SPILLOVER EFFECTS OF MERGER AND ACQUISITION ANNOUNCEMENTS ON COMPETITORS WITHIN THE WIND ENERGY AND SOLAR ENERGY INDUSTRIES

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Overview

In this work, effects of mergers and acquisitions (M&A) in the wind and solar energy industry on a constant targets' peer group are examined. The event study methodology is used based on the ordinary least square (OLS) model. The data is classified into panels of companies and clusters of transactions and the significance of the cumulative average abnormal returns (CAAR) is tested. The results obtained indicate that there are different relevant effects present. While in the wind energy industry, significant effects within the US and European markets are noticeable, in the solar industry deals in Asia tend to globally affect stock price within the industry. Throughout the industries, the market generally does not mainly react on the event date, but rather around the specific dates.

While there is a growing concern for a shift towards energy sources that will not dwindle and that are not environmentally damaging, fossil-fuels such as coil, oil or natural gas are still the most widely used types of energy sources. As costs for renewable are now falling due to maturing technology, new sources of power generation can be expected to become accessible and widespread. To respond to wider stakeholders' expectations, power and utilities companies are making significant changes in the way they use technology. However, while many companies in this industry recognise the need to change their strategy and business model, most have just taken the first step towards this direction. Interestingly, strong environmental management and weak environmental management, as indicated by environmental performance award and crises, have shown to deliver positive, respectively negative returns. Therefore, there are inherent incentives for companies outside the renewable energy sector to engage in M&A activities to capture these so-called "green premiums". Another aspect which also raised our interest for renewable energy firms is the existence of climate externalities: producing environmentally friendly energy does not only benefits the owners of firms, but also has some social benefits.

In the light of the growing M&A activity in the renewable energy sector, and particularly for the wind and solar energy industries, this work investigates the effects of M&A transactions on the target's peers' stock returns instead of only focusing on the acquirer´s firm value.

Methods

For the study, M&A transactions in the timeframe from 2003 to 2017 are observed. To ensure a certain relevance of a transaction for the whole industry and therefore a potentially observable reaction, the deal value is set to a minimum threshold of USD 50 million for all observations. Very small transactions might not be relevant on a global level. In total 9 companies and 13 deals are examined for the wind energy industry, while 10 companies and 8 deals are examined for the solar energy industry.

To study effects of M&A activity on other market participants, an event study is a commonly used econometric tool. This paper follows: definition of event, definition of selection criteria, estimation of normal and abnormal returns, calculation of cumulative average abnormal returns and statistical testing of results.

Results

Wind Energy and Solar Energy

Table 1 and 2 present the aggregated data on wind and solar energy respectively split into three panels: A global panel, including all competitors in the peer-group, a US / Europe panel, including all US / European based competitors and an Asia panel, including all Asian based competitors. As shown in the respective columns, the event window is split into four different cases to distinguish long-term and short-term effects. The rows separate three different deal-specific cluster, showing deals in the US / Europe, deals in Asia as well as all deals in distinct categories.

Table 1: Wind energy, Fisher's combined probability test X^2 and Cumulative Abnormal Returns

	Wind	Global Panel				US / Europe Panel				Asia Panel			
		[-10;+15]	*[-5;+5]*	*[-1;+1]*	*[-1;+5]*	*[-10;+15]*	*[-5;+5]*	*[-1;+1]*	*[-1;+5]*	*[-10;+15]*	*[-5;+5]*	*[-1;+1]*	*[-1;+5]*
Deal cluster	*Global*	***38,6280****	*26,4397*	*21,3692*	*20,1442*	***44,8833****	*18,7269*	*23,1603*	*25,9154*	*24,2841*	*21,1092*	*27,3376*	*15,3866*
		(0,0498)	(0,0233)	(0,0118)	(0,0133)	**(0,0614)**	(0,0202)	(0,0133)	(0,0161)	(0,0691)	(0,0381)	(0,0277)	(0,0202)
	US / Europe	***34,9219*****	*17,8673*	*13,6296*	*12,4554*	***38,8965*****	*12,6836*	*16,2558*	*20,5564*	*19,9686*	*14,5981*	*22,8010*	*10,9871*
		(0,0618)	(0,0240)	(0,0102)	(0,0121)	**(0,0742)**	(0,0209)	(0,0136)	(0,0173)	(0,0750)	(0,0389)	(0,0306)	(0,0198)
	Asia	*3,7061*	*8,5723*	*7,7395*	*7,6887*	*5,9867*	*6,0433*	*6,9045*	*5,3589*	*4,3154*	*6,5110*	*4,5366*	*4,3994*
		(0,0229)	(0,0218)	(0,0152)	(0,0160)	(0,0324)	(0,0188)	(0,0128)	(0,0135)	(0,0559)	(0,0365)	(0,0213)	(0,0209)

Table 2: Solar energy, Fisher's combined probability test X^2 and Cumulative Abnormal Returns

	Solar	Global Panel				US / Europe Panel				Asia Panel			
		[-10;+15]	*[-5;+5]*	*[-1;+1]*	*[-1;+5]*	*[-10;+15]*	*[-5;+5]*	*[-1;+1]*	*[-1;+5]*	*[-10;+15]*	*[-5;+5]*	*[-1;+1]*	*[-1;+5]*
Deal cluster	*Global*	***31,5520****	*22,7933*	*6,3383*	*18,0103*	***27,2150****	*21,9096*	*6,5326*	*14,0231*	***25,1832****	*10,8304*	*6,6639*	*12,6809*
		(0,0873)	(0,0704)	(0,0287)	(0,0554)	**(0,1354)**	(0,1051)	(0,0464)	(0,0707)	**(0,0889)**	(0,0523)	(0,0412)	(0,0537)
	US / Europe	*9,9535*	*2,2138*	*2,5064*	*3,2612*	*7,3000*	*2,6850*	*2,1111*	*2,0734*	*8,2122*	*2,5050*	*3,5366*	*5,2866*
		(0,0784)	(0,0282)	(0,0396)	(0,0400)	(0,1142)	(0,0528)	(0,0647)	(0,0510)	(0,0844)	(0,0386)	(0,0606)	(0,0673)
	Asia	***21,5985****	***20,5794****	*3,83189*	*14,7491*	***19,9150****	***19,2245****	*4,42146*	*11,9496*	***16,9710****	*8,32538*	*3,12729*	*7,39424*
		(0,0926)	**(0,0957)**	(0,0222)	(0,0647)	**(0,1481)**	**(0,1364)**	(0,0355)	(0,0825)	**(0,0916)**	(0,0605)	(0,0296)	(0,0455)

a. Italic numbers represent Fisher's combined probability test X^2
b. *, ** and *** represent the rejection of Fisher's combined probability test H0 at the 90%, 95% and 99% significance levels
c. ( ) represent the Cumulative Abnormal Returns

Wind Energy Compared to Solar Energy

Comparing results from wind and solar energy tables, it is noticeable that effects in the wind market are primarily resulting from European deals, mainly affecting competitors within the same Panel. On the opposite, in the solar sector, deals in the Asian market appear to dominate, however affecting not only Asian competitors but rather even more extreme US and European competitors.

Additional to the general market leading position in the industries, the results indicate more intense intercontinental competition in the solar market considering the high relevance of Asian deals on the European market.

Further considering CARs in the two different sectors, the solar industry clearly shows higher CARs. Especially interesting in this context is the insight that US and European competitors tend to be more heavily affected than their Asian peers.

Conclusions and Discussion

This paper examines spillover effects of M&A announcements in the solar and wind energy sector performing an event study, with a focus given on the target's peer group. The results obtained indicate that there are different relevant effects present. While in the wind energy industry mainly deals in US/Europe affect the market – thereby primarily in US and Europe, in the solar industry deals in Asia lead to global stock price movements in the industry. It is noteworthy that throughout the industries the market generally does not mainly react on the event date, but rather around the specific dates

Even though the results show some significance, the results of the event study might suffer from companies that hold a large multi-product portfolio or if there is a large product differentiation, for instance in terms of quality and technology, on the market. In addition, the benchmark index used for estimating the normal returns might fail to explain the actual normal returns for each company and therefore bias the abnormal returns.

As far as our work solely focuses on wind and solar energy, an interesting follow-up study could examine additional industries in the renewable energy sector replicating the methodology used in this paper.