perspective by means of an analysis of stock market reaction to the alliance announcements of European electricity and gas supply firms. Furthermore, no previous studies have focused exclusively on the M&A transactions of European utilities, although some prior studies have either looked at a specific European country or included M&As of European utilities in their overall sample (e.g., Feißt, 2004; Thomas, 2006). At the same time, the operating structures of the utility industry and energy supply companies, as well as the regulatory systems, largely differ across the continents and even from one country to the next. Deriving determinants of value creation in acquisitions and alliances drawn from a diverse sample that includes utilities from more than one continent or market may well be quite difficult.[25] The following empirical investigation will consequently focus solely on business combinations among European energy supply firms.

Initially, it will be necessary to investigate the major market developments and characteristics of the utility industry in Europe; this is carried out in the next section. In deriving the hypotheses on value creation in M&As and alliances, the findings and conclusions from chapters three and four, respectively, are taken into account.

Thereafter, the methodology and sample characteristics are presented, followed by the reporting and discussion of the results for both the M&A and alliance samples. Finally, I conclude both empirical investigations by describing the implications of my results for managers and investors, acknowledging the limitations of my study, and identifying areas for future research.

[25] EU-countries are viewed here as one integrated market because they fall under the same regulatory framework.

5.1 Analysis of the European utility industry

For nearly two decades, governments in many industrialized countries have been working to deregulate economic sectors that were formerly characterized by vertically integrated monopolies; one of these sectors is the utility industry.

Figure 12 provides an overview of the traditional segments of the utility industry. A utility firm might be active in several of these segments at any one time. Utilities can be differentiated by ownership into public and private or mixed public/private firms. Publicly owned utilities include co-operative and municipal utilities. Municipal utilities are usually owned to a greater or lesser extent by the local municipality, whereas co-operative utilities are owned by the customers they serve. Typically, municipal utilities have a rather broad product portfolio that generally includes the segments of energy and water supply as well as disposal. Many of the utilities that focus on the retail market are multi-utilities—firms that bundle together various utility services.

The focus of this work is on privately owned utilities, i.e., investor-owned utilities, operating primarily in the energy supply segment, which encompasses the grid-bound third-party supply of electricity, gas, district heating, and energy for cooling purposes.[26] Unlike public utilities, private utilities may be listed on the stock exchange—a primary condition for inclusion in the sample.

Figure 12: Segments of the utility industry

Commodity products ← **Bundling of utility functions** → Non commodity products

Energy supply	Non energy-related supply	Disposal	Communication	Transportation
-Electricity -Gas -Heat -Cooling energy	-Water	-Sewage treatment -Waste disposal	-Telephone lines -Cable television -Internet -Radio -Other	-Public transport

Source: author

The typical value chain of a fully vertically integrated electricity supply firm can be seen in figure 13; these four main activities are complemented by administration. A simplified value chain for gas supply companies in liberalized markets would include the same value chain segments—with one additional segment in the value chain, namely gas storage (e.g., Kesting, 2006).

[26] In the following, the use of the terms “utility” or “utility firm” refers to utilities operating in the energy supply segment.

Figure 13: Simplified electricity supply value chain

Source: author

With respect to its position in the value chain, a firm today can choose between complete vertical integration (from generation to retail), partial vertical integration (active in two or more segments of the value chain), or specialization (active in only a single segment). Large players in the European market (in terms of market share), such as EDF, RWE and E.on, are typically fully vertically integrated from generation to retail. Nowadays, in the aftermath of the introduction of reform programs for the liberalization and deregulation of the European energy supply sector, specialized companies can be found in Europe at each stage of the value chain. European utilities that specialize in generation, for example, include the British companies National Power and Power Gen, which exclusively operate power plants and have sold off their other utility assets. Utilities that specialize in transmission/infrastructure include, for example, all the newly unbundled transmission companies, such as EGT (E.ON Gastransport). Utilities specializing in trading include, for example, Statkraft Markets (power and gas) or Natgas (gas only). Finally, sole retailers are to a large extent the municipal utilities.

Utilities can further be differentiated by their geographic reach. Essentially, one can differentiate between those utilities operating internationally, those with a focus on a specific market, and local or municipal utilities. This is an initial general distinction; there are also regional particularities; in Germany, for example, one finds large supra-regional players (usually vertically integrated), so-called *Verbundunternehmen*.

A final distinction might be made according to the customers these firms serve. Whereas utility firms specializing in generation, transmission, and trading have other utility firms as their customers (regional and/or local distributors), fully vertically integrated firms and utilities specializing in the retail segment serve final customers—either private households or large industrial users; vertically integrated utilities may, of course, also have other utility firms as customers.

Restructuring of the European energy supply sector

Traditionally, the supply of electricity, gas, and water were (vertically integrated) monopolistic businesses, either state-owned (the majority of cases) or under price-regulated, mixed private/public ownership (as in Belgium, Germany, Switzerland); regulated regional monopolies were prevalent in most countries (Haas et al., 2006). In those situations where

companies were under state ownership or regulation, control usually extended across the entire value chain (or the national parts thereof). This began to change in the early 1980s, first in America and later in Europe. With the deregulation and liberalization of the European electricity and gas market, this vertically integrated value chain was broken up and separate market segments began to form, moving always in the direction of greater competition. Nowadays, only certain segments of the value chain within the utility industry are still viewed as being in need of regulation; this is because of their natural monopolistic character (see, e.g., Drasdo et al., 1998, 31; Kiesling, 2004, 53). Natural monopolies in the network segments of the value chain (energy/gas transmission and distribution) tend to be tolerated because of the high economies of scale available in the operation of the networks and high investment specificity—transmission and distribution costs are lowest when energy distribution is performed by one company only (Weizsäcker, 1994, 198). In the other segments, the European Commission sees competition as being generally possible.

During the 1990s, many European countries began to restructure their electric power sectors in order to introduce competition, achieve greater sector performance, and thus provide long-term benefits to consumers. The restructuring programs have included privatization of state-owned firms, the separation of potentially competitive segments such as generation and retail supply from naturally monopolistic segments, the creation of competitive trading and retail markets, and the application of performance-based or incentive regulatory schemes (PBR) to the remaining regulated segments (Joskow, 2006, 1).

Genuine liberalization in Europe began with Britain's restructuring and privatization in 1990, followed by Norway in 1991, and gradually spread to other European countries. The restructuring of electricity markets in most continental European countries began in the late 1990s and is still going on. This process was triggered by the European Commission's 1996 directive "concerning common rules for the internal market in electricity" (EC, 1996), the intention of which was the creation of a common European electricity market. In June 1998, the first natural gas directive was passed by the European Parliament and the Council. It created the foundation for a harmonized European gas market by defining "common rules for the internal market in natural gas" (EC, 1998). The major issues of these directives were minimum requirements for the unbundling of generation, transmission, and distribution activities (transmission, distribution, and storage activities in the gas sector), minimum market access, and various approaches for access to the grid (negotiated or regulated, third-party access, and single buyer). Integrated electricity and gas ventures were obliged to keep separate accounts for their generation, transmission, and distribution activities (and storage, in the case of gas). The participating countries were given until February 1999 to "transpose" the EU Directives into their own national laws and regulations. Independent energy regulators

were introduced in all countries except Germany[27] (and Switzerland, which is not a member of the EU).

In order to push the member states toward faster implementation of the EU guidelines, the so-called “directives of acceleration” were applied in August 2003. These directives repealed the directives of 1996 and 1998, the major issue being the complete market opening of the European energy (electricity/gas) sector. Both directives stated that all commercial electricity and gas customers must be able to freely choose their supplier by 1 July 2004, at the latest, and that all customers must have this right by 1 July 2007.

Although the EU directives have been implemented to large part in most of the EU-15 countries, there are still some remaining problems hindering the development of a truly competitive internal electricity and gas market.

Since the passage of the first electricity directive, the gradual establishment of the Internal Electricity Market has led to remarkable growth in cross-border electricity trade in the EU. Nonetheless, most utility firms still face congestion on several cross-border lines and thus have limited opportunities to fully exploit the existing economic export and import potentials between markets; consequently, there are at least seven different sub-markets in Europe, separated by insufficient transmission capacities and variations in grid-access conditions (Haas et al., 2006, 266). These network constraints represent a major barrier to the free exchange of electricity within the European Internal Electricity Market.

Another major obstacle for effective competition can be seen in the fact that in most EU countries a few companies own a large share of the electrical generation capacity. With respect to market share in central Europe, in 1998 ten generating firms owned 60% of the generation capacity, whereas in 2002 it was only six (Codognet at al., 2005). Especially high rates of concentration can be found in Belgium, France and Greece, where the top three electricity generators have 88% or more share in the electricity wholesale market and less than three companies have more than 5% share of production capacity (see table 4). In the retail sector the same phenomena can be seen. For example, in Germany the top three suppliers have a market share of 47% in the small commercial and household segment, in France it is 96% and in Greece it is even 100% (EC, 2008).

A similar picture emerges when one looks at the upstream gas markets in major EU countries. In Finland, Greece, Luxembourg, Portugal and Sweden there is only one company with an over 5% share of gas production/import capacity and thus most of them have a 100% share in the gas wholesale market (see table 4). In the retail market, the top three suppliers hold a market share of more than 90% in the small commercial and household segment in Denmark, France, Greece, Ireland and Luxembourg. (EC, 2008).

[27] Regulatory authorities responsible for electricity and gas were first established in 2005 when the new energy act (*Zweites Gesetz zur Neuregelung des Energiewirtschaftsrechts*) took effect.

Table 4: Electricity generation and upstream gas market structure

Country	Number of companies with more than 5% share of electricity production capacity	Share of three largest electricity generators	Number of companies with over 5% share of gas production / import capacity	Share of three largest gas shippers in wholesale market
Austria	5	52%	4	80%
Belgium	2	88%	3	100%*
Denmark	2	76%	7	90%
Finland	5	57%	1	100%
France	1	93%	2	na
Germany	5	69%	7	na
Greece	1	95%	1	100%
Ireland	4	72%	6	na
Italy	5	74%	3	67%
Luxembourg	2	73%	1	100%
Netherlands	4	60%	4	na
Portugal	3	75%	1	na
Spain	4	80%	6	75%
Sweden	3	79%	1	100%*
UK	6	37%	10	42%*

Source: EC, 2008, 12-20 *figures are from 2005 since more recent figures were not available

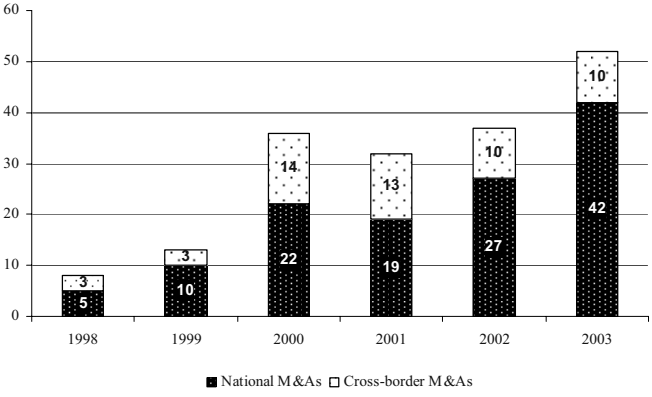
The EC summarizes the competitive situation with regard to the internal market as following: "the basic concepts of the internal energy market have become embedded in terms of the legal framework, institutional arrangements and the physical infrastructure… meaningful competition does not exist in many Member States. Often customers do not have any real possibility of opting for an alternative supplier. Even customers who have successfully changed supplier are often not satisfied with the range of offers they receive" (EC, 2007, 2). Other shortcomings that hinder an effective competition are primarily seen in the following areas: vertical foreclosure (in particular, unbundling of network and supply), lack of transparency (information asymmetry between the vertically integrated major players and their competitors as regards data relating to network availability for electrical interconnections and gas transit pipelines as well as data on the operation of generation capacity and gas storage), the need for more effective and transparent price formation, downstream markets (particularly the negative implications of long contract durations and renewal clauses for industrial customers and local distribution companies), unbalanced markets that favor the large companies and create barriers for new companies, and finally the not fully exploited potential for liquefied natural gas supplies to favor less concentrated downstream markets (EC, 2007, 4–11).

Reasons and motives for business combinations in the European energy supply sector

The primary reason for the upsurge of business combinations in the European energy supply industry during the 1990s has been deregulation. The initial decrease in energy prices—

especially in the segment of large industrial customers—put pressure on energy suppliers to cut costs. Rising fiscal duties and taxes and the fear of not being able to pass such increases on to end consumers contributed to the pressure to cut costs. Smaller and less integrated utilities may well have been afraid of falling behind in product and service quality and in the acquisition and retention of qualified personnel. Presumed favorable and last opportunities aspects may also have quickened M&A activities in the energy industry (see, e.g., Stahlke, 2007, 1, or Thomas, 2006, 36). Furthermore, although global demand is continuously rising, increases in the demand for electricity in the European countries are expected to be rather low. In particular, the Western European electricity market is characterized by moderate demand growth and low price elasticity; in Europe, anticipated final demand growth for electricity is 1.4% per annum until 2030 (the lowest growth rate of all OECD regions) and 0.9% for gas (IEA, 2004, 462). Finally, the European energy supply sector has thus far been characterized by relatively low switching rates among private customers; in Germany, for example, less than 6% of private customers changed supplier following the opening of the market, whereas approximately 35% of the large industrial customers did so (EC, 2005). However, customer switching rates are probably not the best indicator for competition and do not allow to make proper statements about the growth potential in a market as they only concern the retail part of the value chain in the energy supply industry; i.e. even if a customer changes its supplier, its electricity or gas may still originate from the same utility firm (that is active in the generation/import part of the value chain) and only the final supplier has changed. Nevertheless, in view of moderate demand growth the ability of firms to grow organically in this market is limited; hence, European energy suppliers have also responded to these challenges by increasing their M&A activities since the start of deregulation (see figure 14).

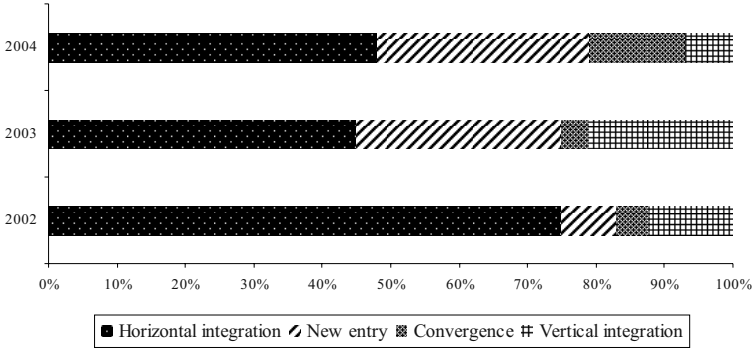
Figure 14: Electrical sector national and cross-border M&As in the EU



Source: Codognet et al., 2005

PricewaterhouseCoopers (2004) investigated the underlying rationales of the top 40 M&A transactions in the energy supply industry from 2002 to 2004; as can be seen in figure 15, the dominant underlying motivation was horizontal integration.

Figure 15: Top 40 deals in utility industry: analysis of rationales – 2002 to 2004



Source: modelled after PricewaterhouseCoopers, 2004

Horizontal acquisitions offer utilities the best opportunity to achieve market power and increased efficiency (see chapter 3.1 and 5.2).

The term "new entry" in figure 15 captures the increased involvement of investment groups, consortia, and holding companies with no prior significant operations in the energy sector.[28]

European customers are demanding not only electricity but also gas supply and services. This demand, along with the synergistic opportunities that can be exploited through combined offerings, has led to a power and gas market convergence in Europe. This is reflected in corporate strategies following the beginning of liberalization, which has led to so-called *convergent* mergers and acquisitions activities (summarized under the heading "convergence" in figure 15). This "multi-utility" strategy focuses on the combined supply of electricity and gas (and sometimes water) primarily in order to realize economies of scope (see also chapter 5.2).

Besides the concentration between electricity and gas, vertical integration (which occurs when a power and/or gas entity acquires another entity whose operations are in a different part of the value chain) is another defining feature of this consolidation phase in Europe's energy industry (see also figure 15). The industrial reference model for electricity completely changed between 1995 and 2001, shifting from a preference for vertical disintegration between generation, trading, and sales to final consumers toward a preference for vertical re-integration of production, trading, and final sales. Through vertical acquisitions, a utility may reduce the purchase and sales options of its competitors; vertical integration may also hinder

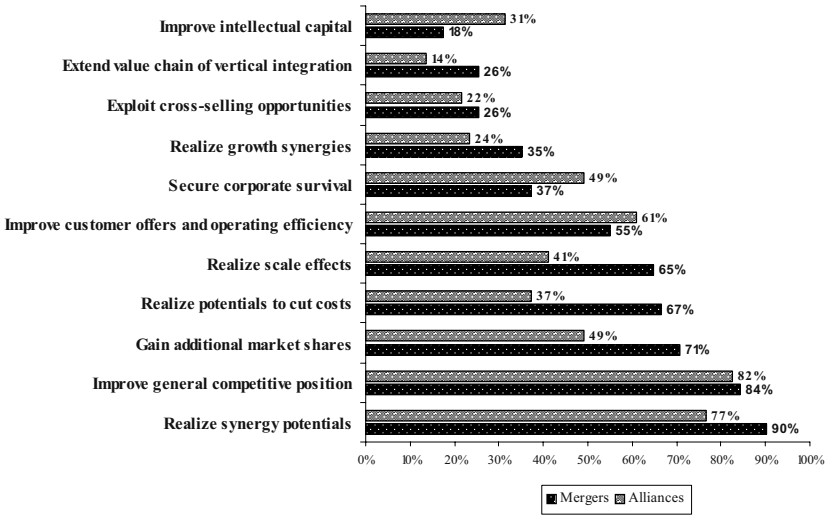
[28] Privatizations are also included (see PricewaterhouseCoopers, 2004, 3).

potential market entrants, as simultaneous entry in more than one production stage is quite capital-intensive; it also makes it possible for utilities to reduce transaction costs. The integration of an upstream or downstream value chain may allow a firm to reduce market risks. In competitive energy markets, vertical integration may thus be viewed as a good way to protect the company against volatility and the cyclical nature of the markets (Haas et al., 2006, 286).

Alliances have in part become more common among utility firms as they expand beyond their traditional boundaries of a regulated environment and move into less familiar territory. Alliances offer the ease of withdrawal and allow all parties to retain a separate identity outside the agreement. Joint ventures as well as contractual agreements may allow utilities to save costs, for example, by consolidating service functions. Smaller utilities, in particular, may benefit from an increase in total customer base and/or revenues by reaching the "critical mass" perceived as necessary for corporate survival in the industry. Alliances in the European utility sector vary in scope and purpose. Joint ventures are often formed in order to jointly build and operate power plants or gas pipelines, thus splitting the costs and risks of the investment among the parties involved. Smaller energy suppliers often reduce their procurement costs by forming purchasing alliances, thus increasing their negotiation power over pre-suppliers. Other types of alliances include marketing alliances; alliances that bundle various energy services, such as billing, metering, advertising or IT; and alliances whose goal it is to expand beyond the traditional energy supply sector, e.g., alliances with companies that manufacture, market, and sell power systems producing electricity from renewable energy sources.

In a survey of 51 German energy suppliers, Stahlke (2007) found that the primary motives for entering alliances are: the realization of synergies, the lack of know-how or qualified personnel, the desire for low-cost energy procurement, and conservation of autonomy (Stahlke, 2007, 87–88). In comparison to the motives given for M&A transactions, the motives named by companies entering alliances (which tend to be smaller than those doing M&As) were more existential, i.e., involved issues of survival and existence. Figure 16 summarizes the results.

Figure 16: Motives for mergers and alliances in the German energy supply industry



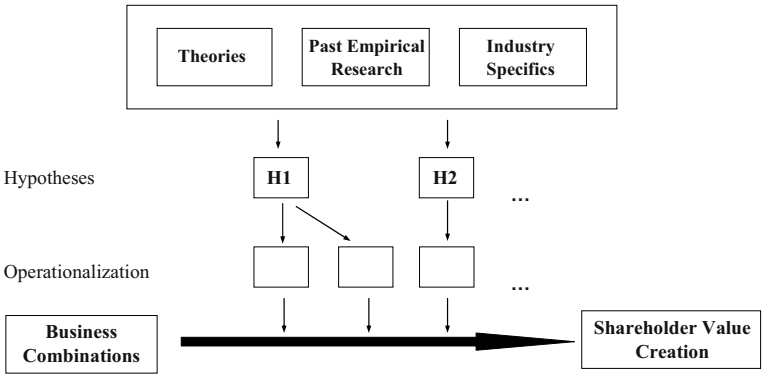
Source: Stahlke, 2007, 46

The realization of synergy potentials was highly relevant for both alliances and mergers; however, the areas in which these synergies were to be realized differed. In alliances, energy suppliers primarily intended to realize scale effects in energy procurement and in retail, whereas in mergers the reduction or removal of redundant corporate functions in administration, maintenance, and other areas was primarily relevant.

5.2 Derivation of hypotheses

Which determinants influence value creation in acquisitions and alliances in the European energy supply industry? In this section I will derive theory-based hypotheses with regard to this question. In doing so, I will also look at the results of prior empirical research, in particular, findings from the meta-analyses presented in chapters three and four, as well as the specific conditions of the European energy supply industry; figure 17 depicts the approach diagrammatically.

Figure 17: Approach for derivation of hypotheses



Source: author

5.2.1 Determinants of successful M&As in the European energy supply industry

Industry relatedness of bidder and target

The degree of relatedness is one of the most often examined determinants of value creation in M&A transactions. Strategy researchers have proposed that a higher degree of relatedness between combining firms should correspond to a higher firm performance (see e.g., Rumelt, 1974).

Efficiency as well as monopoly theory are typically used to explain the influence of relatedness on value creation in mergers (see chapter three for a detailed description of both theories). According to efficiency theory, operational synergies that stem from economies of scale and scope may be realized in related transactions. Managerial and financial synergies are the primary motive for unrelated transactions, but are also achievable in related mergers. Another type of synergy that may be realized in related M&A transactions, namely collusive synergy, is explained by the monopoly theory.

Two of the three M&A meta-analyses discussed in 3.2 demonstrate that relatedness has an impact on value creation in M&A transactions (Datta and Pinches, 1992; Bausch and Fritz, 2005). Becker-Blease et al. (1993) investigated relatedness in mergers of US energy supply firms and found that deals between electricity and gas utilities are value decreasing. Burns et al. (1998) in his investigation of US energy supply firms found higher value creation for bidders in horizontal acquisitions.

Most prior studies of relatedness as a major determinant of value creation in mergers used the so-called “product count” approach, which is based on the SIC system, which classifies companies or business units into four-digit industry groupings according to their primary

product or service activity. The advantage of this approach is that it results in a continuous measure of relatedness and is based on objective data (Lubatkin et al., 1997). This work follows this approach and differentiates between four types of M&A strategies[29]:

Focused mergers are mergers between utilities operating in the same primary lines of business (either pure electric or pure gas mergers).

Convergent mergers are mergers that take place between electric and gas utilities.

Mergers between electric utilities and other utilities from SIC class 49 besides gas (or respectively, mergers between gas utilities and others besides electricity)—mainly water supply and disposal—are classified as **concentric mergers**.

Conglomerate mergers are mergers of electric or gas utilities with companies operating in completely unrelated lines of business (outside SIC class 49).

Because of the infrastructure-bound nature of the services in the energy supply industry, it is mainly cost-side synergies that should be realizable in M&A transactions (e.g., Gaul, 2006, 1330). Cost-side synergies are primarily achieved through increased efficiencies in the operating business. This type of synergy aims to directly affect the cash flow development and capital costs of the parent firms by influencing the value determinants of current business activities (Bausch, 2003, 226). The capital market tends to place more confidence in the realization of cost-side synergies than in revenue synergies or synergies through additional business,[30] as these are typically more difficult to quantify and thus to predict.[31] Economies of scale and scope are particularly relevant for cost synergies, as they make possible improvements to profit margin and capital turnover. The market structures of the various European countries and the generally high concentration grades in this industry, in particular, hint at the great economies of scale that European energy supply firms might be able to realize (Gaul, 2006). The achievement of economies of scale presumes an overlap of the value chains of the merger participants; accordingly, economies of scale are not realizable in conglomerate mergers (Scherer, 1990). In the following, the potential synergy effects of the different types of mergers are analyzed in more detail.

Focused mergers

Potential cost-side synergies in focused mergers of energy supply firms may be realized in nearly all parts of the value chain. At the production stage, utilities might realize cost synergies by bundling their activities in the procurement of primary energy sources, as the

[29] Please see appendix 1.2 for a detailed classification of merger strategies according to SIC codes.

[30] Revenue synergies arise, e.g., in mergers of companies having complementary products and/or possibly complementary customer groups and distribution channels, thus allowing mutual cross-selling (see Bausch, 2003, 266).

[31] This argument was also frequently mentioned during the interviews with analysts of energy supply firms that were carried out in preparation of this empirical study.

resulting size advantages may lead to more favorable purchase conditions. They may also bundle the purchase of construction components and maintenance services or put in place a joint unit for plant maintenance (see e.g., Feißt, 2004, 121–122).

In trading, utilities may save costs when specific human resources and infrastructure become redundant. These potential cost savings, however, are regionally limited (see page 76). This is not the case with IT-infrastructure; technically mature IT systems should be able to process greater volumes of data. The joint use of IT systems does not lead to higher IT development costs; further cost savings may result from the omission of various fees, for example, for the connection to the electronic trading systems of electricity exchanges.

At the transmission stage, further potential for value creation lies in the realization of synergies from the combination and optimization of grids and infrastructure. An increased number of customers connected to the electricity grid can lead to smoother load profiles and consequently a reduction of the difference between maximum available and average used capacity. Thus, reserve capacities can be reduced and power plants optimally deployed.[32] These potential scale effects are less relevant for gas utilities, as demand fluctuations can be regulated through supply storage and adjustements in pipeline pressure. A further efficiency increase may come through the internalization of external effects. For example, the integration of formerly separate electric grids with partly reverse transmissions may lead to reductions in pipeline losses (Drasdo, 1998, 33). Scale effects in electricity or gas distribution are achievable in the form of economies of density. These are decreasing distribution costs per customer if the number of customers increases in a given geographic area. Econometric estimations prove, for example, that two cables can be laid for nearly the same cost as one cable (Drasdo, 1998, 36). Utilities may likewise bundle the purchase of materials and services and share grid maintenance. As in the generation stage, utilities typically maintain some employees in reserve for unplanned peak loads. Cost savings may be realized here, too, when the grid areas of acquirer and target are close enough for the joint assignment of technicians and at least one of the partners has not reached its critical mass, i.e., an optimal load curve. Finally, the integration of two grids or networks makes possible the bundling of the network control stations that are responsible for monitoring and certain switching operations (electrical) or pressure regulation (gas); however, knowledge of applicable technical standards and the specifics of local operations is important; consequently it can be assumed that this type of synergy is regionally limited (see Feißt, 2004, 127).

Rising advertising costs suggest that scale effects in brand development should be possible in the retail segment of the value chain. Consolidation of billing systems and call centers, as well as the development of joint sales structures, may also lead to economies of scale.

[32] This is only possible when the involved utilities operate in the same electricity network.

Finally, further cost savings might be achieved by consolidating the administration of individual business units, management boards, strategic planning efforts, and various shared services—for example, standardized IT systems (joint purchase of standardized controlling and finance applications, hardware, and software). However, these types of synergy are to a large extent (with the exception of consolidating administration of individual business units) also realizable in all other types of mergers.

Under the buzzword "multi-utility," in the late 1990s many utilities began combining various grid-bound energy sources and commodities. This kind of M&A transaction can be found here in the convergent and concentric merger categories. The motivation for convergent and concentric mergers typically is to diversify operations, offer a wider range of services to customers, and achieve efficiencies in marketing and other overhead costs.

Convergent mergers

An additional motivation in convergent mergers by electrical suppliers is to obtain direct access to natural gas as fuel for gas-powered generating plants (Becker-Blease et al., 2003). Convergent mergers achieve cost synergies primarily through economies of scope.

At the production stage, economies of scope are especially relevant for the operation of gas-powered generating plants. Utilities can realize synergy effects through a combined procurement of gas (for both electrical production as well as for resale). Larger purchase volumes and consequently greater market power should result in lower prices; furthermore, per unit transaction costs should decrease. The owner of a gas-powered generating plant is also able to take advantage of fluctuations in the *spark spread*. Spark spread is the difference between the unit price of electricity and the purchase price of the gas needed for its production. In the case of rising gas prices, for example, the owner of a gas-powered generating plant may decide not to use the gas to generate electricity as planned, but instead sell the gas at higher prices on the gas market and then purchase the electricity from another supplier.

With respect to transmission and distribution, shared maintenance of the grid as well as joint planning and construction of new network infrastructure also allows for cost savings.

At the retail stage, the same synergies as in focused mergers can be achieved. Additionally, potential cost synergies may be realized from the simultaneous marketing of power and gas to customers. The marketing knowledge that electrical suppliers have gained in the electrical energy market—a market that was deregulated earlier—may be transferred to gas supply firms. Furthermore, growth potentials and market synergies may be realized by cross-selling gas and electrical products (EIA, 2001, 103). Private customers, in particular, may find it more convenient to have only one supplier for both, as well as only one invoice and a single sales representative.

Concentric mergers

M&A transactions classified as concentric mergers in this work have significantly less overlap in their value chains than do those between energy and gas supply companies.[33] Accordingly, economies of scale are scarcely realizable in concentric mergers. Instead, synergies are primarily realizable in retail. The reasoning behind the synergies of convergent mergers in the retail segment are analogically valid for concentric mergers; however, they are often overestimated—particularly those to be achieved through cross-selling.[34] Large industrial customers, for example, often do not want to be dependant upon one supplier and would rather buy electricity and/or gas and water from different sources. As for private customers, it is often highly questionable whether a utility might indeed earn a higher margin by selling more than one product; the sale of multiple products to a customer also involves higher risks—a negative experience with one product might well lead to the loss of the customer for both. To reduce this risk, companies in other industries—in the consumer goods market, for example—often utilize different brands. "Synergies between water supply and energy supply business should not be overestimated" was the statement of the CEO of Gas de France, Jean-Francois Cirelli, when talks began concerning a potential merger between Gas de France, a French gas supply company, and Suez, a French-Belgian multi-utility company that provides French customers with water via its subsidiary Lyonnais des eaux (*Handelsblatt*, 2006).

Conglomerate mergers

In the conglomerate merger category, the value chains of the companies involved typically do not have any overlap; thus the realization of economies of scale plays no significant role. The same holds true for the realization of economies of scope, which are primarily to be expected in convergent mergers. Conglomerate mergers, rather, aim at diversification effects, such as reducing the risks of future development in the core business and expanding product-market combinations with high growth potential (see chapter 3.1). During the 1990s, for example, European utilities chiefly diversified into the telecommunications and Internet market, which was in a high-growth phase at the time (see, e.g., Schierek and Thomas, 2006, 1340).

Figure 18 summarizes the potential synergies that may be achieved through an increased efficiency in the operating business.

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[33] The value chain of water supply companies consists of acquisition/production, conditioning, distribution, accumulation, and treatment.

[34] This was also frequently stated in the interviews with industry experts carried out in preparation of this study.

Figure 18: Major cost-side synergy potentials in different types of mergers of energy supply firms

Type of merger / Value chain segment	Production	Trading	Transmission & Distribution	Retail	Administration
Focused M&A	• Common procurement of primary energy sources, construction components and maintenance services or common plant maintenance • Joint engineering of power or gas plants	• Redundant HR and infrastructure* • Common usage of IT-systems, omission of various fees	• Smoothing of load profiles*, reduction of reserve capacities* and pipeline losses (for electricity utilities) • Economies of density through increased no. of customers in one area (e.g. simultaneous laying of more than one cable/pipeline) • Common purchase of material, services • Common grid/network maintenance and bundling of grid/network control stations*	• Common building of brands • Combination/ consolidation of billing systems, call centers, sales structures*	• Consolidation of administration of business units, management boards, strategic planning department, shared services
Convergent M&A	• Common procurement of gas • Usage of spark spread		• Common grid/network maintenance, e.g. flexible employment of combined workers • Joint grid construction tasks: common planning and laying of cables and pipelines	• Common building of brands & parallel marketing of power and gas to customers • Combination/ consolidation of billing systems, call centers, sales structures*, meters reading	• Consolidation of management boards, strategic planning department, shared services
Concentric M&A				• Common building of brands & parallel marketing of power/gas and water to customers • Combination/ consolidation of billing systems, call centers, sales structures*, meters reading	• Consolidation of management boards, strategic planning department, shared services
Conglomerate M&A					• Consolidation of management boards, strategic planning department, shared services

*synergies are regionally limited

Another argument in favor of greater value creation in focused and convergent mergers can be derived from monopoly theory. According to monopoly theory, horizontal mergers—much like the M&A transactions classified here in the focused and convergent merger category—are the most popular type of merger for increasing market power (see chapter 3.2.). Although concentric and conglomerate mergers may just as well be used to deter potential entrants and thus increase a firm's market power—particularly through the cross-subsidization of products—horizontal mergers seem especially relevant in the energy supply industry for achieving that goal (Freytag et al., 2005, 5). It is therefore assumed that industry relatedness influences value creation in the sense that focused and convergent mergers of energy supply firms lead to greater value creation as perceived by the capital market than do concentric or conglomerate mergers.

Accordingly, the first hypothesis is:

H1: Focused and convergent mergers and acquisitions of European energy supply firms create more value than do concentric and conglomerate mergers and acquisitions.

Regional Focus

In addition to product and resource relatedness, researchers also investigated market relatedness of the transaction partners, which is generally measured in terms of geographic proximity. Empirical studies typically consider whether the target and the bidder are from the same national market or not (e.g., Eddy and Seifert, 1984).

Under the aspects of efficiency, internationalization of companies can be explained by Dunning's (1977) eclectic paradigm, which proposes three conditions for foreign direct investments: ownership-specific advantages, location-specific advantages and internalization advantages. In addition to the eclectic paradigm, the finance literature offers another possible benefit of internationalization: portfolio diversification (see, e.g., Markides & Ittner, 1994). A negative impact of cross-border transactions is seen by the proponents of the learning theory, who argue that heterogeneity in markets increases the complexity of managing widespread business units and, thus, may exhaust managerial capacity (Jones & Hill, 1988; Roth & O'Donell, 1996; Williamson, 1975).

In fact, empirical studies show that a geographic dispersion of business activities is indeed often accompanied by communication, coordination, and motivation problems (Hofstede, 1980); in addition, increased internationality typically increases exposure to financial and political risks such as currency fluctuations, government regulation, and trade laws (Boddewyn, 1988; Brewer, 1981; Reeb et al., 1979). Some empirical studies have come to the conclusion that for the bidding firms there are no significant or possibly even negative abnormal returns in cross-border transactions (e.g., Doukas and Travlos, 1988 or Conn and Connell, 1990). This is frequently justified with a "foreign acquirer premium," meaning that

in cross-border M&A transactions bidders pay higher premiums than in national acquisitions. Prior meta-analytical research showed no significant difference in value creation between international and national mergers for bidders (Bausch and Fritz, 2005). Prior research findings with respect to cross-border M&As in the energy supply industry were either insignificant or negative (see, e.g., Feißt, 2004).

The nature of transport losses means that electrical power can only be transported for a limited distance. At the same time, electrical energy suppliers face congestion problems and insufficient transmission capacities on several cross-border lines in the EU (see chapter 5.1). Because of the regionality of the product, the international activities of electrical energy suppliers thus assume a local presence in the areas where electricity is consumed. And, since electricity is a commodity, a contractual transfer of resources is hardly possible (Feißt, 2004, 22); thus an internalization of the activities is necessary. This means that, according to Dunning's eclectic paradigm, ownership-specific advantages primarily determine whether international activities take place or not. Ownership-specific advantages result from intangible resources such as the know-how transfer from utilities that are operating in more liberalized markets to foreign entities in less liberalized markets. Furthermore, and more relevant for energy suppliers, there are ownership-specific advantages from the realization of scale effects through a combined management of the entities. Compared to national M&As, however, these are rather limited. As discussed above, a large portion of the synergy potentials are expected to come from the combination of activities in energy production, transmission, and distribution. Because of the limited geographical extension of supply areas, activities in these value chain stages can only be combined or connected when both companies operate in the same or in neighboring geographical markets; hence, in comparison to other industries, potential operative synergy effects for cross-border M&As should be significantly lower. For various types of synergies, it is necessary that the networks of two utilities be connected with each other and that sufficient transmission capacities be available. The synergy effect resulting from the smoothing of load profiles and the reduction of reserve capacities (described on page 73) is one example. However, differing technical standards with respect to the network segment mean that synergies at the transmission/distribution stage (e.g., from the combination of network control systems) are typically lower in cross-border transactions. The control of networks over various borders leads to an increased complexity which may well cancel out any possible synergies; knowledge of the applicable technical standards and local operations are essential. This last argument also applies to the trading segment. Here, synergies realized through cost savings with respect to employees and infrastructure are primarily possible on a national level because of the various local specificities of the individual wholesale markets. For example, central portfolio management across various markets and countries is hardly possible as the success of a trading organization largely depends upon profound market knowledge. Moreover, synergies from the consolidation of call centers and billing systems are also primarily achievable in the same national market.

This is due to the differing regulatory systems, pricing systems, and language barriers in the various EU countries.

Finally, cultural differences in cross-border M&As of utilities may lead to increased transaction complexities.

Therefore, it is hypothesized that:

H2: National mergers and acquisitions of energy utilities in Europe create more value than do cross-border mergers and acquisitions.

Transaction time

Mergers and acquisitions tend to occur in waves, both economy-wide and industry-wide (Toxvaerd, 2004). The reasons for these waves can be both strategic and non-strategic in nature. In theories that incorporate strategic elements, merger waves are characterized by the fact that the merger activity of other firms induces a firm to merge (see, e.g., Fridolfsson and Stennek, 2005). In theories that consider non-strategic elements, merger waves are characterized by an exogenous shift in the economic environment, such as deregulation, globalization, or the introduction of new technologies, that simultaneously makes all mergers attractive (Toxvaerd, 2004). Gort (1969) and Mitchell and Mulherin (1996) report evidence, for example, that M&A activity significantly correlates with technological shocks and generally with disturbances to the economy or a specific industry. In his economic disturbance theory, Gort (1969) states that there exist economic "boom phases" in which mergers and acquisitions are generally positively valued by the market.

In the course of the various merger waves in the past, firms have furthermore followed varying M&A strategies that could possibly lead to varying impacts on value creation over time (Bausch and Fritz, 2005); the dominate strategic goal of the various M&A transactions thus differs throughout these waves. From a viewpoint of the entire economy, the following major strategic rationales are commonly distinguished:

Table 5: Major strategic objectives of M&As in various time periods

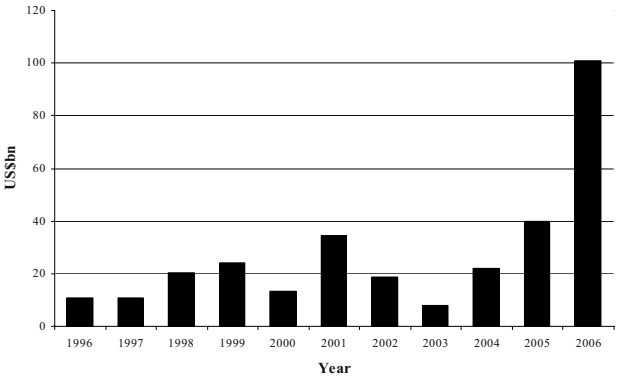
Period	Wave	Strategic Rationales
1897-1904	1st	Avoidance of overcapacity and price decrease by horizontal mergers, trusts
1916-1929	2nd	Vertical integration; attempts to reach a dominate market position and cover all segments in the value chain
1965-1969	3rd	Expansion of portfolios and diversification lead to huge conglomerates, mainly in the U.S
1984-1990	4th	Concentration on core business and realization of synergies
1994-2000	5th	Globalization, international expansion, value-based corporate leadership

Source: Müller-Stewens, 2000, 41ff.

Bausch and Fritz (2005) found in their meta-analyses of M&As and financial performance that value creation is influenced by time of transaction, increased constantly over time, and was greatest in the most recent phase of their sample (1992–2000), which was characterized by globalization and shareholder value orientation.

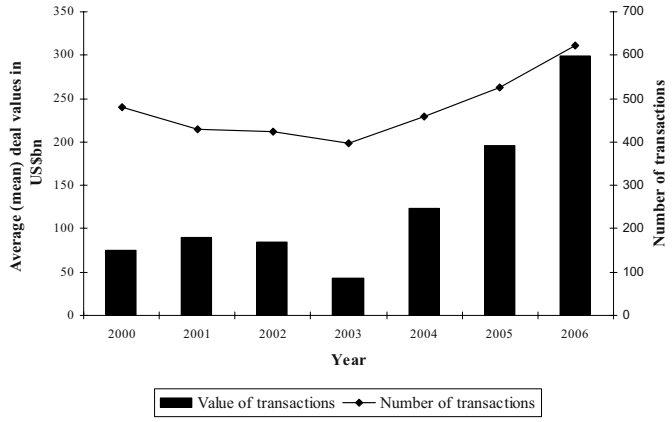
The first M&A wave in the European energy supply industry lasted one or two years longer than in the economy in general. Figure 19 depicts the development of the transaction value of cross-border electricity deals in Europe; figure 20 shows the worldwide development of electricity and gas deals by value and by number.

Figure 19: Development of transaction values (average mean deal values) of cross-border electricity deals in Europe



Source: PWC, 2003, 2005, 2006, author

Figure 20: Worldwide electricity and gas deals by value and by number



Source: PWC, 2001, 2003, 2005, 2006, author

After the beginning of liberalization in Europe, the number of mergers steadily increased until the year 2001 and then fell in 2002 and 2003; in 2004, the market saw a resurgence in deal activity from the relative lows in the two prior years (PWC, 2004). Since then the number of mergers has begun to again increase steadily. The second major wave in the European utility industry is thus still continuing and by now it cannot be said when it will end.

The two waves are likewise characterized by distinct business environment contexts as well as distinct underlying rationales for the transactions. In the first period, from 1997 to 2003, the dominant underlying strategic rationale for M&As was a focus on fast growth in order to build scale, to build mass at home, and to establish presence in cross-border markets. Furthermore, other utilities tried to develop the "multi-utility" strategy by entering water or telecom sectors (Credit Suisse, 2007, 30).

Ultimately managers did not pursue M&As in order to realize synergies, but rather to maximize growth. This is not necessarily congruent with shareholder value creation. As explained by the agency theory (Williamson, 1964), managerial self-interests are closely related to the size of a company. Managers that try to maximize their own utility, strive for fast company growth. Inasmuch as mergers and acquisitions are, in practice, the fastest growth path (Firth, 1980), a direct link can be found between the acquirers' merger activity and the self-interests of their management.

With respect to the business environment context, the market liberalization of the European energy supply industry that took place during this first phase completely changed the competitive environment in which utilities were operating. Managers suddenly faced a very much uncertain business environment. They were not able to hark back to proven strategies as it was the first time they had been exposed to competition; ultimately they had no clear idea of what the impact of market deregulation on oversupplied electricity markets would be. It therefore seems plausible that managers simply did what other managers in their industry did; accordingly, many utilities were most likely induced to merge by the M&A activity of other utilities in this first merger wave. At the same time, managers also knew that the number of attractive targets was limited.

These efforts toward "bigger is better," empire-building, and diversification (notably by EDF, RWE, E.ON, Endesa and Vattenfall) largely ended in record gearing ratios and goodwill writedowns (Credit Suisse, 2007, 29).

The second wave (2003–2006) brought a more considered, strategic approach to acquisitions and is characterized by a return to core businesses. Utilities increased their focus by rationalizing, divesting, and seeking in-fill acquisitions in key areas of activity. Interest in the multi-utility concept has abated; RWE, for example, has disposed of its water assets in the UK because they did not bring the expected financial benefits.

The second wave is characterized by a more transparent environment, with established deregulation in most EU countries as well as a clearer role of the EU in the energy markets (Credit Suisse, 2007, 30). Furthermore, strategic actions were increasingly aligned with capital market requirements, which put pressure on energy supply firms to focus on shareholder value creation. With a stronger orientation on shareholder value, M&As probably became a value-generating strategy. Therefore, over time, the market for corporate control seems to have become more efficient in reducing agency conflicts by achieving a stronger orientation on shareholder's goals. Thus, the hypothesis is:

H_3: The mergers and acquisitions of energy supply firms in Europe that took place between 2004 and 2006 created more value than did the mergers and acquisitions occurring between 1998 and 2003.

Mode of payment

An acquiring firm can choose either cash or stock financing or some combination thereof as mode of payment. Cash and stock transactions lead to different accounting and tax implications for the transaction; however, from a capital market perspective this is of less consequence because here the choice of the payment mode as a signal to the market comes to the fore. In case of stock transactions, the capital market assumes that firms choose payment via stock when they consider their stock valuation to be relatively high—thus financing the transaction is cheaper via stock (Myers and Hajluf, 1984). If the bidder pays cash, this sends a signal to the capital market that the acquirer is solvent and expects high cash flows (Seidel, 1995). The capital market may view payment by cash as a sign of strength and perhaps assume that the company can refinance itself, for example, using bank loans. However, some empirical studies have reported that all-cash transactions have higher premiums than all-stock deals (e.g., Huang and Walkling, 1987).

Reviewing prior meta-analytic research, Datta et al. (1992) found that both bidders and targets are worse off in stock transactions whereas King et al. (2004) found no significant difference in value creation with respect to the mode of payment. Becker-Blease et al. (2003) found that both all-cash and all-stock transactions led to decreased returns for bidding energy supply companies in the US.

Utilities may use the financing of acquisitions to boost growth—especially as organic growth opportunities are limited because volume growth is low in most European markets. Acquisitions may be used to enhance earnings per share growth either because the cost of financing is very low or because of the synergies generated. A low level of interest rates and low sector leverage allow European utilities to finance acquisitions in cash (Credit Suisse, 2007, 31).

Another argument in favor of cash payments is that utilities probably have been valued more conservatively than other industries in the past decade (Gupta, 2000, 52). According to Myers and Hajluf (1984), payment by stock should then be less favorable. Furthermore, for solvent companies the spending of free cash flow on M&As can also be a good method to make them less attractive as a target of a hostile takeover (see, e.g., Wirtz, 2003). Finally, cash payments have the advantage that the closing of the transaction is typically faster than in stock payments, as the seller will typically more quickly agree to the deal in a cash transaction. Private equity companies and hedge funds, which often buy into shares of target companies when an M&A announcement is made, call outright for cash payments.

H4: Value creation is higher in European mergers and acquisitions in which the bidding energy supply company pays in cash or uses a combination of cash and stock instead of paying for a target entirely in stock.

Prior experience

Various empirical studies have suggested an influence of prior experience on M&A performance (e.g., Bühner, 1992; Hayward, 2002; Hitt, 1998), whereby the number of prior M&A transactions is mostly used as an indicator for acquisition experience.

The basic assumption is that companies learn with each succeeding merger; management becomes more adept at finding the necessary structure and at avoiding administrative problems that might have a negative performance impact (Lubatkin, 1983, 223–224). Firms that frequently conduct M&As have already established processes which ease the identification and integration of the resources of the target company and should accordingly outperform firms which are less active in the acquisitions market. This assumption is consistent with the experience curve effect according to which organizations become more efficient at a task with increasing experience (e.g., Henderson, 1974).

However, meta-analytical research results on prior experience as a major influencing variable on M&A performance were either insignificant (King et al., 2004) or found a negative impact of prior experience on M&A performance (Bausch und Fritz, 2005). Feißt (2004) analyzed the M&A track record of bidders in international M&As for 27 sample acquisitions of European and US electricity utilities. He was not able to clearly show a relationship between the M&A track record of bidders and firm performance, although he made this observation for individual M&A deals. A reason for a negative impact of a high number of previous transactions might be that management capacity may be exceeded when doing a series of acquisitions within a short period of time (Kusewitt, 1985, 166).

With regard to the European energy supply industry, it may be assumed that prior M&A experience is particularly relevant because of the complex legal and political frameworks, for example, EU regulation and merger control, political pressures to preserve national interests

in the energy sector, etc., which may lead to higher transaction costs. Bidders which have already gone through an M&A process in this industry should be able to lower transaction costs. It is presumed that utilities with (more) prior experience operate more quickly and efficiently during the entire M&A process, and thus the capital market should value transactions of experienced bidders more positively than those of utilities with no (or a low level) of prior experience.

H5: Prior experience with mergers and acquisitions positively influences value creation from mergers and acquisitions of European electricity and gas utilities.

Takeover of state-owned versus private utilities

Traditionally most electric and gas utilities in Europe have been owned by the state. With the beginning of the liberalization process in the European utility industry many utilities were privatized; thus many energy supply firms were acquired in the context of privatizations.

The strategies that state-owned companies pursue, as well as the structures and cultures, differ from those of private firms. At the same time, the state typically is interested not only in economic but also political goals with respect to privatization. Research findings suggest that state-owned firms are less sensitive to market incentives and more greatly influenced by external political interests (Rainey, Backoff, and Levine, 1976; Fottler, 1981). Their objectives are more numerous and include such diverse goals as preservation of employment, import substitution, subsidization of consumption, buttressing of national security, and increases in the invisible resources of politicians (Aharoni, 1986). As a result, state-owned firms exhibit lower efficiency; it thus could be assumed that companies which have been acquired in the context of privatization offer a particularly large potential for the realization of operational and managerial synergies. Privatization should accordingly lead to increased efficiency and profitability.

It is assumed that because of the greater synergistic potentials, the capital market values the takeover of state-owned utilities more positively than of private utilities.

H6: Value creation is greater for European energy utilities in takeovers of state-owned utilities as compared to takeovers of private utilities.

Explorative analysis

The meta-analyses discussed in chapter three as well as the interviews with industry experts revealed other potential determinants of value creation in mergers and acquisitions that might be relevant for the following empirical investigation. These are financial leverage, country of origin, relative size, number of bidders, and bidders' approach; a further investigation looked at whether stock listing had an impact on value creation of bidding companies. These factors

are accounted for in an explorative analysis. Table 6 depicts the formation of the subsamples according to the variables that are to be investigated in the confirmatory and explorative analysis.

Table 6: Variables to be investigated and formation of subsamples for M&As

Variables	Formation of subsamples
Confirmatory analysis	
Industry relatedness	SIC Commonality between bidder and target
Regional focus	National vs. cross-border – bidder and target are headquartered in same vs. different countries
Time of transaction	Acquisitions from 1 January 1999 to 31 December 2003 vs. acquisitions from 1 January 2004 to 31 December 2006
	Each year from 1998 to 2006
Payment mode	All stock vs. cash or cash and any other payment mode
Prior experience	Number of prior M&A in past three years
Privatization	Acquisition of private target vs. acquisition of state-owned target
Explorative analysis	
Leverage	Debt to equity ratio
Country of origin	Home county of bidder/target
Relative transaction size	Transaction volume in % of market value of acquirer
Stock listing of target	Target listed on stock exchange or not
Bidders approach	Merger vs. tender offer
Relative size of bidder	Market value of acquirer
Number of bidders	One or more than one

5.2.2 Determinants of successful alliances in the European energy supply industry

Relative size

The meta-analysis of alliances conducted in the context of this work (see chapter four) found that the size of the partner firms influences the performance of alliances.

By entering into a co-operative agreement, smaller firms are able to acquire knowledge, skills and other resources that would probably be difficult to obtain or gain access to otherwise. Furthermore, by entering alliances smaller firms may “emulate many of the functional aspects of large integrated enterprises, without suffering possible dysfunctions associated with large size” (Teece, 1992, 4). Smaller firms are typically characterized by greater flexibility, which enables them to better leverage collaboration potential (Das et al., 1998). Large firms often experience greater inertia because of their extensive administrative machinery, which leads to inefficiencies (Van de Ven et al., 2000).

An alliance may offer smaller utilities the only opportunity to achieve the critical mass necessary to operate successfully in certain value chain segments or to realize synergies from scale effects. Smaller utilities often reduce their electrical energy procurement costs by forming purchasing alliances, thus increasing their negotiation power with respect to pre-suppliers. For the upstream value chain segments, a certain critical size is essential as these segments are characterized by high operating risks, including, for example, decreasing resale prices or blackouts; these may lead to cash flow volatilities that cannot be absorbed or smoothed out by smaller electrical or gas suppliers. In the downstream value chain segments, smaller utilities may profit from entering an alliance by means of joint customer services or by cross-selling their products. Furthermore, smaller utilities may realize cost-side synergies by bundling internal services such as IT, billing, metering, and maintenance services. An example of a smaller stock-listed utility that entered into an alliance in order to realize scale effects was the German company MVV which, in 2006, allied with two smaller municipalities (Stadtwerke Kiel and EV Offenbach) and bundled services in IT, billing, metering, networks, and trading in five jointly owned subsidiaries under a combined umbrella brand ("24/7"). MVV expects to attain a synergistic gain of approximately €12 million per year through this co-operative agreement.

Finally, for smaller utilities, which probably do not have the access and/or the knowledge of foreign markets, alliances may also provide a means for international expansion. Accordingly, it is proposed that relative size influences value creation in the sense that smaller utilities benefit relatively more from entering an alliance than do larger energy suppliers.

H1: Value creation in alliances is greater for smaller European energy utilities.

Explorative analysis

One recommendation of the meta-analysis in chapter four was to include further potential moderating variables that could not be investigated in the meta-analysis. Among them was the number of partners involved in an alliance, previous alliance experience as well as business environment factors. The latter largely depend upon the region in which the partners are operating; therefore, the home countries of the alliance partners will be included as a potential moderator. It was further suggested that consideration be given to how an interaction between or combination of variables could influence value creation. In particular, the joint consideration of the parent firm's primary business activities and the primary industry of the alliance activity could provide further results. Hereafter this variable will be referred to as *firm-venture industry relatedness*. Both variables will also be investigated individually. Since previous research has also found that alliances tend to be announced when a firm's performance is deteriorating (see, e.g., Mohanram and Nanda, 1998), past performance will also be investigated as a potential moderating variable. Another potential determinant of value

creation in alliances that has been confirmed in the interviews with industry experts was the partner location, because the entrance into cross-border versus national alliances might be associated with differing motivations. Further, the level of commitment of the alliance partners was controlled for by differentiating between equity-based and contractual alliances. Finally, the transaction time was controlled for by investigating each year from 1998 to 2006.

Table 7 shows the variables that are to be investigated in the confirmatory and explorative analysis.

Table 7: Variables to be investigated and formation of subsamples for alliances

Variable	Formation of subsamples
Confirmatory analysis	
Relative size	Total sales compared to the overall sample
	Market value compared to the overall sample
	Smaller vs. larger partner in one alliance
Explorative analysis	
Number of partners	One or more than one
Prior experience	Number of prior alliances in past three years
Country of origin	Home counties of respective partner firms
Industry of alliance activity	Industry of alliance activity according to SIC Code
Partner-partner industry relatedness	SIC Commonality between parent firms
Firm-venture industry relatedness	SIC Commonality between firm and the venture in which it participates
Past performance	ROE in the year prior to the alliance
	ROI in the year prior to the alliance
Partner location	Partners headquartered in same vs. different countries
Type of alliance	Equity-based versus contractual
Time of transaction	Each year from 1998 to 2006

5.3 Method

As already emphasized, this study takes the perspective of a firm's shareholders. Thus, the success of any business combination has to be measured in terms of value creation for the firm's shareholders as measured by an increase in a firm's market value (see chapter 2.5). The most suitable method for the evaluation of the success of any business combinations is to be found in the event study method, which exclusively uses market value as a measure of performance. Unlike management surveys, which typically use subjective performance evaluations of the management, or accounting-based analysis, which uses data that offers the possibility of manipulation with respect to accounting policy (e.g., the build up and write-back of undisclosed reserves), the event study method provides an objective measure of performance. With a properly functioning price mechanism in place, the market value of a

firm should reflect its true value. A precondition for this is the existence of an information-efficient market. Fama (1970) defines a market as efficient if all market prices reflect all available information at all times as this enables market participants to react immediately to new information being lanced on the market. Thus, ongoing price changes can be viewed as a reaction to the ongoing, random arrival of information (Fama, 1970).

Efficient capital market theory (Fama, 1970) holds that stock prices adjust instantaneously to new information and incorporate all relevant information. Stock prices are generally not subject to manipulation by insiders and presumably reflect a firm's true value, as they are assumed to represent the capital market's overall unbiased assessment of the present value of the future cash flows to shareholders (McWilliams and Siegel, 1997; Rappaport, 1987). Thus, an event's economic impact can be measured using stock prices observed over a relatively short time period. An event study assesses whether there is an abnormal stock price effect associated with an unanticipated or exogenous event (Peterson, 1989; McWilliams and Siegel, 1996). It measures the abnormal return, which is calculated as the difference between the actual return observed on the stock market on the date of the event and the anticipated return that would have been expected without the occurrence of the event (MacKinley, 1997, 15). These abnormal returns are calculated to reflect the reaction of the stock market to the arrival of new information (McWilliams and Siegel, 1997).

The first step in an event study is the identification of the exact time frame of the occurrence of the events. Following this step, the length of the event period has to be defined for which the abnormal returns should be calculated. In this present study the primary event period is one day prior to the announcement day to one day after announcement [−1, +1]. The advantage of this relatively short event period is that test statistics are more powerful (Brown and Warner, 1985, 15) and the probability of confounding events is lower (Mc Williams and Siegel, 1997, 637). Additionally, stock price effects are measured for the intervals [−10, +10], [−5, +5], [−3, +3] and for day 0.

A security's price performance can only be considered "abnormal" relative to a particular benchmark. Thus it is necessary to specify a model generating "normal" returns before abnormal returns can be measured (Brown and Warner, 1980). The present event study is based on the market model and involves the computation of risk-adjusted returns (Singh and Montgomery, 1984):

$$R_{it} = \alpha_i + \beta_i R_{mit} + \varepsilon_{it} \qquad (3)$$

where:
R_{it} = rate of return on the share price of firm i on day t
R_{mit} = the rate of return on a market portfolio of stocks (a performance index) on day t

α = the intercept term
β = the systematic risk of stock i
ε_{it} = the error term, with $E_{(\varepsilon it)} = 0$

In comparison to the mean-adjusted and market-adjusted models, the market model controls for risk effects and provides the results with the greatest statistical power (Brown and Warner, 1985, 12). The parameters of the market model (α, β) are estimated through an ordinary least-square regression for a period ranging from 180 to 21 trading days before an event. With an estimation period of 160 days, this study follows the approach of the majority of prior event studies which use an estimation period between 100 and 300 days and thus offers the possibility of methodological comparison with prior research (see, e.g., Picken, 2003, 94). A performance index measures the development of the price value of capital investments assuming the flowback of reinvestments and is thus adjusted (Jansen and Rudolph, 1992). In this work, the Dow Jones Stoxx Utilities Index is used as a market index as it represents the largest group of Eurozone stocks classified as utility companies and thus reflects an overall picture of the population of the companies involved. The index contains a market capitalization weighting and a variable components number (see appendix 2 for details on the index components).[35]

In the next step, the expected rate of returns R_{it} is calculated on the basis of the regression parameters (α_i, β_i) determined for the estimation period:

$$R_{it} = \alpha_i + \beta_i R_{mt} \qquad (4)$$

Then, the abnormal return is calculated by taking the difference between the observed normal return during the event period and the expected return:

$$AR_{it} = R_{it} - R_{it} \qquad (5)$$

Any significant difference from the "normal" actual return is viewed as abnormal, or excess, return. The abnormal return needs to be measured for all firms and events for the set period around the event (McWilliams and Siegel, 1997).
The calculated abnormal returns for each event and each firm must then be aggregated into a portfolio so that it is possible to study the performance differences. Therefore, an equal-weighted portfolio needs to be built by aggregating the individual AR_{it} from each event. Given N events, the sample aggregated abnormal returns for each day t is:

[35] On a trial basis the Euro Stoxx 50 Performance index was used in the same calculations but the results were substantially the same.

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \qquad (6)$$

where:
N = number of events on the portfolio
AAR_t = average residual for the portfolio at day t
AR_{it} = abnormal return of share i on day t

The effect on the portfolio over time will then be obtained by cumulating these portfolio residuals. These cumulative average returns can be aggregated for any interval in the event window (Fama, Fisher, Jensen and Roll, 1969). The accumulation is conducted through the daily average abnormal return. Thus, the average cumulative effect of the event of the defined portfolio can be identified for a certain time interval v to w:

$$CAR_{v,w} = \sum_{t=v}^{w} AAR_t \qquad (7)$$

For the present study, the largest possible interval includes 21 event days and goes from $v = -10$ *to* $w = 10$, resulting in a $CAR_{-10,10}$.

For the application of the market model it is necessary that the residuals be independent, homoscedastic, and normally distributed (MacKinlay, 1997, 17).

OLS regression requires linear independence among residuals. Should this assumption not be fulfilled, then autocorrelation is present. If autocorrelation exists, the regression delivers unbiased but inefficient parameter estimations leading to incorrect and non-meaningful tests of significance (von Auer, 1999, 283).
The Durbin-Watson test is used to detect the presence of autocorrelation in the residuals. It tests whether the residual value $u_{i,t}$ depends on the residual value $u_{i,t-1}$ (Durbin and Watson, 1950, 1951 and 1971). The Durbin-Watson test statistic is defined as:

$$d = \frac{\sum_{t=2}^{T} (u_{i,t} - u_{i,t-1})^2}{\sum_{t=1}^{T} u_{i,t}^2} \quad \text{for } t = 1,\ldots,T \text{ (number of residuals)} \qquad (8)$$

In the case of no autocorrelation, d will converge towards the value 2. If positive autocorrelation exists d falls from 2 to 0, and grows from 2 to 4 in the case of negative autocorrelation. Exact upper and lower bounds can be taken from a specific table. In this work tables by Savin and White (1977) are used because unlike Durbin and Watson they also report

upper and lower bounds for sample sizes larger than 100. For 79% of the data for bidders and for 97% of the data for targets in the M&A sample (82% in the alliance sample) no autocorrelation was found. For a further 6% for bidders and 3% for targets (4.5% for the alliance sample) the test did not allow a final conclusion because the data were in the indifference interval. For 9% of the bidders (4.5% for alliance sample) the data showed a negative autocorrelation and for 6% of the bidders (9% for alliance sample) a positive autocorrelation at the 1% level. Thus, for the majority of the data in the samples, the assumption of no autocorrelation is fulfilled. For detailed figures please see appendix 3.1.

The White test is used as a test for homoscedasticity—a constant variance of the residuals over time. As in the case of autocorrelation, the OLS method delivers unbiased but inefficient estimations of the parameters if the assumption of homoscedasticity is not fulfilled (von Auer, 1999, 36, 271).

The LM test statistic of the White test is the product of the R^2 value and the sample size:

$$LM = nR^2 \qquad (9)$$

It follows a *chi* square distribution, with degrees of freedom equal to the number of independent variables. For 74% of the data for bidders and for 82% of the data for targets in the M&A sample (65% of the alliance sample) the null hypothesis of no heteroscedasticity cannot be rejected. Accordingly, the requirement of a constant variance of the residuals over time is fulfilled for the majority of the data in both samples. See also appendix 3.2.

A further assumption of the OLS method is the normal distribution of the residuals. If the residuals are not normally distributed, the OLS method still delivers unbiased and efficient estimators, i.e., the BLUE characteristic[36] is still given. However, non-normally distributed residuals can lead to skewed and thus misleading results in the tests of the hypotheses since they are based on the normal distribution. The significance of the parameters then cannot be tested in an empirically valid form because of improper hypotheses testing (see von Auer, 1999, 306ff.). The normal distribution of the residuals is checked here with the Jarque-Bera test. The test statistic is calculated as following:

$$JB = \frac{n}{6}\left(S^2 + \frac{(K-3)^2}{4}\right) \qquad (10)$$

with $S = \frac{E[x^3]}{(\sigma^2)^{\frac{3}{2}}}$ and $K = \frac{E[x^4]}{(\sigma^2)^2}$

where:

[36] BLUE = Best Linear Unbiased Estimator. See von Auer, 1999, 71.

n: number of observations
S: sample skewness
K: sample kurtosis
x: observed values
σ: standard deviation of observed sample

The statistic *JB* has an asymptotic *chi*-square distribution with two degrees of freedom and is used to test the null hypothesis that the data are from a normal distribution (see Jarque and Bera, 1980). The null hypothesis of a normal distribution of the residuals can be confirmed for only 25% of the regressions in the M&A sample for bidders, for 24% of the regressions for targets and for only 21% in the alliance sample (see appendix 3.3 for details). That means approximately three-fourths of the regressions in both samples do not show a normal distribution of the residuals. In spite of this, as described above, the assumption of normally distributed residuals is not necessary in order to have unbiased and efficient estimators using the OLS method. The problem, however, lies with the usage of a *t*-test for testing the significance of the parameters afterwards. The *t*-test is based on a normality assumption of the estimators. But according to the Lindenberg-Lévy Central Limit theorem, the distribution of a random variable often converges roughly toward a normal distribution if many independent influencing variables affect the random variable (here: error term) (see von Auer, 1999, 306ff.).[37] Even if this is not the case, estimators calculated via the OLS method converge toward a normal distribution in the case of non-normally distributed residuals as long as the sample size is sufficiently large. Typically, a sample size of $n \geq 30$ is seen as a sufficiently large sample size for which the sampling distribution is approximately normal, no matter what distribution the variable has (e.g., Agresti and Finlay, 1999, 159). This is the case for the majority of the calculations.

Accordingly, if $n \geq 30$, a *t*-test is used for testing whether the abnormal returns are significantly different from zero in the event periods under consideration (e.g., Brown and Warner, 1985). If $n < 30$, a Wilcoxon rank-sum test is used. This is a non-parametric test which, in comparison to the *t*-test, does not assume that the source population from which the AAR and CAR are drawn will be normally distributed (e.g., Siegel, 1956).

To test whether the differences in the average CAR in the different subsamples are statistically significant, a two-sample *t*-test is undertaken if both samples have at least a sample size of $n = 30$ (see Rüger, 1988, 260ff.; Degen and Lorscheid, 2002, 331). For $n < 30$ the difference is tested by using a Wilcoxon rank sum test (see e.g., Hartung, 1998, 514ff.).

In order to incorporate the recommendations of the existing meta-analyses on business combinations, I additionally investigate changes in firm performance on the basis of

[37] For the underlying economic issue of a pricing model it can be assumed that such influencing variables are present (see e.g., Picken, 2003, 123).

accounting data. King (2004) concludes in his meta-analysis that the short-term nature of most event studies may not fully capture anticipated benefits from an acquisition due to information asymmetries. The success of a business combination in the accounting based performance analysis will be judged on the basis of a profitability analysis by using the ROE as the dependant variable. The ROE measures a firm's profitability and reveals how much profit a company generates with the money shareholders have invested. The data was taken from Thomson Financial DataStream, which defines ROE as (Net Income before Preferred Dividends − Preferred Dividend Requirement) / Last Year's Common Equity * 100. The ROE is considered over a period of three years prior to three years after the announcement of the transaction. If $n < 30$, the Wilcoxon signed-rank test is used as a test of significance (see, e.g., Hartung, 1998, 541ff.). If $n \geq 30$, the significance of the results is tested via a *t*-test (the procedure is exactly the same as described in Bühner, 1990b, 39–40); however, the validity of accounting-based performance analysis for announcements of business combinations may be limited as it is questionable whether observed changes in accounting-based ratios can indeed be solely attributed to the M&A or alliance transaction. There are various other disadvantages in comparison to the event study method, for example, changes in accounting standards over time (see, e.g., Glaum et al., 2006, 299–300). Hence, the interpretation and the discussion of the results will primarily rely on the results from the event study method.

5.4 Sample

5.4.1 Sample selection

Chosen for inclusion in the sample were all stock-listed European utility companies[38] registered in the Standard & Poor's Compustat Global database under electric or gas SIC codes at anytime between 1998 and 2006. These codes are 4911 (electric services), 4922–4925 (natural gas transmission and/or distribution), 4931 (primarily electric and other services combined), 4932 (primarily gas and other services combined). Additionally, all companies under SIC code 9997 (conglomerates) were screened to see whether any of these companies also had a significant share of their business activities in the electric or gas utility industry. The Compustat Global database includes financial information on publicly held companies around the world (active and inactive) from over 70 countries and up to 12 years of historic data.

This initial sample, then, consisted of 81 firms. In a second step I searched the Factiva database for announcements of mergers, acquisitions, and alliances of these firms in the

[38] From EU-15 countries and Norway and Switzerland.

period from 1 January 1998 to 31 December 2006.[39] Factiva offers news and business information from nearly 10,000 publications, including continuously updated newswires from major global providers, e.g., Dow Jones and Reuters; major national and regional newspapers, e.g., the *Wall Street Journal* and *Financial Times*; magazines, trade journals, and media transcripts; and over 3,500 business and news web sites. For German companies, the VDEW database on M&As and alliances was additionally used.

For the empirical investigation of M&As, the event of interest was defined as the announcement by a stock-listed European energy supply firm of any M&A activity leading to a majority holding of a target's equity (<50%).[40] The announcements of mergers and acquisitions were selected according to the following criteria:

- The takeover was not undertaken as part of a bidder consortium.
- The transaction was closed.
- The transaction value exceeded 1 million US$.[41]
- The target was headquartered in Europe.

With respect to the empirical study of alliances, the event of interest was defined as the announcement by a stock-listed European energy supply firm of either a joint venture (equity-based or with a separate organizational entity) or a contractual co-operation (coordinated value chain activities only).[42]

The announcements of alliances were selected according to the following criteria:

- The transaction was completed.
- The partner firm (or firms) headquartered in Europe or in Russia.
- The alliance activity was not a licensing agreement or a supply contract.[43]

Additional information about the event which was publicly accessible as of the announcement date was gathered from the press archive of the respective firms. In this second step, I was able to identify 181 announcements of mergers and acquisitions and 101 announcements of alliances that fulfilled the criteria above. Next I controlled for confounding events; these

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39 This period was chosen because in prior years the energy supply industry, particularly in continental Europe, was vertically integrated and either state-owned or under price-regulated mixed private/public ownership (see chapter 5.1). Until the end of the 1990s, the standard model was "an effectively vertically integrated franchise monopoly under either public ownership or cost-of-service regulation" (Newbery, 2006). Under these circumstances, the number of transactions prior to 1998 fulfilling the criteria for inclusion in my sample can be expected to be rather limited.

40 In some cases the majority of the voting rights was sufficient although the bidder did not have the majority of the equity holding.

41 See, e.g., for the choice of minimal transaction volume of 1 million US$ Fuller et al. (2002), 1770.

42 See also chapter 4.2 for the distinction between joint ventures and contractual cooperations.

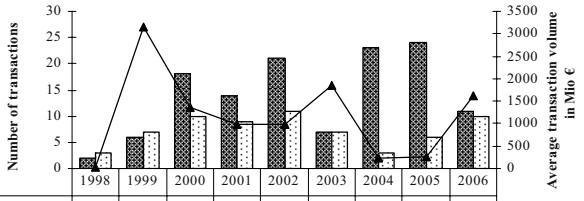
43 Licensing agreements and supply contracts in the energy supply industry have a completely different character than joint ventures and contractual cooperations. Licensing agreements are primarily oil and gas drilling licences. Supply contracts involve the supply of gas, electricity, water, steam and various services agreements, such as meter reading. These are mostly standard contracts and the criteria of a sustained relationship of the involved firms as well as a joint decision-making sphere cannot be considered as being always fulfilled.

include, for example, the announcement of dividends, stock splits and capital increases, earnings and cash flow forecasts, or changes in key executives (Mc Williams and Siegel, 1997, 634; Bühner and Krenn, 2003, 180). In the [−1, +1] event period 43 M&A announcements and 28 alliance announcements had to be excluded due to confounding events. I rigorously controlled for confounding events and went back for each announcement to the Factiva database, as well as to the press release section of the corporate homepages of the involved firms, to check whether any other news had been released in the [−10, +10] event period that could eventually influence stock prices. For the consideration of the [−3, +3], [−5, +5], [−10, +10] event periods I had to exclude, respectively, 20, 23, and 30 further M&A announcements and 9, 12, and 16 further alliance announcements. After controlling for confounding events, Thomson Financial DataStream was used to obtain data on returns on individual equities and market indices. Twelve further M&A announcements and seven alliance announcements had to be excluded from the study due to the impossibility of retrieving the needed daily common stock returns of the announcing firms. Further accounting data such as information from the balance sheet and the profit and loss statement was also taken from DataStream. As the primary event period of interest is the [−1, +1] period, the final sample consisted of 126 M&A and 66 alliance announcements.
For 33 M&A announcements, stock return data was also available for the target firm.

5.4.2 Sample characteristics

Figure 21 gives an overview of the timely development of M&As and alliances as well as the average M&A transaction volume for the sample in the period under investigation. The peak of M&A activity in terms of number of transactions was reached in 2005, whereas in terms of average transaction volume the peak was reached in 1999. The development of alliance activity shows a nearly wavelike form with a first peak in 2002 and an downturn in 2004 and again a rising level of activities in 2005 and 2006.

Figure 21: Number of M&A transactions and alliances and average M&A transaction volume in the sample period



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Number of M&A transactions	2	6	18	14	21	7	23	24	11
Number of alliances	3	7	10	9	11	7	3	6	10
Average M&A transaction volume	42	3164	1352	984	977	1862	232	271	1613

Source: author

As can be seen from table 8, a large number of bidders, targets, and alliance partners are from the UK, which might be due to an earlier liberalization and deregulation process in the sector as compared to the continental European countries. Furthermore, Germany and Italy also are among those countries having a high M&A and alliance activity in the utility sector, although German firms are more than twice as often the bidder rather than the target in the sample. Among the target firms are also a number of Eastern European firms; most of them have been acquired in the context of privatization. Table 8 also shows the home countries of all partners involved in an alliance with at least one stock-listed European electricity or gas supply firm.[44] Again, utilities from the UK, Germany, and Italy are the most active in terms of alliances. Furthermore, French firms, as well as utilities from smaller continental European countries, engaged in a number of alliance activities.

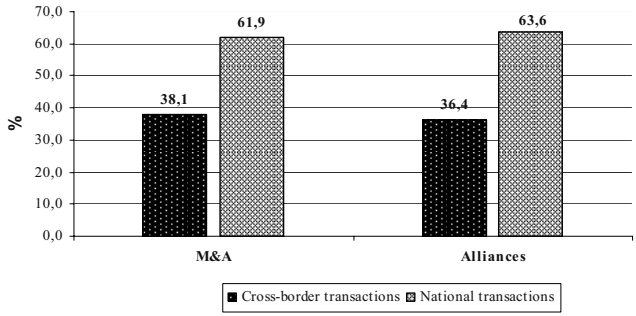
Table 8: Country of origin of bidders, targets, and alliance partners

Country of origin	Bidding firms	Target firms	Alliance partners
Austria	2	-	5
Belgium	1	1	5
Bulgaria	-	2	-
Denmark	2	2	1
Finland	6	4	3
France	5	3	14
Germany	36	17	31
Hungary	-	1	-
Italy	21	25	24
Luxembourg	-	-	2
Macedonia	-	1	-
Moldova	-	1	-
Netherlands	-	7	2
Norway	5	5	3
Poland	-	2	-
Portugal	7	3	3
Romania	-	3	-
Russia	-	-	2
Slovakia	-	1	-
Spain	13	9	9
Sweden	-	3	1
Switzerland	2	3	2
Turkey	-	-	1
UK	26	33	36
Total	**126**	**126**	**144**

Figure 22 shows that the majority of mergers and acquisitions as well as the majority of alliances conducted by electricity and gas supply firms were national transactions.

[44] Some alliances have more than two partners. That is the reason why the total number of alliance partners is not exactly twice the number of alliance announcements.

Figure 22: National versus cross-border transactions



Source: author

European energy supply firms mainly acquired companies from the electric, gas and sanitary services group (see table 9).

Table 9: Industries and industry-relatedness of sample firms

	M&As %	Alliances %
National vs. cross-border transactions		
Cross-border transactions	38.1	36.4
National transactions	61.9	63.6
Total	100.0	100.0
Industry of target/alliance activity		
Construction	1.6	15.2
Communications	3.2	12.1
Electric, Gas and Sanitary Services (49)	73.8	43.9
Wholesale and Retail Trade	1.6	9.1
Services	5.6	10.6
Other	4.0	7.6
Not clear	10.2	1.5
Total	100.0	100.0
Industry relatedness of bidder and target/alliance partners		
Focused	52.4	34.8
Convergent	15.1	6.1
Concentric	7.1	6.1
Conglomerate	15.1	53.0
Not clear	10.3	-
Total	100.0	100.0

Thus, in the majority of the transactions, the industries of the bidding and target firm are related. Some utilities also acquired firms in the services and communication sector, followed by firms in the construction and trade sector. However, compared to the 73.5% of acquisitions in the same (two-digit SIC class) industry these numbers are rather low. When looking at the alliances of European utilities the picture is different. Although a large share of their partner firms are also in the electric, gas and sanitary services group, approximately 15% of their

alliance partners are from the construction industry, followed by 12.1% from the communications industry, 10.6% in the services industry, and 9.1% from the trade sector. Furthermore, the majority of the alliance partners are not related as regards their primary industry.

Table 10 shows a comparison of some key data between the M&A and alliance samples. The average market value of a utility firm announcing an acquisition is nearly 1.5 times as high as the average market value of a utility announcing an alliance. Taking the total sales figure as a measure of firm size, the difference becomes even clearer. A utility announcing an acquisition has 1.75 times the sales of a utility announcing an alliance.

Table 10: Selected key data for M&A and alliance announcements

Key figures	M&A announcements N=126	Alliance announcements N=66
Average transaction volume in million euros	983	-
Median transaction volume in million euros	139	-
Average market value in million euros	14,379	9,696
Median market value in million euros	8,337	5,700
Average transaction volume in % of market value	10.73	-
Median transaction volume in % of market value	1.85	-
Average debt to equity ratio in year prior to the transaction	109.35%	145.09%
Median debt to equity ratio in year prior to the transaction	76.13%	96.42%
Average debt to equity ratio in year after the transaction	126.87%	135.66%
Median debt to equity ratio in year after the transaction	97.62%	93.99%
Average ROE	14.09%	9.20%
Median ROE	13.70%	13.90%
Average ROI	9.91%	8.52%
Median ROI	8.68%	7.35%
Total sales average in million euros	17,702	10,142
Total sales median in million euros	9,677	4,827

The average M&A transaction volume is €983 million and, on average, the target is a tenth of the size of the acquirer in terms of market value. Furthermore, firms entering alliances seem to have a higher leverage than those announcing a merger or an acquisition. Meanwhile, in the case of M&As the average debt-to-equity ratio increases in the year after a merger; this is not the case in the alliance sample. As utility firms often have relatively low leverage, M&As could be a value-creating strategy for spending a firm's free cash and may also allow them to get closer to their optimal capital structure. Furthermore, the firms announcing an acquisition seem, on average, to be more profitable than those announcing alliances as measured by ROE and ROI.

The majority of the bidding utilities seem to be experienced in conducting M&As. The average number of mergers and acquisitions in the three years prior to an announcement included in the sample is 2.73 (see table 11). Where the mode of payment could be identified, utilities mostly paid in cash or a combination of cash and other payment types for their

acquisitions. The sample included 26 transactions where the state or a majority state-owned firm was the seller of a target firm. Furthermore, four announcements with multiple bidders and eight tender offers could be identified. Finally, nearly a third of the target firms are stock-listed.[45]

Table 11: Further information on M&A sample

Sample information	No.	%
Average number of M&A transactions in three prior years	2.73	-
Median number of M&A transactions in three prior years	2	-
Experienced bidders	98	77.8
Non-experienced bidders	15	11.9
n/a	13	10
Total	126	100.0
Payment in shares	7	5.6
Payment in cash or cash and any other form	33	26.2
n/a	86	68.3
Total	126	100.0
Privatizations	26	-
Tender offers identified	8	-
Announcements with multiple bidders identified	4	-
Target is stock-listed	40	31.7
Target is not stock-listed	86	68.3
Total	126	100.0

As in the M&A sample, utilities announcing an alliance are in majority of the cases experienced alliance partners and have carried out, on average, 2.24 alliances in the three years prior to the announcement. Furthermore, most alliances in the sample are equity-based rather than purely contractual and in a bit more than half of the announcements, the parent firm's primary business activity and alliance activity were not related. Finally, eight alliance announcements with more than two partners were identified.

[45] Although 40 target firms are stock-listed, the necessary stock return data was only available for 33 target firms; the sample size of target firms is thus 33.

Table 12: Further information on alliance sample

Sample information	No.	%
Average number of transactions in three prior years	2.24	
Median number of transactions in three prior years	2	
Experienced partners	41	62.1
Partners with no experience	11	16.7
n/a	14	21.2
Total	66	100.0
Equity-based alliances	41	62.1
Contractual alliances	16	24.2
n/a	9	13.6
Total	66	100.0
Unrelated alliance activity and parent business activity (number)	36	54.5
Related alliance activity and parent business activity (number)	29	43.9
n/a	1	1.5
Total	66	100.0
Number of alliance announcements with more than two partners	8	-

5.5 Results and discussion for the investigation of M&As

5.5.1 Overall sample

Table 13 presents the estimated cumulative abnormal returns associated with the announcements of mergers and acquisitions of energy supply firms for bidders and targets over different event periods. As can be seen, the cumulative abnormal return for the bidders over the [−1, +1] period is slightly negative but is not significantly different from zero in any of the event periods considered. In comparison to the CARs of the bidding firms, targets seem to realize significantly positive abnormal returns when a merger or an acquisition is announced. With the exception of the [−10, −1] event period the CARs for targets are significantly positive in all other periods. This observation shows that at the time of the transaction announcement, the capital market accounts for the relevant information of the transaction during a relatively short period of time and that prior information leakage is negligible as returns prior to the announcement are not significant.

Table 13: Overall cumulative abnormal returns for all bidders and all stock-listed targets

	All bidders		All targets	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	126	0.08%	33	3.86%**
[−1, 0]	126	−0.08%	33	3.79%**
[−1, +1]	**126**	**−0.08%**	**33**	**4.66%****
[−3, +3]	106	0.07%	32	6.26%**
[−5, +5]	87	0.36%	27	8.36%***
[−10, +10]	60	−0.28%	27	10.04%**
[−10, −1]	60	0.21%	27	1.15%
[+1, +10]	60	−0.80%	27	4.13%*

***/**/*: 0.01/0.05/0.1 level of significance

The overall results for targets are consistent with most of the prior empirical research. Both prior meta-analytical research (Datta et al., 1992; King et al., 2004; Bausch and Fritz, 2005) as well as industry-specific empirical studies (e.g., Becker-Blease et al., 2003; Berry, 2000; Thomas, 2005) found that, on average, target firm shareholders earn significant abnormal returns when a merger is announced. The results for bidding firms are consistent with those of Datta et al. (1992), who found in his meta-analysis insignificant bidding firm returns. However, two of the meta-analyses discussed in chapter 3 found significantly positive bidding firm returns (King et al., 2004 and Bausch and Fritz, 2005). Prior empirical studies explicitly investigating capital market reaction to M&A announcements of energy supply firms mostly found insignificant (e.g., Mc Laughlin and Mehran, 1995; Leggio and Lien, 2000) or significantly negative CARs (e.g., Bartunek et al., 1993; Thomas, 2005). Thus, the results for bidding energy supply firms are consistent with prior industry-specific research.

In the following, the question of whether certain subsamples nevertheless show significant positive or negative returns is considered.

5.5.2 Confirmatory analysis

Industry relatedness of bidder and target

M&A announcements were divided into focused, convergent, concentric, and conglomerate transactions according to the degree of relatedness of the primary business activities of the bidder and target (primary SIC Code of bidder and target, see appendix 1.2 for detailed description of classification). Table 14 shows the results of this subsample analysis for all bidding utilities. Hypothesis one stated that value creation should be greater for focused and convergent M&A transactions of European energy suppliers than for concentric and conglomerate transactions. Although bidders in focused and convergent mergers show a slightly positive CAR and bidders in concentric and conglomerate mergers a slightly negative CAR in the [−1, +1] event period, the results are not significantly different from zero.

Furthermore, the differences between the two groups are not statistically significant for any of the event periods.

Table 14: Cumulative abnormal returns for bidding energy supply firms according to the acquisition strategy

Relatedness	Focused and convergent M&As		Concentric and conglomerate M&As	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	85	−0.02%	28	−0.03%
[−1, 0]	85	0.00%	28	−0.25%
[−1, +1]	**85**	**0.04%**	**28**	**−0.64%**
[−3, +3]	70	−0.33%	23	−0.12%
[−5, +5]	58	−0.24%	19	0.22%
[−10, +10]	39	−1.26%	14	−1.45%

***/**/*: 0.01/0.05/0.1 level of significance

Table 15 shows the results for bidders and targets in takeovers of stock-listed targets. As above, the CARs for bidders are more negative in concentric and conglomerate M&As than in focused and convergent M&As, but are not statistically different from zero. The comparison between the two groups also does not reveal any significant differences. However, target firms earn significantly positive returns on the announcement day as well as in the [−1, 0] and [−1, +1] event periods, but the differences between the two groups are not significant.

Table 15: Cumulative abnormal returns for bidding energy supply firms according to the acquisition strategy for takeovers of stock-listed targets

Relatedness	Focused and convergent M&As				Concentric and conglomerate M&As			
	Bidders		Targets		Bidders		Targets	
Intervals	N	CAR	N	CAR	N	CAR	N	CAR
Day 0	22	0.25%	22	2.58%**	9	−0.96%	9	7.91%
[−1, 0]	22	−0.03%	22	2.50%*	9	−1.41%	9	7.83%
[−1, +1]	**22**	**−0.08%**	**22**	**3.92%****	**9**	**−1.29%**	**9**	**7.96%**
[−3, +3]	21	−0.19%	21	2.82%	9	−0.67%	9	15.53%
[−5, +5]	18	0.45%	18	3.97%	7	−2.68%	7	20.69%
[−10, +10]	18	−1.25%	18	3.98%	7	−1.74%	7	22.50%

***/**/*: 0.01/0.05/0.1 level of significance

The four acquisition strategies were also tested individually and an investigation was conducted to determine whether any significant differences exist among the acquisition strategies according to whether the bidder was an electricity or gas supply firm. In both cases significant results were not found (please see appendix 4.1).

In summary, the results do not provide sufficient evidence for a relationship between the industry-relatedness of bidder and target and the capital markets' judgment of the transaction. Thus, hypothesis one cannot be confirmed.

The realization of cost-side synergies, which are primarily achieved through an increase in the efficiency in the operating business, may be less relevant for the evaluation of an M&A transaction in the energy supply industry by the capital market than expected. Focused and

convergent mergers were furthermore expected to be the most popular type for the creation of collusive synergies in the European utility industry; however, utilities may also increase their market power via concentric and conglomerate mergers. The realization of cost-side synergies at the retail stage of the value chain is also possible in concentric mergers, and synergies in administration are realizable in both concentric and conglomerate mergers (see figure 19). It could be that the synergies in retail and administration are more important than or at least equally important to those in other value chain stages. As they are realizable in each of the four types of M&As, the capital market does not distinguish between these strategies.

Hence, operative synergy effects are further exploited with the next potential influencing variable.

Regional focus

In a next step, an investigation was conducted to determine whether the regional focus of a transaction had any impact on its value creation. The results for the subsamples of national and cross-border mergers can be seen in table 16. Bidding firm returns are higher in national mergers as compared to cross-border mergers in all event periods but they are not significant.

Table 16: Cumulative abnormal returns for national and cross-border M&As of all bidding energy supply firms

Regional focus	National M&As		Cross-border M&As	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	78	0.14%	48	−0.02%
[−1, 0]	78	−0.07%	48	−0.09%
[−1, +1]	**78**	**0.06%**	**48**	**−0.31%**
[−3, +3]	69	0.56%	37	−0.84%
[−5, +5]	58	0.97%	29	−1.01%
[−10, +10]	43	0.43%	17	−2.08%

***/**/*: 0.01/0.05/0.1 level of significance

Target firm returns are higher in cross-border M&As in all event periods and significantly different from zero, but the comparison of the groups does not reveal significant differences.

Table 17: Cumulative abnormal returns for national and cross-border M&As for takeovers of stock-listed targets

Regional focus	National M&As				Cross-border M&As			
	Bidders		Targets		Bidders		Targets	
Intervals	N	CAR	N	CAR	N	CAR	N	CAR
Day 0	22	−0.25%	22	3.73%	11	0.01%	11	4.11%*
[−1, 0]	22	−0.65%	22	3.36%*	11	−0.27%	11	4.64%*
[−1, +1]	**22**	**−0.26%**	**22**	**3.25%***	**11**	**−0.77%**	**11**	**7.49%***
[−3, +3]	21	−0.19%	21	4.46%	11	−0.53%	11	9.69%**
[−5, +5]	16	0.82%	16	8.28%*	11	−1.64%	11	8.46%*
[−10, +10]	16	0.46%	16	8.36%	11	−3.47%	11	12.48%*

***/**/*: 0.01/0.05/0.1 level of significance

In chapter 5.2.1 it was suggested that operative synergy effects are primarily to be expected from the combination of activities in energy production, transmission, and distribution. Because of the restricted geographical supply areas, these activities can only be combined when both companies operate in the same national market. The results, however, do not indicate that the market particularly values M&A transactions in national markets.

A combination of acquisition strategies and regional focus also did not reveal significant results. Thus, if one considers hypothesis one and two together one may conclude that the realization of operative synergy effects, which according to chapter 5.2.1 are primarily realized in related and national mergers, are not relevant for the capital market when evaluating a merger. This result is somewhat surprising because managers typically make the argument when announcing a merger that it will lead to the realization of these operative synergy effects.

With the results obtained, hypothesis two, which states that national mergers create more value than international mergers for bidding European energy supply firms, cannot be confirmed; however, it is possible that the capital market reacts differently depending on the region of origin of the acquirer and the region entered with the transaction. Both variables will be investigated separately later in the explorative analysis.

Considering the relatively low level of significance, it is also possible that other types of synergies, e.g., financial synergies or other variables entirely, are more important for the capital markets' judgment of value-creating M&As in this industry.

Transaction time

The next subsample analysis was made according to the time of transaction. Merger announcements made between 1 January1998 and 31 December 2003 were classified in the first group and those between 1 January 2004 and 31 December 2006 in the second group. According to hypothesis three, mergers and acquisitions in the second phase should create more value. This hypothesis offered another theoretical explanation—one not based on synergy effects. It was argued that managers undertook mergers in the first phase primarily for self-serving reasons in the context of a "bigger is better" and empire-building attitude. However, the results are again not significant for any of the event periods and no significant differences between the two groups were found.

Table 18: Cumulative abnormal returns for bidding energy supply firms according to transaction time

Transaction time	Phase I (1998 – 2003)		Phase II (2004 – 2006)	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	68	0.13%	58	0.02%
[−1, 0]	68	−0.06%	58	−0.09%
[−1, +1]	**68**	**−0.12%**	**58**	**−0.03%**
[−3, +3]	57	0.68%	49	−0.63%
[−5, +5]	44	1.29%	43	−0.69%
[−10, +10]	33	0.43%	27	−1.15%

***/**/*: 0.01/0.05/0.1 level of significance

For target firms, the results are significantly positive in the first phase, but the differences between the two groups are not significant. In a further test to determine whether time of the transaction is an influencing variable from the perspective of the capital market, each year was tested individually for significance. However, the results do not indicate a clear return pattern and most of them were insignificant (see appendix 4.2).

Table 19: Cumulative abnormal returns for takeovers of stock-listed targets according to transaction time

Transaction time	Phase I (1998–2003)				Phase II (2004–2006)			
	Bidders		Targets		Bidders		Targets	
Intervals	N	CAR	N	CAR	N	CAR	N	CAR
Day 0	22	0.01%	22	3.36%*	11	−0.50%	11	4.85%
[−1, 0]	22	−0.14%	22	3.62%*	11	−1.25%	11	4.13%
[−1, +1]	**22**	**−0.12%**	**22**	**4.68%****	**11**	**−1.05%**	**11**	**4.63%**
[−3, +3]	21	0.85%	21	5.60%*	11	−2.41%*	11	7.52%
[−5, +5]	17	0.26%	18	6.94%*	9	−1.12%	9	11.18%
[−10, +10]	17	−0.49%	18	10.30%**	9	−2.55%	9	9.52%

***/**/*: 0.01/0.05/0.1 level of significance

The results thus provide no support for hypothesis three. Transaction time is obviously not a major determinant of value creation for bidding energy supply firms.

Mode of payment

For the investigation of hypothesis four, M&A announcements were divided according to the mode of payment—either cash or a combination of cash and any other form of payment or payment solely via stock. Utilities are traditionally characterized by relatively high free-cash flows (see Coy, 1997, 118) and thus cash payments were expected to be the preferred payment mode as they are more easily arranged and are less time- and preparation-intensive than stock payments. Furthermore, cash payments were presumed to send a signal of strength to the capital market; in short, a more positive evaluation was expected.

However, the results do not show any support for the hypothesis that mergers paid for in cash or a combination of cash and any other form of payment create more value than those in which the mode of payment was stock. The results are not significant for bidders in any of the

event periods. The same holds true for takeovers of stock-listed targets. This result is consistent with the majority of the meta-analytical research described in chapter 3.2, which did not find significant differences in value creation according to the mode of payment. Nevertheless, one needs to be aware that the sample sizes were quite low, which might be a reason for the insignificance of the results.

Results for targets were only possible to calculate for cash payment as the sample size was only $n = 2$ for stock-listed target firms in mergers paid by stock. As for the majority of the prior results of the target firms, returns were significantly positive in mergers paid by cash (see appendix 4.3 for details). This is in line with prior empirical research, which found that target firms earn significant positive returns in cash transactions (see, e.g., Huang and Walking, 1987 or Wansley et al., 1983).

Table 20: Cumulative abnormal return for bidding energy supply firms according to mode of payment

Mode of payment	Cash		Stock	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	33	0.29%	7	1.79%
[−1, 0]	33	0.34%	7	1.71%
[−1, +1]	**33**	**0.39%**	**7**	**1.03%**
[−3, +3]	29	0.68%	7	0.65%
[−5, +5]	21	1.09%	7	1.02%
[−10, +10]	16	1.02%	7	−0.84%

***/**/*: 0.01/0.05/0.1 level of significance

As previously stated, European electricity and gas suppliers have accumulated significant cash and security holdings which they may choose to spend on M&As. A negative impact on value creation might come from the fact that if a company has more free cash than needed for investment in projects with an appropriate expected return, the management typically tends to invest in unprofitable projects (Jensen, 1986a). Managers then maximize their own utility instead of returning the free cash to shareholders. In this case, an acquisition paid in cash reduces the free cash flow and increases the sum of capital wastefully deployed by the management.

Prior experience

For the investigation of prior experience as a potential influencing variable of value creation in M&A transactions, the sample was divided up according to whether the acquiring firm had announced any other M&A transactions in the three years prior to the merger announcement.[46] In only 15 cases was the transaction the first to be announced in the past three years. These were classified as inexperienced bidders. The great majority had already performed other M&A transactions and were placed in the experienced bidder group. Hypothesis five stated

[46] See, e.g., Bausch and Fritz (2006, 26) for the deployment of this reference period.

that M&A transactions announced by experienced bidders should be valued more favorably by the capital market. The CARs for experienced bidders, however, are less than those of non-experienced bidders in the majority of event periods and are not significantly different from zero. Furthermore, there are no significant differences between the two groups. The only significant result is obtained for the [−1, 0] event period for inexperienced bidders.

Table 21: Cumulative abnormal returns for bidding energy supply firms with and without prior M&A experience in the past three years

Bidders' prior M&A experience	Experienced bidders		Inexperienced bidders	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	98	−0.04%	15	0.41%
[−1, 0]	98	−0.11%	15	−0.05%*
[−1, +1]	**98**	**−0.18%**	**15**	**0.08%**
[−3, +3]	82	−0.15%	12	0.66%
[−5, +5]	65	−0.14%	10	−0.66%
[−10, +10]	40	−0.81%	8	−0.13%

***/**/*: 0.01/0.05/0.1 level of significance

In a further investigation of prior experience, the sample was divided according to whether the bidder had a greater or lesser number of M&A transactions than the overall sample average (of three prior M&As in the past three years). Those announcements exceeding the average were assigned to the group "high level of prior experience," those below to the "low level of prior experience" group.[47] Again, more experienced bidders showed more negative CARs than did those with less experience, but the results are not significant.

Table 22: Cumulative abnormal returns for bidding energy supply firms according to level of prior experience

Bidders' prior M&A experience	High level of prior experience		Low level of prior experience	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	39	−0.04%	52	−0.01%
[−1, 0]	39	−0.16%	52	−0.15%
[−1, +1]	**39**	**−0.42%**	**52**	**−0.02%**
[−3, +3]	32	−0.27%	42	−0.14%
[−5, +5]	23	0.05%	37	−0.78%
[−10, +10]	15	−1.40%	25	−0.36%

***/**/*: 0.01/0.05/0.1 level of significance

Table 23 shows the results for takeovers of stock-listed target firms. Target firms have significant positive returns in the [−3, +3], [−5, +5] and [−10, +10] event periods when the bidder is less experienced.

[47] The same was done for the sample median. As the results were similar to those obtained here, they are only reported in the appendix 4.4.

Table 23: Cumulative abnormal returns for takeovers of stock-listed targets according to level of prior experience

Bidders' prior M&A experience	High level of prior experience				Low level of prior experience			
	Bidders		Targets		Bidders		Targets	
Intervals	N	CAR	N	CAR	N	CAR	N	CAR
Day 0	8	0.34%	8	5.11%	11	−1.09%	11	4.31%
[−1, 0]	8	0.15%	8	5.50%	11	−1.67%	11	3.81%
[−1, +1]	**8**	**0.34%**	**8**	**6.07%**	**11**	**−1.21%**	**11**	**4.10%**
[−3, +3]	8	−0.16%	8	6.41%	11	−0.72%	11	7.94%*
[−5, +5]	6	0.73%	6	7.08%	9	−1.68%	10	9.46%**
[−10, +10]	6	−1.86%	6	10.66%	9	−0.06%	10	10.90%*

***/**/*: 0.01/0.05/0.1 level of significance

However the differences between the two groups are not significant.

Finally, the bidders having the greatest amount of prior M&A experience (five or more prior M&A transactions in the past three years) were compared to those having the least experience (none or only one prior M&A transaction in the past three years). The results are significantly negative for the group with highest prior experience in the [−1, +1] event period. The difference between the two groups is significant at the 10% level (z = 1.39) in the [−1, +1] event period.

Table 24: Cumulative abnormal return for bidders with highest and lowest level of prior M&A experience

Bidder's prior M&A experience	Highest experience level	Lowest experience level
Intervals	N=29	N=33
Day 0	−0.35%	0.11%
[−1, 0]	−0.38%	−0.25%
[−1, +1]	**−0.64% ****	**−0.22%**

***/**/*: 0.01/0.05/0.1 level of significance

The results do hint at prior experience as an influencing variable for value creation in mergers and acquisitions of European energy supply firms; however, the results point in the opposite direction than expected for value creation. Bidding energy supply firms having a higher level of experience show more negative returns than those with less prior M&A experience. Accordingly, hypothesis five cannot be confirmed. A potential explanation for this observation might be that a high number of acquisitions in a relatively short period of time exceeds management capacity and leads to high integration complexity (see Kusewitt, 1985, 166). Furthermore, the transaction process of M&As in the European utility industry may be per se more complex—the great number and variety of regulations at the European and national levels and the differing regulatory environments in each country may limit the degree of learning effects in comparison to other industries. Another explanation may be the high strategic premiums that utilities probably have to pay in light of the fierce competition for a limited number of targets. The subsample of the more experienced bidders had an average transaction volume that was nearly six times as high as the average transaction volume of the less experienced group (€1,210 million compared to €210 million). Thus, it may be that the

absolute value of the strategic premium paid is significantly larger in the more experienced subsample and thus hampers value creation.

Takeover of state-owned versus non-state-owned utilities

In hypothesis six it was assumed that the acquisition of previously state-owned targets offers great potential for the realization of operational and managerial synergies and should consequently lead to higher value creation than the acquisition of private targets. Although the CARs for acquisitions of state-owned targets are higher in the [−1, +1] event period than the CARs of private targets, the results are insignificant. The same holds true for a comparison between the two groups.

Table 25: Cumulative abnormal returns of bidding energy supply firms for takeovers of state-owned and private targets

Privatization	Takeover of state-owned targets		Takeover of private targets	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	26	−0.01%	99	0.11%
[−1, 0]	26	0.04%	99	−0.10%
[−1, +1]	**26**	**0.06%**	**99**	**−0.11%**
[−3, +3]	22	−0.93%	83	0.37%
[−5, +5]	17	−0.94%	70	0.62%
[−10, +10]	10	−1.51%	50	−0.03%

***/**/*: 0.01/0.05/0.1 level of significance

The figures for target firms are similar to the CARs for the overall sample of target firms since only two of the 33 stock-listed targets were majority state-owned. Detailed information can be found in appendix 4.5.

The results provide no evidence in support of hypothesis six. It may be that privatization per se does not lead to higher value creation; perhaps value creation instead depends on the specific circumstances and associated conditions of privatization in the respective country. Particularly in Central and Eastern European countries, utilities in the past decade had increased opportunities for market entry and growth via privatizations. Prior privatization research has found that environmental conditions influence the performance of state-owned firms (Vining and Boardman, 1992) and there appear to be differences according to the country under consideration (Carlin and Landesman, 1997). It may be that the capital market reacts differently depending on the country in which the privatization is undertaken. Thus, in the following, privatizations are considered according to region entered.

Table 26: Cumulative abnormal returns of privatizations according to region entered

Privatization in	Western Europe	Eastern Europe	Scandinavia
Intervals	N=11	N=10	N=5
Day 0	−0.19%	0.07%	0.26%
[−1, 0]	−0.66%	0.63%	0.38%
[−1, +1]	**−0.77%**	**0.63%**	**0.76%***

***/**/*: 0.01/0.05/0.1 level of significance

As can be seen from table 26, privatizations in Scandinavian countries show significant positive returns in the [−1, +1] event period, whereas returns for privatizations in the Western European countries are negative. Privatizations in Eastern European countries are likewise positive, but not significant. The difference between privatizations in West European and Scandinavian countries is significant (z = 1.98 for the [−1, 0] and z = 1.30 for the [−1, +1] event period). The Scandinavian (or Nordic) electricity market, encompassing Denmark, Finland, Norway, and Sweden, is regarded as a well-functioning integrated market with competition in generation and retail, with a comparatively low level of concentration, and strong political support for a market-based electricity supply system without intervention in the market mechanisms (see Amundsen et al., 2006, 145–169). Scandinavian countries probably enjoy a lower level of political risk than do West or East European countries, whereby political risk refers here to the risk that political forces could cause changes in a country's business environment dramatic enough to alter a firm's performance (Merchant and Schendel, 2000, 728). Firms entering countries with lower political risk may save potential transaction costs resulting from negative effects of government-induced discontinuities for which firms would otherwise need to allocate managerial resources (Child and Markoczy, 1993). When comparing privatizations in Scandinavia with takeovers of private companies significant differences are not found.

The capital market may react to other influencing variables for value creation in mergers or acquisitions of European energy supply firms than those discussed so far. In the following, further variables are tested for their impact on value creation by M&A transactions from a capital market—and thus the investors'—perspective.

5.5.3 Explorative analysis

Financial leverage

Many energy supply firms are characterized by a relatively low financial leverage compared to other branches (e.g., Credit Suisse, 2007, 32). Reasons for this low leverage can be seen in high power prices and a relatively low level of capital expenditures. A low leverage could be used to engage in mergers and acquisitions or to increase shareholder remuneration. Continental European utilities, in particular, remain cautious about distributing cash back to

shareholders. They may be concerned about the signal this sends to politicians as well as potential clawbacks (Credit Suisse, 2007, 33). Utilities with a strong balance sheet are therefore probably more likely to engage in mergers and acquisitions, although the best use would be a payout to shareholders. This is in line with the free cash flow theory by Jensen (1986), which implies that managers of firms with unused borrowing power and large free cash flows are more likely to undertake low-benefit or even value-destroying mergers. Further, Jensen writes that low-return mergers are more likely to occur in industries with large cash flows (Jensen, 1987).

Thus one could argue that firms with low leverage are more tempted to undertake unprofitable investments and engage more frequently in non-value creating M&As.

On the other hand, a strong balance sheet in terms of a low debt-to-equity ratio may also send a signal of strength to the stock market. It might show that the company has the necessary financial resources to engage in M&A transactions and is not dependant upon bank loans in order to finance the transaction. According to Modigliani and Miller (1963) and Myers (1984), capital market imperfections make it even necessary for firms to preserve financial flexibility, i.e., "the maintenance by firms of a substantial reserve of untapped borrowing power" (Modigliani and Miller, 1963, 442). Myers (1977) shows how a firm's debt overhang may induce it to forego profitable investment opportunities such as M&As, even when the managers' interests are fully aligned with shareholder interests.

In order to investigate the possible impact of financial leverage on value creation in mergers, the sample was divided according to whether the debt-to-equity ratio of the bidder in the year prior to the acquisition was above or below the sample average.

Table 27 shows that the average CARs of bidding utilities with a low degree of leverage are higher in all event periods but are not significant.

Table 27: Cumulative abnormal returns for bidding energy supply firms with high and low leverage prior to the acquisition

Leverage	High leverage		Low leverage	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	45	−0.02%	78	0.10%
[−1, 0]	45	−0.25%	78	0.02%
[−1, +1]	**45**	**−0.32%**	**78**	**0.08%**
[−3, +3]	35	−0.80%	68	0.44%
[−5, +5]	25	−0.85%	58	0.70%
[−10, +10]	18	−2.07%	40	0.33%

***/**/*: 0.01/0.05/0.1 level of significance

In takeovers of stock-listed targets, the results are significantly negative for bidders with a high degree of leverage (see table 28). Furthermore, the differences between the two groups

are significant at the 10% level for the [−1, +1] event period (z = 1.74) and at the 5% level for the [−1, 0] event period (z = 2.03).

Table 28: Cumulative abnormal returns for takeovers of stock-listed targets by bidders with high and low leverage

Leverage	High leverage				Low leverage			
	Bidders		Targets		Bidders		Targets	
Intervals	N	CAR	N	CAR	N	CAR	N	CAR
Day 0	12	−0.99%	12	6.02%	19	0.17%	19	2.97%
[−1, 0]	12	−2.04%*	12	5.65%	19	0.36%	19	3.09%*
[−1, +1]	**12**	**−1.62%***	**12**	**5.67%**	**19**	**0.33%**	**19**	**4.84%****
[−3, +3]	12	−2.03%	12	9.07%	18	0.86%	18	5.50%*
[−5, +5]	11	−1.35%	11	10.70%**	14	0.05%	14	7.82%
[−10, +10]	11	−4.44%	11	13.97%**	14	0.78%	14	7.32%

***/**/*: 0.01/0.05/0.1 level of significance

Target firms show high average CARs in later event periods, when the bidder has a high degree of leverage (significantly positive at the 5% level for the [−5, +5] and [−10, +10] event periods), whereas the results are significantly positive in earlier event periods (at the 5 % level for the [−1, +1] event period), when the bidder is characterized by a relatively low leverage. However, the differences between the groups are not significant for any of the event periods.

The results give only a weak indication that financial leverage has an impact on value creation in mergers by utilities. The capital market seems to value M&As by bidders with high leverage more negatively than M&As where the acquirer previously had a low degree of leverage. Thus the capital market reacts negatively to M&A announcements by highly leveraged firms because the takeover of stock-listed targets is likely to be financed by bank loans, which may worsen their leverage ratio and bring them further away from an optimal capital structure.

Country of origin

The interviews done in preparation of this study revealed that due to different politico-regulatory and cultural environments the region of origin of the acquirer and the region entered with the transaction could be potential determinants of value creation in the M&A activities of European utilities. In particular, the political-regulatory environment in a country could be a major issue in value creation of utility mergers as this industry is still more highly regulated in some European countries than in others and the political influence can vary among them.

Therefore the sample was divided according to the country of origin of the bidding energy supply firm and the region entered; the results are shown in table 29. For bidders from the UK, the results are significantly different from zero on the announcement day. The differences between UK bidders and bidders from Spain and Germany are also statistically

significant (z = 2.15 and z = 1.73 for comparisons of UK bidders and bidders from Germany and Spain respectively).

Table 29: Cumulative abnormal returns according to origin of bidding energy supply firm for the [−1, +1] interval

Bidders' home country	Italy	Germany	UK	Spain
Intervals	N=21	N=36	N=26	N=13
Day 0	0.09%	−0.01%	0.47%*	−0.27%
[−1, 0]	−0.40%	−0.15%	0.03%	−0.02%
[−1, +1]	**−0.35%**	**−0.34%**	**−0.26%**	**−0.10%**

***/**/*: 0.01/0.05/0.1 level of significance

With one exception the mergers undertaken by UK firms were national. As shown in chapter 5.1, the UK and Ireland constitute a single electricity sub-market in Europe and the realization of cost-side synergies is probably primarily possible within this submarket. The same holds true for Italy, where 18 out of 21 M&As were national. German and Spanish firms were the most active foreign acquirers with 20 out of 36 and 8 out of 13 transactions, respectively, being cross-border. Table 30 displays the results according to the region entered.

Table 30: Cumulative abnormal returns according to origin of target firm for the [−1, +1] interval

Targets' home country	Italy	Germany	UK	Spain	Eastern Europe	Scandinavian Countries	Benelux Countries & France
Intervals	N=25	N=17	N=33	N=9	N=11	N=14	N=11
Day 0	0.08%	−0.32%	0.49%	−0.58%	0.08%	0.40%	−0.44%**
[−1, 0]	−0.38%	−0.08%	0.01%	−0.86%	0.60%	1.08%	−0.38%**
[−1, +1]	**−0.07%**	**−0.11%**	**−0.40%**	**−1.05%**	**0.39%**	**1.98%**	**−0.53%**

***/**/*: 0.01/0.05/0.1 level of significance

In this sample, firms entering Eastern European and Scandinavian countries realize the highest returns, although they are not significant. Utilities entering the Benelux countries and France earn significant negative returns. Interestingly, these are the countries (in particular, France and Belgium) which tended to be latecomers in the liberalization process and which still have the highest concentration rates in electric energy production and the gas upstream market structure as compared to other countries in Western Europe (see EC, 2008, 11–13 and 16–18). A comparison of the Benelux and France group with the other regions entered reveals significant differences with respect to all other groups besides Germany and Spain. The countries where utilities earn positive (although not significant) returns upon entering them are the Scandinavian countries and Eastern European countries. The liberalization process started much later for the Eastern European countries, but the geographic diversification in these countries probably offers other benefits such as larger synergy potentials, because acquisitions in these countries are to a large extent privatizations. As discussed earlier, state-owned firms often exhibit lower efficiency and thus may offer large potential for the realization of operational and managerial synergies. Furthermore, in comparison to Western Europe, Eastern European countries are characterized by higher electricity demand growth

and thus provide utilities the opportunity to grow and enhance their revenues (see IEA, 2004, 462–472).

Relative size of target

The relative size of the target or the relative size of the transaction from the acquirer's viewpoint is typically used as a control variable in empirical studies of the performance effects of mergers and acquisitions (e.g., Capron, 1999; Seth, 1990b) and has been found to impact M&A performance (e.g., Haspeslalgh and Jemison, 1991). There are several reasons for a potential impact of size. For example, the takeover of a relatively large target may lead to higher integration complexity and considerable costs for the new organizational structure of the target (see, e.g., Bühner, 1990, 114–119). On the other side, it could be that the target must achieve a certain size in order to have a measurable impact on the stock market value of the acquirer or to be noticed by the capital market respectively. This could lead to a potential bias of the capital market evaluation. The significant returns for the overall sample of the targets, however, speak against this.

The relative size of the target vs. the bidder was measured as the transaction volume in percentage of the market value of the acquirer. A relative size measure was used as it takes into account that from the viewpoint of a large acquirer a target may be seen as being small, while a smaller acquirer might view the same target as large. The sample was divided up according to whether relative size was below or above the sample average.

As can be seen from table 31, there are no significant differences between the groups in any of the event periods. The results are nearly the same when using the sample median and are thus not reported here (see appendix 4.6).

Table 31: Cumulative abnormal returns for small and large targets

Relative size of target	Small		Large	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	102	0.09%	24	0.03%
[−1, 0]	102	−0.06%	24	−0.13%
[−1, +1]	**102**	**−0.11%**	**24**	**0.05%**
[−3, +3]	88	0.13%	18	−0.22%
[−5, +5]	72	0.22%	15	0.75%
[−10, +10]	46	0.01%	14	−1.22%

***/**/*: 0.01/0.05/0.1 level of significance

Accordingly, the results give no indication of a potential bias of the capital markets' evaluation.

Target is stock-listed or not

There are a number of reasons of why a stock-listing of the target firm may impact the valuation effects of merger announcements of acquirers. First, private companies cannot be as easily traded as shares of stock-listed companies. From the perspective of the owner this reduces the value of his shares in comparison to investment forms which can be more easily made liquid. Meanwhile the selling of shares in a public company has more or less the character of a public auction; private companies typically only have few investors. Professional arbitragers, which provide additional market feedback when public companies are sold, are lacking in the sale of private companies. Accordingly, acquirers may use a relative negotiation advantage in private auctions (see, e.g., Koeplin et al., 2000). Potential tax savings might be a further source of higher CARs for takeovers of private companies. If a private company is acquired in cash, this has a direct impact on the taxes of the former owner(s). However, if the company is acquired and paid for in shares, tax impacts can be delayed for an indefinite time (see, e.g., Poulsen and Stegemoller, 2002).

In the European energy supply industry, the majority of companies are not stock-listed. This fact is also reflected in M&A transactions of European utilities. As table 32 shows, the majority of transactions are acquisitions of not stock-listed, thus private targets. With the exception of the announcement day, the CARs for takeovers of private targets are higher in all event periods. However, the results are not significant; the same is true for the differences between takeovers of stock-listed and private targets.

Table 32: Cumulative abnormal returns of bidding energy supply firms for takeovers of stock-listed and non stock-listed targets

Stock-listing of target	Stock-listed		Not stock-listed	
	All bidders		All bidders	
Intervals	N	CAR	N	CAR
Day 0	40	0.10%	86	0.07%
[−1, 0]	40	−0.18%	86	−0.03%
[−1, +1]	**40**	**−0.22%**	**86**	**−0.02%**
[−3, +3]	33	−0.01%	73	0.11%
[−5, +5]	28	0.23%	59	0.35%
[−10, +10]	20	−1.50%	40	0.33%

***/**/*: 0.01/0.05/0.1 level of significance

Thus, the conclusion must be that the stock-listing of the target has no impact on value creation of bidding energy supply firms.

Finally, an investigation was carried out to determine whether bidders' approach and the firm size of the bidder had any impact on value creation. For both potential influencing variables the results were insignificant and are reported in the appendices 4.7 and 4.8. Unfortunately, it was not possible to investigate whether the number of bidders has any impact on value

creation as only four transactions with multiple bidders have been identified and thus the sample size was too small.

5.5.4 Additional accounting-based analysis

Table 33 shows the results of the accounting-based analysis using the ROE as a measure of firm performance.

Table 33: Results for confirmatory and explorative analysis when using ROE as a performance measure

Return on equity					
Sample under investigation	**N**	**ø three years before transaction in %**	**ø three years after transaction in %**	**Difference**	**p-value for difference between groups**
All bidders	76	13.43	16.15	+2.72	
Focused and convergent	56	13.54	16.92	+3.38	0.3754
Concentric and conglomerate	17	13.48	15.23	+1.76	
National M&As	43	13.07	18.77	+5.70	0.2164
Cross-border M&As	33	13.90	12.73	−1.17	
Phase I	40	15.76	14.51	−1.25	0.1563
Phase II	36	10.84	17.97	+7.13	
Cash	20	16.35	18.57	+2.23	na
Stock	1	na	na	na	
Experienced bidders	64	13.36	16.50	+3.13	0.3001
Inexperienced bidders	11	10.47	12.62	+2.15	
High level of experience	30	15.59	16.05	+0.46	0.3061
Low level of experience	36	10.39	16.05	+5.66	
Highest experience level	19	14.59	16.03	+1.44*	0.3379
Lowest experience level	22	9.37	14.35	+4.99	
State-owned targets	15	13.55	18.43	+4.88	0.3753
Private targets	60	13.53	15.69	+2.16	
High leverage	29	12.15	14.36	+2.22	0.3841
Low leverage	46	14.45	17.08	+2.63	
Italian bidders	13	7.85	13.11	+5.26**	0.0031***[a], 0.5281[b]
German bidders	21	12.07	12.07	0.00	0.0095***[c], 0.4875[d]
UK bidders	14	22.92	27.23	+4.31*	0.0248**[e]
Spanish bidders	11	14.44	17.21	+2.77	0.0298**[f]
Italian targets	16	9.66	12.05	+2.39	0.3218[g]
German targets	5	4.74	14.68	+9.94*	0.2214[h]
UK targets	20	20.61	23.45	+2.84	0.1675[i]
Spanish targets	7	11.49	14.43	+2.94	0.0956*[j]
Eastern European targets	9	13.05	15.73	+2.68	0.5485[k]
Scandinavian targets	9	11.80	17.17	+5.37	0.6847[l]
Benelux and French targets	7	12.25	13.35	+1.10	
Small targets	60	13.45	17.77	+4.32	0.1056
Large targets	16	13.33	10.05	−3.28	
Target is stock-listed	21	13.57	16.61	+3.05	0.4750
Target is not stock-listed	55	13.38	15.97	+2.59	

***/**/*: 0.01/0.05/0.1 level of significance

[a]Italian vs. German bidders, [b]Italian vs. UK bidders, [c]German vs. UK bidders, [d]German vs. Spanish bidders, [e]UK vs. Spanish bidders, [f]Spanish vs. Italian bidders
German vs. [g]Italian targets/ [h]UK targets/ [i]Spanish targets/ [j]Eastern European targets/ [k]Scandinavian targets/ [l]Benelux and French targets

For the majority of the subsamples the ROE increased in the three years after the transaction. Thereby, the subsamples of national M&As, Italian bidders, German and Scandinavian targets, bidders with a low level of experience, and transactions undertaken from 2004 to

2006 had the highest increase of ROE. Bidders doing cross-border M&As, mergers in the years 1998 to 2003, and bidders buying relatively large targets show a decrease in ROE. As with the capital market's evaluation of the M&A transactions of European utilities, the accounting-based analysis shows neither a significant positive nor negative value creation for the overall sample. The majority of the remaining results are also in line with the results of the event study. Significant differences between the average ROE three years prior and three years after the transaction are observable for prior M&A experience, the country of origin of the bidding firm, and the region entered. To differentiate between privatizations in different regions was not possible as the number for all privatizations for which the necessary accounting data was available was already only 15. Significant differences in the comparison between the groups are revealed for the country of origin and the country entered with the transaction.

5.5.5 Summary and conclusions

Table 34 summarizes the results of the confirmatory and explorative analysis for the investigation of potential determinants of value creation in mergers and acquisitions of European energy supply firms.

The results show that, on average, bidding energy supply firms are not able to significantly increase their market value via mergers and acquisitions. The abnormal returns in the [−1, +1] event period are negative. In light of this result the question remains why European energy suppliers then undertake M&A transactions. As discussed in chapter 2.5, the management's primary responsibility is to maximize shareholder value; the shareholder value approach requires that a merger or an acquisition is only be conducted when the outcome yields a greater market value for the firm than without the business combination. Thus, one must conclude that maximization of a firm's market value is probably not the primary motive of managers of European utilities when undertaking M&A transactions. Viewing mergers as an act of rational choice, another potential explanation is that managers are trying to maximize their own utility. One of the arguments for the empire-building motive of managers is that as the size of a company increases, typically the management's compensation does so as well (see Marris, 1964; Jensen, 1986a). A revenue increase resulting from an M&A transaction would thus also increase the income of the respective managers (e.g., Rodermann, 1997, 59). Other authors suggest the "increasing prestige" or "visible heritage" offered by an increased company size (Balzer, 2000, 78; Macharzina, 1995, 574) as arguments. However, since the results for the overall sample of bidders are not negatively significant, it cannot be clearly said that M&A transactions by European utilities are motivated by the empire-building motives of managers.

Table 34: Summary of results

Hypotheses	Analysis based on capital market reaction (for the [−1, +1] interval)	Additional analysis based on accounting data (ROE)
Focused and convergent mergers and acquisitions of European energy supply firms create more value than do concentric and conglomerate mergers and acquisitions.	not confirmed	not confirmed
National mergers and acquisitions of energy utilities in Europe create more value than do cross-border mergers and acquisitions.	not confirmed	not confirmed
The mergers and acquisitions of energy supply firms in Europe that took place between 2004 and 2006 created more value than did the mergers and acquisitions occuring between 1998 and 2003.	not confirmed	not confirmed
Value creation is higher in European mergers and acquisitions in which the bidding energy supply company pays in cash or uses a combination of cash and stock instead of paying for a target entirely in stock.	not confirmed	na
Prior experience with mergers and acquisitions positively influences value creation from mergers and acquisitions of European electricity and gas utilities.	not confirmed, weak evidence for negative influence of high prior experience	not confirmed[a]
Value creation is greater for European energy utilities in takeovers of state-owned utilities as compared to takeovers of private utilities.	not confirmed in general, but weak evidence that value creation depends on country in which privatization is undertaken	not confirmed[b]
Explorative Analysis	**Analysis based on capital market reaction (for the [−1, +1] interval)**	**Additional analysis based on accounting data (ROE)**
All bidders	not significant	not significant
All targets	significantly positive	na
Leverage	significant negative returns for bidders with high leverage in takeovers of stock-listed targets	not significant[c]
Country of origin of bidder	not significant[d]	significantly positive for UK and Italian bidders[e]
Country of origin of target	not significant[f]	significantly positive for takeovers of German targets[g]
Size of target	not significant	not significant
Stock-listing of target	not significant	not significant

[a] Significantly positive for highest experience sample (difference between groups is insignificant)
[b] Differentiation according to country of privatization was not possible
[c] Differentiation between all takeovers and takeovers of stock-listed targets was not possible
[d] Not significant in the [−1, +1] event period, but significant higher returns for UK bidders on the announcement day (difference in comparison to German and Spanish bidders is significant)
[e] Difference to German and Spanish bidders significant
[f] Not significant in the [−1, +1] event period, but significant negative returns for takeovers of firm from the Benelux countries and France on the announcement day and the [−1, 0] event period (difference in comparison to firms from Italy, UK, Eastern European and Scandinavian countries are significant)
[g] Difference with respect to Eastern European group is significant

Black (1989) postulated that managers overpay for targets because they are too optimistic and because their interests diverge from those of their shareholders. In an efficient capital market an overpayment should lead to an according decrease in the stock price of the bidder. It may be that the high strategic premiums paid by the utility firms neutralize value increases from synergies. On the other side, target firm shareholders should then benefit from this overpayment. This argument would be in line with the observed significant positive returns for target companies.

Hypotheses on potential determinants of value creation in M&As of European energy suppliers were derived on the basis of existing theory and prior empirical research and with

consideration given to the specifics of the utility industry. It was expected that industry relatedness and internationality of the transaction would be important variables influencing value creation; however, the results did not support these assumptions. The major argument in favor of a higher value creation in related mergers was based on cost-side synergies, which allow the realization of operational synergies at each stage of the value chain (focused mergers) or in the majority of the value chain stages (convergent mergers). It was argued that in contrast to concentric or conglomerate mergers, focused and convergent mergers offer substantial opportunities to realize economies of scale and scope in production, trading (focused mergers only), and transmission and distribution. Because of the limited geographical supply areas, these synergies are only realizable when utilities are operating in the same country and thus cannot be realized in cross-border mergers. Synergies at the retail stage of the value chain, however, are also achievable in concentric mergers. Furthermore, operational synergies in administration, such as shared services, can also be achieved in unrelated and cross-border mergers. Thus, synergies in retail and administration may well be more important than or at least equally important to those in other value chain stages; as they are realizable in all four types of M&As, the capital market probably views these strategies equally. A recommendation for future research would be to investigate the synergy potential in M&A transactions of European energy suppliers for each value chain stage separately.

The investigation of the third variable, time of transaction, was based on another theoretical approach derived from the assumption of rational choice. According to the disturbance theory (Gort, 1969) merger waves arise when economic disturbances change the ordering of individual expectations and increase the general level of uncertainty. In the period of time under investigation, two merger waves in the European utility industry were identified, which were assumed to have different environmental contexts as well as distinct underlying rationales for M&A transactions. It was argued that the dominant underlying strategic rationale of the first period (focus on rapid growth in order to scale up quickly, build-up of mass in the home market, establishment of a presence in cross-border markets, and development of the "multi-utility" strategy), which was characterized by an environmental context of uncertainty (first-time exposure to competition and no proven strategies) is not necessarily in congruence with shareholder value creation. The underlying rationales of the second wave (2003–2006), which was characterized by a more transparent environment and with established deregulation in most EU countries, were supposed to more closely correspond to shareholder goals (a refocusing on core business). However, the results did not confirm a different valuation of M&A transactions according to time of transaction. Thus the capital market makes its judgment without respect to the time period in which an Energy supplier undertakes its M&A transactions.

It was expected that mode of payment would reveal important information to the capital market about whether the bidder sees its own company as being under- or overvalued and/or whether the acquirer is solvent and has or anticipates high cash flows. The results obtained

speak against this assumption, because the choice of payment mode did not have any significant influence on the cumulative abnormal returns.

Surprisingly, the investigation of prior M&A experience showed just the opposite—as anticipated, bidders with high prior experience had significant negative returns and target returns were significantly positive when the bidder was less experienced. One explanation was that a high number of acquisitions in a relatively short period of time may exceed management capacity (see Kusewitt, 1985, 166); furthermore, the ability to generate learning effects may be limited in this industry due to the increased complexity of the M&A transaction process, resulting from the various regulations at the European and national levels and the various political-regulatory environments in each country. Since the average transaction volume in the group of more experienced bidders was nearly six times as high as that in the less experienced group, it was further suggested that high strategic premiums may be responsible for these negative effects upon returns. Thus, in future studies, it would be interesting to investigate whether strategic premiums overcompensate for potential synergies in M&As of European utilities.

The empirical investigation of the takeovers of private versus state-owned targets initially revealed no significant differences. However, when looking at the various countries in which privatization took place, significant differences were found. Utility firms were able to realize significant positive returns when buying state-owned firms in the Scandinavian countries. The Scandinavian market has comparatively strong political support for a market-based electricity supply system without intervention in market mechanisms and is thus probably characterized by a lower political risk than Eastern and Western European markets and, in comparison to many of the continental European countries, is marked by a relatively lower level of concentration in electricity generation and retail (EC, 2005). Utilities entering these countries via privatizations probably pay lower strategic premiums and are less affected (if at all) by political influences, which may save them transaction costs.

Further potential moderators of value creation in M&A transactions of European energy suppliers were then examined in an explorative analysis. It was found that utilities having a high degree of leverage prior to the M&A announcement showed significant negative returns in takeovers of stock-listed targets. The capital market probably interprets this as a signal of weakness as highly leveraged companies are not likely to have the necessary financial resources for an M&A transaction and likely must depend on bank loans to finance the transaction. The takeover of a stock-listed target financed by bank loans will further increase the firm's leverage and is likely to bring them even further away from their optimal capital structure.

In light of the differing politico-regulatory and cultural environments in the various European countries, a further investigation was conducted to determine whether the country of origin

and the country entered with the transaction were potential determinants of value creation. Bidders from the UK earned significantly positive returns on the announcement day. The UK has the longest tradition of liberalization and restructuring of the utility industry, followed by the Scandinavian countries. As regards country entered, it was found that utilities entering the Benelux countries and France earned significant negative returns. Interestingly, these are the countries (in particular, France and Belgium) that tended to be latecomers in the liberalization process and still have the highest concentration rates in electrical production and the gas upstream market structure as compared to other countries in Western Europe (see EC, 2008, 11–13 and 16–18). Thus, one could conclude that the specific political-regulatory circumstances in a country do matter when undertaking M&As in the European utility industry and thus should be analyzed and considered in advance of such a transaction. This result is also in line with the finding of significant differences according to the country in which privatization took place.

Finally, an investigation was carried out to determine whether the size of the target and the stock-listing of the target can potentially affect value creation. The examination of the target's size should rule out the possibility that the capital market only reacts to announcements where the target is of certain minimal size. No significant differences between large and small transactions were found in either the event study or in the accounting-based analysis. In light of the relatively low level of significance of the results so far, it was important to exclude this potential bias of the capital market evaluation.

Stock-listing of a target was likewise not found to be an influencing variable in value creation of European utility mergers.

The results show that in the past, on average, mergers and acquisitions in the European utility industry did not create value for the bidding firm's shareholders. From the viewpoint of an investor, it is better to hold shares in a target than in the acquiring firm, as the target firms earned significant positive returns. Managers of bidding firms should consider the political-regulatory environment of the country they plan to enter and keep in mind that a large number of acquisitions in a short period of time as well as a high degree of leverage may be lead to significant value losses.

A large number of potential determinants of value creation were examined in this empirical investigation; nevertheless, there is room for further research. Due to the limited availability of data, it was not possible to look at strategic premiums paid or differentiate synergy potentials according to the individual value chain stages of European energy suppliers, but these should certainly be considered.

Application of a process perspective to value creation in M&A transactions would also make possible an investigation of variables belonging to the post-transaction or integration phase of

a business combination; a process perspective can also include other core and support processes of business combinations, such as those belonging to human resources or communication and information processes. Finally, of utmost importance is the need for a clear M&A or alliance vision, which should stand at the very beginning of each and every business combination and must also be clearly communicated to the capital market.

With regard to the chosen methodology of the study, an additional longitudinal study could serve to complement this work, as the application of a longer time frame might reveal other potential determinants—particularly in an industry with relatively little experience in a competitive market environment.

5.6 Results and discussion for the investigation of alliances

5.6.1 Overall sample

Unlike with mergers and acquisitions, utility firms entering alliances realize a significantly positive increase in the firm's value. The average cumulative abnormal return is 0.94% for the [−1, +1] event period.

Table 35: Overall cumulative abnormal returns for alliance announcements

	All alliances	
Intervals	**N**	**CAR**
Day 0	66	0.53%**
[−1, 0]	66	0.91%**
[−1, +1]	**66**	**0.94%***
[−3, +3]	56	0.81%
[−5, +5]	47	1.28%
[−10, +10]	32	1.07%

***/**/*: 0.01/0.05/0.1 level of significance

This result is in line with the small but significantly positive value gains that were found in the meta-analysis in chapter four. The author is not aware of any prior industry-specific research investigating value creation in alliances.

The results suggest that the stock market anticipates benefits from the pooling of resources or the coordination of activities in alliances of European energy suppliers.

In the following, an investigation is conducted to determine whether certain variables influence this relationship between alliances and the creation of shareholder value.

5.6.2 Confirmatory analysis

Relative size

Total sales and market value in the year prior to the alliance announcement were used as measures of firm size (see, e.g., Chang and Chen, 2002). The sample was divided into subgroups according to whether the firm's total sales (market value) were below or above the sample median. Additionally, subsamples were established according to whether the utility firm was the smaller or larger partner (as measured by total sales in the year prior to the announcement) in the alliance it entered (see, e.g., Das et al., 1998).

Hypothesis one stated that smaller utility firms should benefit more from entering an alliance agreement than larger utilities. This is because it is only through alliances that smaller energy suppliers may reach the critical mass necessary to operate successfully in certain value chain segments or to realize synergies from scale effects in the industry. Larger firms already have this critical mass and probably form alliances for different reasons, for example, product development. Furthermore, the announcement of an alliance by a relatively large firm may only have a minor effect on its stock valuation, whereas the announcement by a smaller firm of a purchase alliance, for example, is something important and "big news," which should instantly be reflected by the capital market in the evaluation of stock prices.

The results in tables 36 and 37 show a different picture, however, and are somewhat surprising. Only for large firms are the results significantly positive, no matter whether firm size is measured by sales or market value. In nearly all event periods, larger firms have significantly positive returns. Over the [−10, +10] event period, larger firms gain 3.86% (2.69% when firm size is measured via market value) while smaller firms show negative CARs amounting to −1.72% (−0.55%). The difference between the two groups is significant at the 10% level for the [−10, +10] event period (z = 1.43).

Table 36: Cumulative abnormal returns for small and large utilities as measured by sales

Firm size I	Small		Large	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	33	0.49%	33	0.57%**
[−1, 0]	33	1.12%	33	0.70%*
[−1, +1]	**33**	**0.97%**	**33**	**0.92%***
[−3, +3]	28	0.40%	28	1.23%
[−5, +5]	23	0.38%	23	2.21%*
[−10, +10]	16	−1.72%	16	3.86%**

***/**/*: 0.01/0.05/0.1 level of significance

Table 37: Cumulative abnormal returns for small and large utilities as measured by market value

Firm size II	Small		Large	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	33	0.48%	33	0.58%**
[−1, 0]	33	1.11%	33	0.72%
[−1, +1]	**33**	**0.83%**	**33**	**1.05%***
[−3, +3]	28	0.78%	28	0.85%*
[−5, +5]	23	0.96%	23	1.54%*
[−10, +10]	16	−0.55%	16	2.69%*

***/**/*: 0.01/0.05/0.1 level of significance

The consideration of whether a firm was the smaller or the larger partner in an alliance reveals that in the majority of the event periods, the larger partner shows significant positive value gains. The larger partner realizes an average increase of 1.54% in CARs in the [−1, +1] event period, which is significant at the 5% level. The smaller partner also has significant positive gains, even though they are a bit lower and significant only at the 10% level. The differences between the two groups are significant for the announcement day (z = 1.47).

Table 38: Cumulative abnormal returns for the smaller and the larger partner in an alliance

Partner size	Smaller partner		Larger partner	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	19	0.03%	19	0.74%**
[−1, 0]	19	0.74%	19	1.19%**
[−1, +1]	**19**	**1.22%***	**19**	**1.54%****
[−3, +3]	15	3.61%	15	1.16%
[−5, +5]	14	2.40%	13	1.53%*
[−10, +10]	10	4.44%	9	0.93%

***/**/*: 0.01/0.05/0.1 level of significance

With regard to the results above, hypothesis one cannot be confirmed—the results contradict the stated hypothesis. One has to conclude that the stock market reacts more positively to the announcement of alliances made by larger utilities.

Hagedoorn and Schakenraad (1994) postulate that larger companies should benefit more from partnering because successful partnering requires effective organization, something more likely to be found in large firms. Thus, transaction costs are lower for larger firms as they are likely to have a more professional administration. Smaller firms probably encounter increased transaction costs, e.g., for writing enforceable contracts or monitoring costs. Simonin (1997) also suggests that to create value from alliances, it is necessary to have disposable resources, expertise, and market power.

5.6.3 Explorative analysis

Number of partners

An investigation was undertaken to determine whether the number of partners in an alliance influences value creation, as multiple partners may increase the complexity of the alliance management and thus transaction costs.

The first subsample includes those alliance announcements in which two parent firms were involved. As expected, this was the case for the majority of the alliance announcements. Those alliances with more than two parent firms were grouped in the multiple partners subsample.

The results are only significantly positive for alliance announcements with two parent firms. In the majority of event periods, the CARs for alliances with multiple partners are even negative. There is a significant difference between the two groups in the [−3, +3] event period ($z = 1.70$).

Table 39: Cumulative abnormal returns for alliance announcements with two partners or multiple partners

Number of partners	Two partners		Multiple partners	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	58	0.67%**	8	−0.48%
[−1, 0]	58	1.01%**	8	0.23%
[−1, +1]	**58**	**0.98%***	**8**	**0.70%**
[−3, +3]	49	1.05%	7	−0.85%
[−5, +5]	41	1.75%	6	−1.95%
[−10, +10]	29	2.06%*	3	−8.48%

***/**/*: 0.01/0.05/0.1 level of significance

However, these results call for careful interpretation, as the number of alliance announcements with multiple partners was relatively low ($n = 8$).

An explanation for the observed results is that an increase in the number of partners requires a greater amount of coordination. Further, monitoring and transaction costs can also increase with the number of partners involved in an alliance because of a greater chance of opportunism enhancing the need for screening and monitoring of partners (Gulati, 1995).

Prior experience

In a next step, an investigation of prior alliance experience as a potential determinant of value creation in alliance activities was carried out. The sample was divided according to whether the parent firm had announced any other alliances in the three years prior to the alliance under investigation.

Previous alliance experience may help firms to better anticipate and respond to exogenous challenges related to the implementation of the alliance. Prior experience may also allow firms to better attend to endogenous challenges originating from a partner's opportunistic propensity, which can then reduce transaction costs (Ring and Van de Ven, 1992).

The only significant result can be found in the experienced group for the announcement day; the differences between the groups are also significant ($z = 1.85$ for day 0).

Table 40: Cumulative abnormal returns for experienced and inexperienced alliance partners

Prior experience	Experienced partner		Inexperienced partner	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	41	0.54%*	11	−0.37%
[−1, 0]	41	0.58%	11	1.43%
[−1, +1]	**41**	**0.52%**	**11**	**2.27%**
[−3, +3]	33	0.93%	11	2.62%
[−5, +5]	28	0.74%	7	6.27%
[−10, +10]	16	1.99%	6	7.29%

***/**/*: 0.01/0.05/0.1 level of significance

For a further investigation of prior experience, the sample was divided according to whether the announcing utility had more prior alliance transactions than the overall sample average (of two prior M&As in the past three years) or fewer such transactions. Those announcements exceeding the average were classified as "high level of prior experience," those below were placed into the "low level of prior experience" group.[48]

Firms with a high level of previous alliance experience show significantly positive CARs in the [−1, 0] event period, whereas those with little previous experience show an average significant increase of 6.99% in CARs over the [−10, +10] event period; however, the differences between the groups were not significant in any of the event periods.

Table 41: Cumulative abnormal returns for parent firms with high and low level of prior alliance experience

Level of prior experience	High		Low	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	24	0.35%	18	−0.18%
[−1, 0]	24	0.67%**	18	0.49%
[−1, +1]	**24**	**0.38%**	**18**	**0.94%**
[−3, +3]	19	0.30%	18	2.03%
[−5, +5]	17	0.23%	13	4.47%
[−10, +10]	9	1.25%	10	6.99%***

***/**/*: 0.01/0.05/0.1 level of significance

Finally, a subsample was established that included the alliance announcements of those parent firms with the highest level of prior alliance experience (at least five alliances in the past three years). Here the returns are also significantly positive at the 5% level over the [−1, +1] event

[48] The sample median was again two prior alliance announcements in the past three years.

period. Comparisons with the group of partners having no experience and with the group with a low level of prior experience reveals significant differences on the announcement day (z = 1.81 and z = 1.71 respectively).

Thus, the results offer some evidence that experienced partners and those with a very high level of prior experience create more value on the announcement day than do those with no or a low level of prior experience. Looking at a longer time frame, however, the results are not significantly different for the two groups.

Table 42: Cumulative abnormal returns for parent firms with highest and lowest level of prior alliance experience

Prior experience	Highest experience
Intervals	N=11
Day 0	0.77%
[−1,0]	1.21%**
[−1,+1]	**1.03%****

***/**/*: 0.01/0.05/0.1 level of significance

Country of origin

Next, subsamples were established according to the country of origin of the announcing utility firm as well as according to the country of origin of the alliance partner. As in the case of mergers and acquisitions, the stock market gives alliance announcements by UK firms a significantly positive valuation. Italian and German parent firms earn negative returns in the [−1, +1] event period, although these are not significant. The difference between UK and German firms is significant at the 5% level for the announcement day (z = 2.01). Firms from France and the Benelux countries earn the highest abnormal returns when announcing an alliance (significant at the 1% level for the [−1, +1] event period). The difference between firms from France and the Benelux countries and firms from Italy and Germany is significant (z = 1.65 and z = 2.42, respectively, for a comparison with Italian and German firms in the [−1, +1] event period).

Table 43: Cumulative abnormal returns according to home country of announcing utility firm

Country of origin of announcing utility	Italy	Germany	UK	Benelux countries and France
Intervals	N=10	N=14	N=18	N=12
Day 0	0.10%	−0.28%	0.71%*	1.28%
[−1, 0]	−0.49%	0.31%	1.07%	2.54%**
[−1, +1]	**−0.70%**	**−0.01%**	**1.33%**	**2.73%*****

***/**/*: 0.01/0.05/0.1 level of significance

Similar results were found when investigating value creation according to the home country of the partner firm (of the announcing utility). Partnering with firms from the UK and the Benelux countries and France reveals significant positive returns. The differences among the

subsamples are significant at the 10% level for the [−1, +1] event period for a comparison of the Benelux/France subsample with the Italian and German subsamples ($z = 1.69$ and $z = 1.82$, respectively) and for a comparison of the UK subsample with the Italian subsample ($z = 1.90$).

Table 44: Cumulative abnormal returns according to home country of the partner firm

Country of origin of partner firm	Italy	Germany	UK	Benelux countries and France
Intervals	N=8	N=14	N=16	N=10
Day 0	0.55%	0.04%	0.42%	0.92%**
[−1, 0]	−0.31%	0.48%	1.43%*	0.56%
[−1, +1]	**−0.80%**	**−0.14%**	**1.73%***	**1.23%****

***/**/*: 0.01/0.05/0.1 level of significance

The positive reaction to announcements by UK firms and to announcements in which the partner firm is from the UK may be explained by the fact that this power market enjoys a high degree of liberalization and great potential (Codognet et al., 2002, 122); however, this cannot explain the positive returns of the subsample of the Benelux countries and France. In contrast to acquisitions in this region, alliances with partner firms from the Benelux countries and France are valued positively. France, in particular, is an attractive market in terms of size (second largest market in Europe after Germany in terms of electrical consumption) as well as for strategic reasons (e.g., France has the largest net transfer capacity for transmission and the largest import capacity and is thus an important transit country; see EC, 2005 and UCTE, 2005). In light of France's lower level of liberalization and its slow process of market opening and the frequent intervention of its government as compared to other European countries, alliances may provide a more flexible means of market entry and thus lower transaction costs than M&As—or in some cases very possibly the only means to market entry (see, e.g., the case of the hostile take-over attempt of the French utility Suez by the Italian-based utility Enel and the quick response of the French government, leading to the merger of Suez with Gaz de France).

Industry of alliance activity

In order to measure whether the industry in which the major alliance activities take place has an impact on value creation, four different subsamples were established, according to the major SIC divisions.[49]

The results in table 45 show that alliances taking place in the same SIC division as that of the announcing utility (division E, which is Transportation, Communications, Electric, Gas and Sanitary Services) lead to significant positive value creation. Alliances in the service sector are valued negatively, but the result is insignificant.

[49] Subsamples were established for divisions C, E, and I; all others were summarized in the subgroup "other." For one alliance, the primary industry of the alliance activity could not be identified. See also appendix 1.1 for the SIC divison structure.

Table 45: Cumulative abnormal returns according to industry of alliance activity

Industry	Transportation, Communications, Electric, Gas and Sanitary Services	Construction	Services	Other (Retail & Wholesale Trade, Manufacturing, Mining)
Intervals	N=38	N=11	N=6	N=10
Day 0	0.70%*	0.97%	−0.06%	0.10%
[−1, 0]	1.38%**	0.74%	−0.04%	0.12%
[−1, +1]	**1.45%***	**0.54%**	**−0.05%**	**0.21%**

***/**/*: 0.01/0.05/0.1 level of significance

As the differences between the subsamples are not significant, a clear impact by industry cannot be confirmed.

Partner-partner industry relatedness

Alliance announcements were divided into focused, convergent, concentric, and conglomerate according to the primary SIC code of the parent firms (see appendix 1.2 for a detailed description of the classifications).

The CARs are significantly different from zero for focused and convergent firms. On average, utilities gained 1.55% in the [−1, +1] event period. The difference between the two subsamples is significant for the [−1, 0] event period ($z = 1.85$).

Table 46: Cumulative abnormal returns according to partner-partner industry relatedness

Relatedness of parent firms	Focused or convergent		Concentric or conglomerate	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	27	0.69%**	39	0.42%
[−1, 0]	27	1.40%**	39	0.57%
[−1, +1]	**27**	**1.55%****	**39**	**0.52%**
[−3, +3]	25	0.67%	31	0.93%
[−5, +5]	21	2.05%	26	0.66%
[−10, +10]	14	0.19%	18	1.76%

***/**/*: 0.01/0.05/0.1 level of significance

Efficiency theory postulates that operational synergies from economies of scale and scope can be realized in related transactions. With regard to focused and convergent alliances of European utilities, these economies may, for example, come from bundling purchasing functions or from consolidating service functions such as billing, metering, advertising, or IT. While the consolidation of service functions is also possible to some extent in concentric alliances, this is not the case for conglomerate alliances.

The results are also in line with the transaction cost literature, which suggests that greater similarity between partners' businesses allows for production- and transaction-oriented gains. A high relatedness among parent firms permits easier establishment of the credibility of a partner's intended contributions (Alchian and Demsetz, 1972), making it possible for firms to early-on detect and react to opportunism. Production-oriented gains may, for example, arise

from superior insights into the productivity of their collective resources, as relatedness reduces information asymmetry between these firms (Alchian and Demsetz, 1972). Finally, a higher relatedness between the parent firms' businesses may facilitate communication between partners and enable these firms to extract the competitive potential of the alliance more efficiently than would otherwise be possible.

Firm-venture industry relatedness

As a next potential determinant of value creation, an investigation was conducted to determine whether the capital market takes into account the relatedness of the alliance activity and the parent firm's primary business activity. According to the industrial organization literature, it could be expected that greater similarity between the nature of the business activity undertaken by a firm vis-à-vis that undertaken by the alliance in which it participates would confer economies of scale and scope upon these firms. Economies of scale may decrease a partner's overall production costs by increasing the firm's experience and/or make it possible to secure transaction-specific gains, for example, quantity discounts (Porter, 1985). Economies of scope may arise as opportunities for learning or the transfer of skills and knowledge across value chains increase with increased similarity between businesses (Porter, 1985).

As can be seen from table 47, both subsamples show significant positive returns in some of the event periods. Over the [−1, +1] event period, alliances with a firm-alliance relatedness generate significantly positive returns, whereas those without a firm-alliance relatedness do not.

Table 47: Cumulative abnormal returns according to firm-venture industry relatedness

Relatedness of alliance activity and parent firm primary business activity	Related		Unrelated	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	29	0.43%	36	0.70%*
[−1, 0]	29	1.00%*	36	0.90%*
[−1, +1]	**29**	**1.28%***	**36**	**0.72%**
[−3, +3]	27	0.52%	28	0.98%
[−5, +5]	21	2.18%	25	0.50%
[−10, +10]	14	−0.23%	17	2.10%

***/**/*: 0.01/0.05/0.1 level of significance

However, the differences between the two groups are not significant. Thus, there is no indication that the capital market values any of these two types of alliances more positively. Whereas firms in the related-subsample may profit from economies of scale and scope, firms in the unrelated subsample may, for example, enjoy the advantage of no (or at least lower) monitoring costs associated with knowledge protection and rivalry management. Other benefits may include diversification advantages, such as risk reduction, leading to reduced volatility in a company's earnings.

Past performance

It has been previously suggested that past performance of the parent firms may influence value creation in alliances (e.g., Kim and Park, 2002).

For the investigation of this potential determinant of value creation, four different subsamples using ROE as a measure of past performance were established. Those alliance announcements for which the parent firms had a lower ROE than the overall sample average were grouped in the low past performance subsample; those alliance announcements where the parent firms showed a greater-than-average ROE in the year prior to the announcement were grouped in the high past performance subsample; this process was then repeated using sample median in place of sample average.

The results are significantly positive for alliance announcements in those situations where the parent firm had a high past performance (no matter whether the subsamples were established according to overall sample average or median) but the differences between the subsamples are not significant.

Table 48: Cumulative abnormal returns for parent firms with high and low past performance as measured by ROE

Past performance	ROE							
	Low (< average)		High (> average)		Low (< median)		High (> median)	
Intervals	**N**	**CAR**	**N**	**CAR**	**N**	**CAR**	**N**	**CAR**
Day 0	21	−0.04%	42	0.56%*	31	0.07%	31	0.66%*
[−1, 0]	21	0.60%	42	0.83%*	31	0.45%	31	1.09%**
[−1, +1]	**21**	**0.69%**	**42**	**0.97%***	**31**	**0.50%**	**31**	**1.30%****
[−3, +3]	19	0.92%	34	0.77%	27	0.08%	25	1.68%**
[−5, +5]	17	0.95%	28	1.23%	23	-0.15%	21	2.59%**
[−10, +10]	12	2.12%	18	0.07%	17	-0.49%	12	2.92%

***/**/*: 0.01/0.05/0.1 level of significance

In a further investigation, ROI was additionally used as a measure of past performance. Subsamples were established in the same manner as for the ROE. Unlike the ROE, the ROI also incorporates the debt portion of the capital and measures how much profit a company generates in relation to the entire capital invested. The data was taken from Thomson Financial Data Stream, which defines ROI as (Net Income before Preferred Dividends + ((Interest Expense on Debt − Interest capitalized) * (1 − Tax Rate)) / Last Year's Total Capital + Last Year's Short Term Debt & Current Portion of Long-term Debt) * 100.

As with the preceding, the results are only significantly positive for utilities in the high past performance subsamples. This time, however, there are significant differences between the two groups. In the [−1, +1] event period, firms having a greater-than-average past performance are valued more positively than those with a low past performance (z = 1.72); on the announcement day the difference between these groups is even clearer (z = 3.03). When

using the median as the cut-off point for the grouping into the high and low past performance groups, the results are similar but a bit weaker.

Table 49: Cumulative abnormal returns for parent firms with high and low past performance as measured by ROI

Past performance	ROI							
	Low (< average)		High (> average)		Low (< median)		High (> median)	
Intervals	N	CAR	N	CAR	N	CAR	N	CAR
Day 0	35	−0.23%	28	1.10%***	31	−0.03%	31	0.78%*
[−1, 0]	35	0.37%	28	1.23%*	31	0.67%	31	0.90%
[−1, +1]	**35**	**0.39%**	**28**	**1.49%****	**31**	**0.75%**	**31**	**1.08%**
[−3, +3]	29	0.72%	27	0.91%	26	1.05%	29	0.68%
[−5, +5]	23	1.27%	24	1.29%	22	1.66%	25	0.94%
[−10, +10]	16	1.63%	16	0.52%	15	2.71%	17	−0.38%

***/**/*: 0.01/0.05/0.1 level of significance

Utilities that were able to achieve a high past performance have already demonstrated their ability to efficiently deploy the capital under their command; thus, these firms may already enjoy a higher degree of credibility in the capital market in terms of their ability to efficiently deploy resources under their control than do firms with lower past performance. In turn, investors probably believe in the superior ability of these firms to generate future profitability—lending strength to their faith in the alliance as a good investment.

Partner location

In a further step, an analysis was performed to determine whether the capital market's judgment differed with respect to national and cross-border alliances. The CARs for cross-border alliances are higher in all event periods and are significantly positive at the 5% level in the [−1, +1] event period. The differences between the groups are significant for the announcement day (z = 1.88), the [−5, +5] event period (z = 1.94) and the [−10, +10] event period (z = 2.20).

Table 50: Cumulative abnormal returns for national and cross-border alliances

Partner location	National		Cross-border	
Intervals	N	CAR	N	CAR
Day 0	42	0.28%	24	0.96%**
[−1, 0]	42	0.73%	24	1.22%
[−1, +1]	**42**	**0.69%**	**24**	**1.39%****
[−3, +3]	35	−0.34%	21	2.73%
[−5, +5]	27	−0.39%	20	3.53%
[−10, +10]	18	−2.42%	14	5.55%*

***/**/*: 0.01/0.05/0.1 level of significance

Thus, one could conclude that it does matter whether the alliance partners are from the same or from different countries. In contrast to cross-border mergers, the capital market values

announcements of cross-border alliances more positively than those of national alliances. The major benefits of cross-border alliances are well documented in the literature (for further details see, e.g., Contractor and Lorange, 1988 and chapter 4.2 of this work).

A large number of the cross-border alliances in the sample were undertaken to jointly build and operate power plants and/or gas pipelines. This type of alliance allows the large block of fixed costs and the risks of such an investment to be split among the parties involved. Furthermore, such investments in generation or import capacity may be valued positively by the capital market, because with the exception of the network segment of the value chain the highest profit margins are typically earned in generation or import, respectively. Another important reason for cross-border alliances is to ensure secure supplies. In a survey of utility managers by PWC (2006), half of the European respondents answered that they believe that power blackouts and interrupted gas supplies are more likely to occur in the future than was the case five years ago. A particular worry was the concern about political instability in gas supply source countries. The potential cost synergies, the reduction of risk, and the reduction of resource dependence are likely responsible for the significant positive evaluation of the capital market.

In contrast, the majority of national alliances are undertaken in order to gain access to the partner's customers and for the purposes of mutual cross-selling and/or the marketing of additional services to customers. The benefits of joint construction and operation of a power plant are easily to recognize, whereas benefits from cross-selling each other's products are probably more difficult to predict; the marketing of additional services may also be highly questionable in a market where the main product criterion is typically viewed to be price.

Type of alliance

Utilities entering contractual alliances are able to generate significantly positive returns in the [−1, +1] and [−1, 0] event period; however, in later event periods, the CARs turn negative, although they are not significant. The announcement of equity-based alliances generates positive CARs over all event periods, but the results are not statistically different from zero. The differences between the two groups are not significant in any of the event periods.

Table 51: Cumulative abnormal returns for equity-based and contractual alliances

Type of alliance	Equity-based		Contractual	
Intervals	**N**	**CAR**	**N**	**CAR**
Day 0	41	0.46%	16	0.52%
[−1, 0]	41	0.82%	16	1.52%**
[−1, +1]	**41**	**0.68%**	**16**	**1.58%***
[−3, +3]	35	1.19%	15	−0.50%
[−5, +5]	28	1.81%	14	−0.59%
[−10, +10]	19	2.60%	10	−3.26%

***/**/*: 0.01/0.05/0.1 level of significance

Thus, announcements of contractual alliances are, on average, perceived as good news whereas equity-based alliances are perceived as neither good nor bad news. The significant positive effect of contractual alliances and the insignificant results for equity-based alliances raises questions about the value of a strong commitment of the partners via equity. One reason for the significant positive returns of contractual alliances may be the greater flexibility of contractual alliances—an equity commitment, on the other hand, is more difficult to reverse and renders alternative options more costly (Williamson, 1985). Furthermore, in contrast to contractual alliances, equity-based joint ventures in the utility sector often fall under the EU Merger Regulation and are subject to the review process of the European Commission. Firms entering contractual alliances may save the transactions costs associated with this review process.

However, a consistently abnormal return pattern with respect to extent and direction cannot be identified from these results. Furthermore, the differences between the groups are not significant. Accordingly, the type of alliance cannot be clearly confirmed as a variable influencing value creation in alliances of European utility firms.

Finally, an investigation was also carried out to determine whether time of transaction is a potential determinant of value creation in alliances of European energy suppliers. Subsamples were established by year, from 1999 to 2006. The only result which was significant appeared on the announcement day for the year 2000 (significantly positive at the 10% level). The results are reported in appendix 5.1.

5.6.4 Additional accounting-based analysis

Table 52 shows the results of the accounting-based analysis using the ROE as a measure of firm performance. For the majority of the subsamples the ROE increased in the three years after the transaction. As with the capital market's evaluation of the alliances of European utilities, the accounting-based analysis shows a significant positive value creation for the overall sample. Furthermore, the accounting-based analysis also confirms the relative size of the partner as an influencing variable. The increase of firm performance for large utilities is significantly positive at the 1% level. A comparison with the subsample of small utilities reveals significant differences. The same observations are made when considering the smaller and the larger partner in an alliance. As before, alliances with only two partners performed on average better than those with multiple partners. The difference between the subsamples is significant at the 10% level. With regard to a partner's prior alliance experience, the results confirm those of the event study. Utilities with a high level of prior alliance experience were able to increase their ROE from an average of 6.47% in the three years prior to the alliance to an average of 19.48% in the three years after the alliance; this is the highest increase in ROE for all the subsamples investigated. In the same period the average ROE of utilities with a low

level of prior experience decreased from 12.52% to 8.95% and for utilities with no prior experience the decrease was even larger (from 9.26% to 3.89%). The difference between the subsamples of utilities with a high and low level of prior experience as well the differences between the subsamples of utilities having undertaken more than four prior alliances and those with none or a low level of prior experience are significant at the 10% level. The results thus confirm prior alliance experience as determinant of value creation in alliances of European energy suppliers. The investigation of the country of origin of the announcing firm also reveals significant differences between the groups. Firms from the UK show a significant positive increase in firm performance. The difference between firms from the UK and Italy is significant at the 1% level. No significant results were found for the industry of alliance activity, the partner-partner industry relatedness, or the firm-venture industry relatedness. In contrast to the results obtained in the event study, no significant differences are to be found for the investigation of past performance and between national and cross-border alliances. No significant results were found for either type of alliance (contractual or equity-based). An investigation according to time of transaction was not possible because of lack of a sufficient number of transactions for each year.

Table 52: Results for confirmatory and explorative analysis when using ROE as a performance measure

Return on equity					
Sample under investigation	**N**	**ø three years before transaction in %**	**ø three years after transaction in %**	**Difference**	**p-value for difference between groups**
All alliances	30	9.74	13.50	+3.76*	
Small utilities (by sales)	15	9.12	5.70	−3.43	
Large utilities (by sales)	15	10.35	21.31	+10.95***	0.0013
Small utilities (by market value)	15	0.91	6.62	+5.71	
Large utilities (by market value)	15	18.57	20.38	+1.81***	0.0162
Smaller partner	7	2.42	10.56	+8.13	
Larger partner	12	17.50	20.49	+2.99***	0.10>p>0.05
Two partners	24	9.42	14.77	+5.35*	
Multiple partners	6	11.01	8.45	−2.57	0.0784
Experienced partner	23	9.95	16.22	+6.27	
Partner with no experience	6	9.26	3.89	−5.36	0.3576
High level of experience	13	6.47	19.48	+13.02	
Low level of experience	11	12.20	7.84	−4.36	0.0257
Highest experience	9	8.83	19.65	+10.81*	0.10>p>0.05[a]
Country of origin of announcing utility					
Italy	6	6.88	6.21	−0.67	p>0.20[b]
Germany	9	2.18	12.10	+9.91	0.2000[c]
UK	8	19.34	21.99	+2.65**	p<0.01[d]
Benelux countries and France	3	na	na	na	
Country of origin of partner firm					
Italy	5	9.48	8.17	−1.31	p>0.40[b]
Germany	8	-0.38	10.56	+10.94	p>0.40[c]
UK	6	19.78	22.42	+2.64	0.2000[d]
Benelux countries and France	3	na	na	na	
Industry of alliance activity					
Transportation, Communications, Electric, Gas and Sanitary Services	18	10.41	13.07	+2.67	0.1010
Construction	3	na	na	na	
Services	5	13.81	13.15	−0.66	p>0.40
Other (Retail & Wholesale Trade, Manufacturing, Mining)	4	13.04	15.41	+2.36	0.1471
Focused and convergent	11	4.39	8.12	+3.73	
Concentric and conglomerate	19	12.83	16.62	+3.78	0.5353
Related alliance activity and parent firm primary business activity	15	8.27	10.20	+1.93	
Unrelated alliance activity and parent firm primary business activity	15	11.21	16.81	+5.60	0.4179
High past performance (by ROE)	15	18.51	19.54	+1.03*	
Low past performance (by ROE)	15	0.96	7.46	+6.50	0.8808
High past performance (by ROI)	15	17.49	15.89	−1.60*	
Low past performance (by ROI)	15	1.98	11.11	+9.13	0.6031
National	20	7.68	13.69	+6.01*	
Cross-border	10	13.86	13.13	−0.73	0.2891
Equity-based	19	11.91	12.89	+0.98	
Contractual	9	3.94	14.47	+10.54	0.1936

***/**/*: 0.01/0.05/0.1 level of significance
[a]Highest experience vs. low level of experience and highest experience vs. no prior experience
[b]Italian vs. German firms, [c]UK vs. German firms, [d]Italian vs. UK firms

5.6.5 Summary and conclusions

Table 53 summarizes the results of the confirmatory and explorative analysis of potential determinants of value creation in alliances of European energy suppliers.

Table 53: Summary of results

Hypotheses	**Analysis based on capital market reaction (for the [−1, +1] interval)**	**Additional analysis based on accounting data (ROE)**
Value creation in alliances is greater for smaller European energy utilities.	Results contradict hypothesis: significantly positive for larger firms or larger partner respectively	Results contradict hypothesis: significantly positive for larger firms or larger partner respectively
Explorative Analysis	**Analysis based on capital market reaction (for the [−1, +1] interval)**	**Additional analysis based on accounting data (ROE)**
All alliances	significantly positive	significantly positive
Number of alliance partners	significantly positive for alliances with two partners only	significantly positive for alliances with two partners only
Prior alliance experience	significantly positive for parent firms with greatest experience[a]	significantly positive for parents firms with greatest experience
Country of origin of announcing utility	significantly positive for firms from the Benelux countries & France[b]	significantly positive for firms from the UK[c]
Country of origin of partner firm	significantly positive for allying with firms from the UK, the Benelux countries & France[d]	not significant
Industry of alliance activity	significantly positive for alliances in the same SIC division as utilities[e]	not significant
Partner-partner industry relatedness	significantly positive for related parent firm business activities	not significant
Firm-venture industry relatedness	significantly positive for related firm-venture industry[e]	not significant
Past performance	significantly positive for parent firms with high past performance[f]	significantly positive for parent firms with high past performance[e]
Partner location (national vs. cross-border)	significantly positive for cross-border alliances	significantly positive for national alliances[e]
Type of alliance (equity-based vs. contractual)	significantly positive for contractual alliances[e]	not significant
Time of transaction	not significant[g]	na

[a] Further significant positive returns for experienced group on announcement day
[b] Compared to Italian and German firms; further significantly positive for UK firms on announcement day (difference to German firms significant)
[c] Significant differences in comparison to Italian bidders
[d] Significant differences between Benelux countries & France in comparison to German and Italian samples, significant differences between UK and Italian sample
[e] No significant differences between groups
[f] Difference with respect to low performance group only significant when using the ROI as a measure of past performance
[g] Only significantly positive for the year 2000 on the announcement day

The result of the overall sample shows that European energy suppliers are obviously able to create value in alliances. In comparison to mergers and acquisitions, alliances probably provide some major benefits in the utility industry, and there may be specific reasons for

pursuing them. In acquisitions the acquiring firm must restructure and integrate the target firm; integration of different organizational cultures and management styles may result in increased restructuring costs. The majority of the European energy suppliers—most of which had been operating as monopolistic businesses in a regulatory, non-competitive environment for decades prior to the introduction of the reform programs in the 1990s—probably had a relatively rigid, inflexible organizational culture. Utilities were most likely not used to undergoing significant changes; targets can also be resistant to change and impede organizational integration, thus preventing potential merger benefits from being fully or immediately realized (Ennew et al., 1992). The resulting opportunity costs may be significant. Moreover, managers may have been reluctant to release resources under their control (Jensen, 1986a) thus inducing agency costs. Unlike mergers and acquisitions, an alliance permits a firm to retain its own separate identity outside the agreement as well as a certain ease of withdrawal. Alliances are characterized by a lower degree of integration, mutual interaction, and control; managers need not fear losing their sphere of influence. In addition to the higher restructuring and increased agency costs, high acquisition premiums might also hamper value creation in mergers and acquisitions of European energy suppliers.

Alliances and mergers in the European utility industry are probably undertaken for different reasons. Stahlke (2007) found in an investigation of the motives for mergers and alliances of German energy suppliers that the primary motives for entering alliances are the realization of synergies, the obtainment of missing know-how and qualification of internal human resources, securement of cheap energy supplies, and conservation of autonomy (Stahlke, 2007, 87–88). The essential differences in motives between both types of business combinations were that for alliances managers named more existential motives, whereas in M&A transactions the importance of gaining market share, cost cutting, and the realization of scale effects as well as growth were clearly more important. This suggests that in M&As, the primary emphasis is not necessarily on shareholder value creation but rather corporate growth, gaining market share, and extending the sphere of influence.

Potential determinants of value creation in alliances of European energy suppliers were examined on the basis of existing theory and prior empirical research, with consideration given to the specifics of the utility industry. It was assumed that smaller firms, in particular, would benefit from entering alliances that may be their only means to achieve the critical mass necessary to operate successfully in some value chain segments or to realize the synergies from scale effects in this industry; however, the results did not support these assumptions and showed instead that relatively larger firms benefit more from allying with partners than do smaller firms. One explanation offered was that larger companies may benefit more from partnering because successful partnering requires effective organization, something which is usually only available to larger firms. It may also be that larger firms are in a stronger position to negotiate and thus better able to successfully assert their interests.

It was found that alliances in which only two parent firms are involved created more value than did those with multiple partners. This is most likely due to a greater level of coordination and increased monitoring, as well as the additional transaction costs resulting from greater chances of opportunism (Gulati, 1995) that would be associated with multiple partners.

The results then showed that prior alliance experience and superior past performance positively influenced value creation in alliance announcements by European energy suppliers. It was argued that prior alliance experience may help firms to better anticipate and respond to exogenous challenges related to the implementation of the alliance and to endogenous challenges originating from a partner's opportunistic propensities (Ring and Van de Ven, 1992). The positive influence of superior past performance on value creation may result from the investors' belief in their superior ability to maintain profitability as well as the assumption that such firms will also more successful in future transactions.

One of the most interesting results is the importance of region of origin and region entered in a transaction with regard to value creation in both types of business combinations. As previously for the M&A sample, value creation was influenced by the country of origin of the announcing utility as well as by the country of origin of the respective partner firms. That means that country-specific factors are likely to influence value creation in business combinations of European energy suppliers. Announcements of M&As as well as of alliances by UK firms created value. Alliance announcements with a partner firm from the UK were also valued significantly positive. Alliance announcements by firms from the Benelux countries and France were also valued significantly positive. In the case of M&As, the capital market valued the acquisition of targets from the Benelux countries and France negatively, whereas announcements of alliances with firms from these countries were valued significantly positive. This suggests that firms are probably better off to enter the Benelux countries and France via alliances instead of M&As. This could further suggest that it is in general better for firms to enter countries with a lower degree of liberalization via alliances. Regardless of the fact that these countries are in general probably less susceptible to foreign acquisitions, alliances allow the partner to adapt more slowly to the local environment, learn about the market and reduce its liabilities of foreignness, and reduce the risks associated with a new market entry.

The operating environment for European utilities is usually influenced by a variety of laws and regulations; these may originate at the European level but their national implementation can change considerably. In order to better understand why value creation is more likely in certain countries than in others, a recommendation for future research would be to investigate individual country-specific factors, such as political intervention (e.g., in energy pricing or moves against foreign ownership), number of incumbent operators, privatization and number of state-owned firms, opportunities for customers to chose between suppliers, and the role of independent consumer watchdogs. Furthermore, future studies could look at whether certain

entry modes are more advisable in this industry than others depending on the shape of these country-specific factors.

The industry relatedness of the parent firms was also found to influence value creation in alliances. Announcements of alliances by utilities with related primary business activities were value creating. These types of alliances allow the realization of economies of scale and scope, for example, by bundling purchasing functions or by consolidating service functions such as billing, metering, advertising, or IT. Although, the consolidation of service functions may also be possible in concentric alliances, this is not the case for conglomerate alliances.

It was further found that the capital market positively values cross-border alliances. One potential reason may come from the various underlying motives for national and cross-border alliances. The majority of the cross-border alliances in the sample included the joint construction and operation of power plants and/or gas pipelines. The resulting risk reduction and cost saving potentials would explain the significantly positive returns. In national alliances, partner firms primarily want to realize revenue-based synergies from mutual cross-selling and from offering additional services to customers. It was argued that this type of synergy is probably more difficult to predict and not as obvious to the capital market. Furthermore, the value creation potential of offering additional services to customers in such a market is questionable.

Value creation in alliances of European utilities was not influenced by type of alliance (equity-based vs. contractual), the industry of the alliance activity, the firm-venture industry relatedness, or time of transaction.

The results show that investors do benefit from holding securities in European utilities announcing alliances. With regard to the research question, it was found that the number of partners, prior alliance experience, the country of origin of the firms involved, the industry relatedness of the parent firms' primary business activities, past performance, and partner location (in terms of cross-border vs. national) influences value creation in alliances of European energy suppliers. Thereby, alliance announcements by relatively large utilities; alliance announcements with only two partners; announcements by experienced firms; announcements made by firms from (or with partners from) the UK, the Benelux countries or France; alliances where the parent firms are in related businesses; announcements by firms with superior past performance; and announcement of cross-border alliances were valued significantly positive by the capital market and thus created shareholder value. Accordingly, investors should watch for these characteristics when deciding to invest in stocks of European utilities. Managers of utilities must likewise consider these variables when undertaking alliance activities in this industry.

Some subsamples are characterized by a modest sample size and should thus be interpreted with caution; however in many cases, the results were not only significant in the [−1, +1]

event window, but also in a variety of other event windows. This consistency provides further support for the significance of the findings. Of course, as in any event study, this analysis is based on the assumption of stock market efficiency, meaning that all publicly available information is immediately reflected in the stock price and is not subject to manipulation by insiders.

Furthermore, as the primary event period of interest, the [−1, +1] event period was chosen; the choice of event period can greatly influence the results. Here, the [−1, +1] event period was chosen as the test statistics are accordingly more powerful (Brown and Warner, 1985, 15) and the probability of confounding events is lower (Mc Williams and Siegel, 1997, 637). Scholars using other event periods may come to further findings. Nonetheless, this work documents new and interesting evidence of differential stock market valuations of alliances in the European utility industry and provides some explanation for those differences.