Study of Patterns and Effects of M&A in Renewable Energy Sector Using Event Study Analysis

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Overview

M&A activity within the renewable energy sector surged to an increase of over 70 percent throughout 2010 on the 260 deals completed in 2009 and this trend has continued in 2011(KPMG, 2011). Especially, China saw the highest transaction value of 5.4 billion USD in the last 12 months and among regions, Asia was the clear leader at 8.9 billion USD(IMAP, 2010). This means Asia pacific will take a major role in M&A activities of renewable energy market and therefore we need in-depth analysis of an effect of M&A activities to suggest appropriate strategies and policy implications.

In this paper, we study the impact of the types of mergers and acquisitions (M&A) on renewable energy companies' value using an event study analysis. Some renewable energy companies are doing business limited in only one energy resources but the other are doing business that handle various resources. We expected that an effect of M&A between the companies treating a same resource (called horizontal merger) will be different from those of M&A between the companies treating different resources (called conglomerate merger). To compare these effects we used the event study analysis (Kane, E. J., 2000).

Event study is a statistical method to assess the impact of an event on the value of a firm using stock price. Wan, K. and Wong, K. (2009) find that political barrier resulted in a substantial decline in the market value of US oil companies. Stotz, O. et al (2010) review a positive market reaction to the public announcement in both the short and long term using 689 open-market purchases of public equity by private equity investors (PEIs). Both studies use an event study methodology and many other studies use this methodology to evaluate the value of companies after an event including M&A. However, the patterns and effects of M&A in renewable energy sector hasn't studied yet.

The data employed in this paper is renewable companies' M&A cases mainly reported in U.S., China and India. We classify the data into two groups by the type of M&A. Basic data is secured through SDC Platinum Database which provides authoritative coverage of global equity issues, M&A, syndicated loans, private equity, project finance, and more - giving the information such as amount of cash, announce date and the transaction size.

Methods and data

Generally event study goes through the 6-step process (Khotari and Warner, 2006).

(1) Event Definition: Based on the point of event occurrence, define the analysis period. In this study the event will be M&A deals in the renewable energy sector and the event window will be for 2 weeks off and on.

(2) Sample Selection Criteria: Choose companies related in the event and collect stock returns data of the companies.

(3) Normal and Abnormal Return measure: Normal return is the expected rate of return under normal circumstances and abnormal return is the difference between actual stock return after an event occurs and normal return.

$$AR_{it} = R_{it} - E\left(R_{it} \middle| X_{it}\right) \quad ,$$

where AR denotes abnormal return, R denotes actual return and $E(R)$ denotes normal return. In general there are two ways to model based on X . One is constant-mean-return model which regard X a constant and the other is Market model which regard X an overall stock market return. In this study we use second model that means the companies' stock returns and the overall stock market return maintain a linear relationship with each other (Sim et al, 2010).

(4) Building Market model:

$$R_{it} = a_i + \beta_i R_{mt} + \varepsilon_{it}$$

Where R_i denotes company i's stock return and R_m denotes market return and we use each market's major index such as S&P 500.

(5) Aggregation of Abnormal Returns: Cumulate abnormal returns separated by time within event window to estimate overall effect of the event.

$$CAR_i(t_1, t_2) = \sum_{t_1 \sim t_2} AR_{it}$$

(6) Null hypothesis test: Form a hypothesis that the effects of different M&A types are not different from each other and define t-value as below to verify the statistical significance.

$$t = CAR(t_1, t_2) / [Var(CAR(t_1, t_2))]^{1/2} \sim N(0,1)$$

Expected results

First, both types of M&A show positive effect on companies' value. In the case of horizontal merger that merges within same type of source, as economies of scale achieved the company can expand their business bigger than before. In the case of conglomerate merger that merges within different types of sources, different types of resources play a back up sources to each other so that it makes the company have more secure system.

Second, for the less advanced resources the effect of horizontal merger will show bigger effect because they need to reduce costs urgently and it will be achieved easily by economies of scale.

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