Characteristics of Acquirers and Targets in Domestic and Cross-border M&As

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1. Introduction

Mergers and acquisitions (M&As) have been an active economic activity since the 1980s. They have played an important role in shaping industry structures and economic growth. Important questions that need to be addressed are as follows: Why do firms engage in M&As? What causes M&As? Do M&As create value? How? Economic theory has provided some answers to these questions. For example, mergers create synergies, result in economies of scale, and increase market power. Empirical research has also tried to address some of these questions but failed from giving satisfactory answers. This paper aims to contribute to empirical literature by investigating individual firms’ performance before and after their M&A activities and comparing them to non-participants, that is, firms that do not engage in M&As.

We will paint a complete portrait of the M&A participating firms called M&A participants. In particular, we will explain how M&A participants are different from non-participants and how acquiring firms (called acquirers) and target firms (called targets) are different. Our empirical study has a number of distinguishing advantages compared with the existing literature. First, we use the most recent M&A data and cover a longer time span (1991–2007). Second, we examine a comprehensive set of performance measures, such as size, technology, productivity, and profitability. Third, we examine the difference between domestic M&As and cross-border M&As and explore the role of the economic
development level of the countries where the merging firms belong to. The goal of this paper is not to provide a theory or test any existing theory but to present a set of empirical regularities about acquirers, targets, and non-participants. Results from the present study will enhance our understanding of M&A activities and will be useful for future theoretical studies and empirical investigations. Although we have provided explanations to some of the results, full explanations require extensive reviews of existing theories and introduction of new theories, which are beyond the scope of this study.

Our findings show that compared with non-participants, M&A participants are larger in size [measured in terms of sales, total assets, number of employees, and research and development (R&D) expenditure, respectively]; have better technologies (measured in terms of asset to labor ratio, and R&D expenditure to labor ratio, respectively); have higher productivity (defined as sales per worker); and have higher profitability (defined as total earning). For the participants, acquirers are better than targets in all these performance measures.

Firms participating in cross-border M&As are different and their performance is correlated with the foreign countries' economic development levels. We find that in the pre-merger period, the US firms that acquire foreign firms in the developing countries are significantly better than those that acquire foreign firms in the developed countries.

We also provide a dynamic analysis of firm characteristics and performance, enabling us to see how firms are different from a different perspective. Our general findings are as follows: (i) acquirers’ growth in most performance measures is faster in the pre-merger period than in the post-merger period; (ii) targets’ growth in the pre-merger period and in the post-merger period generally do not differ significantly; (iii) in the pre-merger period, acquirers, targets, and non-participants do not have statistically significant differences in their growth rates with regard to all performance measures; and (iv)
in the post-merger period, their growth rates are not significantly different either. These findings have clear implications on the impacts of M&As. It is important to make it clear that our results are mainly about the *correlations* between the firm performance and the selection of the firms (i.e., as acquirers, targets, or non-participants), but not about *causal effects*. It is important to investigate the causal effects, but which is beyond the scope of any single paper.

Although this study is the first to provide a systematic analysis of M&A firms’ performance, it is closely related to a large literature of empirical studies on M&As. In their survey article, Andrade et al. (2001) point out that mergers occur in waves and have strong clusters by industries. This pattern is observed based on aggregate-level (country and industry level) data and has been explained largely by technological innovations, supply shocks, and deregulations. This line of research has improved our understanding of why and when mergers occur. In contrast, our study uses micro-level (firm level) M&A data to provide a detailed and complete picture of the merging firms. Hence, our study supplements this line of research and enhances our understanding of who engages in mergers. Some studies (e.g., Andrade and Stafford, 2004; Bradley and Sundaram, 2006; and Breinlich, 2008) have also compared acquirers, targets, and non-participants, but they focused on a much smaller set of performance measures than that covered in our study.

In finance literature, there are numerous studies on returns to M&As, as surveyed by Andrade et al. (2001), Bruner (2002) and Betton et al. (2008). This literature is mainly concerned about how M&As affect the acquirers' and targets' stock prices, and whether they generate abnormal profits. In contrast, we compare acquirers, targets, and non-participants based on a set of performance measures and examine the changes in growth rates of those measures from the pre-merger period to the post-merger period. Our analysis allows us to see the impacts of M&As in a broader set of financial aspects.
Although there are several studies on merger impacts using firms’ reported financial data, they were conducted based on different samples of mergers (e.g., different time periods, different industries, different countries, etc.) and different performance measures.\textsuperscript{7} As a result, their findings are hard to compare and are inconclusive. Our study contributes to this line of research, hoping to help reach some conclusions in the future when more studies are available. One advantage of our study is that it uses a newer and larger database to examine a larger set of performance measures.\textsuperscript{8}

Cross-border M&As are one form of foreign direct investment (FDI). Thus, our study also contributes to the FDI literature by showing how the acquirers (investors) are different from the targets in cross-border M&As and how the investors from the same countries (the US, for example) if they invest in developed countries are different from those that invest in developing countries.

The remainder of the paper is organized as follows. We describe our data in Section 2. In Section 3, we provide broad pictures of M&A activities at the aggregate level. Various comparisons of acquirers, targets, and non-participants are presented in Sections 4, 5 and 6. Section 7 provides the concluding remarks.

2. Data

This study is based on the most complete M&A data from Thomson Financial Securities Data Company (SDC). The SDC database includes all M&A deals (both private and public transactions) in the world.\textsuperscript{9} For each deal, SDC reports the date of the transaction, value of the transaction (if available), shares transacted, firms involved, acquirer’s and target’s nations and industries, and many items from the firms’ financial statements. Our study focuses on the period of 1991–2007. Year 1991 was the beginning of a new merger wave that ended in 2002, whereas 2007 was the latest year with a complete record of the world M&A deals in the SDC database at the time when this study began.
One objective of this study is to analyze firms’ pre- and post-merger performance, and thus we need detailed firm-level pre- and post-merger information. Given this intensive data requirement, we focus on the M&As involving US firms because the required data are readily available from Compustat North America. Thus, M&As in our study include the US domestic M&As and cross-border M&As in which either the target or the acquirer is a US firm. Compustat North America includes financial and market information of all US companies that are publicly traded. Data are extracted from these companies’ income statements, balance sheets, statements of cash flows, and other supplementary data sources.

M&As take place in all sectors of an economy. The impacts and patterns of M&As in different sectors can be very different. To obtain clear results, we confine our analysis to the manufacturing sector. Within the manufacturing sector, we further divide firms into various industries following the 1987 version four-digit standard industry classification (SIC) system.

To link firms’ performance with their M&A activities, we construct a new dataset based on the abovementioned databases. In our new dataset, all firms are listed American firms in the manufacturing sector found in Compustat North America. Each firm’s information in our dataset includes the firm’s financial data from 1991–2007, which are downloaded from the Compustat North America, and the firm’s M&A data during the same period, which are downloaded from the SDC database. Our analysis on pre- and post-merger performance is therefore based on and confined to this new dataset.

3. Overview of M&As

In this section, we will describe the general features of M&As. We will examine M&As at the country, industry, and firm level, respectively. Since in this section we do not need firms' performance information, we include all American manufacturing firms, both public and private, from the SDC database.
Merger Waves

To give a general picture of M&As in the 1991–2007 period, we plot the number of M&As (the solid
curve against the left vertical axis) and their values (the dotted curve against the right vertical axis, in
billion US$) in Figure 3-1 on an annual basis. There are two waves of M&As during the period of
1991–2007 in both the number of deals and the value of transactions. The first wave ended in around
2002, and the second wave started in around 2003.12 Both the domestic M&As and cross-border M&As
exhibit a similar pattern.

M&A Distribution across Industries

One stylized fact identified in the literature (e.g., Mitchell and Mulherin 1996; Andrade, Mitchell and
Stafford, 2001) based on M&A data from the earlier years is the strong industry clustering of M&As.
That is, some industries receive far more M&As than others during a given time period. One
explanation for such clustering is that M&As are partly driven by industry-specific shocks (e.g., costs,
demands, or deregulation). This force for M&As implies that if the industry-specific shocks are different
during different time periods, we should expect to see different M&A clusters across industries.

We explore the above possibility using our data. To this end, we divide the manufacturing sector
into 22 industries based on SIC two-digit level and, following Mitchell and Mulherin (1996), derive
M&A distribution according to the targets’ industries.13 Figure 3-2 depicts the distribution based on the
number of M&A deals during the first merger wave (1991–2002) and during the second merger wave
(2003–2007).14 We observe that when focusing on industries within the manufacturing sector, the
industry distributions of M&As in the recent two merger waves are almost identical. There are two
possible reasons for this feature. First, the shocks in those two waves may have been similar; that is, the
merger-inducing shocks that occur in an industry in the first wave occur again in the same industry in
the second wave, and those industries that do not experience many merger-inducing shocks in the first
wave do not experience those shocks again in the second wave. Second, there are common shocks in all
industries (e.g., GDP shocks) in both waves, but some industries are more responsive to the shocks than
others due to the different natures of those industries. For example, firms in some industries adjust their
structures more quickly and drastically than firms in other industries.

Although our observations are based on merger activities of both public and private firms, we also
draw graphs based on public firms only and find that the patterns are almost identical to those in Figure
3-2. While the above industry distributions are derived from the targets’ industries, the results are
similar if we classify M&As by acquirers' industries.

Focusing on public firms' M&As, Andrade et al. (2001) use data from all industries' M&As and
find that the types of industries that made up the waves in the three decades, that is, 1970s, 1980s and
1990s, are tremendously different. This finding is in contrast to our observation that cross-industry
distributions of M&A deals in the two recent waves are similar. One possibility for such different
observations is that we focus on manufacturing sector only while they cover both manufacturing and
services sectors. Another possibility is that the two factors we use to explain our observation above were
not present in the period between early 1970s and middle 1990s.

INSERT Figure 2 here.

4. Comparing Acquirers, Targets, and Non-participants

While there are a large number of empirical studies about the impacts of M&As on both targets and
acquiring firms, why firms engage in M&As remains less understood. Although we do not aim to
provide a direct answer to this M&A-participation question, we believe it is important to understand
how the would-be merging firms are different from the non-merging firms and how the would-be acquirers are different from the would-be targets. In this section, we will provide a series of comparisons among acquirers, targets, and non-participants in many aspects, including firm size, technology, productivity, and profitability. As we need financial data of the non-participants, we confine our comparisons to all publicly listed firms.

Data and Summary Statistics

We are particularly interested in four categories of firm characteristics and performance: (1) size, which includes a firm’s total sales (SALES), total assets (ASSET), number of employees (LABOR), and R&D expenditure (R&D); (2) technology, which includes assets per employee (ASSET/LABOR), and R&D expenditure per employee (R&D/LABOR); (3) productivity, that is, sales per employee (SALES/LABOR); and (4) profitability, which is represented by earnings (EARNING). Note that earning is the earnings before interest, taxes, depreciation, and amortization (i.e., EBITDA, which is the difference between income and cost). We should make it clear that when we say firm A has better performance than firm B, we simply mean that A has higher values in those measures than B, which does not necessarily mean that A is better or more efficient than B.

A number of issues arise when we construct the above performance measures. First, when firm A acquires firm B in a year, we treat A as an acquirer in that year, but when A is acquired by firm C in another year, we treat A as a target in that year. A firm may be an acquirer in some years and a target in some other years. This may not be a bad treatment because the same firm can be very different over time; thus, this may be part of the reason why it is an acquirer at some time and a target at some other time. Second, because it is often a lengthy process to reach an M&A deal, we use a firm’s financial data in the year before the deal to represent the firm’s performance before or at the time of the M&A deal.
This approach has also been adopted by Maksimovi and Philips (2001) and Andrade and Stafford (2004). Alternatively, we can measure a firm’s performance using a five-year average prior to the M&A deal. The results obtained are the same qualitatively as those using one year before the M&A deal and so we just report the result using the one-year lag approach. Third, firms participate in M&As at different times, and thus their performances are affected by the overall economic situation at the time of their M&As. To make those monetary measures comparable over time, we adjust them using GDP, taking 1991 as the base year. Specifically, we multiply each performance value in year $t$ by $\frac{\text{GDP}_{1991}}{\text{GDP}_t}$.

Based on the above classification, we obtain 38846 observations of listed firms, in which 54.61% of them (21215 in number) are firms that never engaged in any M&A during 1991–2007, and the rest (17631) are M&A participants. Among the M&A participants, 56.99% of them (10048 in number) are acquirers in domestic deals, and 3.78% of them (667 in number) are targets in domestic deals, 37.99% of them (6698 in number) are acquirers in cross-border deals, and 1.24% of them (218 in number) are targets in cross-border deals.15

| INSERT Table 4-1 here. |

The summary statistics of all performance measures for the different types of firms and their comparisons are presented in Table 4-1. All nominal measures are in million US$, and labor is in thousand people. Columns (1)-(3) are the means of the corresponding measures. On one hand, acquirers have larger means than targets in all performance measures, and targets have larger means than non-participants.16 On the other hand, cross-border acquirers (targets) have larger means than domestic acquirers (targets) in all performance measures.

**Regression Results**

The simple comparison based on Table 4-1 could be misleading because there may be some other
factors driving the differences among the five groups of firms. One obvious factor is that firms belong to different industries and different industries have different performance results by nature. To obtain a more reasonable comparison, we examine the performance differences among the five groups of firms by controlling for industry specific factors. To this end, we run the following regression for each performance measure ($X$):

$$\ln X_i = \alpha + \beta_1 ACQ_i + \beta_2 TAR_i + \beta_3 ACQ_i \ast CB_i + \beta_4 TAR_i \ast CB_i + IND_i + \varepsilon_i$$

where $ACQ_i$ is a dummy variable equal to one if firm $i$ is an acquirer and zero otherwise; $TAR_i$ is a dummy variable equal to one if firm $i$ is a target and zero otherwise; $CB_i$ is a dummy equal to one if firm $i$ is involved in an cross-border deal and zero in a domestic deal; $IND_i$ is the industry dummy (at SIC 4-digit level); and $\varepsilon_i$ is the normally distributed error term. The regression results are reported in Table 4-2.

The pecking order presented earlier in Table 4-1 is confirmed by our regression results. As all coefficients are significantly positive, we can assert that participants are better than nonparticipants. We have also conducted the F-test for several comparisons between participants. In the last two columns of the table, p-value 1 is for the test of null hypothesis “$\beta_1 < \beta_2$” and p-value 2 is for the test of null hypothesis "$\beta_1 + \beta_3 < \beta_2 + \beta_4$". Both null hypotheses are rejected. Hence, the acquirers have better performance than the targets in all aspects in both domestic deals and cross-border deals. This finding is consistent with the theory and observation of Jovanovic and Rousseau (2002) and Maksimovic and Phillips (2001). Jovanovic and Rousseau (2002) argue that mergers can be viewed as acquisitions of low productive firms' assets by firms with high productivity. By studying plant sales between firms, Maksimovic and Phillips (2001) find that transactions improve the allocation of resources. Related to
this literature, our study adds two points. First, we find that assets are transferred from low performance firms to high performance firms where performance is measured not only by productivity but also many other aspects. Second, the high performance firms choose to buy assets from some less well performed firms, but not from those firms with very low performance. This result is consistent with the “cherry picking” story of M&As, that is, acquirers target good firms. Because $\beta_3$ and $\beta_4$ are both positive and significant, we see that cross-border acquirers are better than domestic acquirers and cross-border targets and better than domestic targets.

Comparisons between Pre-merger and Post-merger Performance

The preceding subsection reveals the performance differences among acquirers, targets, and non-participants before their M&As (i.e., in the pre-merger period). How are firms different after their M&As? How does each firm’s performance change after its M&A? To answer these questions, we first define and construct post-merger data. Corresponding to the pre-merger data, we focus on a firm’s post-merger performance in the year after its M&A deal. Accordingly, we obtain 37636 observations of the listed firms, in which 56.37% of them (the same 21215 observations as in the pre-merger dataset) never engaged in any M&A during 1991–2007 and the rest (16421) are M&A participants. Among the M&A participants, 65.45% (10748) are acquirers of domestic deals and 3.91% (642) are targets of domestic deals, 29.01% of them (4764 in number) are acquirers of cross-border deals, and 1.63% of them (267 in number) are targets of cross-border deals.

We run the regressions similar to those in the preceding section but use post-merger performance data. The results are reported in Table 4-3. All estimates are positive and statistically significant (except for the targets’ earning measure), indicating that both acquirers and targets are better than

INSERT Table 4-3 here.
non-participants after the M&As. Domestic acquirers have better performance than targets after the M&As, as confirmed by our F-test in the column "p-value 1", and cross-border acquirers are better than cross-border targets, as confirmed by our F-test in the column "p-value 2".

We next examine whether merger participants perform better in the post-merger period than the pre-merger period. We could run a regression for the acquirers with their pre-merger performance measure and their post-merger performance measure. However, such a result could be affected by the industry trend. To avoid this industry specific trend effect and other effects, we take the non-participants as the benchmark. Specifically, we run the following regression:

$$\Delta \ln X_i = \alpha + \beta_1 ACQ_i + \beta_2 TAR_i + \beta_3 ACQ_i * CB + \beta_4 TAR_i * CB + T_i + IND_i + \varepsilon_i$$

where the dependent variable is the performance difference, which is defined as: for a merger participant $i$, if it reaches a deal in year $t$, then $\Delta \ln X_i = \ln X_{i,t+1} - \ln X_{i,t-1}$; for a nonparticipant, because there is no merger year to be associate with, we calculate its $\Delta \ln X_i$ for every year $t$. All other variables on the right-hand side are defined before while $T_i$ is the year dummy. The regression results are presented in Table 4. There are three sets of results. First, comparing the pre- and post-merger performance, we find that acquirers and targets all improve their performance. This conclusion is reached since all the following F-tests are rejected at the 1% significant level: $\alpha + \beta_1 < 0$, $\alpha + \beta_2 < 0$, $\alpha + \beta_1 + \beta_3 < 0$, and $\alpha + \beta_2 + \beta_4 < 0$. Second, we have also done the F-test for $\beta_1 < \beta_2$, $\beta_1 + \beta_3 < 0$, $\beta_2 + \beta_4 < 0$ and $\beta_1 + \beta_3 < \beta_2 + \beta_4$. All these null hypotheses are rejected at the 1% significance level. Thus, both the domestic and cross-border acquirers improve their performance more than the corresponding targets. Finally, the above F-tests together the positive significance of $\beta_1$ and $\beta_2$ indicate that merger participants, both the domestic and cross-border, improve their performance more than the non-participants.
Summary

The following are the main results obtained in Section 4 from the comparisons among acquirers, targets, and non-participants:

(i) M&A participants have better performance measures than non-participants prior to their M&As.

(ii) Acquirers have better performance measures than targets prior to their M&As.

(iii) The comparisons in (i) and (ii) also hold for post-merger performance.

(iv) Acquirers’ post-merger performance is better than their pre-merger performance, and targets’ post-merger performance is also better than their pre-merger performance.

5. Growth Pattern Comparison

In the previous sections, we identified that M&A participants are different from non-participants prior to the time of and right after their M&A deals based on static comparisons. In this section, we will make dynamic comparisons on the following issues: (i) Is there any difference between the growth rates of the M&A participants before and after M&As? (ii) Are the growth rates of the M&A participants before the M&As systematically different from those of the non-participants? (iii) Are the growth rates of the M&A participants after the M&As systematically different from those of the non-participants? We will also compare acquirers and targets in all these aspects.

To answer these questions, we specify a time window to define a firm’s M&A participation. As before, we define M&A non-participants as the firms that never became involved in any M&A deal during the entire sample period of 1991–2007. However, unlike before, M&A participants are the firms that became involved in at least one M&A deal during the window period of 1998–2002 but were not
involved in any M&A deal in the other two periods, that is, 1991–1997 and 2003–2007. Note that this classification is different from that used earlier because we need a long pre-merger period and a long post-merger period to calculate the growth.

**M&A Participants: Pre-merger versus Post-merger Period**

We calculate the growth rates of individual performance measures for the pre-merger period and the post-merger period, respectively. For each participant i, we first identify the M&A year $T_i$, which is the first year when the firm had an M&A deal during 1998–2002. We then calculate the average growth rate of measure $X$ in the five-year period prior to $T_i$ as the pre-merger growth rate, $G_{Xi0}$, and similarly the average growth rate of measure $X$ in the five-year period after $T_i$ as the post-merger growth rate, $G_{Xi1}$. Specifically,

$$G_{Xi0} = \frac{1}{5} \sum_{t=T_i-5}^{T_i-1} \frac{X_{i(t+1)} - X_{i \mu}}{X_{i \mu}}$$

$$G_{Xi1} = \frac{1}{5} \sum_{t=T_i}^{T_i+4} \frac{X_{i(t+1)} - X_{i \mu}}{X_{i \mu}}$$

Our objective is to determine whether there is any systematic difference between firms’ pre-merger growth and post-merger growth. To this end, we run the following regressions:

$$G_{Xim} = \alpha + \beta_1 AFTERM + \beta_2 AFTERM * CB + \gamma X_{im} + T_i + IND_i + e_{im}$$

where $m=0$ is for the pre-merger period, $m=1$ is for the post-merger period, $G_{Xim}$ is firm i’s growth rate, $AFTER_0=0$, $AFTER_1=1$, $X_{i0} = X_{i(T_i-4)}$, and $X_{i1} = X_{iT_i}$. As a variable’s average growth rate in a given period may be affected by the absolute values of the variable, we control for this effect by incorporating the initial value of $X_i$ of the corresponding period. This is how $X_{im}$ is defined. The time variable $T_i$ captures the M&A participation year fixed effect, which is a dummy equal to 1998, 1999, 2000, 2001, or 2002. We run these regressions for all acquirers and all targets, respectively. We also run the F-test for the null hypothesis "$\beta_1 + \beta_2 = 0$" and report the p-value. Generally we cannot reject this hypothesis.

The results for all acquirers are reported in Table 5-1. The $\beta_1$ of all measures are negative although
some of them are not statistically significant. Thus, acquiring firms in domestic M&As grow faster in the pre-merger period than in the post-merger period. This result together with that from static comparison (Subsection 4.3) paints the following picture: acquiring firms in general improve their performance over time (and so their post-merger performance is better than the pre-merger performance), but the speed of improvement slows down after the mergers. One possible explanation is that after a firm has grown very fast for some period of time, it seeks to acquire another firm’s asset to capitalize its growth, but the acquisition will eventually slow down its growth pace because its size has been enlarged and all performance measures have been raised to higher levels.\textsuperscript{21} For the cross-border acquirers, although $\beta_2$ in all regressions are generally positive, they are insignificant. Moreover, the F-test shows that $\beta_1+\beta_2$ are not significantly different from zero. Therefore, the growth rate of the acquirers in cross-border M&As does not change significantly after the acquisitions. One exception is EARNING. Cross-border acquirers earn significantly less after the deals than before the deals, which may imply that cross-border M&As are more costly to the acquirers than domestic M&As.

The results from the targets group are mixed. For targets in domestic M&As, the differences in growth rates before and after M&As are not statistically significant for most performance measures. Two significant estimates with negative sign are total asset and total employment, indicating that the growth rates are faster in the pre-merger period than in the post-merger period. The only significant estimate with positive sign is asset per labor, meaning that this growth is faster in the post-merger period. All measures in the technology and productivity categories have positive estimates, and profitability measures has negative estimate. Hence, the growth in technology and productivity is faster in the post-merger period than in the pre-merger period. However, the growth pattern is reversed in profitability.\textsuperscript{22} Moreover, as the signs of $\beta_2$ are mixed and $\beta_1+\beta_2$ is not significantly different from zero,
the growth rate of the targets in cross-border M&As does not change significantly after the acquisition.

INSERT Table 5-1 here.

INSERT Table 5-2 here.

**M&A Participants versus Non-Participants**

We now examine whether M&A participants and non-participants have different growth rates in their pre-merger period than in their post-merger period. To this end, we calculate the average growth rate of each non-participant in the 1993–1997 (five years) for comparison in the pre-merger period and the average rate of each non-participant in the 2003–2007 for comparison in the post-merger period.

Following the formula for the M&A participants, we have $G_{X_i} = \frac{1}{5} \sum_{t=1992}^{1996} \frac{X_{i(t+1)} - X_{i(t)}}{X_{i(t)}}$ for all non-participants in the pre-merger period. We then run the following regressions for the pre-merger growth including all firms:

$G_{X_i} = \alpha + \beta_1 ACQ_i + \beta_2 TAR_i + \beta_3 ACQ_i \cdot CB_i + \beta_4 TAR_i \cdot CB_i + \gamma X_i + T_i + IND_i + \epsilon_i,$

where $T_i$ is the year dummy as defined earlier but is equal to 1997 for all non-participants in the case of pre-merger period. In the above regressions, the baseline is the non-participants, and thus $\beta_1$ and $\beta_2$ measure the difference between acquirers and non-participants and that between targets and non-participants, respectively. We also calculate the non-participants’ growth rate in the post-merger period as $G_{X_{ii}} = \frac{1}{5} \sum_{t=2002}^{2006} \frac{X_{i(t+1)} - X_{i(t)}}{X_{i(t)}}$ and run the same regressions for all firms with the post-merger period growth. $T_i = 2003$ for non-participants in this case.

We find that in almost all measures, the $\beta$ estimates are not statistically significant. For this reason, we do not include the table to save space.

**Summary**
The following are the main results obtained in Section 5 from the comparisons among acquirers, targets, and non-participants:

(i) Acquirers in domestic M&As generally have higher growth in the pre-merger period than in the post-merger period, but this is not true for acquirers in cross-border M&As.

(ii) In both domestic and cross-border M&As, targets’ growth in the pre-merger period and that in the post-merger period do not differ significantly.

(iii) M&A participants’ growth is not statistically different from the non-participants in both the pre-merger and post-merger periods.

6. M&As with Developed Countries and Developing Countries

In this section we explore the role of a country’s development level in cross-border M&As with the US firms. In particular, we would like to know whether the US firms that acquire foreign firms from a developed country are systematically different from the US firms that acquire foreign firms from a developing country, and how. Similarly, we would like to know whether the US firms that are acquired by foreign firms from the developed countries are different from the US firms that are acquired by foreign firms from the developing countries, and how.23 For this purpose, we first classify all foreign countries into two groups, one being those belonging to the OECD in year 2000 and the other being those non-OECD countries. That is, we treat OECD countries as the developed countries and the non-OECD countries as the developing countries. It is clear that in this section, all merger deals are cross-border deals.

Let us introduce the following regression

\[ \ln X_i = \alpha + \beta_{OECD_i} + IND_i + \varepsilon_i \]

where \( X_i \) is the performance of US firm \( i \), \( OECD_i \) is a dummy equal to one if the foreign firm which has
the merger deal with the US firm $i$ is from an OECD country and zero otherwise. Therefore, $\beta$ captures the difference between the US firms that have M&As with foreign firms from the OECD countries and the US firms that have M&As with foreign firms from non-OECD countries. The industry fixed effect is controlled for. We run this regression for the acquirers and targets, separately.

The pre-merger performance differentials are reported in the following Table 6-1. The left panel shows that the US firms that will acquire foreign firms in the non-OECD countries are significantly better than the US firms that will acquire foreign firms in the OECD countries (except in R&D/LABOR). This may reflect the fact that it is tougher to complete an M&A deal (or to do business in general) in the developing countries than in the developed countries. The right panel shows that the US firms that will be acquired by foreign firms from OECD countries are generally not significantly different from those US firms that will be acquired by foreign firms from non-OECD countries. The two exceptional cases are LABOR and R&D, which shows that foreign acquirers from OECD countries would like to acquire the US firms with larger employment and more R&D than the acquirers from non-OECD countries.

INSERT Table 6-1 here.

We have also run the regression for the post-merger performance. The comparison results are very similar to those obtained from the pre-merger performance. To save space, we do not report the table.

We next examine the differences in performance between the pre-merger and post-merger periods for the US acquirers and targets in cross-border M&As. We run the following regressions for the US acquirers and the US targets, respectively:

$$\ln X_{im} = \alpha + \beta_1 AFTER_{m} + \beta_2 AFTER_{m} * OECD_i + D_i + \varepsilon_{im}$$

The regression results are reported in Table 6-2, in which we are particularly interested in $\beta_2$.

From both the left (US acquirers) and the right (US targets) panels of Table 6-2, we can see that $\beta_1$
is positive in all performance measures and statistically significant in most of the measures, indicating that the US firms (both as acquirers or as targets) in cross-border M&As with firms from non-OECD countries have better performance in the post-merger period than in the pre-merger period. Note that $\beta_2$ in the left panel of the table is positive but insignificant in most performance measure while $\beta_2$ in the right panel is negative and significant in most performance measures. Thus, the US acquirers improve their performance more (though not statistically significant) after they acquire OECD targets than after they acquire non-OECD targets. However, the US targets’ performance (except EARNING) is improved less after they are acquired by OECD acquirers than after they are acquired by non-OECD acquirers.

INSERT Table 6-2 here.

7. Concluding Remarks

In this paper, we contribute to the empirical literature on M&As by investigating individual firms’ performance before and after their M&A activities and comparing them with non-participants. We observe some pecking orders. In particular, we show that compared with target firms, acquiring firms are larger in size, have better technology, have higher productivity, and have higher profitability. Similar results apply to the comparisons between targets and non-participants, and the comparisons between acquirers and targets. In addition, we also identify some dynamic patterns of firm characteristics and performance in the pre-merger period and in the post-merger period. These patterns are useful for understanding the impacts of M&As.

Our study offers some regularities on the performance differences among acquirers, targets, and non-participants. These regularities serve to motivate further theoretical research to understand firms' motivation to engage in M&As and the impacts of M&As.

As we include a large set of performance measures (8 in total), not all of them have the same sign
and are all statistically significant. Thus, we only make our conclusions based on the comparisons of the overwhelming majority of the measures, not all the measures. However, this compromise is superior to limiting the performance measures to only a few in numbers. Identifying the patterns based on a large number of performance measures is one of the most important distinguishing features of our study.

Data limitation prevents us from extending our analysis to more issues and making our claims more general. For example, the analysis is based on publicly listed firms only. This significantly reduces the number of observations. It also prevents us from extending our findings to all firms because private firms may have a different growth pattern. We conjecture that firms in mergers can be very different from those in acquisitions. Again, we are not able to separate them in this study to examine their differences. These issues will be tackled in our future research.

References


Rhodes-Kropf, M. and D. Robinson, “The market for mergers and the boundaries of the firm”, *Journal*


1 From the social welfare point of view, examining the effects of M&As on consumers and competition is also important.

2 Andrade et al. (2001) and Bruner (2002) are two useful reviews of the empirical literature.

3 Using stock prices, Bradley and Sundaram (2006) examine the relation between the pre-acquisition and post-acquisition performance of acquiring firms. They find that performance drives acquisitions in the sense that acquirers' performance is better than the market prior to the acquisitions but not post-acquisitions.

4 Table 7 of Andrade and Stafford (2004) summarizes the comparison between acquirers and targets. They find that for the sub-sample of own-industry M&As, acquirers have significantly higher q, cash flows, and lagged stock returns, as well as lower leverage and capacity utilization than their target companies. Bradley and Sundaram (2006) also compare some aspects of firm characteristics. They find that acquiring firms outperform the market, and frequent acquirers significantly outperform infrequent acquirers. However, the performance in their study is mainly stock price. Breinlich (2008) finds that the
Canada-U.S. Free Trade Agreement results in a wave of domestic M&As in which acquirers are generally more productive than targets.

5 A general conclusion is that after the announcements of acquisitions, target firms’ stock prices go up (more precisely, they earn abnormal return from the market), but the changes in acquiring firms’ stock prices are not so clear cut.

6 Bruner (2002, Exhibit 1) presents a comparison between using stock market price and using reported financial data on their strengths and weaknesses.

7 Ravenscraft and Scherer (1989) focus on return on assets and find that mergers destroy value. In contrast, Healy et al. (1992) focus on operating cash flows and conclude that merged firms have higher operating cash flows than their industry peers. Andrade et al. (2001) use a better methodology and a longer time span to reach the following conclusion: the combined target and acquirer’s operating performance is better than their industry peers prior to the merger, and the relative performance improves slightly subsequently to the merger transaction. The specific performance measure in their study is a firm’s operating margin, which is the ratio of cash flow to sales. McGuckin and Nguyen (1995) and Schoar (2002) focus on more fundamental performance, that is, total factor productivity and find that mergers do not change the acquiring firms’ productivity because the productivity improvement in the acquired plants is offset by the productivity loss in the acquirers’ existing plants.

8 The types of financial performance measures used in the literature include leverage, Tobin’s q, holdings of cash, managerial share ownership, level of management confidence, and size of capitalization. However, we use a very different set.

9 Before 1992, SDC included only deals involving at least 5% of the ownership of a company, where the transaction was valued at $1 million or more or where the transaction value was not disclosed. The SDC database classifies all M&As in 10 categories. We exclude two categories in our study, that is, buy back and recapitalization, because they are very different types of acquisitions from the others.
10 The matching of the firms from the two databases is conducted using CUSIP (the company codes), which is available in both databases.

11 Note that we would not be able to trace a target’s performance if its name has been changed after the acquisition. Thus, the average performance of the targets is calculated based on all targets remain in the sample. There could be a potential bias. However, we have also run all the regressions based on a special subsample which only includes firms with records in both the pre- and post-merger periods. We found that all results reported in this paper are qualitatively the same as those obtained based on our large sample. As this subsample is much smaller, we use the uncensored sample from the whole dataset.

12 Mergers occur in waves. This is a consistent feature observed in the literature (e.g., Mitchell and Mulherin 1996; Andrade, Mitchell and Stafford, 2001). Qiu and Zhou (2007) offer a theoretical explanation for merger waves.

13 The SDC classification of industries is slightly different from the 1987 version four-digit SIC system. Aside from the manufacturing sector defined in SIC (Division D in SIC), SDC also includes construction (Division C in SIC) and prepackaged software (7372 in SIC) in its manufacturing sector.

14 We can also present a figure about industry distributions based on the value of M&A deals in billion US$. The pattern is similar and we omit it to save space.

15 Note that although generally there is one acquirer and one target in each acquisition deal, our dataset includes many more acquirers than targets. This is because many publicly listed firms acquire private firms and the private targets are not included in the dataset.

16 This pecking order is also confirmed by the Kolmogorov-Smirnov test.

17 Harris and Robinson (2002) find that foreign firms acquire the most-productive plants in U.K. This of course implies that targets are better than the non-participants.

18 For the post-merger performance we have also tried employing average measures over the 5 years in the post-merger period. The qualitative conclusions remain unchanged.

19 Note that there is another type of firms that had M&As in either the 1991–1997 period or the 2003–2007 period. However, it is not clear how they should be different from other firms.

20 Note that the chosen window period (1998-2002) and the length of growth rate calculation (5 years)
are somewhat arbitrary. However, we need to leave enough time spans for the calculation of pre- and post-merger growth rates and given that our entire sample period is 1991-2007, there is little room to move or expand the window period and change the length of growth rate measure. We have done some robustness checks by allowing them to change for one or two years. The qualitative conclusions do not change.

21 In the finance literature, which mainly focuses on stock returns, Healy, Palepu, and Ruback (1992) check the merged firms’ operating cash flows and find that cash flows drop from the pre-merger level on average.

22 In the literature, Ravenscraft and Scherer (1989) find that in the 1975–1977 period, target firms suffered a loss in profitability following the mergers. Our finding is not about the loss in profitability but the slowdown in the growth rate of profitability. Harris and Robinson (2002) find that productivity of the targets in U.K. decline after the acquisitions.

23 We could also ask the following questions: when the US firms acquire foreign firms, are the targets from the developed countries and those from the developing countries systematically different, and how? When foreign firms acquire the US firms, are the acquiring firms from the developed countries and those from the developing countries significantly different, and how? However, since we do not have detailed information of the foreign firms, we would not be able to answer these questions.