

# Foreign Ownership and Firm Performance: Emerging Market Acquisitions in the United States

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## Abstract

This paper examines the recent upsurge in foreign direct investment by emerging-market firms into the United States. Traditionally, direct investment flowed from developed to developing countries, bringing with it superior technology, organizational capital, and access to international capital markets, yet increasingly there is a trend towards “capital flowing uphill” with emerging market investors acquiring a broad range of assets in developed countries. Using transaction-specific information and firm-level accounting data we evaluate the operating performance of publicly traded U.S. firms that have been acquired by firms from emerging markets over the period 1980-2006. Our empirical methodology uses a difference-in-differences approach combined with propensity score matching to create an appropriate control group of non-acquired firms. The results suggest that emerging country acquirers tend to choose U.S. targets that are larger in size (measured as sales, total assets and employment) relative to matched non-acquired firms. In the years following the acquisition target firm sales and employment decline while profitability rises compared to matched non-acquired firms, suggesting significant restructuring of the target firms.

Key words: foreign direct investment, capital flows, emerging markets, acquisitions, firm performance,

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## 1. Introduction

This paper examines the recent upsurge in foreign direct investment by emerging-market firms into the United States. Traditionally, foreign investment flowed from developed to developing countries, bringing with it superior technology, organizational capital, and access to international capital markets, yet increasingly there is a trend towards “capital flowing uphill” with emerging-market investors acquiring a wide variety of assets in the developed world.<sup>1</sup> In particular, the recent spate of cross-border acquisitions by Indian and Chinese companies is the subject of heated debate in policy circles. For example, the acquisition bid by CNOOC, the Chinese state-owned oil company, to take over Unocal met with considerable resistance in Washington and was ultimately thwarted. Another example of a high profile emerging-market acquisition was the Indian Tata Motors 2008 purchase of Ford's Jaguar and Land Rover divisions. Using transaction-specific acquisition data and firm-level accounting data, this paper studies how U.S. firms that are acquired by firms from emerging markets fare relative to their non-acquired counterparts.

The first hypothesis we examine, based on evidence from developed-market foreign direct investment (FDI) flows to emerging markets, is whether foreign ownership is associated with improvements in firm-profitability or plant-productivity (Caves, 1996, Aitken and Harrison, 1999, Perez-Gonzales, 2005, Arnold and Javorcik, 2005, Petkova, 2007).<sup>2,3,4</sup> In the case of recent emerging-market acquisitions, while the role of sovereign wealth funds and the build-up of U.S. dollar reserves in emerging-markets are seen as motivations for acquisitions in developed-markets, the productivity-improving role of technology transfers from emerging to

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<sup>1</sup> According to estimates by the United Nations Conference on Trade and Development (UNCTAD), the outward foreign direct investment (FDI) flow from the developing economies as a group was \$226.7 billion in 2006, an increase of 85% from the year before. Net developing country FDI flows, inward minus outward, decreased from 2005 to 2006 by 3.5%.

<sup>2</sup> Previous studies have focused on the effects of FDI on plant-level productivity measures such as total factor productivity (TFP) or labor productivity (output per worker). Using firm-level financial data, the focus of our paper is on an accounting measure of profitability (ROA) in line with operating performance studies that attempt to identify the sources of gains from acquisitions. The rationale in these studies is that if there are gains from acquisitions they should be eventually reflected in firms' cash flows.

<sup>3</sup> FDI includes “Greenfield” investment in new assets in a foreign country, and acquisition of pre-existing foreign assets (also termed “Brownfield” investment).

<sup>4</sup> Antras, Desai, and Foley (2008) document the productivity-improving role of U.S. multinational firms. They find that U.S. multinationals are able to exploit technologies abroad through FDI, especially in countries where monitoring is non-verifiable and financial frictions exist. Fukao et al. (2006) compare domestic to foreign M&A in Japan and find that Japanese target firms that receive foreign investment experience more rapid improvements in productivity and profitability than those that were acquired by domestic firms. Akben-Selçuk (2008) studies a similar issue using data on Turkish firms.

developed markets is not obvious, especially in light of the vast differences in capital-labor and output-labor ratios between these two sets of markets.<sup>5</sup>

Wells (1983) and reports by Citigroup (2005) and Boston Consulting Group (2005) suggest three potential motivations for overseas expansions that are specific to emerging-market firms, these include: 1) entering new markets, 2) obtaining natural resources, and 3) acquiring advanced technology and related brand equity. Lenovo's 2004 purchase of IBM's personal computer business is a case-in-point. It involved entry into the U.S. market, acquisition of technology, and of an established brand. CNOOC's bid for Unocal, points to emerging market demand for natural resources. Antkiewicz and Whalley (2006) highlight several case studies of recent completed and failed attempts by Chinese companies to acquire firms in the OECD. They suggest that the recent wave of Chinese outbound M&A is driven by the necessity to acquire access to resources, new technology and distribution networks in the target country.

The second hypothesis from traditional theories of FDI that we examine relies on comparative input costs as the motivating rationale for investment flows from developed to emerging markets. Whereas industrial country acquirers often seek lower labor costs in emerging-markets, we hypothesize that emerging-market acquirers may relocate (or in-source) manufacturing activity while keeping existing distribution networks in the host country of the acquired business. The idea here is that emerging-market firms come from environments where labor costs are low and they may be in the position to in-source jobs by exploiting the low wages in their home countries by downsizing labor-intensive activities in the U.S. following the acquisition.

The transaction-specific data on cross-border Mergers and Acquisitions (M&As) used in this paper come from the Thomson Financial SDC Platinum database that records all M&As involving U.S. firms that were announced between January 1, 1980 and July 1, 2007. We focus on publicly traded U.S. targets both because open financial markets in the U.S. have led to a substantial number of cross-border M&As, and because public U.S. firms are required to disclose detailed accounting data. The work that follows complements the existing literature on post-

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<sup>5</sup> In this context it is worth noting that Forbes (2008) finds evidence that foreigners hold greater shares of their investment portfolios in the United States if they have less developed financial markets, suggesting that our focus on FDI by emerging market firms may also provide insights into the implications of broader investment trends into the U.S.

acquisition firm performance, with our analysis specifically focused on acquisitions made by emerging country firms.

To evaluate the impact of emerging-country acquisitions on U.S. firm performance and restructuring we examine stock market and accounting measures as well as employment outcomes. Abnormal announcement returns provide a forward-looking estimate of expected shareholder value creation. Post-acquisition we evaluate the changes in accounting measures of performance (profitability, investment and sales) and firm-level employment data in the target U.S. firms.

The first empirical challenge we face in estimating post-acquisition outcomes is one of causality versus selection. Are emerging-market firms simply picking certain types of acquisition targets or do foreign acquisitions change target-firm performance? There is some evidence in the literature on how acquirers select targets.<sup>6,7</sup> In this paper, we find evidence of selection in that emerging-country firms tend to acquire public U.S. targets with relatively high levels of sales, employment and total assets. Crucial to any comparison between pre-and post-acquisition operating performance of target firms is therefore the issue of selecting an appropriate expected performance benchmark in the absence of the acquisition (Andrade et. al., 2001). Ideally, one would like to compare the performance of a firm that receives foreign investment to the performance of the firm's identical twin with no foreign investment.

In this paper we ask the counterfactual question: what would have happened to those firms that did, in fact, receive foreign ownership, if they had not received it? While this exact counterfactual is not typically observable, propensity score matching, which involves selecting a "control" group of non-acquired firms closely matched to the "treatment" group of acquired firms, is one way to create sets of such twins artificially. Propensity score matching can then be

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<sup>6</sup> In particular, Froot and Stein (1991) show that asymmetric information could lead foreign firms to buy U.S. firms in times when the value of the U.S. dollar is low relative to the foreign currency. They provide empirical evidence of a negative relationship between the value of the dollar and FDI flows into the U.S. using aggregate FDI data, and this relationship is also explored in Chen (2008) using more detailed firm-level data. Harris and Ravenscraft (1990) find evidence that foreign firms prefer technology-intensive industries, Rossi and Volpin (2004) find that targets are typically from countries with poorer investor protection than their acquirers' countries.

<sup>7</sup> Haskel, Pereira and Slaughter (2007) describe how U.S. states differ in their incentive packages and taxes with regards to foreign acquirers. At the Federal level there were few legal restrictions on FDI into the United States during the time period studied here, although more stringent laws were recently put into place in order to restrict FDI that threatens U.S. "national security"; these restrictions came into effect in 2007. See: <http://www.ustreas.gov/offices/international-affairs/cfius/>

combined with difference-in-differences estimates to eliminate time-invariant and unobservable differences between the acquired and non-acquired firms.

In order to measure the profitability of U.S. target firms after they are acquired, we focus on the accounting measure of operating income before depreciation, amortization and taxes (OIBD). In order to control for the relative size of the target firm, we scale OIBD by total assets, thus focusing on return on assets (ROA). We also track changes in other aspects of target-firm operations, such as property, plant and equipment, employment, and sales following the acquisition.

We find that the stock price response of target firms is positive and significant around the time of acquisition announcement. Average cumulative returns on the target stock price within a three-day window around the announcement date of the acquisition increase by 8%. This return remains significant and positive when we extend the window to ten and twenty-one business days. Correspondingly, we find that after acquisition the profitability of acquired targets improves. The target firm's return on assets increases by 7% in the five years following acquisition.

We also find strong evidence that acquiring firms undertake significant restructuring of target firms. Relative measures of employment, sales and plant, property and equipment (PP&E) in the target firms decrease in the years after acquisition. In addition, the pattern of increasing profitability (income/assets) and declining sales is consistent with improvements in firm-efficiency following acquisition. For instance if firms shut down or get rid of unprofitable divisions, sales would go down but profits as a percent of assets would increase. Also, declining employment and net PP&E suggest downsizing of divisions to improve overall profitability as a percent of assets.

The downsizing of employment is consistent with the comparative input cost hypothesis where acquirers from emerging markets may be in a position to exploit the low wages in their home countries by downsizing labor-intensive activities in the U.S. following the acquisition. The U.S. target experiences declining sales accompanied by improvements in profitability, suggesting more streamlined but efficient operations following restructuring by the emerging-market acquirer.

Methodologically, an alternative design of the control group could involve the comparison of the post-acquisition performance of firms acquired by emerging-markets with

those acquired by either other U.S. firms or other developed-market firms. For instance, Chen (2011) explores the question of whether, given that a firm is acquired, the country of origin of the acquirer matters (so that the control group is other acquired firms rather than non-acquired firms). Chen finds that compared to domestic acquisitions, U.S. target firms acquired by foreign firms (either from emerging markets or from industrialized countries) experience higher returns on assets. However, these performance improvements stem from channels that differ depending on the type of foreign acquirer. Emerging market acquisitions lead to reductions in sales and employment, whereas acquisitions by industrial country firms increase sales and employment in U.S. targets. The results of this study reflect similar patterns in performance improvements and restructuring processes within the U.S. targets that are acquired by emerging market firms.

The paper is also related to a number of studies that investigate the causal link between foreign ownership and plant performance. For example, Aitkin and Harrison (1999) conclude from a sample of Venezuelan firms that foreign ownership is correlated with productivity improvements. Arnold and Javorcik (2005) use plant-level data from Indonesia and find that foreign ownership leads to significant improvements in productivity in the year of acquisition as well as in subsequent years. Petkova (2008) conducts a similar study using Indian plant level data and concludes that foreign owned plants experience improvements in productivity three years following foreign investment. Moreover, it is also related to the literature concerned with spillovers from FDI. While Aitkin and Harrison (1999) find negative effects on domestic firm productivity from FDI, Javorcik (2004) identifies positive FDI spillovers effects on domestic firms through backward linkages. In the developed-market context, a series of papers concentrating on acquisition targets in the United Kingdom, Girma et al. (Girma, 2005; Girma et al., 2006, 2007) document improvements in growth rates of firm performance following foreign acquisitions. These studies, however, do not specifically differentiate between emerging and developed country acquirers.

The remainder of the paper is structured as follows. Section 2 introduces the datasets employed in the empirical analysis. The details of the difference-in-differences propensity score matching estimator are explained in Section 3. Section 4 presents the empirical results, section 5 presents robustness checks and Section 6 concludes.

## 2. Data Description

Our data sample contains all M&As involving U.S. firms initiated by firms in emerging markets that were announced between January 1, 1980 and July 1, 2007 reported by SDC Platinum, a database from Thomson Financial. The data include all public and private M&A transactions involving at least 5% ownership<sup>8</sup> of a target firm in the U.S.<sup>9</sup> The SDC data is based on information from over 200 English and foreign language news sources, SEC filings and the filings from its international counterparts, trade publications, news wire reports, and proprietary surveys of investment banks, law firms, and other advisory firms.

For each transaction, the SDC database provides the date on which the transaction was first announced as well as the date on which the transaction became effective. The database provides characteristics of the target and acquiring firms including: name, nation, industry sector, and primary North American Industry Classification System (NAICS). The database also includes transaction-specific information on percent of shares acquired, the percent of shares owned before and after the transaction is completed, the percent of shares sought by the acquiring firm, and the method of payment.

Over the sample period, the SDC database includes 1,500 completed M&A transactions between an emerging market acquirer and a U.S. target. The focus of the analysis in the paper is on the subsample of 480 outbound M&A transactions by emerging country firms and U.S. target firms that remain publicly traded after acquisition. Furthermore, we eliminate firms from countries that are considered tax havens, e.g. Bahamas, Bermudas<sup>10</sup>, etc. which leaves us with a sample of 259 M&A transactions. Among the remaining deals, 81 transactions involve multiple acquisitions of the same target. We only include the first of multiple acquisitions in our dataset as we are interested in what happens to a U.S. target when it is first acquired by an emerging-market firm. This trims our sample to 214 transactions. Where information is available, these observations cover M&A transactions that result in a change in majority control in the target firm as well as acquisitions of minority shares. Most of our observations include information on the method of payment, the value of the transaction, and the NAICS codes of the respective acquirer and target firms.

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<sup>8</sup> The IMF and the OECD define FDI using a 10% threshold, though a broader definition of FDI is ownership of an amount of shares or voting power that allows participation in the management or control of the target firm.

<sup>9</sup> See Appendix A for a full list of the markets included in the database.

<sup>10</sup> See Appendix A for a list of tax-haven markets as defined by the OECD (2008).

Table 1 provides information on the representativeness of our sample; it presents the main transaction characteristics for the acquisitions in our sample in comparison to transactions that involve an emerging-market firm acquiring a US target company excluded from our sample. The transactions that are excluded from our sample involve privately-owned target firms, subsidiaries, joint ventures, and government entities. The mean transaction values are similar across the two samples. The top five target firm industries also overlap across the two groups, with about half of the target firms being located in the manufacturing industry. The top five acquiring firm industries also display similarities along with some differences. The top industry for acquirers in our sample is in the finance sector whereas the emerging-market acquirers excluded from our sample are predominantly from the manufacturing sector. About half of the acquirers across both groups tend to be publicly-listed firms. The last category of comparison is the country of origin of the acquiring firms across the two different groups. The distribution of the acquiring firm's continents are similar, with the majority of acquiring firms situated in Asian countries for both groups, followed by Latin American and African countries. Lastly, the excluded group of deals has proportionately more firms coming from India than what is represented in our sample.

Data on the U.S. target firms in our sample come from Compustat and the Center for Research in Securities Prices (CRSP). Compustat reports financial statement data and CRSP contains stock return information. Information provided in SDC on our target firms allows matching across these databases. During this process, we lose observations because some of the target firms are renamed after acquisition or are delisted. The availability of firm-level data in Compustat varies significantly by year and by variable. For example, the employment variable is only reported on a voluntary basis in Compustat. Out of the original 214 transactions between emerging country acquirers and public U.S. targets in the SDC dataset, roughly 120 firms (56%) have accounting performance variables reported in Compustat over the five years post-acquisition and 175 firms (81%) have usable stock returns data in CRSP.

Table 2 presents information by country of origin on the number and value of acquisitions of U.S. firms in our sample. The top five emerging market countries whose firms acquired U.S. targets over the period 1980-2007 are: Hong Kong, Singapore, Mexico, South Korea, and Taiwan. The fact that many of the acquisitions involve firms from Hong Kong and Singapore raises the possibility that the acquiring firms are conduits for ultimate buyers who are

located in developed countries. In order to insure against this possibility we tracked down information on the acquiring firms' ultimate parent nation using the Compustat ticker codes. There are 31 deals in our sample for which the ultimate parent company is not located in a developing country (i.e., New Zealand (24), United States (4), Canada (1), Liechtenstein (1), and British Virgin Islands (1)). In our empirical analysis we conduct robustness checks excluding these deals, as well as all deals involving acquiring firms from Hong Kong, Taiwan and South Korea.<sup>11</sup> Our sample includes acquisitions in each of the years from 1981 through 2007. Figure 1 shows the time-series pattern of direct investment into the U.S. from emerging market economies. The solid line in figure 1 is the cumulative value of M&A transactions into the US by emerging market firms for each year between 1981 and 2007 based on data from SDC, while the dashed line depicts US investment outlays undertaken by emerging-market investors based on BEA data. The SDC and BEA data show a dramatic increase in emerging-market cross-border M&A in the latter half of the 2000s. The investment outlays into the US made by emerging-market firms mimic the net purchase data from UNCTAD with a small surge in 2000, and a more pronounced surge in the latter half of the decade beginning in 2004.

Figure 2 presents information on the value of M&As in our sample (which are also listed in the last column of table 2) together with the number of deals and the industry in which the target firm is located. In the figure the surface area of each bubble shows the total value of deals within each one-digit industry sector, while the location of the bubble is determined by the average value and the total number of deals within an industrial sector. The figure indicates that in about half of all transactions the target firm is in the manufacturing sector and the average value of acquisitions in the manufacturing sector is much larger than the value of acquisitions in other industries.

Table 3 provides information that highlights the varying range of motivations for the acquisition of US firms by firms domiciled in emerging markets. Appendix B describes these acquisitions in some detail by incorporating reports (from Factiva) from the business press at the time of the acquisitions. Table 3 includes transaction details such as information about acquiring firm industry characteristics and also provides a snapshot of the financing techniques used in the acquisitions of the firms. The range of industries with emerging-market firm acquisitions is varied, spanning manufacturing, finance and the information technology. Excerpts from the press

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<sup>11</sup> The results are robust to these alternative samples and are available upon request.

reports contain suggestive information on the motives for these acquisitions, and largely confirm our priors regarding the motivations for acquisition of U.S. firms by emerging market companies; the most commonly cited motives include access to (i) technology and (ii) distribution networks, market access and brand name acquisition.

The first example in Table 3 shows that in 2004, Agrobios (AB), a Mexican perishable food manufacturer acquired Authentic Specialty Foods (ASF) in a tender offer. Newspaper reports suggest that the acquisition seems to have been driven by a desire on the part of AB for access to ASF's brand name recognition and distribution network in the United States. Similarly, Mexico's Cemex, one of the world's biggest cement companies acquired cement manufacturer Southdown in November 1996 also in a tender offer to expand the firm's presence in the United States. Reports of Taiwan's Bank SinoPac merger with Los Angeles-based Far East National Bank cite market access to an Asian customer base in the United States as one of the main motivations for the merger. Market access was also the main motive for China's Sun Media Investment Holdings Ltd acquisition stake in Broadcast International Inc, an operator of enterprise satellite TV networks.

Technological alliances form a second broad class of motivations for emerging-market acquisitions. For example, CDC software, a Hong Kong based software arm of the acquired technology provider chinadotcom acquired Ross Systems Inc (RS), a developer of business software and supplier to mid-size process manufacturers, in a stock swap transaction. Similarly, India's Infosys Technologies Ltd. made a strategic investment in the US-based CiDRA Corp., a developer technology for optical networks to take advantage of a growing market both within and outside India. Singatronics Asset Holdings acquisition of Candela Laser Corp, the world's largest maker of flash-lamp-excited tunable dye lasers, positioned the firm to take part in a specialized high technology industry and to profit from the growing US medical instrumentation market.

If we focus on the top 20 deals by acquisition value between emerging country firms and public U.S. targets we find that about half are horizontal, meaning that the acquirer and the target are in the same industry. In our sample about one sixth of the deals involve horizontal M&As and about one third of the deals involve an acquisition of 50 percent or more of the target.<sup>12</sup>

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<sup>12</sup> Our sample includes only those target firms that are kept as independent units and whose financial data continues to be followed by Computat after acquisition.

Table 4 provides average accounting (OIBD, sales) and employment information for the target firms sorted by NAICS industry. We focus on these outcome variables in our empirical analysis of how these acquisitions impact U.S. targets.

### 3. Empirical Strategy

#### 3.1 Difference-in-Differences Matching Estimation

It seems unlikely that emerging-country firms acquire U.S. firms at random. As discussed in the introduction, ideally, in order to evaluate the impact of foreign ownership we would like to have information on the set of prospective firms from which the target was selected. In other words, we would like to compare the performance of a firm that receives foreign investment to the performance of the firm’s identical twin (or multiple) with no foreign investment.<sup>13</sup> While this sort of twin or “runner-up” firm is not generally observable, we use propensity score matching techniques to identify a control group of non-acquired U.S. firms that closely match the U.S. targets.<sup>14</sup> A firm is “selected” into the control group if it is sufficiently similar to the acquired firms on the basis of the key determinants of the acquisition decision. In other words, our goal is to find a set of control firms that are a priori equally likely to be acquired by an emerging-market firm as those firms which ultimately are acquired. One of the main advantages of the method is that it allows matching without parametric assumptions or imposing a particular model specification, *ex ante*.

Let  $A_{i,t} \in \{0,1\}$  be a dummy variable indicating whether a U.S. firm is acquired by an emerging-market firm at time  $t$  and let  $y_{i,t+u}^1$  denote target-firm performance outcome variables  $u$  periods after the acquisition takes place, where  $u \geq 0$ . The outcome variable for the matched non-acquired U.S. firms is given by  $y_{i,t+u}^0$ . For a given U.S. firm, we will only observe performance outcome variables in one of the two states; foreign acquisition ( $y_{i,t+u}^1$ ), or not

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<sup>13</sup> Our control group consists of all U.S. target firms that did not receive investment by emerging market firms. This group includes firms that have received investment by non-emerging market firms or other U.S. domestic firms, as well as firms that never received outside investment throughout our sample period.

<sup>14</sup> Greenstone, Hornbeck and Moretti (2008) are able to identify “runners-up” directly in a different context, measuring agglomeration spillovers from the opening of a new manufacturing plant, using publicly available information on “losing counties”. Since this sort of data on “potential runner-up targets” is not available, we construct the control group econometrically.

$(y_{i,t+u}^0)$ . The average effect of an emerging-market firm acquisition of a U.S. target is the following:

$$\begin{aligned} & E[y_{i,t+u}^1 - y_{i,t+u}^0 \mid A = 1] \\ &= E[y_{i,t+u}^1 \mid A = 1] - E[y_{i,t+u}^0 \mid A = 0] - \{E[y_{i,t+u}^0 \mid A = 1] - E[y_{i,t+u}^0 \mid A = 0]\} \end{aligned}$$

The term in the first line is the average treatment effect on the treated (ATET), and the term in braces in the second line is a “selection” term, which is zero if the assignment to the treatment and control groups is random. Our assumption is that firms have observable characteristics,  $\mathbf{X}$ , that make them attractive targets. Our approach is to match acquired and non-acquired firms on the basis of these  $\mathbf{X}$ s and then calculate the treatment differential (the effect of being acquired) on each of the outcome variables of interest. The average of the differential over all acquired firms and all  $\mathbf{X}$ s measures the average effect of foreign acquisition. Formally, Angrist and Krueger (2000) show that effect of the treatment on the treated is given by:

$$\begin{aligned} E[y_{i,t+u}^1 - y_{i,t+u}^0 \mid A = 1] &= E\{E[y_{i,t+u}^1 \mid X, A = 1] - E[y_{i,t+u}^0 \mid X, A = 0] \mid A = 1\} \\ &= E[\Delta_x \mid A = 1], \end{aligned}$$

where  $\Delta_x = E[y_{i,t+u}^1 \mid X, A = 1] - E[y_{i,t+u}^0 \mid X, A = 0]$ . The underlying assumption is that all the firms (whether acquired or not) have the same expected performance under domestic ownership. This is referred to as the conditional independence assumption (CIA):  $E[y_{i,t+u}^0 \mid X, A = 1] = E[y_{i,t+u}^0 \mid X, A = 0] = E[y_{i,t+u}^0 \mid X]$ .

For the CIA to be satisfied, the vector  $\mathbf{X}$  should contain all variables that affect both acquisition and performance outcomes. The choice of variables included in  $\mathbf{X}$  is described in more detail below. Another assumption required for matching is that it should not be possible to predict the probability of a foreign acquisition perfectly, i.e.  $0 < \Pr(A = 1 \mid X) < 1$ .

Matching on a vector of variables is difficult because it requires weighting differences in one dimension against another. Rosenbaum and Rubin (1983) provide a solution to this dimensionality problem by matching firms on propensity scores, which in our context is the conditional probability of being acquired by an emerging-county firm given  $\mathbf{X}$ :

$$P_i = \Pr(A_{i,t} = A(\mathbf{X}_{i,t-1})).$$

This matching technique allows us to take into account differences in observable characteristics across the firms in our database. We then combine matching with difference-in-differences analysis to eliminate the differences between the acquired and control firms that are unobservable and time invariant.

Rather than treating each of our firms linearly and with the same weight, our difference-in-differences estimator paired with propensity score matching allows us to include only acquired firms within the common support and picks control firms according to the metric function specific to the matching method. The common support refers to treated firms that do not lie above the maximum or below the minimum propensity score for the matched control group.

In our analysis, after we generate the propensity scores using a probit estimation, we apply propensity score reweighting paired with difference-in-differences. The second step of the estimation procedure allows us to control for other covariates that might also impact a firm's performance as well as controlling for industry, year and states fixed effects.<sup>15</sup> The combined propensity score reweighting and difference-in-differences estimator for the average treatment effect on the treated is as follows:

$$\frac{1}{n} \sum_{i=1}^n \hat{p}(X_i) \left[ \frac{y_{t+u}^1 - y_{t'}^1}{\hat{p}(X_i)} - \frac{y_{t+u}^0 - y_{t'}^0}{1 - \hat{p}(X_i)} \right],$$

where  $\hat{p}(X_i)$  is the predicted probability of U.S. firm being acquired by an emerging market acquirer and  $y_{t'}^1(y_{t'}^0)$  is the performance of a U.S. firm in period  $t'$  that is acquired at time  $t$  (1) or not acquired (0).

Note that the most common form of matching applied in the international trade literature has been, thus far, nearest neighbor matching. Yet, Frölich (2004) provides a Monte Carlo analysis comparing alternative matching estimators and suggests that nearest neighbor matching shows poor performance. Our sense is that the choice of matching depends largely on the availability of data. Although all matching estimators are consistent, in finite samples, the choice of technique can make a difference. If comparison observations are few, single nearest neighbor matching performs poorly, since it draws from a diminishing pool of controls that might not be close matches. If comparison observations are plentiful and evenly distributed, nearest neighbor matching makes good use of the rich comparison group data.

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<sup>15</sup> See Ho et al. (2007) for an excellent overview of the benefits of combining propensity score matching with standard parametric methods.

In our analysis, the ranges in comparison observations are generally wide, but they are asymmetrically distributed due to the nature of our firm-level data. Therefore, nearest neighbor matching is not an ideal choice. Kernel matching could provide a plausible alternative approach since it uses the additional data where it exists, but does not include poor matches. A significant drawback of kernel matching, however, is that it requires a bandwidth selection and the small sample size of our treatment group can lead to instability in the standard error estimation.

The recent econometric literature finds that propensity score reweighting has some attractive properties (Hirano, Imbens and Ridder (2003), Busso, DiNardo and McCrary (2008)). In particular, this form of matching does not require a bandwidth, and can attain the semi-parametric efficiency bound. Moreover, unlike nearest neighbor matching, the smoothness in the control group selection lends itself well to bootstrap estimation of the standard errors.

### *3.2 Evidence of Selection*

In order to examine whether our assumption that firms are not randomly selected for acquisition is justified we check whether firm characteristics prior to acquisition are correlated with subsequent foreign ownership. The test involves a regression of the various firm-level performance measures on two dummy variables. The first dummy variable indicates those U.S. firms with foreign ownership in year  $t$ . The second dummy variable is switched on three years prior to the ownership change, for those U.S. firms that were eventually foreign acquisition targets. We also control for industry, region and year fixed effects in the regression. The estimation results, presented in Table 5, illustrate that future foreign acquisition targets are larger in size, measured by log sales and log total assets, than non-acquired domestic firms up to three years before acquisition.<sup>16</sup> Furthermore, the regression estimates indicate that acquired firms have more employees and higher debt than non-acquired firms. These systematic differences indicate that foreign investors do not choose target firms at random. Our analysis of the post-acquisition performance of U.S. firms takes this selection into account.

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<sup>16</sup> Karolyi and Liao (2009) examine cross-border acquisitions by government-controlled acquirers and find that they are more likely to pursue larger targets than corporate acquirers. In our sample 22 of our 214 emerging market country acquirers (10%) are government controlled.

### *3.3 Timing Issues*

Unlike longitudinal matching studies, where treatment occurs uniformly at one point in time, the firms in our data set are targets of acquisition at varying times. This variation in treatment timing poses the challenge of how to assign counterfactual treatment dates to the firms that are not acquired by emerging-market firms. We follow Petkova's (2008) approach of proportional-random acquisition time assignment. We determine the fraction of the total number of acquisitions that occur in each calendar year during our sample period, and then assign the hypothetical treatment year to the firms in the control group in the same proportion as their occurrences in the acquisition group. For example, if one-tenth of all acquisitions occurred in 1995 in our sample of targets, then one-tenth of all firms in the control group receive the hypothetical treatment year 1995. Before assigning the date, we make sure that the control firm's year of incorporation precedes the treatment year and that the firm remains non-acquired throughout the entire span of our data.

One drawback of the proportional-random acquisition time assignment is that it does not take into account the timing of failed acquisition attempts that may have occurred in different years than did the successful acquisitions. Unfortunately the limited information we have on failed acquisitions does not provide a large enough sample to use for this purpose. As an alternative, we run the analysis without timing constraints on the control groups and instead allow each control firm to be matched with the treated firms multiple times as long as their propensity scores are close to each other. Essentially, this is sampling with replacement. The results are robust to this alternative timing method (and are available from the authors upon request).

### *3.4 Propensity Score Matching Estimation*

After assigning the hypothetical foreign acquisition dates to the control firms that are not acquired (do not receive treatment) over our sample period, we need to realign the time series data for each firm. More specifically, in the year of acquisition (actual or hypothetical), we set  $t=0$ , in the year following the acquisition  $t=1$ , and in the year prior to the acquisition,  $t=-1$ , etc. The propensity score is the estimated probability of being acquired in period  $t=0$  based on firm characteristics in period  $t=-1$ . We estimate this probability using a probit model, where the

dummy variable  $A_{i,t}$  equals 1 in the year a firm is the actual target of acquisition and zero otherwise<sup>17</sup>.

### 3.4.1 Choice of Covariates

We select our control group of non-acquired firms based on a set of observable characteristics that comprise the vector  $\mathbf{X}$ . It is important to select covariates that affect the acquisition decision as well as the operating performance of the firm. Theory, institutional details, and earlier work in this field guide our choice of covariates. The control variables include factors that drive both the acquisition and performance of the firm, such as: age, size (measured by log of total assets, log of sales and log of employment), operating income, debt, cash, net income, and net property, plant, and equipment. In the estimation, the values of each of these variables are from the year prior to the actual or hypothetical acquisition year. In choosing the year preceding the acquisition, there arises a concern of an “Ashenfelter Dip.” This term is based on the finding in Ashenfelter (1978) that in job program evaluations, participants tend to experience a temporary decline in earnings prior to enrolling in a program. In this data set of target firms, however, there is no visible decline in target firm accounting performance in the year prior to acquisition. As a robustness check we also use variables in three or five years prior to the acquisition and the results remain unchanged.

The age of a firm indicates the maturity of a potential target. Variables such as total assets and sales convey information about the market size of the target firm as well as its productive capacity. Operating income before depreciation (OIBD) and net income describe the profitability of the target firm. Debt and cash variables are financing variables. Property, plant and equipment (PP&E) measure the physical capital stock of a firm.

Lastly, year, region and industry dummies are in the vector of control variables, where industry dummies are based on 2-digit NAIC codes and regional dummies are based on the U.S. state where the target firm is located. Industry dummies are critical variables of acquiring firms’ preferences as well as controls for industry specific performance. Year dummies control for business cycle fluctuations that impact both selection and performance of the target firm. State dummies control for the different tax laws where the target firm is located that have an impact on

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<sup>17</sup>Alternatively, we could also assign zero to a target firm where there has been an acquisition announcement that eventually fell through. Due to the limited number of such cases, however, this analysis was not feasible.

selection and performance. These fixed effects are of particular importance because existing papers in the area of FDI show that foreign firms select their target firms in certain industries and states (Harris and Ravenscraft, 1990, Haskel, Pereira and Slaughter, 2007).

We also use a range of alternative covariates in our estimation including a 4-digit industry market share constructed using all firms in Compustat, and Research and Development (R&D) expenses. The results using these covariates are not significantly different from those we obtain without the addition of these variables, though their inclusion reduces our sample size considerably.<sup>18</sup>

## 4. Results

### *4.1 Preliminary Evidence: Stock Market Reaction to Acquisition Announcements*

If capital markets are semi-strong form efficient with respect to public information, stock prices will quickly adjust following an acquisition announcement, incorporating any expected value changes (Andrade et al, 2001). The two commonly used event windows are the three days immediately surrounding the acquisition announcement, and a longer window beginning several days prior to the announcement and ending at the close of the acquisition. As a first step, we examine the abnormal stock return for the acquired targets around various different windows of time surrounding the announcement of the acquisition.

We calculate the mean cumulative return of the target stock price within a one, three, and twenty day window of the announcement date. We assume that stock prices follow a single factor market model. Our estimation period is 280 days before and up until 30 days preceding the event date. Using a standardized value of the cumulative abnormal return, we test the null hypothesis that the return is equal to zero.<sup>19</sup>

Table 6 displays announcement period abnormal returns for U.S. targets that are acquired by emerging country firms. The announcement period cumulative abnormal return over the three-day window is 8.9% for 175 completed acquisitions. When the event window is expanded to three days prior to the acquisition announcement and ending three days after the announcement, the mean abnormal return is essentially identical. Over an even longer window of

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<sup>18</sup> Other potential candidates for the covariates, such as firm-level imports and exports, the number of patents held, variables related to managerial skill, capital expenditure, advertising expenses or major brands owned, are unfortunately not available for most of the firms in our sample.

<sup>19</sup> In future work we plan to also compare target firm returns to both their matched control firm returns and their industry average return on the announcement date.

twenty days, the mean abnormal return increases to 9.7%. In comparison to domestic U.S. M&As, where target firms' average three-day abnormal return is around 16% for the three-day window and rises to 24% over the longer event window of 20 days (Andrade et al. (2001)), acquisitions of U.S. targets by emerging-country firms tend to have lower abnormal returns.

#### *4.2 Propensity Score Matching Estimates*

Our approach to constructing an appropriate comparison group of non-acquired firms involves a two-step matching process. The first step, a probit regression, estimates the probability of foreign acquisition based on past values of various measures of firm performance (age, OIBD, cash, sales, assets, employment, debt, income) as well as state, year and industry fixed effects. The results of the probit indicate that the target firm industry and state as well as the year of the acquisition are important factors in determining the likelihood that a U.S. firm is acquired. In particular, target firms in manufacturing are more likely to be acquired than firms in other industries. This result corroborates findings in previous work that industry and taxes play major roles in acquisition decisions. In terms of financial characteristics, we find that firms with more cash are more likely to be acquired. In our sensitivity checks, we perform tests using subsamples of firms in similar industries to take this heterogeneity into account, and find that the results are robust.

As mentioned in the methodology section, we impose a common support by dropping treatment observations (firms that are acquired) whose propensity score is higher than the maximum or less than the minimum propensity score of the non-acquired (control) firms. The second step involves using the propensity scores as weights to create the control groups and combining it with a difference-in-differences approach. This second step involves running a weighted difference-in-differences regression, using the propensity score as weights. Due to the parametric nature of the second step, we can also include other covariates that explain firm performance as well as control for industry, year, and state fixed effects.

Figure 3 provides an illustration of the effects of our two-step propensity score reweighting approach. The three densities plotted in the figure depict the predicted probability, i.e. propensity score, of acquisition for the acquired firms (red), the non-matched and non-acquired firms (black), and the propensity score reweighted matched non-acquired firms (blue). The matching estimator performs extremely well as evidenced by the proximity between the

density of the acquired firms and that of the reweighted matched non-acquired firms.<sup>20</sup> In terms of our two step procedure, if we did not “select” our control group, this group would include all U.S. firms that are not acquired (the blue line). Our two-step matching involves constructing an appropriate counterfactual for each acquired firm given the set of observable covariates available for the firms. The propensity score provides a summary index of all the covariates combined, so that matching essentially brings the group of control firms closer to the acquired firms on all available dimensions.

The density plot in Figure 3 reveals that among the non-acquired firms a large proportion have almost zero probability of being acquired. A simple difference-in-difference estimator would treat these firms the same as those non-acquired firms that are more likely to be acquired. The propensity score matching estimator, in contrast, assigns more weight to control firms that are similar to the acquired firms in terms of propensity scores. In other words, propensity score matching in this context ensures that our comparisons involve firms that are very similar prior to acquisition. One could argue that this approach reduces the chances of finding differences in post-acquisition performance (given that the firms are so similar prior to acquisition), but it also ensures that our tests will not simply be picking up differences in acquired and non-acquired firm performance that are unrelated to acquisition.

#### *4.2.1 Balancing Tests*

One way to assess the performance of our propensity score matching is to calculate the standardized differences for the covariates in our probit regression. Specifically, for each covariate, we take the average difference between the acquired firms and the matched control firms and normalize it by the pooled standard deviation of the covariate in the acquired and control group samples. Based on Rosenbaum and Rubin (1985), we calculate the following measure:

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<sup>20</sup> We also used alternative matching estimators, including the Mahalanobis distance metric and kernel matching. Results are qualitatively similar to those reported using propensity score reweighting, and are available upon request.

$$SDiff(X_k) = 100 \frac{\frac{1}{n_1} \sum_{i \in \{A_i=1\}} [X_{ki} - \sum_{j \in \{A_j=0\}} W(P_i, P_j) X_{kj}]}{\sqrt{\frac{\text{var}_{i \in \{A_i=1\}}(X_{ki}) + \text{var}_{j \in \{A_j=0\}}(X_{kj})}{2}}},$$

where  $n_1$  is the number of acquired firms and  $n_0$  is the number of non-acquired firms in the control group.

Table 7 shows that our propensity score method does a good job of matching a set of control group firms that were not acquired to the set of firms that were acquired by emerging-market firms along the dimensions of the observable covariates. The balancing test results indicate that the differences in our matched parameters are all well below 20 indicating that our approach is capable of grouping together relatively similar firms.<sup>21</sup> In particular, the covariates log cash, log sales, log employment, and log of net property, plant and equipment before matching show significant differences in means between acquired and non-acquired firms. After matching, however, the means of the covariates between the two groups are not significantly different.

Consider the firm-size characteristic as measured by log sales in table 7. The first row of coefficients for log sales compares the acquired (treated) firms with the non-acquired (control, unmatched) firms. In other words, the “unmatched control” refers to the set of firms that would have otherwise comprised the control group had we not undertaken propensity score matching. The coefficients for log sales in the first row suggest that the acquired firms are significantly larger, on average, than the unmatched set of control firms. The difference in size is statistically significant as evidenced by the t-statistic and p-values in the final two columns. The second row presents mean log sales numbers for the acquired firms along with the “matched control” firms that were not acquired. In stark contrast, the variation in log size is not significantly different across the treated and control groups when matching takes place. The reduction in bias as a result of propensity score matching along the dimension of log sales is about 98%. The reduction in bias for other observable covariates ranges from 47% for the firm-age variable to 99% for the log assets variable.

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<sup>21</sup> A value for the standardized difference between treated and matched control mean values suggested by Rosenbaum and Rubin (1983).

### *4.3 Post-Acquisition Performance and Restructuring*

Tables 8, Panels A-F present our difference-in-differences propensity score reweighting results for various measures of post-acquisition firm performance.  $t=\{0,5\}$  denotes the post-acquisition year. The second column presents the matched coefficient estimate. Estimates in bold indicate statistical differences in measured post-acquisition performance for acquired and matched non-acquired firms. Common support refers to the set of firms for whom the propensity score range overlaps across control (non-acquired) and treated (acquired) firms. Off support refers to the number of treated (acquired) firms whose propensity score lay above the maximum value or below the minimum value for the control (non-acquired) firms. Note that changes in post-acquisition performance are calculated relative to year  $t=-1$ , prior to the acquisition.

Panel A presents results for OIBD scaled by total assets, or return on assets (ROA). These estimates indicate that the ROA for acquired firms declines significantly compared to the firms in the “propensity score matched” control sample in the year of acquisition. It appears that profits start to increase in years 1-4 following the acquisition but the increase is not statistically significant. In the fifth year post-acquisition the ROA increases significantly for acquired firms (relative to the non-acquired firms in our control group). In particular, the ROA increases by 7% in year five for the acquired firms relative to the control sample and also relative to the year prior to the acquisition. The time-series pattern in the ROA numbers is consistent with restructuring in the early years following the acquisition leading to improved profitability in later years. We also conducted an F-test of joint significance that shows that the post-acquisition increase in profitability is jointly significant across the five years following acquisition.

The advantage of our methodology is that we can identify the timing of the profitability improvements. Propensity score matching also requires large samples with substantial overlap between groups of the treated (acquired) and control (matched non-acquired) firms. From Table 8 panel A, we see that the sample size of control firms under “common support” are an order of magnitude higher than the treated group suggesting that our estimates are measured with high precision. Moreover, the numbers under “off-support” suggest that there is substantial overlap in the treated and control samples; there are only two firm-years of treated observations excluded from the estimation. A caveat remains that while propensity score matching attempts to identify matched twins in the control group and difference-in-differences estimation accounts for time-invariant, unobservable differences across treated and matched firms, hidden bias may remain

because matching only controls for observed variables to the extent that they are perfectly measured (Shadish, Cook and Campbell, 2002). Also, to the extent that there are unobservable time-varying differences in firm characteristics across the treated and control samples, we are unable to account for them.

The results in Table 8 Panels B-D indicate that employment, net property, plant, and equipment (PP&E), and sales all decrease significantly for acquired firms (again, relative to matched control non-acquired firms) in the year of and the five years after acquisition.<sup>22</sup> While the decline in net PP&E is significant in all years except for the year of acquisition, the decline in employment and sales appears to persist across the five years following acquisition. Moreover, for all our outcome variables, the results are jointly statistically significant over the entire sample period.

The pattern of increasing profitability (income/assets) and declining sales is consistent with improvements in firm-efficiency following acquisition.<sup>23</sup> For instance if firms shut down or get rid of unprofitable divisions, sales would go down but profits as a percent of assets would increase. Also, declining employment and net PP&E suggest downsizing of divisions to improve overall profitability as a percent of assets. While data constraints do not allow us to directly test whether targets are downsized or restructured, we would expect capital efficiency and productivity to rise as a result of restructuring.

Estimates for three alternative outcome variables that measure changes in the scale of the firm and productivity improvements are shown in Panels E and F in Table 8. Sales-to-Assets, a measure of capital efficiency, show an initial decline followed by improvements in later years. This finding is consistent with the hypothesis that the restructuring process takes time to be implemented so that efficiency improvements are realized a few years following the acquisition. Consistent with this pattern, Sales-to-Employment, a measure of labor productivity, decreases in

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<sup>22</sup> In the cases of acquisitions that occurred toward the end of our sample, we often have less than five years of post-acquisition data. In order to check that our results are not driven by these cases, we re-estimate using balanced samples (including only firms that had all five years' worth of post-acquisition data) and find that the results are robust to the exclusion of these acquisitions.

<sup>23</sup> Another factor that might impact firm performance is business cycle fluctuations. We devised several ways to control for these effects. The first way is to use the proportional time assignment for the untreated group of firms. Secondly, the year dummies in the probit specification also control for time-specific selection that is related to business cycle fluctuations. In addition, we ran separate tests for particular years in the sample. For example, for all target firms that were acquired in 1995 we only assigned control firms that did not receive acquisition up until 1995 and followed their respective performances. This setup is called dynamic matching, and it focuses on one particular year at a time. The downside to this method is that for several years, there are not enough treated firms for the analysis.

the years following acquisition but shows an increase in year 5 after the acquisition. Assets-to-Employment, a proxy of capital intensity, also shows a decline in the initial years following the acquisition and rises in later years. While these numbers should be interpreted with caution because coverage in the employment data is limited, the pattern is consistent with the time-to-build nature of investment in physical capital. The initial decline in the assets/employment ratio is also consistent with plant shutdowns following the acquisition event.

The productivity results in Table 8 need to be interpreted with particular caution. Conyon et al (2001) emphasize that overall efficiency evaluations are hard to make based on employment and output alone. Consistent with the results in our paper, their paper suggests that the downsizing of merged firms through divestment could have different effects on the efficiency of the retained parts of the business depending on what parts of the existing company the new parent has divested. If inefficient operations were divested, overall efficiency should improve. However, in some cases, it is also possible that more successful units might have been divested in order to satisfy the needs of the new parent company. Capron (1999) echoes this explanation and suggests that asset divestiture and resource redeployment are ways for the merged firm to exploit economies of scale and scope and finds that although they might improve overall acquisition performance, results about target firm efficiency can be mixed. Unfortunately, from our data it is not possible to discern whether the acquirer firm chose to cut more productive or less productive units.

In sum, we find evidence in support of the two hypotheses we set out to test. First, increasing profitability is consistent with the hypothesis that foreign ownership is associated with improvements in plant productivity. Second, declining sales in the target firms along with the downsizing of employment are consistent with the comparative input cost hypothesis. Acquirers from emerging markets come from environments where labor costs are low and they may be in the position to in-source jobs by exploiting the low wages in their home countries by downsizing labor-intensive activities in the U.S. following the acquisition. The U.S. target experiences improvements in profitability with more streamlined but efficient operations following restructuring by the emerging-market acquirer.

## 5. Robustness Checks

### 5.1 *Simple Difference-in-Differences Estimation*

To highlight the importance of constructing an appropriate benchmark for comparison to evaluate post-acquisition performance we report simple difference-in-difference estimates without applying propensity score matching. The simple difference-in-differences estimates compare the post-acquisition performance of targets to the performance of all non-acquired U.S. firms. We include the same covariates as in our probit estimation as control variables in the difference-in-differences estimation. Table 9 (Panels A-D) present the results. Since simple difference-in-difference estimation does not correct for selection effects, the coefficient estimates for our four performance measures, (OIBD/assets, employment, sales, and net property, plant and equipment) are often larger in magnitude and always of the same sign and similarly statistically significant, as compared to the corresponding, more conservative, propensity score matching estimates. It is however reassuring that the sign and statistical significance of the estimates from difference-in-differences are in the same direction as the propensity score matching estimates and provide a cross-check on characterizing the impact of emerging-market acquisitions on various outcome measures of target performance.

Quite apart from the selection issue, we would expect these estimates to differ from those produced using propensity score matching for two reasons: 1) the underlying functional form is restricted to be linear in the simple difference-in-differences approach, whereas the propensity score method is semi-parametric, and 2) the difference-in-differences approach does not take into account the common support problem, whereas propensity score matching ensures that far lying outliers are excluded.<sup>24</sup>

### 5.2 *Additional Tests*

SDC Platinum provides information about acquisitions that are announced but not completed or withdrawn. Using this sample of failed transactions we can examine whether the

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<sup>24</sup> We also conducted an exercise where we matched firms by industry and compared their post-acquisition performances. These estimates can be considered as an intermediate case between simple difference-in-differences and the full-blown propensity score matching approach. The coefficient estimates using this approach are available upon request. They are generally smaller than those found using simple difference-in-differences, but once again since they do not correct for selection effects, larger in magnitude than those reported in table 8 based on the propensity score matching approach. As we increase the complexities of the matching procedure by adding more covariates, we expect the estimated coefficients to decrease in magnitude and significance compared to the simple difference-in-difference.

firms that were potential acquisition targets differ from their non-acquired counterparts. If it is foreign ownership that drives the post-acquisition performance of the acquired firms, we expect that following propensity score matching, the firms that were “potential” targets should perform similarly to the firms that are in the matched control sample but not the subject of foreign interest, since the foreign acquisition was never successfully completed. Although it is not possible to test this hypothesis formally given the limited number of failed acquisitions, Table 10 provides suggestive evidence; the eighteen potential targets in our sample experience declines in employment and increases in sales in the year the M&A transaction is announced and are similar to a group of matched non-acquired firms in the years after the failed acquisitions, suggesting that post-acquisition performance of acquired firms is driven by the transfer of ownership to foreign hands. However, given the small number of failed acquisitions in our sample, more formal statistical analysis is not possible.

We also perform a number of additional robustness checks that involve dividing our sample of acquired firms into various subgroups consisting of: 1) majority and minority control acquisitions, 2) acquisitions financed solely by cash, 3) only manufacturing firms, 4) acquiring firms located in East Asia<sup>25</sup>, and lastly, 5) firms not in the same industry as the acquiring firm. The estimates are shown in Table 11 (Panels A-G). The statistical significance of the results varies due to sample sizes. For example, for the group of horizontal acquisitions, in which both acquiring and target firms share the same industry, the sample size is much smaller than that for diversifying acquisitions. Thus, although the magnitudes of the estimates are similar to those of the whole sample, the statistical significance is not. Overall, the robustness checks confirm the results in the main analysis when using the full sample.

## **6. Conclusion**

This paper undertakes a systematic analysis of the performance of U.S. firms that are acquired by firms located in emerging markets. To do so, we examine both stock market and accounting-based measures of firm performance following the announcement of an acquisition of a U.S. firm by an emerging-market firm. In particular, we use transaction-level M&A

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<sup>25</sup> We also conduct robustness checks on a sample that excludes all deals involving acquiring firms with parent companies based in Hong Kong, Singapore, Taiwan and South Korea. The results are similar in magnitude and statistical significance to those reported and are available upon request.

information along with firm-level financial statement data to examine the post-acquisition operating performance of publicly listed U.S. targets.

Our results suggest that emerging country firms tend to acquire public U.S. targets with relatively high levels of sales, employment and total assets indicating that the selection of acquisition target is non-random. To address the issue of selection, we employ propensity score matching to carefully construct a matched sample of control firms that were not acquired. The matching methodology is combined with difference-in-differences estimation to eliminate time-invariant unobservable firm characteristics.

We find evidence for both the profitability improvement hypothesis and the comparative input cost hypothesis. The stock price response of these U.S. targets is positive and significant around the time of the acquisition announcement. Following the acquisition, the performance of target firms tends to improve. In particular, the return on assets in target firms increases by 7% in the five years following the acquisition. The evidence also suggests that U.S. target firms undergo significant restructuring after acquisition by an emerging-market firm. In particular, employment and capital decrease, suggesting that divisions may be sold off or closed down. This conjecture is also supported by the fact that sales decline after acquisition.

In conclusion, our results indicate that (i) acquisitions by firms from emerging markets influence post-acquisition performance of U.S. target firms (sales and employment decline, profits rise); and (ii) there is selection along observable characteristics based upon which emerging market firms choose acquisition targets in the U.S. (higher sales, assets, employment). In the paper we attempt to control for (ii) using propensity score matching combined with difference-in-differences estimation. There remains the possibility that selection based on time-variant unobservable characteristics (that are orthogonal to the observable characteristics used in our propensity score matching) may be driving our results. However, the evidence presented in the paper suggests that emerging market firm acquisitions impact the performance of U.S. target firms. More generally, the results in the paper serve to illustrate the importance of constructing careful benchmarks from which to evaluate post-acquisition performance and the advantage of propensity score matching in this context.

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## Appendix A

Acquiring Countries in the sample:

Algeria, Argentina, Bahrain, Brazil, China, Costa Rica, Croatia, Ecuador, Egypt, Hong Kong, India, Indonesia, Kuwait, Malaysia, Mexico, Nigeria, Papua N Guinea, Russian Fed, Saudi Arabia, Singapore, South Africa, South Korea, Taiwan, Thailand, Trinidad & Tobago, Uganda, Uzbekistan, Venezuela

Tax Haven Countries (as defined by the OECD, 2008) excluded from the sample:

Bahamas, Bermuda, British Virgin Islands, Cayman Islands, Cyprus, Netherland Antilles, Panama

## Appendix B

Excerpts from business press reports (from Factiva) for acquisitions listed in Table 3:

### *1. Market Access, Distribution Network Expansion and Branding*

- a)* In June 1994, Agrobios (AB), a unit that manufactures tortillas for Desc SA de CV, acquired all the outstanding common stock of Authentic Specialty Foods Inc (ASF) for a total value of US\$141.9 million. Newspaper reports described Desc, SA, the Mexican food, chemical and automotive parts conglomerate as saying that it had agreed to buy Texas-based Authentic Specialty Foods to expand its U.S. distribution network for Mexican food products. Reports also said that Desc has been acquiring brand-name food and auto parts businesses, tapping the growing Mexican economy and exploiting Mexico's expanding commercial ties with the U.S. The transaction was also seen as a signal of Desc's intention to buy more companies in the fragmented Mexican food industry, both in Mexico and the United States
- b)* Mexico's Cemex, one of the world's biggest cement companies acquired cement manufacturer Southdown for about US\$2.6 billion in November 1996. The transaction details suggest that Cemex assumed US\$185 million in Southdown's debt. "Southdown is an excellent fit for Cemex," said Lorenzo H. Zambrano, chairman and chief executive of Cemex according to reports in the Associated Press. "The company's management and facilities are world class and, I believe, will mesh well with our global network. This combination will not only expand our presence in the United States, but help us compete more effectively in all our markets."
- c)* In 2002, China's Sun Media Investment Holdings Ltd acquired a 25.7% stake in Broadcast International Inc, a provider of satellite uplink and related equipment services, for US\$16.5 million, in a privately negotiated transaction. International Broadcasting Co., Ltd of America was a two-decade-old operator of enterprise satellite TV networks, located in the Salt Lake City. Sun Media became the largest shareholder of International Broadcasting Co., Ltd. Along with the right to subscribe to US\$15 million of shares of International Broadcasting, Sun Media also obtained a 45% stock option for the company and planned to renew the services of International Broadcasting in an all-round way by internet protocol television (IPTV) and network multi-media publishing technology, to make International Broadcasting the leading global business-to-business IPTV operator.

- d) In the commercial banking sector, Taiwan's Bank SinoPac merger with Los Angeles-based Far East National Bank, for US\$94 million closed in the mid-1990s. Analysts reported that Chinese banks in the United States were pursuing new Asian business. Details of the strength of Chinese banks suggested for example that the Far East National Bank, a subsidiary of Taiwan's Bank SinoPac serves mainly ethnic-Chinese businesses and was now aggressively pursuing other Asians in the United States. One banker commented that Chinese and Taiwanese banks were actively pursuing the Korean business in the United States. He added that Koreans felt more comfortable with Asian banks. Another insider commented that US banks without branches or partners in Asia often found it hard to serve Asian customers satisfactorily.

## 2. *Technological Alliances, Market Access and Access to Capital*

- a) CDC software, a Hong Kong-based software arm of the acquired technology provider Chinadotcom (CC) acquired Ross Systems Inc (RS), a developer of business software and supplier to mid-size process manufacturers, in a stock swap transaction valued at US\$66.2 million. The transaction was set to provide Ross with access to CDC's R&D resources as well as the capital it needed to grow organically and through acquisitions according to senior sales and marketing staff. The CDC transaction would also provide Ross with better access to the Asian market. Research analysts suggested that Ross would likely get a boost in sales from existing chemical industry customers who were looking to expand into the fast-growing Chinese market.
- b) Corimon, a paint and coating Venezuelan manufacturer raised its stake in Grow Group to 26% for an indicated value of US\$56.27 million and illustrates a case where the acquisition provided access to capital for the US target and access to technology for the emerging-market acquirer. Corimon was interested in Grow's technology for high-performance coatings, namely industrial and marine coatings, while Grow was interested in Corimon's resin manufacturing capability, which Grow also lacked. According to analysts, the Venezuelan company Corimon (Caracas) was not only taking a financial stake in Grow Group (New York), but also forging a strategic alliance with Grow. The alliance was seen as a way to open up the South American market for Grow. While the company had several distributors in South America, it did not have manufacturing facilities or expanded sales staff there.
- c) Yet another example of a technological alliance combined with market access is that of Infosys Technologies from India which made a strategic investment in the US-based CiDRA Corp., a developer of agile photonic devices for high-precision wavelength management and control for optical networks. Earlier in the year, the two firms allied to develop bandwidth management products to address the needs of the burgeoning optical fiber market in and outside India.
- d) Similarly, earlier in the sample period in 1988, Singatronics Asset Holdings, a unit of Singatronics acquired about one million shares of Candela Laser for about US\$7 million, increasing Singatronics' stake in Candela to 27%. Candela Laser Corp was the world's largest maker of flash-lamp-excited tunable dye lasers. The acquisition made Singatronics the largest shareholder in the US firm putting it in a position to take part in a specialized high-technology industry and to profit from the growing US medical instrumentation market.

## Appendix C

Steps followed in our propensity score matching methodology:

1. Run Probit regression where:
  - (a) Dependent variable:  $Y=1$ , if a firm is acquired by an emerging-market firm;  $Y = 0$ , otherwise.
  - (b) Choose appropriate conditioning variables, covariates which are observable firm characteristics such as age, size, profitability, financing-mix, etc.
  - (c) Obtain propensity score: predicted probability ( $p$ ) or  $\log[p/(1-p)]$ .
2. Generate weights using propensity scores:
  - a) for acquired firms, assign weight = 1.
  - b) for non-acquired firms, assign weight =  $p/(1-p)$  using predicted probability in 1c).
3. Run multivariate difference-in-difference regression with the generated weights in 2) and covariates that were used in the initial probit along with industry, year, and state fixed effects to eliminate time-invariant, unobservable differences between acquired (treated) and non-acquired (matched control) firms to examine post-acquisition firm performance.

## Appendix D

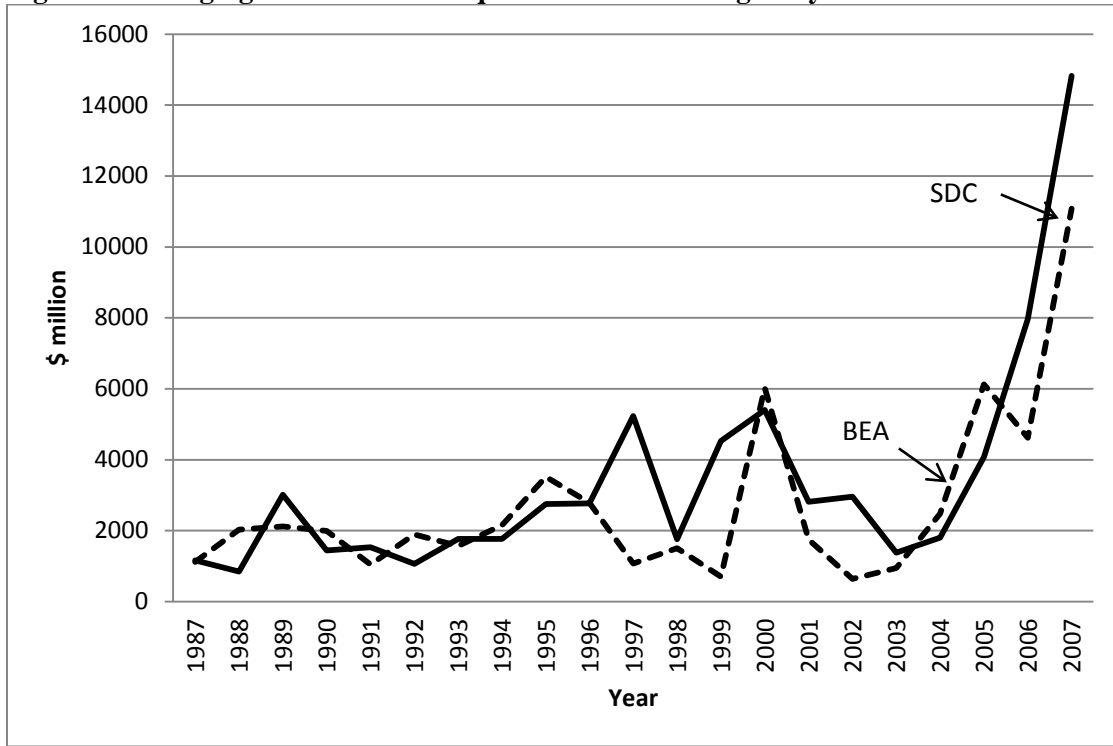
Details of Sample Construction:

	N	Percent
Number of transactions with Emerging Market Acquirer and a U.S. Target	1,500	100
Number of Completed Transactions with Emerging-Market Acquirer and public U.S. Target	480	32
Number of Transactions with Tax Haven Country <sup>26</sup> as domicile of Acquirer	221	15
Number of Firms with Multiple Acquisitions	45	3

Source: SDC Thomson M&A database.

<sup>26</sup> Countries are listed in Appendix A.

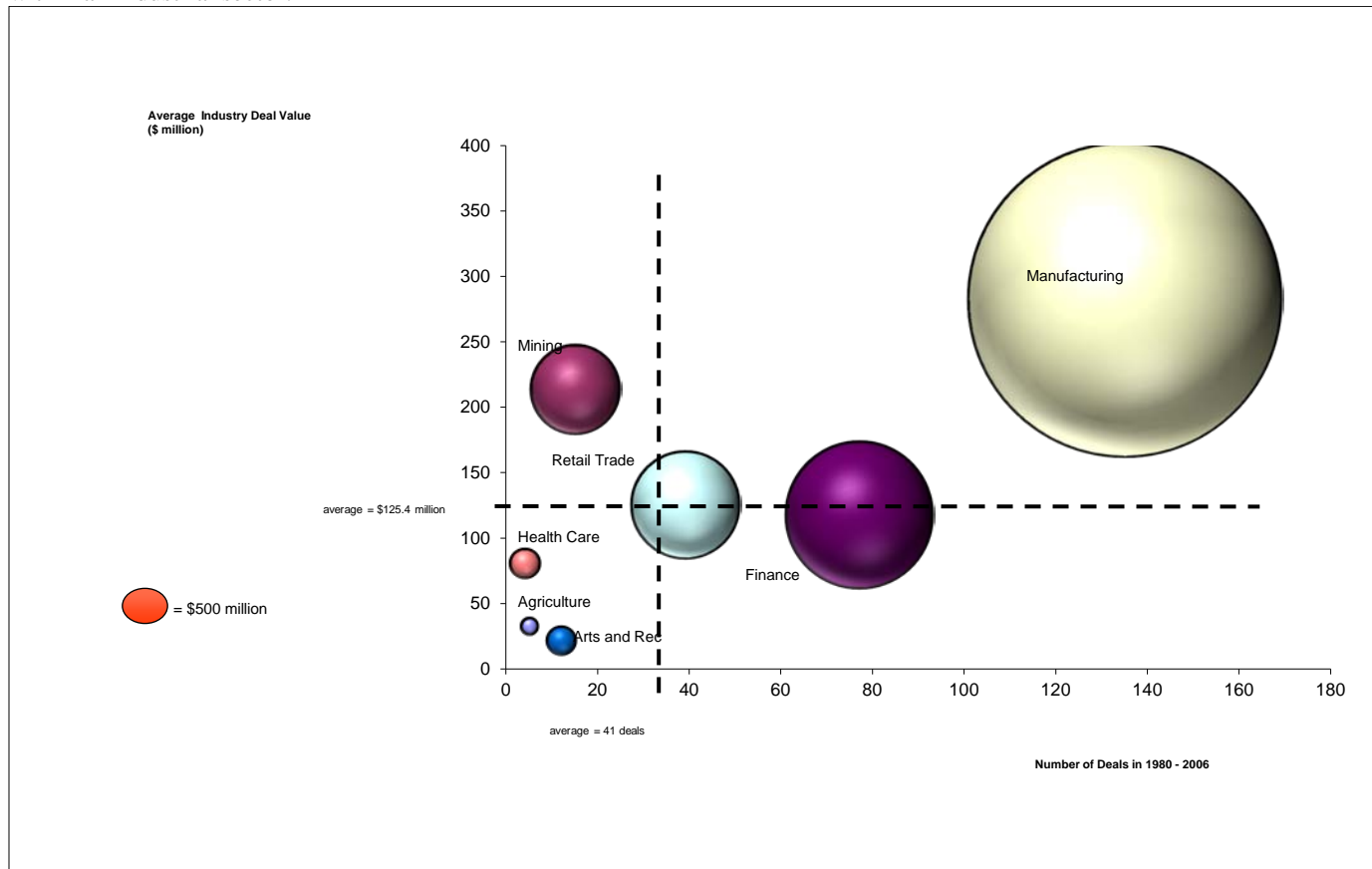
**Figure 1: Emerging-Market Firm Acquisitions of U.S. Targets by Year**



Source: SDC and BEA. The black line in this figure shows the cumulative value of M&A transactions into the US by emerging market firms for each year between 1981 and 2007 based on data from SDC; the dashed line shows US investment outlays undertaken by emerging-market investors based on BEA data.

## Figure 2: Number and Value of M&A deals by Target Sector

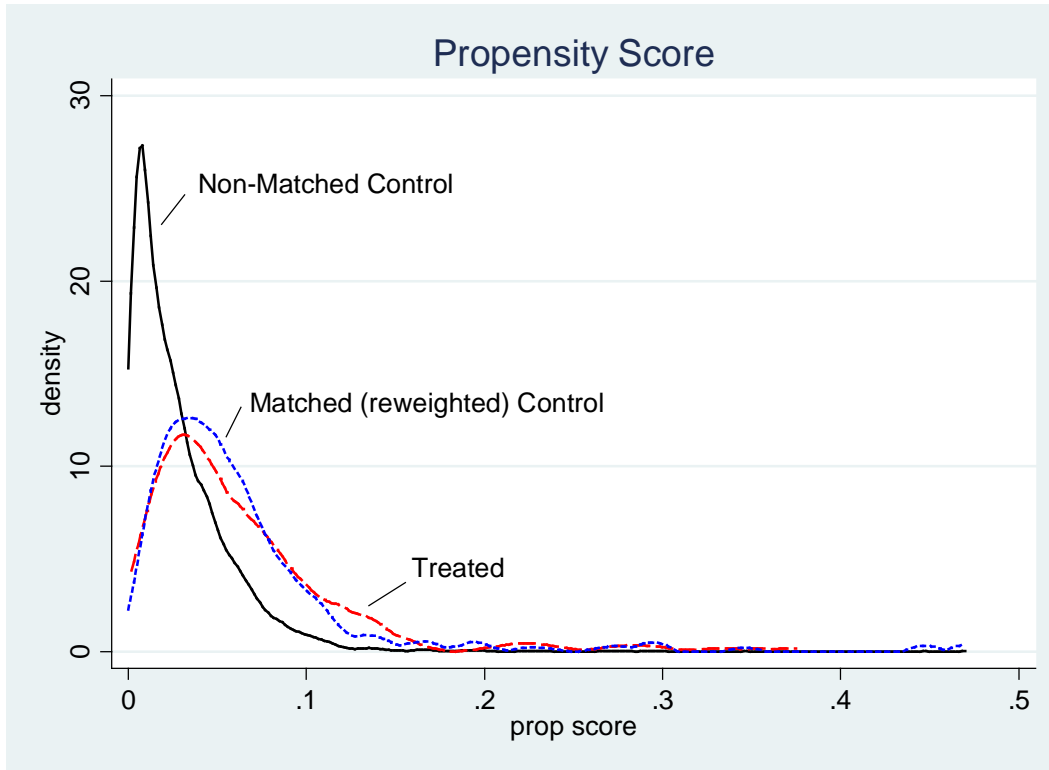
Notes: The figure presents information on the industries in which the target firms belong along with the number (horizontal axis) and average value of the transaction (vertical axis). The surface area of each bubble shows the total value of deals within each one-digit industry sector, while the location of the bubble is determined by the average value and the total number of deals within an industrial sector.



Source: SDC Thomson M&A Database.

**Figure 3: Propensity Scores for Acquired (treated), Control (matched non-treated) and Non-treated non-weighted firms**

Notes: This figure provides an illustration of the effects of our two-step propensity score matching approach. The three densities plotted in the figure depict the predicted probability, i.e. propensity score, of acquisition for the acquired firms (red, dashed), the non-weighted and non-acquired firms (black), and the reweighted propensity score matched non-acquired firms (blue, dotted).



Source: Authors' calculations based on SDC Thomson M&A Database and Compustat North America 1980 – 2006.

**Table 1: Representativeness of our M&A Sample**

Deal Characteristic	Our Sample	Emerging-market M&A excluded from our sample
<b>Mean value of transaction (\$mil)</b>	71.72	63.84
<b>Target Industries (%)</b>		
Manufacturing	50.78	47.53
Information	9.84	8.86
Real Estate and Rental and Leasing	9.33	12.63
Finance and Insurance	7.77	10.43
Wholesale and Retail Trade	7.25	8.24
Mining, Quarrying, and Oil and Gas	6.22	2.67
Transportation and Warehousing	3.11	2.43
Other Services	2.59	5.96
Agriculture, Forestry, Fishing and Hunting	1.55	0.31
Utilities and Construction	1.55	0.94
<b>Acquirer Industries (%)</b>		
Finance and Insurance	54.4	23.69
Manufacturing	26.42	43.37
Information	5.18	10.43
Mining, Quarrying, and Oil and Gas	3.63	2.59
Real Estate and Rental and Leasing	3.63	9.18
Utilities and Construction	2.07	1.88
Wholesale and Retail Trade	2.07	2.59
Transportation and Warehousing	1.04	2.35
Other Services	1.04	3.29
Agriculture, Forestry, Fishing and Hunting	0.52	0.63
<b>Acquirer Public Status (%)</b>		
Public	46.11	53.25
Priv.	27.46	25.1
Sub.	12.95	17.33
Govt.	10.88	2.9
Inv.	2.59	0.47
J.V.	0	0.94

Deal Characteristic	Our Sample	Emerging- market M&A excluded from our sample
<b>Acquirer Geography (%)</b>		
Africa	3.12	5.11
South and Central America	17.63	12.72
Asia	75.64	65.11
West Asia	4.66	6.04
South, East and South-East Asia	70.98	59.07
East Asia	44.04	30.98
China	2.59	4.24
Hong Kong, China	29.53	13.88
Korea, Republic of	5.18	5.49
Macao, China		0.08
Taiwan Province of China	6.74	7.37
South Asia	5.18	13.1
India	5.18	12.47
Pakistan		0.55
Sri Lanka		0.08
South-East Asia	21.76	14.99
Brunei Darussalam		0.08
Malaysia	2.07	3.29
Philippines		1.02
Singapore	18.65	9.65
Thailand	1.04	0.71
Vietnam		0.24
South-East Europe and the CIS (Transition economies)	3.63	1.58
Southeast Europe	0.52	0.16
Croatia	0.52	0.08
Czechoslovakia (former)		0.08
Commonwealth of Independent States (CIS)		
Belarus		0.08
Russian Federation	3.11	1.18
Ukraine		0.16
Unspecified		15.24

Source: SDC Thomson M&A Database.

**Table 2: Number and Value of Acquisitions of U.S. targets by firms in Emerging Markets, 1980-2007.**

Notes: This table provides a break-down of transactions by acquiring country. The first column lists the name of the acquiring country. The second column presents the number of transactions. The third column presents the fraction of total transactions accounted for by the acquiring country. The final column presents the total nominal transaction value in millions of USD by acquiring country.

Acquiring Country	Number of Transactions	% of Total Transactions	Nominal Transaction Value (\$ mil)
Hong Kong	57	26.64	3309.572
Singapore	36	16.82	6412.92
Mexico	26	12.15	9346.126
Taiwan	13	6.07	731.567
Saudi Arabia	11	5.14	1463.797
South Korea	11	5.14	319.409
India	10	4.67	154.346
Russian Fed	7	3.27	932.947
Argentina	5	2.34	5035.794
China	5	2.34	44.83
Bahrain	4	1.87	1478.356
Kuwait	4	1.87	5.745
Malaysia	4	1.87	38.11
Brazil	3	1.4	4.313
Egypt	2	0.93	8.905
South Africa	2	0.93	1900.151
Thailand	2	0.93	27.12
Venezuela	2	0.93	63.27
Algeria	1	0.47	0
Costa Rica	1	0.47	12.5
Croatia	1	0.47	1
Ecuador	1	0.47	0
Indonesia	1	0.47	23
Nigeria	1	0.47	6
Papua N Guinea	1	0.47	2.7
Trinidad & Tob	1	0.47	0.6
Uganda	1	0.47	0.68
Uzbekistan	1	0.47	30.8
<b>Total</b>	<b>214</b>	<b>100%</b>	

Source: SDC Thomson M&A Database.

**Table 3. Acquirer Characteristics (source: Factiva)**

Date Announced	Acquirer Name	Target Name	Acquirer Nation	Acquirer Full Name	Acquirer SIC Description	Acquisition Techniques
5/7/1994	Agrobios (Desc SA de CV)	Authentic Specialty Foods Inc	Mexico	Agrobios(Desc SA de CV)	Tortilla Manufacturing/Perishable Prepared Food Manufacturing	Going Private Tender Offer Tender/Merger Financial Acquirer
8/6/1992	Bank SinoPac	Far East National Bank,CA	Taiwan	Bank SinoPac	Commercial Banking	NA
9/3/1999	Chinadotcom Corp	Ross Systems Inc	Hong Kong	Chinadotcom Corp	Internet Service Providers Wired Telecommunications Carriers Wireless Telecommunications Carriers	Stock Swap
9/28/1996	CEMEX SA DE CV	Southdown Inc	Mexico	CEMEX SA DE CV	Cement Manufacturing Ready-Mix Concrete Manufacturing Brick, Stone, and Related Construction Material Merchant Wholesalers Offices of Other Holding Companies	Tender Offer Tender/Merger
7/21/1988	Corimon CA SACA	Grow Group Inc	Venezuela	Corimon CA SACA	Paint and Coating Manufacturing	Open Market Purchase Privately Negotiated Purchase
8/8/1996	Infosys Technologies Ltd	CiDRA Corp	India	Infosys Technologies Ltd	Computer Facilities Management Services Software Reproducing Software Publishers Data Processing, Hosting, and Related Services Computer Systems Design Services Other Computer Related Services	NA
11/16/1984	Singatronics Asset Holdings	Candela Laser Corp	Singapore	Singatronics Asset Holdings Private Ltd	Other Electronic Component Manufacturing	Privately Negotiated Purchase
9/17/2002	Sun Media Invest Hldgs Ltd	Broadcast International Inc	Hong Kong	Sun Media Investment Holdings Ltd	Electronic Computer Manufacturing Other Communications Equipment Manufacturing Software Publishers Other Computer Peripheral Equipment Manufacturing Offices of Other Holding Companies	Privately Negotiated Purchase

**Table 4: Number of Acquisitions of U.S. Targets by Emerging-Market Firms & Industry Characteristics, 1980-2007.**

Notes: This table presents summary statistics for U.S. target by industry from Compustat North America. The first column presents the industry code. Column 2 presents the industry description followed by the number of firm-year observations, the total number of firms in the industry and the number of firms acquired by emerging-market firms. OIBD/Assets presents the average operating income before depreciation, amortization and taxes (\$ million). The last two columns present average sales (\$ million) and employment (million) by industry.

NAICS	Industry	Firm-Year Observations	Total number of firms	Number of Firms Acquired	OIBD (Mean) \$million	Total Assets (Mean) \$million	Sales (Mean) \$million	Employment (Mean) million
11	Agriculture	2,015	81	5	78.64	1,025.18	1,540.33	22.12
21	Natural Resources	13,486	1,287	12	61.62	483.75	296.16	1.68
22	Utilities	10,085	495	2	24.12	247.60	184.01	0.40
23	Construction	3,733	315	1	34.46	384.54	198.72	1.90
31-33	Manufacturing	92,935	7,604	118	94.72	824.18	1,000.49	6.74
42	Wholesale Trade	9,217	805	8	101.75	1,243.46	1,509.49	7.02
44-45	Retail Trade	10,802	978	16	77.87	743.30	1,475.87	7.76
48-49	Transportation & Warehousing	6,417	576	10	251.86	2,886.27	2,441.86	14.35
51	Information	22,753	2,627	30	201.39	1,754.11	737.93	3.21
52	Finance & Insurance	30,786	4,828	20	2,244.27	65,056.48	8,545.27	18.72
53	Real Estate	6,042	531	8	5.35	147.09	41.96	0.18
54	Professional Services	10,097	1,050	6	31.94	200.14	168.12	1.07
56	Administrative Services	4,743	492	1	-1.67	20.90	17.80	0.09
62	Health Care & Social Assistance	4,049	441	2	16.42	121.52	131.32	2.03
71	Arts, Entertainment, & Recreation	1,848	193	2	0.83	14.33	11.88	0.18
72	Accommodation & Food Services	5,245	469	10	17.36	159.18	167.09	2.59
81	Other Services	1,126	115	8	NA	NA	NA	NA

**Table 5: Evidence of Selection in the Three Years Preceding Acquisition**

Notes: These regressions test whether U.S. firm performance prior to acquisition is correlated with subsequent foreign ownership. The dependent variables are sales, assets, OIBD, cash, debt and employment and the independent variables include:  $D\_foreign_t$  (a dummy variable which indicates those U.S. firms with foreign ownership at time  $t$ ),  $D\_futureacq$  (a dummy variable which indicates those U.S. firms that become acquisition targets of emerging-market firms three years prior to the ownership change), and industry, region and year fixed effects. The dependent variables are expressed in log terms. All significant coefficients are in bold and indicate that foreign investors do not choose target firms at random. \* indicates significance at 10%; \*\* significant at 5%; \*\*\* significant at 1%. Standard errors are in parentheses.

	Sales	Assets	OIBD	Cash	Debt	Employment
$D\_foreign_t$	0.906*** (0.19)	0.952*** (0.19)	0.281 (0.21)	0.815*** (0.20)	0.896*** (0.24)	0.737*** (0.20)
$D\_futureacq_t$	0.898*** (0.10)	0.897*** (0.10)	0.553*** (0.11)	0.925*** (0.11)	0.753*** (0.13)	0.790*** (0.10)
Observations	236223	244249	182936	217800	197547	161948
R-squared	0.172	0.231	0.193	0.197	0.203	0.186

**Table 6: Cumulative Abnormal Stock Returns for Acquisition Targets**

Notes: The sample covers acquisitions of U.S. targets by emerging-market firms between January 1, 1980 and July 1, 2007. The day of first mention of the acquisition in SDC Thomson is taken as day '0'. Abnormal gain to the U.S. target is computed as the cumulative abnormal return based on a single factor market model. The estimation period is 280 days before and up until 30 days before the event day. The CAR is the cumulative average abnormal return and is described in detail in section 4 of the paper. The Patell Z statistic is based on the Patell (1976) test that assumes cross-sectional independence. It is constructed by standardizing CAR by the respective standard errors. It follows a standard normal distribution under the null hypothesis.

Days	N	Mean CAR	Patell Z
(-3,+3)	175	8.87%	13.669***
(-1,+1)	175	8.53%	20.068***
(-10,+10)	175	9.71%	8.537***
(-20,+20)	175	11.13%	6.466***
(-30,+30)	175	11.44%	4.871***

**Table 7: Balancing Tests**

Notes: These tests check whether our matching approach is capable of grouping together relatively similar firms. The table presents the average difference in each of the covariates between the: (1) acquired firms and the unmatched non-acquired firms, and (2) the acquired firms and the matched (reweighted) non-acquired firms. Differences are normalized by the pooled standard deviation of the covariate in the two samples.

Variable	Sample	Mean		%bias	%reduction in bias	t-test	
		Treated	Control			t	p> t
Age	Unmatched	24.640	23.915	5.8		0.6	0.548
	Matched	24.717	24.333	3	47.1	0	0.996
OIBD	Unmatched	216.690	292.840	-6.9		-0.66	0.507
	Matched	217.930	230.040	-1.1	84.1	-0.43	0.668
Log Cash	Unmatched	2.378	1.884	19.7		1.99	<b>0.047</b>
	Matched	2.367	2.345	0.9	95.6	0.48	0.632
Log Sales	Unmatched	5.367	4.883	21.4		2.09	<b>0.037</b>
	Matched	5.360	5.368	-0.4	98.3	0.34	0.733
Log Assets	Unmatched	5.558	5.261	12.9		1.27	0.205
	Matched	5.548	5.549	-0.1	99.5	0.39	0.698
Log Employment	Unmatched	0.484	0.140	16		1.66	<b>0.097</b>
	Matched	0.463	0.527	-3	81.3	0.25	0.799
Log Debt	Unmatched	3.280	3.041	7.7		0.8	0.424
	Matched	3.261	3.353	-3	61.4	0.27	0.789
Net Income	Unmatched	4.240	7.981	-20		-1.83	<b>0.068</b>
	Matched	4.135	4.177	-9.9	50.2	-0.44	0.66
Log Net PPE	Unmatched	3.961	3.601	14		1.41	0.16
	Matched	3.950	4.052	-4	71.8	0.41	0.684

**Table 8: Post-Acquisition Performance Characteristics (Propensity Score Matching and Difference-in-Differences)**

Notes: This table documents difference-in-difference estimates for the post-acquisition performance between acquired and "matched control" firms that were not acquired. Panels A-D report post-acquisition OIBD/Assets, log employment, log net PP&E and log sales, respectively.  $t=\{0,5\}$  denotes the post-acquisition year. The second column presents the matched coefficient estimate. Estimates in bold indicate statistical differences in measured post-acquisition performance for acquired and matched non-acquired firms. Common support refers to the set of firms for whom the propensity score range overlaps across control (non-acquired) and treated (acquired) firms. Off support refers to the number of treated (acquired) firms whose propensity score lay above the maximum value or below the minimum value for the control (non-acquired) firms.

**Panel A: Post-Acquisition Performance (OIBD/Asset)\***

t	Matching Estimate	Bootstrapped Std. Err.	Z-Stat	P> z	<u>Common Support</u>		<u>Off Support</u>	
					Untreated	Treated	Untreated	Treated
Difference-in-Differences combined with propensity score reweighting estimates								
0	<b>-0.042</b>	0.009	-4.66	0.000	5,027	128	0	0
1	0.042	0.134	0.31	0.755	4,440	115	0	1
2	0.082	0.191	0.43	0.668	3,992	102	0	0
3	0.045	0.033	1.39	0.165	3,598	86	0	1
4	0.138	0.094	1.46	0.143	3,203	74	0	0
5	<b>0.070</b>	0.024	2.95	0.003	2,861	69	0	0

\*Joint significance between year 0 and year 5

**Panel B: Post-Acquisition Employment\***

t	Matching Estimate	Bootstrapped Std. Err.	Z-Stat	P> z	<u>Common Support</u>		<u>Off Support</u>	
					Untreated	Treated	Untreated	Treated
Difference-in-Differences combined with Propensity Score Matching estimates								
0	<b>-0.069</b>	0.014	-4.77	0.000	3,102	94	0	0
1	<b>-0.119</b>	0.020	-6.06	0.000	2,718	82	0	0
2	<b>-0.167</b>	0.029	-5.74	0.000	2,370	74	0	0
3	<b>-0.223</b>	0.041	-5.47	0.000	1,919	60	0	0
4	<b>-0.230</b>	0.045	-5.16	0.000	1,640	50	0	0
5	<b>-0.464</b>	0.056	-8.29	0.000	1,414	45	0	0

\*Joint significance between year 0 and year 5

**Panel C: Post-Acquisition Net PP&E\***

t	Matching Estimate	Bootstrapped Std. Err.	Z-Stat	P> z	<u>Common Support</u>		<u>Off Support</u>	
					Untreated	Treated	Untreated	Treated
Difference-in-Differences combined with Propensity Score Matching estimates								
0	-0.162	0.032	-5.14	0.000	5,039	128	0	0
1	<b>-0.133</b>	0.043	-3.12	0.002	4,439	115	0	1
2	<b>-0.137</b>	0.051	-2.68	0.007	3,980	103	0	0
3	<b>-0.202</b>	0.052	-3.87	0.000	3,599	87	0	1
4	<b>-0.265</b>	0.060	-4.4	0.000	3,198	75	0	0
5	<b>-0.412</b>	0.075	-5.5	0.000	2,860	69	0	0

\*Joint significance between year 0 and year 5

**Panel D: Post-Acquisition Sales\***

t	Matching Estimate	Bootstrapped Std. Err.	Z-Stat	P> z	<u>Common Support</u>		<u>Off Support</u>	
					Untreated	Treated	Untreated	Treated
Difference-in-Differences combined with Propensity Score Matching estimates								
0	<b>-0.064</b>	0.011	-5.95	0.000	5,039	128	0	0
1	<b>-0.186</b>	0.017	-11	0.000	4,439	115	0	1
2	<b>-0.218</b>	0.020	-10.87	0.000	3,980	103	0	0
3	<b>-0.217</b>	0.026	-8.4	0.000	3,599	87	0	1
4	<b>-0.308</b>	0.034	-8.96	0.000	3,198	75	0	0
5	<b>-0.301</b>	0.035	-8.55	0.000	2,860	69	0	0

\*Joint significance between year 0 and year 5

**Panels E and F (Bootstrapped standard errors based on reps=100 in parenthesis)**

t	Log(Sales/Assets)		Treated # of Obs.	Sales/Assets		Treated # of Obs.
0	-0.013	(0.010)	126	<b>0.044</b>	(0.011)	127
1	-0.020	(0.013)	113	0.021	(0.014)	114
2	<b>0.050</b>	(0.015)	101	0.083	(0.092)	103
3	<b>0.078</b>	(0.018)	85	<b>0.126</b>	(0.029)	86
4	<b>-0.046</b>	(0.024)	73	-0.190	(0.237)	73
5	<b>0.081</b>	(0.022)	68	<b>0.150</b>	(0.029)	68
t	Log(Sales/Employment)		Treated # of Obs.	Log(Asset/Employment)		Treated # of Obs.
0	<b>-0.025</b>	(0.012)	93	<b>0.010</b>	(0.012)	94
1	<b>-0.066</b>	(0.015)	82	<b>-0.037</b>	(0.015)	82
2	<b>-0.048</b>	(0.017)	73	<b>-0.059</b>	(0.021)	74
3	-0.031	(0.023)	59	<b>-0.067</b>	(0.030)	60
4	<b>-0.145</b>	(0.035)	50	0.004	(0.030)	50
5	<b>0.066</b>	(0.033)	45	<b>0.105</b>	(0.034)	45

**Table 9: Post-Acquisition Performance Characteristics (Simple Difference-in-Differences with Controls)**

Notes: This table documents simple difference-in-difference estimates for the post-acquisition performance between acquired and non-acquired firms. We use the same covariates as in the probit estimation as control variables. Panels A-D report post-acquisition OIBD/Assets, log employment, log net PP&E and log sales, respectively.  $t=\{0,5\}$  denotes the post-acquisition year. The second column presents the simple difference-in-differences coefficient estimate. Estimates in bold indicate statistical differences in measured post-acquisition performance for acquired and non-acquired firms.

**Panel A: Post-Acquisition Performance (OIBD/Asset)**

t	Coefficient Estimate	Std. Error	Z-Stat	P> z	Untreated	Treated
Simple Difference-in-Differences						
0	-0.055	0.065	-0.85	0.397	5,027	128
1	0.180	0.953	0.19	0.850	4,440	115
2	0.376	1.252	0.3	0.764	3,992	102
3	0.089	0.275	0.32	0.747	3,598	86
4	0.248	0.539	0.46	0.645	3,203	74
5	0.127	0.236	0.54	0.590	2,861	69

**Panel B: Post-Acquisition Employment**

t	Coefficient Estimate	Std. Error	Z-Stat	P> z	Untreated	Treated
Simple Difference-in-Differences						
0	-0.002	0.063	-0.02	0.981	3,102	94
1	-0.076	0.073	-1.04	0.300	2,718	82
2	<b>-0.186</b>	0.087	-2.13	0.033	2,370	74
3	<b>-0.182</b>	0.095	-1.92	0.055	1,919	60
4	<b>-0.214</b>	0.099	-2.15	0.031	1,640	50
5	<b>-0.276</b>	0.113	-2.44	0.015	1,414	45

**Panel C: Post-Acquisition Net PP&E**

t	Coefficient Estimate	Std. Error	Z-Stat	P> z	Untreated	Treated
Simple Difference-in-Differences						
0	-0.188	0.143	-1.31	0.190	5,039	128
1	<b>-0.275</b>	0.153	-1.8	0.072	4,439	115
2	<b>-0.326</b>	0.162	-2.01	0.044	3,980	103
3	<b>-0.372</b>	0.174	-2.14	0.033	3,599	87
4	<b>-0.441</b>	0.185	-2.39	0.017	3,198	75
5	<b>-0.592</b>	0.193	-3.06	0.002	2,860	69

**Panel D: Post-Acquisition Sales**

t	Coefficient Estimate	Std. Error	Z-Stat	P> z	Untreated	Treated
Simple Difference-in-Differences						
0	<b>-0.080</b>	0.043	-1.88	0.061	5,039	128
1	<b>-0.213</b>	0.059	-3.59	0.000	4,439	115
2	<b>-0.274</b>	0.068	-4.02	0.000	3,980	103
3	<b>-0.305</b>	0.081	-3.76	0.000	3,599	87
4	<b>-0.331</b>	0.091	-3.64	0.000	3,198	75
5	<b>-0.327</b>	0.093	-3.5	0.000	2,860	69

**Table 10: Failed Transactions**

Notes: This table enumerates M&A transactions that were announced but failed to be completed. Columns 1-3 present the target name, acquirer name and acquirer nation. Columns 4 and 5 present the dates the transactions were announced and withdrawn. Columns 6 and 7 present the announced target's change in employment and sales in the year the transaction was announced.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Target Name	Acquirer Name	Acquirer Nation	Date Announced	Date Withdrawn	Target Change in Employment	Target Change in Sales
Wits Basin Precious Minerals	Easyknit Enterprises Hldgs Ltd	Hong Kong	11/29/2006	11/1/2007	NA	NA
KDI Corp	Impala Pacific Corp	Hong Kong	4/28/1986	8/21/1986	-0.538	-0.033
SSMC Inc	Berjaya Corp Bhd	Malaysia	2/6/1989	3/22/1989	NA	NA
Aeronca Inc	Korean Airlines Co Ltd	South Korea	6/10/1986	10/7/1986	NA	NA
AT&T Latin America Corp	Southern Cross Latin America	Argentina	1/7/2003	9/3/2003	NA	NA
American Maize-Products Co	Usaha Tegas Sdn Bhd	Malaysia	2/27/1995	7/14/1995	NA	NA
Bear Stearns Cos Inc	Jardine Strategic Holdings Ltd	Hong Kong	9/30/1987	10/23/1987	-0.046	0.009
Cole National Corp	Moulin Intl Hldgs Ltd	Hong Kong	4/15/2004	7/25/2004	NA	0.173
CalMat Co	Investor Group	Hong Kong	10/19/1987	10/30/1987	0.220	0.402
FNB Rochester Corp, NY	Cukurova Holding AS	Turkey	5/9/1990	9/4/1990	NA	NA
Friedman Industries Inc	Investor	Venezuela	11/7/1986	5/5/1987	NA	NA
Emerson Radio Corp	Semi-Tech Co Ltd	Hong Kong	3/15/1991	4/1/1992	NA	NA
Metromedia International Group	Investor Group	UAE	10/2/2006	12/31/2006	-0.370	-0.008
Phoenix Medical Technology Inc	MBf International	Hong Kong	8/8/1990	10/4/1990	NA	NA
Builders Transport Inc	TriSun Medical America Inc	China	3/19/1990	10/4/1990	NA	0.053
Tesoro Petroleum Corp	Oakville NV (Kuo Invt Ltd)	Hong Kong	5/31/1990	12/20/1990	-0.057	0.268
Unocal Corp	CNOOC	China	6/22/2005	8/2/2005	NA	0.224
Union Texas Petroleum Holdings	Chinese Petroleum	Taiwan	9/28/1990	12/19/1990	NA	NA

**Table 11: Robustness Checks (Propensity Score Matching and Difference-in-Differences)**

Notes: This table documents difference-in-difference estimates for the post-acquisition performance between acquired and matched non-acquired control firms. Each panel reports post-acquisition OIBD/Assets, log sales and log employment.  $t=\{0,5\}$  denotes the post-acquisition year. Each column presents the propensity score matched difference-in-differences coefficient estimate and bootstrapped standard errors based on reps=100 in parentheses. Estimates in bold indicate statistical differences in measured post-acquisition performance for acquired and matched non-acquired firms.

Panel A: Majority Acquisitions (sample size)						
t	OIBD/Asset (12)		Log Sales (12)		Log Employment (7)	
0	<b>-0.195</b>	(0.025)	<b>-0.146</b>	(0.027)	<b>-0.350</b>	(0.039)
1	0.140	(0.421)	<b>-0.433</b>	(0.043)	<b>-0.277</b>	(0.061)
2	0.546	(0.730)	<b>-0.728</b>	(0.059)	<b>-0.383</b>	(0.089)
3	-0.155	(0.126)	<b>-0.508</b>	(0.081)	<b>-0.559</b>	(0.103)
4	0.184	(0.412)	<b>-0.668</b>	(0.114)	<b>-0.695</b>	(0.130)
5	<b>0.156</b>	(0.099)	<b>-0.864</b>	(0.125)	<b>-0.882</b>	(0.154)

Panel B: Minority Acquisitions (sample size)						
t	OIBD/Asset (104)		Log Sales (104)		Log Employment (80)	
0	-0.004	(0.008)	<b>-0.034</b>	(0.011)	<b>-0.034</b>	(0.014)
1	0.032	(0.142)	<b>-0.111</b>	(0.017)	<b>-0.111</b>	(0.020)
2	0.055	(0.201)	<b>-0.240</b>	(0.020)	<b>-0.240</b>	(0.029)
3	0.053	(0.034)	<b>-0.264</b>	(0.026)	<b>-0.264</b>	(0.041)
4	0.133	(0.098)	<b>-0.201</b>	(0.034)	<b>-0.201</b>	(0.047)
5	<b>0.064</b>	(0.025)	<b>-0.423</b>	(0.035)	<b>-0.423</b>	(0.060)

Panel C: Cash Acquisitions (sample size)						
t	OIBD/Asset (102)		Log Sales (102)		Log Employment (80)	
0	<b>-0.040</b>	(0.010)	<b>-0.074</b>	(0.011)	<b>-0.118</b>	(0.014)
1	0.043	(0.144)	<b>-0.171</b>	(0.017)	<b>-0.120</b>	(0.020)
2	0.081	(0.206)	<b>-0.218</b>	(0.020)	<b>-0.201</b>	(0.030)
3	<b>0.063</b>	(0.035)	<b>-0.220</b>	(0.027)	<b>-0.302</b>	(0.042)
4	0.148	(0.102)	<b>-0.290</b>	(0.036)	<b>-0.229</b>	(0.047)
5	<b>0.068</b>	(0.026)	<b>-0.261</b>	(0.036)	<b>-0.483</b>	(0.059)

Panel D: Manufacturing Acquisitions (sample size)						
t	OIBD/Asset (53)		Log Sales (53)		Log Employment (43)	
0	-0.001	(0.011)	-0.021	(0.015)	<b>-0.072</b>	(0.016)
1	0.060	(0.208)	<b>-0.142</b>	(0.022)	<b>-0.191</b>	(0.025)
2	0.071	(0.296)	<b>-0.239</b>	(0.026)	<b>-0.267</b>	(0.035)
3	<b>0.118</b>	(0.050)	<b>-0.234</b>	(0.034)	<b>-0.351</b>	(0.046)
4	0.122	(0.144)	<b>-0.417</b>	(0.048)	<b>-0.350</b>	(0.058)
5	<b>0.078</b>	(0.036)	<b>-0.348</b>	(0.049)	<b>-0.564</b>	(0.071)

Panel E: East Asian Acquirers (sample size)

t	OIBD/Asset (70)		Log Sales (71)		Log Employment (56)	
0	<b>-0.093</b>	(0.011)	<b>-0.089</b>	(0.012)	<b>-0.100</b>	(0.016)
1	0.052	(0.169)	<b>-0.208</b>	(0.019)	<b>-0.151</b>	(0.023)
2	0.153	(0.243)	<b>-0.265</b>	(0.024)	<b>-0.230</b>	(0.035)
3	0.053	(0.041)	<b>-0.290</b>	(0.030)	<b>-0.341</b>	(0.045)
4	0.137	(0.117)	<b>-0.467</b>	(0.041)	<b>-0.391</b>	(0.051)
5	0.040	(0.029)	<b>-0.469</b>	(0.042)	<b>-0.635</b>	(0.059)

Panel F: Horizontal Acquisitions (sample size)

t	OIBD/Asset (20)		Log Sales (20)		Log Employment (13)	
0	-0.021	(0.016)	<b>-0.055</b>	(0.021)	-0.025	(0.025)
1	-0.038	(0.306)	<b>-0.075</b>	(0.032)	<b>-0.313</b>	(0.041)
2	-0.114	(0.447)	<b>-0.198</b>	(0.038)	<b>-0.654</b>	(0.055)
3	0.039	(0.072)	<b>-0.260</b>	(0.047)	<b>-0.558</b>	(0.067)
4	-0.046	(0.217)	<b>-0.418</b>	(0.060)	<b>-0.830</b>	(0.077)
5	0.057	(0.055)	<b>-0.516</b>	(0.069)	<b>-1.205</b>	(0.096)

Panel G: Diversifying Acquisitions (sample size)

t	OIBD/Asset (106)		Log Sales (95)		Log Employment (81)	
0	<b>-0.048</b>	(0.009)	<b>-0.070</b>	(0.011)	<b>-0.104</b>	(0.015)
1	0.051	(0.143)	<b>-0.221</b>	(0.017)	<b>-0.104</b>	(0.021)
2	0.113	(0.205)	<b>-0.243</b>	(0.021)	<b>-0.108</b>	(0.031)
3	0.049	(0.035)	<b>-0.224</b>	(0.028)	<b>-0.135</b>	(0.043)
4	<b>0.166</b>	(0.101)	<b>-0.261</b>	(0.036)	<b>-0.086</b>	(0.046)
5	<b>0.071</b>	(0.025)	<b>-0.255</b>	(0.037)	<b>-0.305</b>	(0.058)