



### **Motives behind M&A: A study of European Utilities**

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Motives behind M&A: A study of European Utilities

Abstract

**Purpose:** This study aims to investigate the motivation and post-merger operating performance of European utility sectors following mergers and acquisitions.

**Design/Methodology/Approach:** Motives behind M&A is examined by looking into the relationships between total gains, target gains and acquirer gains. Post-merger operating performance is measured by comparing the the sample of European utilities with a matched portfolio based on size and market to book ratio with respect to five accounting indicators: growth in turnover, growth in earnings before interest and tax, return on assets, net profit margin and growth in fixed assets.

**Findings:** Synergy is the primary motive for M&A in the European utility firms. This study also found that post-merger operating performance is negative and significant across all the five accounting indicators matched by size and market to book ratio suggesting that utility mergers underperform in the long-term. The findings suggest that gains accruing to utilities involved in acquisitions are short term in nature.

**Practical Implications:** Negative post merger operating performance bears important policy implications as in future antitrust/competition authorities should be more vigilant before approving utility mergers.

**Originality/Value:** Public utilities possess several characteristics that are different from industrial firms and therefore need to be examined separately. Empirical literature on mergers and acquisitions is very limited on utilities. This study has addressed this gap by examining the motivation and post-merger operating performance of the European utility firms.

I. Introduction

Mergers and acquisitions (M&A) have become popular means for firm growth and corporate restructuring (Uddin & Boateng, 2014). It is therefore not surprising that M&A have accelerated and have become a global phenomenon (Boateng, Wang and Yang, 2008; Nguyen, Yung and Sun, 2012). Over the last decade this trend has been increasingly observed in the European utilities sector. For example, from 2008 to 2010 global top deals were predominantly headed by mergers in the utility sector and in 2008 and 2009 more than eighty percent of utility mergers in Europe were from the utilities sector (ATKearney, 2017). One of the reasons for the surge in utilities M&A in Europe is due to fall in market capitalization of European utilities after 2008 due to

political and regulatory pressure. The second reason as reported by ATKearney (2017) is the availability of cheap finance from private equity and infrastructure funds.

Despite the growing trends of M&A, research evidence indicates that M&A generally fails to meet the anticipated goals in terms of profitability. Ravenscraft and Scherer (1987); Tetenbaum (1999); Hudson and Barnfield (2001); Erez-Rein et al. (2004) point out that more than half of all M&A deals fail financially or destroy firm value for the acquiring firms. The intriguing question therefore is: if M&A activities do not create value, why do companies continue to engage in them? The paper attempts to answer this question and shed lights on the motives and performance of the European utility M&A.

From a comprehensive review of literature on entry mode internationalization/mergers and acquisitions and diversification, Reddy (2014) developed a synopsis of 17 theories behind these corporate events. Yaghoubi, Yaghoubi, Locke and Gibb (2016a) and (2016b) undertook an extensive review of M&A literature to examine the gaps that have still remained in this area. The two part study reported that the sources of values in mergers and acquisitions are still unknown. Kinatader, Fabich and Wagner (2107) had examined domestic M&A in BRICs countries and reported positive and significant target shareholder returns in the announcement period. While a number of studies have examined the motivation and performance of M&A of publicly held industrial firms (see, Ghosh, 2001, 2004; Ravenscraft and Scherer, 1987; Zhang, 1998; Nguyen, Yung and Sun, 2012; Hodgkinson and Partington, 2008; Du, Boateng and Newton, 2015), the motivation and performance of acquisitions in utility firms have been ignored in the extant literature. Indeed, we know relatively little about what motivates acquisitions in the utilities sector and their performance. The lack of research in respect to the motivation and performance of utility acquisitions is a serious omission and ought to

be investigated. This is because public utilities possess several characteristics that are different from industrial firms. First, the regulatory environment faced by public utilities is different (Bertunek, Jessell and Madura, 1993). For example, the public utilities are extensively regulated by the governments in terms of their operations including the prices they charge for their services. Second, M&A in the utility sector are made more complicated and time consuming by the regulatory agencies. Although further liberalisation and deregulation of the utilities market in the UK and Continental Europe in the 1990s have reduced the government restrictions in most European countries in terms of control through the principle of golden shares (Dnes et al, 1998; Nestor, 2005), the regulatory agencies continue to make the takeover activities in utility market time consuming and difficult. Lastly, public utilities provide service that are essential for economic growth and development and are generally natural monopolies. The above characteristics such as regulatory pressures, pricing policies may impede acquisition transactions and reduce the gains accruing to M&A in the utility firms. Yet we have seen some high profile M&A transactions in this sector over the past two decades including Electricite de France (EDF)/Grainage in 1998, National Power/Calortex in 1999; National Grid Group/Lattice Group in 2002. Our next question is: how do these firms perform in the long run?

We attempt to answer the question relating to the motivation by employing the Berkovitch and Narayanan (1993) model that utilises short-term wealth effects to identify and separate different motives for acquisitions. To address the issue of performance, we compare the sample of European utilities with a matched portfolio comprising of companies in the same industry, size and market to book ratio. The results show that synergy is the primary motive behind M&A in the European utilities sector. Regarding the operating performance (OP), this study finds that post-merger

returns are negative and significant across all the five accounting indicators matched by industry, size and market to book ratio suggesting that utility mergers underperform and that synergies are not realised in the long-term. This paper contributes to M&A discourse by shedding lights on the reasons for acquisitions and the OP of the European utilities. We also show that the synergy motive that drives utility acquisitions is realised in the short-term but not in the long-term suggesting that gains accruing to utilities involved in acquisitions are short term in nature.

The rest of the article is structured as follows. Section 2 reviews the literature regarding the motivation and performance of M&A. Following that section 3 presents the data and methodology. Section 4 discusses the empirical findings and finally section 5 provides the conclusions and discusses the implications of the findings.

## 2. Literature Review

### *2.1 Wealth Gains and Motivation for M&A*

Prior literature suggests that three main motives, namely, synergy, agency and hubris<sup>1</sup> drive acquisitions and the effect of the wealth of bidders provides an indication of the motivation for M&A (Berkovitch and Narayanan, 1993, Seth et al, 2000; Roll, 1986; Georgen and Renneboog, 2000, Nguyen, Yung and Sun, 2012). The studies by Sudarsanam et al. (1996); Gupta et al (1997), Seth et al (2000), DeLong (2001) and Houston et al (2001); suggest that if M&As are driven by the synergy motive then such acquisitions should be wealth enhancing. In similar vein, Berkovitch and Narayanan

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<sup>1</sup> The synergy hypothesis proposes that M&A take place when the value of the combined firm is greater than the sum of the values of the individual firms (see Bradley et al, 1988). Agency hypothesis suggests that managers of the acquiring firms engage in M&A in order to maximise their own self-interest at the expense of the shareholders (Jensen and Meckling, 1976). Hubris theory contend that there are no gains from M&A and takeovers take place due to acquirer managers' overconfidence/mistakes in estimating the potential gains from M&A (Roll, 1986).

(1993), Gupta et al (1997), Seth et al (2000), Goergen and Renneboog (2004) and Hodgkinson and Partington (2008) looked into the relationship between the combined gains, target gains and acquirer gains as motives behind M&A and found agency and hubris motives to be important drivers for M&A. Roll (1986) point out that, if large gains accrue to target shareholders and small returns (or in some cases, negative but statistically insignificant returns) to the acquiring firms, it provide evidence to acquirer that the acquisition is not wealth creating. In such cases, Roll (1986) argues that an acquisition that was initiated on a basis of synergy may be consummated on the basis of hubris. Supporting this line of thinking, Berkovitch and Narayanan (1993) note that, even if, the total gain is positive for a sample of takeovers, the acquirer gains might be negative for many of the firms in the sample and studies should allow for such combination to be evaluated.

The table below summarises the relation between the target and total gain; acquirer and total gain as hypothesised by Berkovitch and Narayanan (1993).

**[Insert Table 1 here please]**

It is pertinent to note that Berkovitch and Narayanan (1993) model above has been used by several studies both in US and Europe (e.g. Gupta et al, 1997; Zhang, 1998; Seth et al, 2000; Goergen and Renneboog, 2004 and Hodgkinson and Partington, 2008) to analyse the motivation for M&A. While these studies have reported that synergy is the predominant motive behind M&A, some of these studies have also reported the presence of agency or hubris or both in varying degrees in the culmination of such purposes. This suggests that M&As are not motivated by a single reason and this conclusion is consistent with the findings of Boateng, Wang and Yang (2008) who

found that Chinese M&As are driven by a set of multiple motives. However, none of these studies have examined motives behind M&A in regulated<sup>2</sup> industries and that is the subject of this paper.

## 2.2 Operating Performance

Previous studies have examined M&A performance from the perspectives of two time horizons, namely, short-run performance and long-run performance. Studies in respect of short-term performance use share-price information to examine wealth gains following acquisition announcement while both share price information and accounting based measures such as return of assets are used to evaluate the long-run performance of merging firms. In the context of M&A of utility sectors, short term performance and long-term abnormal returns have been examined by Datta et al. (2013) and they reported positive target gains and negative acquirer gains where both the gains to target firms and losses to acquirer firms were lower in absolute terms in comparison to non-regulated sectors. Datta et al. (2013) also reported negative post-merger abnormal returns in the three-year period following the completion of M&A. All of these studies have focused on the motives of M&A in the energy sector and on individual countries within Europe. It is important, however, to point out that the study by Datta et al. (2013) did not examine the OP of M&A but suggested that future research on M&A in the utilities sector should look into post-merger OP using accounting based measures. Responding to this call, this study investigates the OP of European utilities. Due to the dearth of research, we review the OP for industrial firms.

(Insert Table 2 here)

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<sup>2</sup> All companies are subjected to some form of regulation. Here regulated industries refer to those industries that are subjected to economic regulation like price-cap regulation in the UK and rate of return regulation in the US in the context of utility sectors.



Sharma and Ho (2002) have done a comprehensive review of literature on post-merger OP and reported mixed results. We have done a similar review of studies post 2000 (for studies before 2000, see Sharma and Ho, 2002) and this is shown in table 2. The review of studies in table 2 suggests mixed evidences on post-merger OP. For instance, Reddy, Nangia and Agrawal (2013), Linn and Switzer (2001), Heron and Lie (2002), Rahman and Limmack (2004) and Kruse et al (2007) have reported increase in post merger OP. These results are also evidenced in earlier literatures like Healy et al (1992) and Cornett and Tegrarian (1992). On the other hand Ravenscraft and Scherer (1987), Yeh and Hoshino (2002), Mantravadi and Reddy (2008) and Bertrand and Betschinger (2012) have reported losses and Ghosh (2001), Moeller and Schlingemann (2004), Sharma and Ho (2002), Powell and Stark (2005), Martynova et al (2007), Dutta and Jog (2009) Kumar (2009) and Rao and Nicholson (2016) have reported insignificant changes in post merger OP. None of the studies in table 2 have examined post merger OP in utilities sector. Datta et al. (2013) noted that “Utility sectors are indispensable and bear significant social welfare characteristics, so it is vital to examine whether the market’s perception of M&As within such sectors is any different from that in non-regulated industries. Moreover utility sectors are characterized by natural monopoly with significant economies of scale and scope.” In this context, this study aims to address the gap by examining post-merger OP of European utility sectors.

**3. Data and methodology**

*3.1 Data*

M&A data was taken from Securities Data Corporation (SDC) database for over 20 years period from 1990 to 2012. The rationale for selecting this time period is that



the European utilities engaged in M&A on a significant scale after the structural changes of privatization, liberalization and deregulation that took place in the early 1990s (Armstrong et al, 1994). The sample comprises of completed deals and publicly listed targets in Europe and non-European countries. The acquirer consists of European companies in one of the four utility industries namely, electricity, gas, water and telecommunications. For the post-merger OP, this study looks at combined entities listed in one of the European stock exchanges. In addition, we selected deals where the percentage of shares owned after transaction by the acquirers is more than 50%. Data on market value, net profit margin, return on assets, earnings before interest and tax, market to book value, turnover, and fixed assets for both the sample and the control firms were obtained from Datastream database.

Based on the above criteria, a total of 172 M&A in the European utilities sector were obtained. The distribution of M&A in table 3 shows that 50% of M&A has taken place in the electricity sector followed by 34% in telecom, 11% in water and 5% in gas. In addition, more than half of the deals in our sample were from UK, Spanish and German companies as shown in table 3. For evaluating motives behind M&A we needed data for both the targets and acquirers as well as combined firm after the merger. This reduced our final sample to 75.

**(Insert Table 3 here please)**

### *3.2 Measurement of short-run stock price performance*

In order to calculate the target gains, acquirer gains and total gains (shown in section 3.3), this study first evaluates the average abnormal returns (ARs) and average cumulative abnormal returns (CARs) by employing event study analysis. The efficient market hypothesis posits that in the absence of any event announcement, the securities are expected to earn normal returns. So presence of abnormal movements in share

prices following the announcement of an event (in this case announcement of M&As) reflects the impact of the announcement of the event on the security returns.

Brown and Warner (1980) posit that a security price performance can be shown as ‘abnormal’ when it is compared to a benchmark (normal returns). The abnormal return is the difference between actual ex-post return of the security that is obtained over the event window and the normal or expected return of the firm that is obtained from the estimation window.

In this study we use OLS market model as benchmark to calculate the normal returns, since it is ‘relatively powerful’ and ‘well specified’ under a variety of conditions (Brown and Warner, 1985).

The OLS market model benchmark is expressed as follows:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \tag{1}$$

In equation 1,  $R_{i,t}$ ,  $R_{m,t}$  are the rate of return for security  $i$  on day  $t$  and rate of return for market index<sup>3</sup> on day  $t$ , respectively. The expected return  $E(R_{i,t})$  under the OLS market model is expressed as follows:

$$E(R_{i,t}) = \hat{\alpha} + \hat{\beta} R_{m,t} \tag{2}$$

In equation 2, the estimates of  $\alpha_i$  and  $\beta_i$ , which are  $\hat{\alpha}$  and  $\hat{\beta}$  are obtained by regressing security returns  $R_{i,t}$  on the market return  $R_{m,t}$  over the estimation window.

The abnormal return for firm  $i$  at event date  $t$  is expressed as follows:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \tag{3}$$

In equation 3,  $R_{i,t}$  is the actual return of  $i^{th}$  firm on the event day  $t$  and  $E(R_{i,t})$  is the normal benchmark return obtained from OLS market model. Equation 4 shows the

<sup>3</sup>. Since the sample of firms comes from different European countries, so for each country their respective market indices have been used as a proxy for the market return  $R_{m,t}$ .

cumulative abnormal return for firm  $i$  over the 21 days event window  $(-10, +10)$ . This is shown below.

$$CAR_{-10,10}^i = \sum_{t=1}^{t2} AR_{i,t}, \quad (4)$$

Following Collins and Dent (1984) and Brown and Warner (1985) this study has used the time series standard deviation test as the test statistic to examine the statistical significance of  $AR_{i,t}$  and  $CAR_{-10,10}^i$ .

### 3.3 Measurement of motives behind M&A by examining: Combined gains

$TargetGain^i$  is the gain (or loss) accrued to the  $i^{th}$  target firm shareholders and

$AcquirerGain^i$  is the gain (or loss) accrued to the shareholders of the  $i^{th}$  acquirer firm.

$$TargetGain^i = MV_{Target}^i * CAR_{Target}^i(-10,+10) \quad (5)$$

$$AcquirerGain^i = MV_{Acquirer}^i * CAR_{Acquirer}^i(-10,+10) \quad (6)$$

$$TotalGain^i = TargetGain^i + AcquirerGain^i \quad (7)$$

$MV_{Target}^i$  and  $MV_{Acquirer}^i$  are the market capitalisation of the  $i^{th}$  target firm and  $i^{th}$  acquirer firm respectively. All the market capitalisations are expressed in British pound sterling. The total gains are reported in millions<sup>4</sup>. Wilcoxon<sup>5</sup> ranked test was carried out to determine whether the median total gain is statistically greater than zero.

### 3.4 Measurement of motives: Target gain, Acquirer gain and Total gain

Following Berkovitch and Narayanan (1993) and Seth et al (2000), this study examined the relation between target gains, total gains and acquirer gains by the following equations.

$$Target\ gain = \alpha + \beta * Total\ gain \quad (8)$$

<sup>4</sup> Seth et al (2000) have termed this as dollar gains since in their studies the total gains were reported in US dollars.

<sup>5</sup> Wilcoxon signed rank test is a non-parametric equivalent of t-test. It is used when the distributional assumptions that underlie t-test is not satisfied. This test is used in several extant studies to determine the statistical significance of the median

Target gain =  $\alpha + \beta \cdot \text{Acquirer gain}$  (9)

From the definition of synergy, agency and hubris (see footnote 1) the following hypotheses have been developed.

H1a: M&A of European utilities are motivated by synergy. This would imply positive total gain and positive  $\beta$  coefficients in equations 8 and 9.

H1b: M&A of European utilities are motivated by agency. This would imply negative total gain and negative  $\beta$  coefficients in equations 8 and 9.

H1c: M&A of European utilities are motivated by hubris. This would imply zero total gain and zero  $\beta$  coefficient in equations 8.

To determine if synergy and hubris hypotheses co-exist in the positive total gain<sup>6</sup> subsample the following equation has been analysed following, Seth et al (2000).

Target gain =  $\alpha + \beta_1 \text{Acquirer gain} + \beta_2 (\text{Acquirer gain} \cdot \text{Dummy})$  (10)

Dummy<sup>7</sup> = 0 if acquirer gain is positive and 1 if acquirer gain is negative. If  $\beta_1 + \beta_2$  is negative in the negative acquirer gain subsample this would imply simultaneous presence of synergy and hubris (since equation 10 is examined only on positive total gain subsample and hence synergy motive has already been established).

3.5 Measurement of operating performance

As evidenced in table 2 most of the empirical studies have either used a change model or regression model using various benchmark and control variables. This study has used the change model<sup>8</sup> that is considered superior to the regression model (see Healy et al, 1992). Following Barber and Lyon (1996) and Loughran and Ritter (1997)

<sup>6</sup>By definition, synergy motive will be present only in the positive total gain subsample.  
<sup>7</sup> Dummy variable differentiates the firms with positive acquirer gain to firms with negative acquirer gain.  $\beta_1$  measures the relation between target and acquirer gain in positive acquirer gain subsample while  $\beta_1 + \beta_2$  measure the same in the negative acquirer group subsample.  
<sup>8</sup> Ghosh (2001) and Powell and Stark (2005) maintained that regression based methodology may provide biased results where acquirers differ from control firms on traits that govern future profits.

excess OP<sup>9</sup> is the difference between OP of a utility company following M&A and the mean OP of a benchmark-portfolio comprised of firms that did not engage in M&A with similar size and market to book value ratio during the month of M&A completion.

This study has used five accounting indicators of OP, which are Growth of Turnover, Growth of Earnings before Interest and Tax (EBIT)<sup>10</sup>, Return on Assets (ROA)<sup>11</sup>, Net Profit Margin (NPM)<sup>12</sup> and Growth in Fixed Assets<sup>13</sup>. The three indicators of OP, Turnover, EBIT and Fixed Assets are examined using the change models, while the other two ROA and NPM are examined using level models. These are shown in table 4.

**(Insert Table 4 here please)**

The abnormal operating performance defined earlier is expressed as follows:

$$AOP_{i,t}^L = P_{i,t} - CP_{i,t}^j \quad (11)$$

In equation 11,  $P_{i,t}$  is the level of operating performance of the sample utility company  $i$  at time period  $t$ ;  $CP_{i,t}^j$  is the mean level of operating performance of the matching portfolio for firm  $i$  at time  $t$  and  $j$  refers to different comparison groups used in this study,  $j=1,2$  (1=size, 2=market to book ratio).  $AOP_{i,t}^L$  is the abnormal OP of firm  $i$  at time  $t$ .

<sup>9</sup> Extant literature documents that evaluation of operating performance of sample firms with matched controlled firms can be affected not only by the takeover but also by a host of other factors (see Sharma and Ho, 2002). This problem has been addressed by selecting those control firms that were not engaged in M&A over 3 year period before the acquisition as recommended by Barber and Lyon (1996) and Loughran and Ritter (1997).

<sup>10</sup> This study has taken Earnings before Interest and Tax (EBIT) as proxy for cash flow.

<sup>11</sup> Return on Assets (ROA) is defined as EBT divided by total book value of assets.

<sup>12</sup>  $NPM_{i,t}$  is defined as the relationship between the level of annual EBT and Turnover for firm  $i$  at time  $t$ .

<sup>13</sup> Jung et al (1996) in the context of equity issuance has measured Growth in Fixed Assets as a proxy for managerial overconfidence. Following similar argument it can be postulated that if sample firms' growth in fixed assets are lower than control benchmark-portfolio then hubris or managerial overconfidence can be concluded as one of the motives behind M&A.

The abnormal ‘change type’ OP for equity issuers is defined as the difference between the annual changes in the operating performance of the sample firm and that of the matching portfolio:

$$AOP_{i,t}^C = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t}} - \frac{CP_{i,t}^j - CP_{i,t-1}^j}{CP_{i,t-1}^j} = \Delta P_{i,t} - \Delta CP_{i,t}^j \quad (12)$$

$AOP_{i,t}^C$  is the abnormal OP of firm  $i$  at time  $t$ ;  $P_{i,t}$  and  $P_{i,t-1}$  are the performance of sample firms at time  $t$  and  $t-1$  respectively and  $CP_{i,t}^j$  and  $CP_{i,t-1}^j$  denote the performance of control portfolio for firm  $i$  at time  $t$  and  $t-1$  respectively. The estimation of statistical significance of the median-operating performance difference between sample of M&A in the utilities sector and matching portfolio is verified by calculating Wilcoxon signed-rank sum test.

The review of studies in table 2 shows mixed evidences of OP under both cash flow and earnings based measures of performance. The following hypotheses have been developed in the context of post-merger OP.

H2a: Post-merger OP growth in turnover is lower than that of the control portfolio.

H2b: EBIT of sample utility firms is lower than that of the control portfolio.

H2c: ROA of sample utility firms is lower than that of the control portfolio.

H2d: Net profit margin of sample utility firms is lower than that of the control portfolio.

H2e: OP measured in terms of growth in fixed assets is lower than that of the control portfolio.

#### 4. Results & Discussion

##### 4.1 Results on short run announcement period performance

Panel A of tables 5 and 6 show the mean abnormal returns and average cumulative abnormal returns of the acquirer firms. The results show that acquirer shareholders have earned negative abnormal returns following M&A announcement and most of these are significant at one percent level. On the other hand the target shareholders have earned positive announcement period returns and again these results are significant at one percent level. These results are consistent with empirical evidences obtained in other non-utility sectors. Positive target returns have also been reported by Kinatader et al. (2017). In addition, consistent with Datta et al. (2013), this study showed that target gains were far lower than that reported in non-regulated sectors. Datta et al. (2013) attributed this to the fact that public utilities are local monopolies and remain on the regulatory and political radar that lowers risk and also generates a low stable stream of revenue.

**(Insert Tables 5 and 6 here please)**

#### *4.2 Motives for Utilities M&A*

The results from combined gain shown in table 7 indicate that synergy is the predominant motive behind M&As of European utilities. This is evidenced by positive median combined gain in the eleven days event window surrounding the announcement date and this is significant at five percent. Synergy is also confirmed by the evidence that 61% of total gain is positive.

**(Insert Table 7 here please)**

Panel A of table 8 provides the results of the regression, target gain =  $\alpha + \beta \text{total gain}$ , for the entire sample as well as for the subsample of positive and negative total gain. For the full sample  $\beta$  is positive (0.092,  $t = 3.6$ ) and significant at 1%.  $\beta$  is also



positive (0.37,  $t = 5.9$ ) and significant in the positive total gain subsample. The result in table 7 and panel 8 of table support the hypothesis H1a.

**(Insert Table 8 here please)**

Panel B of table 8 shows no statistically significant relation between target gain and acquirer gain and hence cannot lend support to any of the hypotheses in section 3.4.

None of the  $\beta$  coefficients of panel B of table 8 are statistically significant. Hence simultaneous presence of synergy and hubris cannot be confirmed.

Since hypothesis 1a is accepted, which implies synergy motive, it suggests that M&A in utility sectors occur to generate efficiency, particularly, operating efficiency. The finding that synergy motive drives utility M&As may be explained by the deregulation which occurred in 1990s. Deregulation allows the removal of barriers to merger thereby facilitating the speed of merger transaction leading to cost reduction at given point in time (static synergy). Another plausible explanation for this finding may be due to the pooling of management resources (one head office instead of two), achieving revenue enhancement through marketing and purchasing synergies (greater bargaining power), economies of scale in production leading to cost reductions, and avoidance of duplication of production and other activities.

*4.3 Operating Performance*

The results in table 9 suggest that post-merger OP is negative and significant across all the five accounting indicators matched by industry, size and book to market ratio. This lends support to all our hypotheses from 2a to 2e. The results suggest that although synergy has been found as the predominant motive behind M&A of the

sample of European utilities however the synergy gains have not been realised in the long-term post-merger period.

[Insert Table 9 please]

These results are consistent with Becker-Blease et al (2008) and Datta et al. (2013) who reported negative post-merger abnormal returns using Buy and Hold Abnormal Returns technique (BHAR) in utility sectors. This result is also consistent with extant literature in other sectors that are reviewed in table 2. The negative post-merger OP can also be attributed to the lack of prior experience of the European companies to operate and integrate with other utilities. This point has also been raised by Datta et al. (2013), Bertunek et al (1993) and Ray and Thompson (1990).

## 5. Conclusion

The aim of this study was to examine the motives and post-merger OP of M&As of European utilities. Two different methods have been applied to determine the motives behind M&A. The results from the combined gain method reported that the mean total *CAR* is positive and statistically significant suggesting that synergy motive drives M&A in the utility sector. The presence of synergy is also reinforced in the regression results that show a significant positive correlation between target gain and total gain for the entire sample as well as in the subsample of positive total gain. The synergy motive might have emanated from deregulation that removed the barriers for the utility companies to enable these firms to embark on takeovers at relatively lower transaction costs as argued by Leggio and Lien (2000) and Becker-Blease et al. (2008).

The results of post-merger operating performance however reveal that synergy gains have not been realized by the sample of utility companies in the three-year post-merger period following M&A. The negative post-merger operating performance is consistent with the findings of Datta et al. (2013) following M&A of European utilities and Becker-Blease et al. (2008) in the context of M&A of the US electricity sector. Both of these studies reported negative long run post-merger shareholder returns.

The negative post-merger operating performance might suggest that if synergies existed in M&A of utilities they were passed to other industry stakeholders. For instance, if mergers bring in lower prices, then that might be beneficial to consumers. However further research is required to support this argument in the context of M&As of European utility sectors.

The poor post-merger OP of the utility sectors could also be due to the characteristics of the utility sectors themselves. Utility sectors are marked by some distinct economic characteristics (Vickers and Yarrow, 1988; Armstrong et al., 1994). Most of these sectors supply their end product through a fixed network and are often labelled as network industries with low price elasticity. Many aspects of these sectors like transmission and distribution have natural monopoly conditions like the costs of wires (for fixed line telephones and electricity) and pipelines (for gas and water) are sunk costs and it would be inefficient to have competing networks. Armstrong et al. (1994) postulated that duplication of these networks would be a wasteful expenditure for the economy. From our results it can be interpreted that although synergy motive has been identified as the cause of these mergers but the unique characteristics of these sectors, particularly the natural monopoly feature, did not lead to post merger synergy in terms of positive post-merger OP.

Negative post merger operating performance signals that utilities M&As could have a potential detrimental effect upon maintenance of standards of performance and appropriate investment in infrastructure improvement. Hence it bears important policy implications as in future antitrust/competition authorities should be more vigilant before approving utility mergers. Overall the findings of this study have significant policy implications both from the perspective of corporate governance and economic regulations.

Moreover, it is important to point out that the focus of this paper was to examine three main motives and how they influence operating performance rather than the general motives of M&A hence readers should bear this in mind in their interpretation of the results. We suggest that, future studies in utility sector should utilise all motives for M&As to provide a more holistic understanding of the reasons for utility M&As.

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**Table 1****Relationship between the Target and Total gain; Acquirer and Total gain**

	<i>Target gain and total gain</i>	<i>Target gain and acquirer gain</i>
<i>Efficiency or synergy</i>	+	+
<i>Hubris (winner's curse, overpay)</i>	0	-
<i>Agency or Managerialism</i>	-	-

Source: Berkovitch and Narayanan (1993)

Table 2

<i>Study; sample period</i>	<i>Market</i>	<i>Sample size</i>	<i>Control</i>	<i>Accounting measures</i>	<i>Statistics used</i>	<i>Increase or decrease post operating performance</i>
Rao- Nicholson (2016); 2001-2012	ASEAN countries	57	Industry, size and pre- performance	ROA, Sales margin,	Change and Regression	No significant change
Reddy et al (2013); 2000-2005	India	Small sample	Industry	Profitability, Financial Structure, Liquidity, Turnover, Market Growth and Valuation Ratios	Cylinder model	Superior performance in the post-merger period for both manufacturing and services sectors
Bertrand and Betschinger (2012), 1999-2008	Russia	609	Non-acquiring firm	Pre-tax cash flow/BV assets	Other	Decrease

Papadakis and Thanos (2010); 1997-2003	Greece	50	Industry	ROA/BV	Change	No significant change
Kumar (2009); 1999-2002	India	30	Industry	Combined measure of pre-merger profitability, asset turnover and solvency	Change model	No change
Dutta and Jog (2009); 1993-2002	Canada	1300	Industry, size and pre-performance	Pre-tax cash flow/BV of assets	Change and Regression	No significant change
Pillania et al (2008); 2003	India	74	None	Working capital, Operating profit, Profit before tax, ROE, EPS, debt to equity ratios	Change	Increase
Mantravadi and Reddy (2008); 1991-2003	India	118	None	6 different financial and operating ratios	Change	Decrease
Yen and Andre (2007); 1997-2001	11 countries	287	Industry, Size ROA	Pre-tax operating cash flow (EBITDA)	Regression, change model	Non-linear relationship between concentrated ownership and post-acquisition operating performance

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Kruse et al (2007)	Japan	69	Industry, size	Pre-tax cash flow/MV, Pre-tax cash flow/ assets	Change	Increase
Martynova et al (2007); 1997-2001	Europe	155	Industry, size and pre-performance	Adjusted Pre-tax cash flow/BV of assets; Adjusted Pre-tax cash flow/Sales	Change and Regression	No significant change
Pazarkis et al (2006); 1998-2000	Greece	50	None	Profitability, Liquidity and Solvency Ratios	Change	Decrease
Cosh et al (2006); 1985-1996	UK	363	Industry and profitability	Profit by book assets, profit by sales, profit by market value, cash flow by book assets, cash flow by sales, cash flow by market value of assets	Change model	Positive relationship between CEO ownership and post takeover performance.
Powell and Stark (2005); 1985-1993	UK	191	Industry median and firms matched on industry, size and pre-operating performance	Operating cash flow and pre-depreciation profit	Regression	No significant change

characteristics.

Rahman and Limmack (2004); 1988-1992	Malaysia	94 acquirer firms and 113 target firms	Industry matched for complete sample and size matched for acquirer firms	Ratio of operating cash flow to operating assets	Regression and Change	Increase
Yeh and Hoshino (2002); 1970-1974	Japan	86	Industry	ROA, ROE, Sales growth, Employment Growth	Other	Decrease
Heron and Lie (2002); 1985-1997	US	859	Industry adjusted	Operating Income/Sales	Change and Regression	Increase
Sharma and Ho (2002); 1986-1991	Australia	36	Industry and asset size	ROA, ROE, profit margin, cash flow/sales, EPS, cash flow/no. of shares, cash flow/total assets, cash flow/average shareholders	Change and Regression	No significant change



equity

Ghosh (2001); 1981-1995	US	135	Industry, Size, pre-performance industry	Pre-tax cash flow/MV of assets	Change and Regression	No significant change
Pawasker (2001); 1992-1995	India	36	Industry, size	Pre-tax cash flow/Net assets	Other	Decrease
Linn and Switzer (2001); 1967-1987	US	413	Industry	Pre-tax cash flow/MV of assets	Change	Increase

**Table 3**

**Distribution of M&A of European utility companies across different utility sectors and country of the acquirer firms**

Country\Sector	Electricity	Gas	Water	Telecom	Total
Belgium	3				3
Denmark				3	3
France	2		12	4	18
Finland	7			3	10
Germany	23	2		3	28
Greece				1	1
Italy	2			6	8
Netherlands				1	1
Norway				1	1
Portugal	2				2
Russian Fed	2			2	4
Spain	26	1	1	10	38
Sweden	2			7	9
Switzerland	1			4	5
UK	16	6	6	13	41
Total	86	9	19	58	172

Table 4: Models of abnormal operating performance

This table reports the models of expected operating performance and the related accounting measures. Following Barber and Lyon (1996), the operating performance are estimated using both ‘level’ and ‘change’ type models that measures the performance differential between sample M&A European utilities and corresponding control benchmark portfolio. Models 1,2,3 are used to capture relative annual changes in operating performance for the sample M&A or  $AOP_{i,t}^C = \Delta P_{i,t} - \Delta CP_{i,t}^j$ ; where  $AOP_{i,t}^C$  is the abnormal operating performance for sample firm  $i$  at time  $t-1$  to  $t=0$  and  $\Delta CP_{i,t}^j$  is the annual change in operating performance for control portfolio benchmark group  $j=1,2,3$  that represent size, market to book value and industry respectively. Similarly, models 4,5,6, measure the difference between level of operating performance at discrete times between sample European utilities and corresponding matching portfolio groups,  $j=1,2,3$ .

Panel A Models of abnormal operating performance		
Model	Models of excess operating performance	Comparison groups
1	$AOP_{i,t}^C = \Delta P_{i,t} - \Delta CP_{i,t}^1$	Difference between annual change in sample firms' performance and the annual change in matching size portfolio benchmark
2	$AOP_{i,t}^C = \Delta P_{i,t} - \Delta CP_{i,t}^2$	Difference between annual change in sample firms' performance and the annual change in matching market to book portfolio benchmark
3	$AOP_{i,t}^L = P_{i,t} - CP_{i,t}^1$	Difference between annual change in sample firms' performance and the annual change in industry performance
4	$AOP_{i,t}^L = P_{i,t} - CP_{i,t}^2$	Level difference to matching size portfolio
5	$AOP_{i,t}^C = \Delta P_{i,t} - \Delta CP_{i,t}^3$	Level difference to matching market to book portfolio
6	$AOP_{i,t}^L = P_{i,t} - CP_{i,t}^3$	Level difference to industry performance
Panel B Accounting measures of operating performance		
Accounting indicators		Description
Growth of Turnover		Growth is measured in terms of increase in the reported turnover between t-1 and t=0, or

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	This is measured as the increase in the reported earnings after interest and before tax figures between t-1 and t=0 or $\Delta EBT_{i,t}$
Growth in Earnings before Interest and Tax	$= (EBIT_{i,t} - EBIT_{i,t-1}) / EBIT_{i,t-1}$
	Defined as the $EBT_{i,t}$ divided by the book value of assets of company $i$ at time $t$ , or $ROA_{i,t} = EBT_{i,t} / BV_{i,t}$
Return on Assets (ROA)	Defined as the ratio of the annual EBT and the level of
Net profit margin	Turnover for firm $i$ at time $t$
	Increase in the reported total fixed assets of company $i$
Growth in Fixed Assets	between time t-1 and t=0

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**Table 5 Average abnormal return of the acquirer and target firms based on the OLS market model benchmark**

This table reports the average AR for the entire sample of completed mergers and acquisitions (M&A) of the European utilities from 1990 to 2012. Panels A and B reports the eleven days acquirer *AARs* and target *AARs* surrounding the event date respectively. The *AARs* are calculated for 150 acquirer firms and 144 target firms whose stock prices were available. The *OLS* market model is expressed as follows:  $R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$   $R_{m,t}$  is the return on the equally weighted market portfolio on day  $t$ ;  $R_{i,t}$  is the return for security  $i$  on day  $t$ . In the *OLS* market model the expected return for each security for both the target and acquirer portfolios are obtained by estimating  $\alpha_i$  and  $\beta_i$ . This is done by regressing security returns  $R_{i,t}$  on the market return  $R_{m,t}$  for the estimation period. The expected return  $E(R_{i,t})$  under the *OLS* market model is given by  $E(R_{i,t}) = \hat{\alpha} + \hat{\beta}R_{m,t}$ . The abnormal returns for each security are calculated as follows:

$AR_{i,t} = R_{i,t} - E(R_{i,t})$ . The average abnormal returns is calculated as follows:  $Average\ AR_t = \frac{1}{n} \sum_{i=1}^n AR_{i,t}$ .

The significance of the abnormal returns is tested by *t*-statistic. \*\* indicates significance at 1% level. The fifth column shows the percentage of abnormal returns that were positive on each day in the 11 days event window.

Panel A: Acquirer mean AR based on OLS market model				
Day	N	AR	t- statistic	%(+)
-5	150	-0.016**	-7.18	42
-4	150	-0.018**	-7.97	43
-3	150	0.0003	0.39	47
-2	150	-0.002	-0.83	45
-1	150	-0.001**	-0.65	47
0	150	-0.006**	-2.52	53
1	150	0.002**	0.92	60
2	150	0.001	0.37	55
3	150	-0.001	-0.31	57
4	150	-0.0004	-0.20	55
5	150	-0.0016	-0.75	52
Panel B: Target mean AR based on OLS market model				
Day	N	AAR	t- statistic	%(+)
-5	144	-0.0012	-0.45	37
-4	144	0.001	0.43	60
-3	144	0.0075**	2.79	56
-2	144	0.0089**	3.31	55
-1	144	0.0111**	4.13	59
0	144	0.054***	5.17	66
1	144	0.012**	4.47	37
2	144	0.0019	0.69	47
3	144	0.0027	1.01	54
4	144	0.0017	0.62	55
5	144	-0.0040	-1.51	55

**Table 6 Average cumulative abnormal returns (*CAR*) of the acquirer and target firms based on the OLS market model benchmark**

This table reports the average cumulative abnormal returns (*CAR*) of the portfolio of acquirer (Panel A) and target firms (Panel B) for different event windows. The average *CAR* represents the entire sample of completed M&A of the European utility companies from 1990 to 2012. The M&A announcements are identified from SDC Mergers and Acquisitions Database. The average *CAR* for an event window ( $t_1$ ,  $t_2$ ) is given as follows:

$CAR_{-10,10}^i = \sum_{t=t_1}^{t_2} AR_{i,t}$ . The significance of average *CAR* is tested by *t*-test. \*and \*\* indicates the significance at 5% and 1% respectively.

Panel A: Acquirer average <i>CAR</i> based on OLS market model		
Interval	<i>CAAR</i>	t-statistic
(-10,+10)	-0.14**	-2.9
(-5,+5)	-0.006**	-6.05
(-1,+1)	-0.005**	-3.8
(0,+1)	-0.004*	-2.25
(-1,0)	-0.007**	-4.5
0	-0.006*	-2.52
Panel B: Target average <i>CAR</i> based on OLS market model		
Interval	<i>CAAR</i>	t-statistic
(-10,+10)	0.094**	6.24
(-5,+5)	0.086**	7.9
(-1,+1)	0.076**	8.8
(0,+1)	0.065**	3.9
(-1,0)	0.064**	3.5
0	0.053**	2.6

**Table 7: Total gain over the event window (-10,+10)**

Gain to	Mean	Median	Min	Max	%Positive
Total	-106.40 (-0.207**)	46.09 (1.47*)	-28591.5	10493.23	61
Target	303.61 (-2.52)	20.29 (-2.85**)	-1006.2	7444.49	68
Acquirer	-410.02 (-0.87)	0.003 (1.2)	-27585.31	9885.73	51
Combined gain as %of pre-offer market value of target and acquirer firms	-0.007%     (-0.43)	0.01	-1.06	0.20	61

To evaluate combined gains both the target and acquirer returns are required for an individual deal. So only those pair of deals were taken where both the target and acquirer share price were available. This has reduced the number of deal size to 75.

**Note:** \* denotes statistical significance at 5 percent level and \*\* denotes significance at 1%

**Mean and median in £ million; (N=75)**



**Table 8 Relation between target/total gain and target/acquirer gain**

Notes:\*\* denotes significant at 1%; and \*significant at 5%

Sample	Size	$\alpha$	$\beta$	F	$R^2$	
<b>Panel A: Target gain =<math>\alpha</math> + <math>\beta</math>(Total gain)</b>						
Full Sample	75	322.4**	0.092**	12.7	0.15	
		2.9	3.6			
Positive Total gain subsample	46	74.85	0.370**	34.61**	0.458	
		0.48	5.9			
Negative Total gain subsample	29	85.96	0.024	1.712	0.064	
		0.75	1.3			
<b>Panel B: Relationship between Target and Acquirer gains</b>						
Sample	Size	$\alpha$	$\beta_1$	$\beta_2$	F	$R^2$
Full Sample: Target gain = $\alpha$ + $\beta_1$ (Acquirer gain)	75	339.17**	0.04	—	1.97	0.028
		2.7	1.4			
Positive Total gain subsample: Target gain = $\alpha$ + $\beta_1$ (Acquirer gain) + $\beta_2$ (Acquirer gain)	46	370.47	0.137	134.73	0.663	0.032
		1.5	1.2	0.29		
Negative Total gain subsample: Target gain = $\alpha$ + $\beta_1$ (Acquirer gain)	29	69.450	0.016	—	0.674	0.026
		0.590	0.82			

Table 9 Post merger abnormal operating performance for the sample of utility firms

	Industry-matched	Size-matched	B/M Matched
Growth in Turnover ( $A\Delta T_{i,t}^C = \Delta T_{i,t} - \Delta T_{i,t}^J$ )			
t=0	-9.21%(10.5**)	-9.15%(10.6**)	-9.76%(10.46**)
t+6	-5.43%(11.19**)	-5.72%(11.25**)	-5.88%(15.17**)
t+12	-4.43%(11.32**)	-4.26%(11.55**)	-4.80%(11.25**)
t+18	-5.37%(12.08**)	-5.43%(12.24**)	-5.67%(11.14**)
t+24	-7.32%(12.89**)	-7.24%(12.92**)	-7.48%(12.9**)
t+30	-10.41%(11.20)	-10.28%(11.17**)	-10.57%(11.8**)
t+36	-13.28%(11.10)	-13.12%(11.04**)	-13.36%(11.08**)
Growth in Earnings Before Tax ( $A\Delta EBT_{i,t}^C = EBT_{i,t} - EBT_{i,t}^J$ )			
t=0	-3.68%(11.56**)	-3.52%(11.39**)	-3.87%(12.20**)
t+6	-4.38%(12.39**)	-4.46%(12.35**)	-4.4%(16.28**)
t+12	-2.39%(12.81**)	-2.35%(12.83**)	-2.3%(13.4**)
t+18	-3.35%(12.06**)	-3.36%(12.02**)	-3.4%(12.58**)
t+24	-2.50%*(11.92**)	-2.47%(11.96**)	-2.5%(11.38**)
t+30	-3.40%(11.38**)	-3.45%(11.46**)	-3.6%(12.8**)
t+36	-7.26%(13.01**)	-7.98%(12.99**)	-7.5%(13.9**)
Net Profit Margin ( $A\Delta NPM_{i,t}^C = \Delta NPM_{i,t} - NPM_{i,t}^J$ )			
t=0	-4.72%(10.66**)	-4.78%(10.76**)	-4.44% (10.23**)
t+6	-2.3%(11.30**)	-2.1%(9.29**)	-1.7%(14.31**)
t+12	-5.18%(10.66**)	-5.14%(10.61**)	-5.2%(10.77**)
t+18	-4.73%(10.05**)	-4.67%(9.98**)	-4.12%(11.10)

t+24	-5.78%(11.15**)	-5.56%(9.68**)	-5.9%(11.07)
t+30	-1.75%(12.23**)	-1.67%(11.54**)	-1.5%(12.33**)
t+36	-2.85%(9.89**)	-2.76%(10.01**)	-2.9%(9.71**)
Return on Assets			
t=0	-33.17%(10.56**)	-32.13%(10.61**)	-32.63% (10.53**)
t+6	-37.45%(10.66**)	-37.24%(10.76**)	-37.8%(14.8**)
t+12	-34.8%(11.85**)	-34.7%(11.96**)	-38.4%(10.78**)
t+18	-27.18%(10.91**)	-27.12%(10.84**)	-27.2%(11.17**)
t+24	-37.76%(11.56**)	-37.96%(11.77**)	-37.23%(11.06**)
t+30	-35.34%(11.20**)	-35.24%(11.26**)	-35.4%(11.46**)
t+36	-20.16%(10.45**)	-20.19%(12.06**)	-20.13%(9.80**)
Growth in Fixed Assets			
t=0	-231.6%(10.33**)	-239.3%(10.79**)	-242.16%(9.71**)
t+6	-257.89%(12.26**)	-258.76%(11.04**)	-258.9%(13.5**)
t+12	-270.28%(10.04**)	-270.25%(10.37**)	-270.3%(9.94**)
t+18	-243.89%(10.07**)	-243.99%(10.02**)	-243.7%(9.64**)
t+24	-230.05%(12.33**)	-231.33%(12.37**)	-231.4%(11.54**)
t+30	-156.35%(12.82**)	-157.21%(13.64**)	-157.59%(12.60**)
t+36	-126.83%(10.25**)	-126.51%(10.98**)	-126.71%(10.85**)

This table reports the Operating Performance of the M&A companies which is measured as the difference M&A companies and matching portfolio based on industry, size and book to market ratio. Statistical significance is determined by calculating Wilcoxon Sign Rank Test that tests the null hypotheses that the samples are drawn from the same distribution. Statistical significance are reported in the parentheses

\*indicates significance at 5%

\*\* indicates significance at 1%