DISENTANGLING THE PERFORMANCE EFFECTS OF EFFICIENCY AND BARGAINING POWER IN HORIZONTAL GROWTH STRATEGIES: AN EMPIRICAL INVESTIGATION IN THE GLOBAL RETAIL INDUSTRY

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Mergers and acquisitions (M&A) and organic growth are two common strategies to achieve horizontal growth. In this study, we disentangle two distinct sources of firm performance corresponding to different theoretical perspectives on firm size: firms' bargaining power with respect to suppliers and customers, and operating efficiency arising from scale economies. We conceptually argue and empirically show that relatively, M&A enhance bargaining power in the short term while organic growth enhances operating efficiency over the long term. In order to disaggregate these effects, we use accounting rather than financial or managerial data and test our predictions in the global retail industry over a 20-year period. We examine implications of these results for sustainability of size-based competitive advantages. Copyright © 2014 John Wiley & Sons, Ltd.

INTRODUCTION

Mergers and acquisitions (M&A) and organic growth are two commonly used strategies for firms to achieve horizontal growth, i.e., increase their size within a single business. The performance implications of the two growth modes are ambiguous and mixed (Capron and Mitchell, 2012). We submit that M&A and organic growth may impact performance through two *distinct* size-related theoretical mechanisms (Dranove and Shanley, 1995): enhanced bargaining power with respect to suppliers and customers[1] (Porter, 1980; Scherer and Ross, 1990), and operating efficiency arising from scale economies (Barney, 1991; Cockburn and Henderson, 2001; Makadok, 1999; Scherer and Ross, 1990).

These theoretical drivers have been difficult to tease apart in previous research. First, existing

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[1] Bargaining power is related to the concept of market power; the latter being an industry level concept, while the former is a firm level concept. In order to emphasize the firm-specific effect of size on profitability, we consistently use the term bargaining power.

research on the performance outcomes of M&A compared to organic growth is far from clear due to theoretical as well as measurement challenges. For example, it is difficult to compare bargaining power and scale economy explanations of firm performance in these modes with stock market or managerial survey data (Anand and Singh, 1997; Capron, 1999; Eckbo, 1983). Second, little research has attempted to disentangle the performance effects of growth and size increase in a given business *per se* from that of the firms' mode of growth since firms may endogenously self-select into the optimal mode of growth given their positions and constraints (Hamilton and Nickerson, 2003; Shaver, 1998). While some previous research shows systematic differences among the outcomes of M&A and organic growth (e.g., Woodcock, Beamish, and Makino, 1994), when endogeneity behind the choice of mode is accounted for, the two modes of growth are generally found to achieve similar performance (Brouthers, Brouthers, and Werner, 2003; Shaver, 1998).

In this paper, we go beyond such studies and disentangle the specific effects of bargaining power and scale economies by using customized accounting measures from the retail industry (Kumar, Kerin, and Pereira, 1991; Pellegrini, 1994). We focus in this study on how opting for M&A rather than for organic growth influences these size-related performance effects and disentangle these sources of performance in a sample of 83 firms from the global retail sector over a 20 year period. Our empirical analysis has two unique features. First, using accounting-based data rather than financial or managerial data, we develop specific measures of firm scale-related efficiency and bargaining power *vis-à-vis* its customers and suppliers. In order to achieve this, we test our predictions in the global retail industry, a setting in which the two focal effects can be observed by developing distinct and customized accounting measures corresponding to these theoretical mechanisms. Second, we correct for the endogeneity bias in the mode choice between M&A and organic growth. It is important to note that our focus is limited to the study of the performance *outcomes* of horizontal growth and we do not address the *motives* of firms to undertake different modes of expansion such as the motives to learn, innovate, or expand into new markets or concepts.

We find that the two growth modes affect bargaining power and operating efficiency in significantly *different* ways. Compared with organic growth, M&A increase bargaining power but this advantage disappears over time; M&A decrease operating efficiency and this disadvantage lasts over more extended periods of time. Despite these two opposing effects, we also find clear evidence of an overall negative effect of M&A and an overall positive effect of organic growth on firm performance.

BACKGROUND AND PREDICTIONS

Both horizontal M&A and organic growth are modes through which firms expand in size within an industry. The relationship between firm size and profitability (Panzar and Willig, 1981; Penrose, 1959; Scherer and Ross, 1990) has long been a hotly debated issue. While research has empirically confirmed the existence of a positive link (e.g., Hall and Weiss, 1967), many researchers have added further nuance to various aspects of the size-performance relationship (Karnani, 1984; Makadok, 1999; Woo, 1987). Firms frequently seek rapid growth, on the implicit premise that increased size will lead to enhanced profitability. While growth may lead a firm to expand into new areas of business such as new product lines or upstream and downstream activities, we limit our arguments to growth within a given business, i.e. horizontal growth. The strategy and underlying economics literatures have long argued that horizontal growth produces two main size-related benefits: (1) increased rents originating in enhanced bargaining power and (2) improved operating efficiency resulting from greater scale. These two mechanisms fundamentally differ in that bargaining power results in a transfer of value from suppliers and buyers to the focal firm while operating efficiency gains enhance economic value. On this basis, we posit that the mode through which firms choose to grow horizontally, M&A or organic growth, affects the size-performance relationship and we discuss below how M&A and organic growth differentially affect bargaining power on the one hand and operating efficiency on the other hand.

The differential impact of M&A and organic growth on bargaining power

While the traditional market power perspective ignores differences among firms, bargaining power measures the economic clout at the firm level (Chae and Heidhues, 2004; Chipty and Snyder, 1999; Porter, 1980; Tyagi, 2001) and is positively

associated with size, in particular relative size versus competitors, suppliers and customers. In terms of the modes of growth, M&A are more likely to generate greater bargaining power because horizontal mergers not only increase the size of the firm—which organic growth also achieves—but also directly reduce the number of competitors (Kim and Singal, 1993). In a simple Cournot-type model, such a decrease in number of competitors creates an increase in market power for all firms in the industry. But in the case of horizontal mergers, these benefits may disproportionately accrue to the combining firms who not only gain from the reduced number of competitors in the industry but also can better take advantage of their increased relative size. Compared with organic growth, M&A reduce the number of alternatives for suppliers and buyers, particularly in more concentrated industries, and consequently increase the credibility of the threat of switching all purchases to the lowest bidding supplier and of allocating more sales to higher paying customers.

Further, other factors may enhance the bargaining power increment in case of M&A relative to organic growth. M&A are discrete events likely to trigger major change and a re-evaluation of managerial routines within the merging firms (Capron, Mitchell, and Swaminathan, 2001). In particular, while organic growth is, by definition, pursued incrementally, M&A result in a sudden increase in firm size creating the internal stimulus to renegotiate terms with buyers and suppliers and redesign pricing conditions (Capron *et al.*, 2001). M&A are often explicitly justified by the promise of value creation for shareholders; this is often based on an anticipated increase in profits (Anand and Singh, 1997; Capron *et al.*, 2001; Healy, Palepu, and Ruback, 1992) which in turn creates increased pressure on managers to achieve cost and price advantages quickly. Appropriation of value from suppliers and customers is often seen as one of the quicker mechanisms for increasing profitability in M&A since they are not dependent on the implementation of a long restructuring process and require only limited internal integration (Chae and Heidhues, 2004; Chipty and Snyder, 1999). M&A also create opportunities for the merging firms to learn from each other and share information (Capron, 1999) on, for example, price discrimination or specific terms of trade, and in turn increase bargaining power resulting from knowledge asymmetries (Coff, 2010). Hence, we propose the following hypothesis:

Hypothesis 1: Compared with organic growth, M&A result in greater bargaining power.

The relative impact of M&A and organic growth on operating efficiency

In addition to enhancing bargaining power, increases in size also help create scale economies and hence lead to improved operating efficiency (Banerjee and Eckard, 1998; Banker, Chang, and Cunningham, 2003). However, there are important differences in the efficiency outcome of scale that is accumulated by M&A vs. organic growth.

M&A based growth results in a collection of assets that may not be easily combined to generate scale economies. Hence, in M&A, the location and nature of acquired assets often result in a sub-optimal juxtaposition of pre-existing assets. Further, rapid growth, as achieved through M&A, cannot allow for precise capacity adjustments (Sterman *et al.*, 2007). In contrast, when growing organically, a firm more freely chooses how, when and where to locate its growth activities, thus creating a more optimal array of resources and assets. For example, organic growth makes it possible to precisely focus geographic expansion investments, thus optimizing "economies of density" (Caves, Christensen, and Tretheway, 1984). Further, M&A have been said to often result in the acquisition of undesired or redundant assets (Hennart, 1988), which makes it all the more difficult to achieve all potential efficiency gains. Organic growth, on the other hand, leads to a progressive and more controlled increase in the factors of production, in line with the growth in volume output, and allows for more learning to occur over time (Dierickx and Cool, 1989).

M&A also create specific additional costs such as post-merger integration problems that lead to increased costs or reduced efficiency. Past research has shown that M&A lead to significant internal turmoil (Meyer, 2008), greater top-management turnover (Walsh, 1988), as well as costly disruptions in workforce (Krishnan, Hitt, and Park, 2007). It is therefore unlikely that even a successful post-merger integration process can rapidly result in an equal or greater level of consistency than what would result from organic growth (Simmonds, 1990), while specific additional costs will further reduce the size-related efficiency gains achieved through M&A.

Hypothesis 2: Compared to organic growth, M&A result in lower operating efficiency.

While our hypotheses focus on the immediate performance effects of alternative modes of growth, an intriguing conceptual issue is that of the longer term performance effects of these modes. Even though, as per Hypothesis 1, M&A can generate significant gains in bargaining power, it is unlikely these effects will be permanent. Increased bargaining power achieved by the focal firm is likely to generate a competitive response (Prager, 1992; Smith *et al.*, 1991) and to elicit imitation through herding behaviors (Haunschild, 1993; Keil and Laamanen, 2011) or information cascade effects (Lieberman and Asaba, 2006). The actions and reactions of other firms over time will therefore weaken the initial positive impact of M&A on bargaining power as improvements in price of inputs or outputs achieved by one competitor following M&A are likely to progressively diffuse throughout the industry, thus reducing, and eventually cancelling out, the initial advantage in bargaining power resulting from M&A (Armour and Teece, 1978). The supplier and buyer industries may also undergo consolidation in response to horizontal M&A in the focal industry.

Besides the response of other firms, it is also important to note the cumulative effects of organic growth on bargaining power over time. Organic growth is a fairly continuous evolution and thus, in contrast to M&A, may not generate a strong triggering effect. However, firms that grow organically may periodically re-visit their pricing policy and supplier relations in order to take advantage of any size increases they have achieved. On the other hand, both the triggering effect and information sharing associated with M&A are one-time consequences of the event and will not produce additional effects subsequently.

In a similar vein, the efficiency disadvantage associated with M&A may also be transient in nature. Exploiting synergies following M&A takes time (Morrow *et al.*, 2007) because organizational restructuring is needed to unlock the full potential of M&A (Barkema and Schijven, 2008). Since acquiring firm managers possess limited information about the target, the identification of potential sources of efficiency can take time. Then, inherent organizational inertia needs to be overcome in order to exploit them (Nelson and Winter, 1982). Undertaking reorganizations, rationalizations, asset sales and divestitures inevitably implies some delay

and the full operating efficiency gains theoretically made possible by the size increase achieved through M&A will only materialize over time (Capron *et al.*, 2001; Seth, 1990). In this sense, M&A can be interpreted as creating *diseconomies of growth* that will temporarily compensate for the *economies of size* resulting from the combination of the merging firms' operations (Penrose, 1959: 143).

While the empirical data we use make it difficult to test formal hypotheses on such longer term effects of M&A and organic growth, we will make preliminary observations on the way in which the bargaining power and efficiency effects of M&A and organic growth evolve over time.

SAMPLE, MEASURES, AND METHODS

We selected the global retail industry as our empirical setting because several of its structural features make it particularly suitable for our research. First of all, the pursuit of growth has been a major strategic objective for most players in the industry (Pellegrini, 1994). Second, concentration in retailing has been achieved through both M&A and organic growth (Kumar *et al.*, 1991). Third, and most importantly, this industry setting provides appropriate performance measures on the basis of which we can distinguish between operating efficiency and bargaining power. Our main data sources are the Osiris database for all firm size and performance information and the Thomson Mergers database for the identification of all M&A that occurred in the industry during the study period—1984 to 2003. Our sample includes all public firms referenced under the five four-digit SIC codes corresponding to nonspecialized retail formats: 5311, 5331, 5399, 5411, and 5499. This results in a list of 83 firms. Since not all the firms existed throughout the time period, our resulting unbalanced sample consists of 1,283 firm-year observations.

Dependent variables

In order to disentangle the size effects, we measure various aspects of profitability by using accounting-based rather than market-based performance measures, in line with previous research (D'Aveni and Ravenscraft, 1994; Simmonds, 1990). *Gross margin*, the spread between the price paid by buyers and the price charged by suppliers (cost of goods sold), serves to evaluate

the bargaining power of the focal firm over both its customers and suppliers. In this industry, firms in a given retail format sell a relatively similar range of goods. Greater bargaining power should result in lower costs of purchased goods and/or higher selling prices, but should not significantly affect internal operating costs. Gross margin is calculated, according to the US GAAP guidelines, as the difference between sales and purchases, divided by sales. If this metric increases following M&A, it may imply an increase in prices charged to customers or a decrease in the prices paid to suppliers, or a combination of both; in either case, it reflects an increase in the firm's bargaining power.

We use the variable *Operating Cost*, calculated as operating costs as a percentage of sales, to assess operating efficiency. A firm enjoys higher operating efficiency if its operating cost/sales ratio is lower. Operating costs include depreciation, headquarter, logistics, labor, other sales, and general and administrative costs. As discussed above, operating efficiency gains should be determined primarily by internal operating costs rather than by the cost of purchased goods and services.

We also measure overall firm performance (i.e., profitability) by two variables, *ROA* (Return on Assets) and *Operating Profit* (operating profit as a percentage of sales). ROA is a common measure of profitability in strategy research (Goerzen and Beamish, 2005) and helps compare our results to those in previous research, though it is somewhat unreliable since it is affected by the choice of accounting methods and assumptions (Anand and Singh, 1997; Healy *et al.*, 1992). As an alternative measure, operating profit on sales is not contaminated by choice of accounting rules for asset evaluation.

Independent variables

Our independent variables are two growth modes, *M&A* and *Organic Growth*. As our research aims at better understanding the influence of growth modes on size-related performance effects, we assess M&A through its contribution to firm sales rather than through a dummy variable as has often been the case (Brouthers *et al.*, 2003). Specifically, we first identify all M&A of firms in our sample. For each firm at a given year T, we then calculate the sum of sales contributed by target firms up to year T. Our chosen measure of M&A allows us

to measure the significance of each M&A transaction on overall firm size (measured by sales) and provides a more fine-grained approach than previously used dummy variables. We measure organic growth as the difference between firm sales at year T and the previously calculated M&A growth. In other words, the portion of sales not acquired via horizontal M&A is considered the result of organic growth. We log both measures because the raw values display approximately lognormal distributions. For the measure of organic growth, 26 observations have raw values smaller than 0, which we exclude from the analysis.[2]

Control variables

We include a number of relevant controls at the firm, industry, and country levels. At the firm level, we first control for the annual increase in sales (*Sales Growth*) measured as a year-over-year percentage, because firm growth and profitability are linked, with faster growth potentially resulting from aggressive pricing. Second, we control for the influence of inter-firm alliances. Firms sometimes turn to alliances to achieve some of the objectives that others pursue through M&A (Garrette and Dussauge, 2000; Hennart and Reddy, 1997). A dummy variable *Alliance* accounts for these influences (*Alliance* = 1 if a firm is engaged in an alliance with another industry incumbent during any given year). Third, because internationalization may impact profitability and may create additional operating costs, we include a dummy variable *Internationalization* which equals 1 (0 otherwise) if a retailer is present in more than two countries in a given year. Fourth, we account for the extent of *Product Diversification* with a dummy variable that takes on the value 1 when a retailer operates in more than two different retail formats in a given year. Fifth, experience from recent M&A transactions has been shown to facilitate the post-M&A integration process, thereby improving firm performance (Ellis, Reus, and Lamont, 2009). Consistent with previous studies, we measure *M&A Experience* as the number of M&A made by a firm in the past three years. Our sixth control is *Prior Performance*, which has been linked to post-acquisition performance (Krishnan *et al.*, 2007). We operationalize

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[2] Note that treating the logged values of the 26 observations as zeroes does not alter our findings.

prior performance by a firm's average ROA of the past three years (Ellis *et al.*, 2009).

At the industry level, we include a control variable *Industry Concentration,* measured by the four-firm concentration ratio (Scherer and Ross, 1990), i.e. the cumulated market share of the four major players in the industry. This variable helps disentangle the industry-wide effect of market power from firm-level bargaining power. At the country level, we control for *Interest Rate*, i.e., the rate of return on treasury bonds for each year and each home country of the firms in our sample. We expect these interest rates to reflect the basic opportunity cost in an economy and to affect investor expectations, cost of capital and therefore earnings requirements. In other words, profitability is likely to fluctuate in line with interest rates. We also control for annual *GNP Growth* as a relevant measure of national economic climate because firm performance in retailing is very sensitive to economic fluctuations. We expect profitability to vary positively with GNP growth. We compile both data from the IMF International Financial Statistics Yearbooks. Finally we include three retail format dummies *SIC 5311*, *SIC 5411*, and *SIC 5331*. We combine two formats SIC 5399 and SIC 5499, each having a very small number of observations, and treat it as our baseline category. Different retail formats may have different levels of profitability because of their specificities in terms of location, average store size, service levels, and competition, etc.

Analytical approach

To estimate how M&A affect firm performance relative to organic growth, we would normally estimate the model:

$$Y_{it} = \beta_o + \beta_1 \times MA_{it} + \beta_2 \times OG_{it} + X_{it}\gamma + \varepsilon_{it}, \quad (1)$$

where Y_{it} represents the performance measure, MA_{it} and OG_{it} are two independent variables referring to M&A and organic growth respectively, X_{it} is a vector of control variables, and γ denotes a coefficient vector. Since our sample is an unbalanced panel including numerous firms and relatively few years, a commonly used technique for the analysis of such panel data is the fixed effects method (Wooldridge, 2002). However, we face a challenge in estimating the model since the independent variables MA_{it} and OG_{it} might be endogenous.

Prior research has shown that the extent to which firms rely on either of the two growth modes is affected by observable and unobservable firm and environment-specific characteristics that also influence firm performance (Hennart and Reddy, 1997; Villalonga and McGahan, 2005). Because the choice to engage in M&A or organic growth may be influenced by the unobservable factors that are not included in the vector of control variables, MA_{it} and OG_{it} might correlate with the error term ε_{it} in Equation 1. Due to this potential endogeneity, the traditional method such as fixed effects estimation would yield "biased and inconsistent estimates of the coefficients" (Greene 1990: 591–659).

To correct for the endogeneity biases due to unobserved heterogeneity, we use instrumental variables (IV) estimations. Specifically we use the IV two-stage least squares (2SLS) fixed effects method for panel data models (Wooldridge, 2006). Such IV estimations require at least "one" excluded instrument for each suspicious independent variable that influences the first-stage outcome but not the second-stage dependent variable (Wooldridge, 2002). Because our model includes two suspicious independent variables, we have identified two instruments, *Economic Freedom Index* and *Debt Ratio*. These instruments are likely to have an influence on the extent of reliance on M&A or organic growth but are not expected to directly impact profitability. The economic freedom index, developed by the Fraser Institute, is a proxy for government policy and measures the degree to which the policies and institutions of countries are supportive of economic freedom. Hamilton and Nickerson (2003) argue that government policy is often a relevant instrument variable to use in models that account for endogeneity. A firm's debt ratio is a measure of its financial leverage calculated by dividing its total liabilities (sum of noncurrent liabilities and loans) by shareholders' equity. It may influence a firm's decision to merge and/or acquire (Hitt, Hosskisson, and Kim, 1997) but has little direct incidence on the performance variables since they are independent of interest costs. Debt levels and the resulting interest payments do not directly affect either gross margins or operating costs and profits.[3] They do, however, impact the risk profile and expected returns to

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[3] We use operating profit, not net profit, to measure overall firm performance. While debt directly and deterministically affects net profits, debt ratios do not directly affect operating profit since it is independent of interest payments. This distinction further provides theoretical justification on the selection of debt ratio as an

shareholders and, as such, are likely to influence the choice of how to grow. 28 observations (out of 1283 in total) in our sample display negative debt ratios; we treat these observations as outliers and exclude them from the analysis.

RESULTS

Main results

Table 1 presents the estimation results of M&A impact on bargaining power and operating efficiency. We present the descriptive statistics and pairwise correlation matrix in Table S1.[4] Prior to discussing the IV estimation results, we test for exogeneity the two independent variables considered endogenous, MA_{it} and OG_{it}. In all models, the endogeneity test statistics have p-values greater than 0.10 for the variable OG_{it}, suggesting that the data reject OG_{it} as an endogenous variable. We thus treat it as an exogenous variable in the regression analysis. In contrast, the endogeneity test statistics, as reported in Table 1, confirm the endogeneity of MA_{it} for most models. We therefore use the IV-2SLS fixed effects method to analyze these models, and conduct fixed effects analyses for other models in which MA_{it} is not empirically endogenous as shown by the endogeneity test statistics. For the IV estimation models, we also have checked the relevance of the chosen instruments through multiple tests. A good instrument should not *directly* affect the second-stage dependent variable (i.e. performance); instead it should sufficiently correlate with the endogenous variable. First, we include the two instruments, *Economic Freedom Index* and *Debt Ratio*, as regressors and run fixed effects regression analysis on the four performance measures respectively. This analysis is not part of

the two-step IV estimation, but it indicates that the two instruments do not have statistically significant direct effects on the performance variables. Second, the first-stage IV estimation results show that both instruments have significant impacts on MA_{it}.[5] Third, we conduct both under-identification and weak identification tests for the instruments. All the under-identification test statistics (i.e. the Anderson canonical correlations test) have p-values smaller than 0.001, suggesting that the instruments are correlated sufficiently with the endogenous variable. The weak identification test (i.e. Cragg-Donald Wald F test) statistics are greater than the 10 percent maximal IV size Stock-Yogo critical values, which further confirms the relevance of the instruments (Stock and Yogo, 2005).

In Model 1, M&A have a positive and significant impact on bargaining power. Moreover, a Wald test of the coefficients of M&A and organic growth is positive and significant ($\chi^2 = 23.38$), suggesting that M&A produce greater bargaining power than organic growth, in support of Hypothesis 1. To explore the longer-term impact of M&A on bargaining power, we repeat the analysis of Model 1 by replacing the dependent variable at time T by those at T + 1 through T + 5. As shown in Models 2–6, the Wald test results are significant for only the years T + 1 and T + 2, indicating that M&A's advantage on bargaining power dissipates after only two years. It suggests that external growth provides a one-shot opportunity to re-negotiate terms of trade with suppliers/buyers and that most firms take advantage of such an opportunity shortly after acquisitions occur.

In Model 7, M&A significantly increase operating cost, and the impact is significantly greater than the impact of organic growth on operating cost ($\chi^2 = 70.98$). Because M&A are found to create a decrease in operating efficiency when compared with organic growth, Hypothesis 2 is supported. The results of M&A's impact on operating efficiency over a five-year span (Models 8–12) show that the operating efficiency disadvantage following M&A as compared to organic growth remains significant over a much longer period of time. This might be due to the fact that improving operating

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instrument. Moreover, we find that *Debt Ratio* has an insignificant effect on all the four performance measures. Furthermore, we ran the IV-2SLS FE analysis without the *Debt Ratio* instrument; our results still hold.

[4] We provide a more detailed explanation of our descriptive statistics. Among 83 firms in our dataset, 57 firms were acquirers and 26 firms never conducted any M&A. We observed 173 MA events in total. Therefore, each acquirer made on average about three acquisitions throughout the period 1984–2003. Moreover, eight firms displayed the pattern of serial acquisitions at some point in our observation period, that is, after the focal M&A, the firm made M&A consecutively for the next three years. In addition, multicollinearity is not a major concern in our data analysis. The variation inflation factors (VIF) statistics had absolute levels far below the usual acceptable threshold of 10, with a maximum mean at 1.65.

[5] The authors can provide the first-stage IV estimation results and the results of including instruments (*Economic Freedom Index* and *Debt Ratio*) as regressors to predict performance measures upon request. They are not included in the paper in order to conserve space.

Table 1. Regression analysis of M&A's impact on bargaining power (Hypothesis 1) and operating efficiency (Hypothesis 2)

Dependent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Gross margin (Hypothesis 1)						Operating cost (Hypothesis 2)					
	T	T+1	T+2	T+3	T+4	T+5	T	T+1	T+2	T+3	T+4	T=5
M&A	0.32* (0.15)	0.27† (0.15)	0.29* (0.16)	0.05 (0.05)	0.08 (0.06)	0.10 (0.07)	3.38* (1.52)	2.70† (1.35)	3.01** (1.04)	3.53*** (1.08)	3.15** (0.96)	1.50** (0.52)
Organic growth	-1.58*** (0.32)	-1.52*** (0.35)	-1.91*** (0.39)	-1.80*** (0.38)	-1.60* (0.71)	-1.37† (0.70)	-29.22*** (2.92)	-26.47*** (2.86)	-24.32*** (2.42)	-24.72*** (2.49)	-20.47*** (2.33)	-12.71*** (1.39)
Sales growth	0.04 (0.67)	1.39* (0.68)	0.15 (0.73)	-0.41 (0.72)	1.12† (0.66)	0.47 (0.96)	5.10 (5.42)	7.16 (5.15)	6.60 (4.24)	-2.51 (4.00)	-4.11 (3.61)	-2.08 (2.03)
Alliance	2.69*** (0.60)	2.77*** (0.66)	2.34*** (0.72)	2.23*** (0.61)	1.85 (1.57)	0.07 (1.34)	-5.44 (5.39)	-5.90 (5.48)	-6.40 (4.65)	-6.67 (4.69)	-7.83† (4.67)	-1.80 (2.59)
International	5.62*** (1.23)	2.78* (1.38)	0.96 (1.68)	-0.20 (2.02)	-1.36† (0.72)	-0.91* (0.44)	5.57 (9.58)	4.65 (9.70)	1.00 (9.15)	2.97 (10.88)	2.45 (11.41)	0.95 (12.03)
Product diversification	-1.19 (1.66)	2.64† (1.39)	3.55* (1.69)	1.98 (1.89)	0.96 (1.21)	—[a]	2.59 (10.39)	-0.60 (10.71)	5.80 (10.93)	4.25 (12.01)	1.20 (13.98)	—[a]
M&A experience	-1.05* (0.53)	-0.88 (0.56)	-1.02† (0.58)	0.03 (0.36)	0.09 (0.45)	0.93 (0.66)	-12.57*** (3.50)	-11.36*** (3.24)	-11.37*** (2.55)	-15.91*** (3.29)	-13.43*** (3.00)	-6.41*** (1.72)
Prior performance	0.16** (0.05)	0.15** (0.05)	0.13* (0.06)	0.10† (0.05)	0.08 (0.06)	0.06 (0.06)	-0.90* (0.39)	-2.02*** (0.38)	-1.37*** (0.32)	-0.64* (0.32)	-0.54† (0.29)	-0.42* (0.17)
Industry concentration	0.17 (0.13)	0.18 (0.14)	0.12 (0.15)	0.25 (0.16)	0.25 (0.42)	0.26 (0.42)	-1.98* (0.95)	-1.57† (0.92)	-0.62 (0.81)	0.16 (0.95)	-0.24 (1.06)	-1.17† (0.67)
Interest rate	0.14* (0.06)	0.13* (0.06)	0.06 (0.07)	-0.07 (0.06)	-0.04 (0.08)	-0.12 (0.08)	-0.58 (0.46)	-0.75† (0.44)	-0.59* (0.37)	0.10 (0.38)	-0.01 (0.35)	-0.62*** (0.19)
GNP growth	0.01 (0.09)	0.06 (0.09)	0.04 (0.09)	0.01 (0.09)	0.10 (0.12)	0.02 (0.11)	-0.41 (0.77)	0.05 (0.71)	0.05 (0.58)	0.17 (0.62)	-0.08 (0.54)	-0.25 (0.30)
SIC 5311	-0.17 (3.35)	-1.59 (3.43)	-0.80 (3.51)	-1.94 (3.14)	-3.06 (2.87)	-2.43 (2.20)	-5.77 (28.17)	-19.98 (25.89)	-6.09 (20.45)	8.93 (19.11)	8.55 (16.63)	3.64 (9.00)
SIC 5411	2.01 (3.24)	1.47 (3.31)	1.34 (3.39)	0.08 (3.05)	-0.09 (2.50)	-0.52 (2.31)	-9.54 (25.02)	-20.96 (23.10)	-10.00 (18.34)	2.20 (16.95)	3.39 (14.95)	2.30 (8.17)
SIC 5331	3.78 (3.21)	3.52 (3.27)	3.83 (3.33)	1.33 (2.82)	1.23 (1.35)	0.45 (1.33)	1.47 (24.78)	-11.17 (22.53)	0.15 (17.70)	11.17 (16.45)	10.14 (14.33)	4.46 (7.79)
N	1043	974	902	867	793	721	909	852	800	731	677	628
Estimation method	IV-2SLS FE	IV-2SLS FE	IV-2SLS FE	FE[b]	FE[b]	FE[b]	IV-2SLS FE	IV-2SLS FE	IV-2SLS FE	IV-2SLS FE	IV-2SLS FE	IV-2SLS FE
Underidenti-fication test	68.38***	67.52***	68.57***	--	--	--	54.07***	56.38***	58.38***	47.05***	43.61***	41.80***
Weak identi-fication test[c]	36.32***	36.00***	36.85***	--	--	--	28.40***	29.82***	31.10***	24.76***	22.91***	22.03***
Endogeneity test χ^2	5.56*	4.12*	3.65†	1.52[b]	0.12[b]	0.44[b]	8.16**	6.24**	11.46**	15.48***	14.30***	9.40***
Wald test χ^2 (MA vs. OG)	23.38***	18.21***	22.90***	n/a[d]	n/a[d]	n/a[d]	70.98***	63.45***	81.80***	79.00***	64.60***	67.87***

[a] The variable "product diversification" is dropped in Models 6 & 12 due to collinearity.
[b] For FE models, coefficients of constant terms are not reported. The underidentification and weak identification tests are not applicable. The endogeneity test statistics are obtained by running IV-2SLS FE analysis on the models; the results suggest that the models be analyzed by the FE method.
[c] *** denotes that the weak identification test result is greater than the 10% maximal IV size.
[d] Wald tests are not conducted because the coefficients of the primary variable M&A are insignificant.
Standard deviations are in parentheses.
Coefficients significant at 0.1%***, 1%**, 5%*, and 10%†

efficiency following M&A is a more complex and longer process than usually assumed and that some of the sources of inefficiency attributable to M&A persist over very long periods of time, far exceeding the five-year window used in our study. It might also signal that M&A produce inherent inefficiencies that do not totally dissipate over time (Shaver, 2006).

Taken together, our analysis shows that relative to organic growth, M&A improve bargaining power but hurt operating efficiency. Given the opposing directions of these effects, M&A's impact on overall firm performance is theoretically indeterminate and becomes an empirical question that is likely influenced by specific industry conditions such as scale intensity and latitude for bargaining. Measuring overall firm performance either as *ROA* or *Operating Profit*, we find that in both the short and long term, M&A decrease overall firm performance but organic growth helps improve overall firm performance. The analysis results are presented in Table S2.

Robustness checks

Our results remain supported in a number of robustness checks.[6] First, we control for the possibility that M&A may be driven by the motive of overcoming foreign entry barriers (Meyer, Wright, and Pruthi, 2009) by analyzing a subsample of firms that are involved only in cross-border M&A (i.e., M&A between firms with headquarters in different countries). Second, managers may choose to engage in M&A out of a desire for increased compensation and reduced managerial risk (Combs and Skill, 2003). To account for the managerial incentive to conduct M&A, we include as a control the percentage of managers and directors who were also shareholders of the company. Third, a small group of firms in our dataset never had any M&A and grew purely through the organic mode. Because our theory focuses on the comparison of M&A with organic growth, we exclude this group of firms and run a subsample analysis for firms that grew through both modes. Fourth, we use a set of alternative measures of M&A and organic growth, that is, for a given year T, the M&A variable is the sales contributed by the current-year M&A, organic growth is firm sales *growth* from year T-1 subtracting the

M&A sales. Fifth, in addition to using average prior ROAs of the past three years to control for a firm's prior performance, we add the past-three-year average ratios of *Gross Margin*, *Operating Cost*, and *Operating Profit* as further controls, after ensuring that multicollinearity is not a concern.[7] Sixth, we account for the occurrence of M&A momentum in the post-M&A period by excluding observations of eight serial acquirers (Laamanen and Keil, 2008)—i.e., firms making M&A consecutively for the next three years after a focal M&A event—or adding a control variable that measures the number of M&A a firm conducts in the next three years after a focal M&A event. Finally, we control for the extent to which organic growth adds to a firm's geographic and product diversification. Specifically, we add two flow variables that measure how many countries and how many SIC codes a firm diversified into in any given year through organic growth.

DISCUSSION AND CONCLUSIONS

In this study, we have investigated the relative size effects of horizontal M&A and organic growth on the performance of firms and make several significant contributions to the literature on M&A and growth strategies in general. First, the findings advance our understanding of different sources of performance change following horizontal growth of the firm through different modes. We show that size may impact profitability through very distinct theoretical mechanisms: bargaining power and operating efficiency. These mechanisms reflect two fundamental aspects of a firm's advantage, a price advantage resulting from favorable bargaining conditions with customers and suppliers, and a cost advantage resulting from greater efficiency. Previous research (e.g., Banerjee and Eckard, 1998) has acknowledged, but not teased apart directly, these mechanisms, partly because the stock price data they used provide only composite measures of performance.[8] We overcome this challenge by using customized accounting measures of performance.

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[6] The authors can provide the results of all the robustness checks and analyses upon request.

[7] When the dependent variable is *Gross Margin*, we add the past ratios of gross margin as a control. Similarly, we include the corresponding ratios when the dependent variable becomes *Operating Cost* or *Operating Profit*.

[8] There are a few exceptions such as Eckbo (1983), which uses stock market data to identify industry wide market power and firm specific performance in horizontal M&A. Also, Kim and Singal (1993) use product price data of the airline industry (1985–1988)

Second, our study reveals important trade-offs in the choice of growth mode. Although numerous studies have examined the effect of M&A or—more rarely—organic growth on performance, the comparative effect of the growth modes remains unclear. We show that relative to organic growth, M&A improve bargaining power but decrease operating efficiency. Such findings add insights to extant studies on modes of growth (Villalonga and McGahan, 2005) by demonstrating that the choice of growth mode has significantly different effects in terms of *where* the costs and benefits arise. It also shows that the choice between M&A and organic growth involves a trade-off between increasing bargaining power and improving operating efficiency. This in turn suggests that growth mode choice should be guided by the particular features of the industry in which a firm is competing: in scale intensive industries organic growth might improve overall performance more significantly while in industries where purchases account for a large share of sales and where there is significant latitude for bargaining, M&A might provide greater benefits. Above and beyond such an industry effect, mode choice should depend more on the specific objective or strategy of each firm than on the expected impact on overall profitability. Further studies can extend our research design into various types of industries, notably highly concentrated industries, because determining the actual source of post-merger performance change might also be important from the standpoint of antitrust policy (Kim and Singal, 1993; Prager, 1992).

Third, the paper's results contribute to our understanding of how spurts of M&A and organic growth can complement each other in the longer-term evolution of firms. While one might expect the relative advantage of each mode of growth to dissipate over time, our preliminary findings on the lagged effects of M&A and organic growth suggest that this is primarily the case for the bargaining power benefits associated with M&A. Bargaining power is an easily implemented one-shot consequence of this growth mode and reflects the fact that M&A provide transient "economies of growth", rather than more permanent "economies of size" (Penrose, 1959). In contrast, we observe that the operating efficiency penalty of M&A relative to organic growth seems to persist over longer periods of time. We interpret this as resulting from the complexity and difficulty of successfully implementing the post-merger integration process. Identifying the appropriate assets to divest and relevant reorganizations to undertake is a highly ambiguous and uncertain process. More importantly, once identified, these changes are highly sensitive and organizationally difficult to implement. Therefore, the operating efficiency advantage of organic growth may last, if not for ever, at least for extended periods of time. Future research could explore how the evolution of different performance effects is determined by M&A types and characteristics of the acquiring and target firms.

Fourth, our research extends prior work that has taken into account the endogeneity of mode choice. After accounting for endogeneity, our findings support conventional wisdom and financial market studies suggesting that M&A affect performance negatively while organic growth positively impacts performance (e.g., Woodcock *et al.*, 1994). The findings are empirically robust as evidenced by a number of statistical tests. They are also conceptually justified because we show the theoretically derived positive and negative effects of M&A on different aspects of performance. Our findings suggest that, in the industry we study, M&A's operating efficiency losses outweigh the bargaining power gains, hence imposing a negative *net* impact on firm profitability. Due to methodological and measure differences, this result does not directly contradict existing research with correction for the endogeneity bias. Instead, our research suggests that more efforts be made in addressing the endogeneity issue of firm decision, either by applying the Heckman selection model to account for the endogeneity of the dummy variables measuring entry mode choice (Brouthers *et al.*, 2003; Shaver, 1998) or by using the IV estimation to correct for the endogeneity of continuous variables as we did in this study. Moreover, whereas prior research measures performance either by survival (Shaver, 1998) or subjective survey data (Brouthers *et al.*, 2003), our performance measure is profitability. Such a measure enriches our understanding of the performance implications of M&A and allows for a more direct comparison with many existing studies in finance and strategy on the same topic.

Our study also has implications for practice. It suggests that firms engaging in M&A derive

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to disentangle the market power effect from the operating efficiency effect using a control group of routes unaffected by the merger. Such studies do not include a direct comparison between M&A and organic growth.

an immediate increase in size but pay a price in terms of operating efficiency. This is consistent with the presence of "time compression diseconomies" (Dierickx and Cool, 1989) in the use of M&A, in the sense that an instant increase in firm size is costly. Also, it suggests that firms pursuing different growth strategies need to orient their profit enhancing or cost reduction efforts according to the particular mode of growth they are emphasizing: when making acquisitions, managers should focus on obtaining better prices from suppliers or customers; when growing organically, managers should pay close attention to the better use they can make of available resources and assets. Conversely, if we assume out that managers make fully informed choices, our results could suggest that M&A "naturally" produce bargaining benefits while organic growth "naturally" produces operating efficiency gains, and that managers could further increase profitability by specifically targeting cost reductions that usually go untapped in the particular move they are undertaking, i.e. efficiency gains in M&A and bargaining benefits in organic growth. Overall, our results help open the black box behind the mixed results on the effects of M&A on performance observed in previous studies within the voluminous literatures in IO economics and organizational integration. It seems that the IO-based models that suggest an increase in bargaining power of merging firms, as well as the organizational perspectives on the challenges of integration are both justified.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Table S1. Descriptive statistics and pairwise correlation matrix

Table S2. Regression analysis of M&A's impact on *overall* performance