The Quarterly Review of Economics and Finance 58 (2015) 93–118

Contents lists available at ScienceDirect

The Quarterly Review of Economics and Finance

journal homepage: www.elsevier.com/locate/qref

Long-term impact of merger synergies on performance and value

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ARTICLE INFO

Article history:
Received 26 March 2014
Received in revised form 6 January 2015
Accepted 10 January 2015
Available online 21 January 2015

Keywords:
Mergers
Acquisitions
Related mergers
Unrelated mergers
Synergies
Diversification

JEL classification:
G34

ABSTRACT

We track a sample of mergers completed between 1998 and 2007 in a five year window after the merger, to study whether and to what extent synergies affect Tobin's Q and excess value in the post-merger period. We employ a Heckman two-stage self-selection model and a two-stage non-linear-instrumental variable model to account for potential endogneities in the merger decision across related and unrelated mergers. We document that excess value is positive for related mergers while it is negative for unrelated mergers in each of the five years following the merger, while Q is significantly greater than one for both types of mergers. Q and excess value decrease in the first year following the merger, but then improve systematically each year in the four years after, but with a greater increase in unrelated compared to related mergers. Controlling for self-selection and endogeneity biases, our evidence indicates that merger synergies materialize over time, but differently in unrelated and related mergers. Annual changes in market power, economies of scale and scope, and internal capital market activity contribute to changes in Q and excess value only in unrelated mergers. We conclude that the lack of synergies from market power enhancements and capital market activity in related mergers is consistent with related mergers being motivated by a need for facilitating technology and innovation transfers rather than generating synergies.

1. Introduction

Extant studies document that mergers enhance shareholder value, and attribute the gains to the anticipation of efficiency improvements, strategic enhancement in market power, the availability and expansion of internal capital, and risk reduction from diversification.[1] However, Andrade, Mitchell, and Stafford (2001) point out that empirical research has failed to consistently document a relation between the value gains and the underlying synergies. These early researchers typically use short-term abnormal returns at merger announcements as their metric for the value gains.[2] Recently, however, Maksimovic, Phillips, and Prabhala (2011) show that synergies take time to materialize, as firms continue to redraw their boundaries for several years after a merger. Similarly, Fulghieri and Sevilir (2012) argue that merger synergies only materialize over a few years after the merger, and even then only if the merging firms "collaborate towards the creation of these synergies." Moreover, extant studies typically treat all mergers, related and unrelated, as similar transactions driven by similar motives, even as other researchers argue that the sources and magnitude of synergies, and potential biases in the analysis are different across different mergers.[3]

In this paper, we study the impact of merger synergies on performance and value of the merged entity in a *five year period* after the completion of the merger. We measure performance using Tobin's Q, and value using Berger and Ofek's (1995) excess value.[4] Specifically, we study whether and to what extent changes in the synergies

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[1] See Betton, Eckbo, and Thorburn (2009) for a survey of the empirical evidence on mergers.

[2] Some recent papers that have used shareholder value at the announcement of mergers as the metric of analysis are Bhagat, Dong, Hirshleifer, and Noah (2005), and Betton et al. (2009).

[3] Almeida, Campello, and Hackbarth (2011) argue that liquidity needs motivate firms to undertake mergers especially in high asset-specific industries, even when there are no operational synergies associated with the merger. Fulghieri and Sevilir (2012) predict that the likelihood of generating expected synergies post-merger is higher in "mergers motivated by scope economies than in mergers motivated by scale economies."

[4] Excess value measures the actual value of a multi-divisional firm that is in excess of the imputed value of its parts. The imputed value is estimated as the sum of the stand-alone values of each division of the firm. Measured this way, excess value

http://dx.doi.org/10.1016/j.qref.2015.01.006
1062-9769/

affect changes in excess value and performance in the five-year period after the merger. Our analysis allows us to infer the extent to which firms internalize the synergies and other effects of a merger within five years of merger completion. We recognize the inherent self-selection biases that arise due to the endogeneity of the merger decision with Q and excess value, and control for the biases in our analysis.

We track a sample of 316 mergers completed during the period 1998–2007 over a five year window after the completion of the merger. We find that acquirers on average have higher pre-merger Tobin's Q than targets, a finding that is consistent with the result documented in Andrade et al. (2001) and the implications of the q-theory of mergers posited by Jovanovic and Rousseau (2002). However, a closer scrutiny reveals that this result is confined to related mergers. On average, acquirers in unrelated mergers tend to acquire targets whose Q is similar to their own. Consistent with the findings in Berger and Ofek (1995) we find that both the acquirer and target exhibit negative excess values in the year prior to the completion of the deal. So, acquirers typically acquire already discounted targets (as in Graham, Lemmon, and Wolf, 2002). When we compare the acquirers in related versus unrelated mergers, we find that the negative excess value is confined to the acquirers in unrelated mergers. In contrast, acquirers in related mergers exhibit positive and statistically significant excess values. This suggests that the motives for related and unrelated mergers may be different.

An examination of Q and excess value in a five year window after the merger offers several insights. Q is significantly greater than one and excess value is very close to zero for the overall sample. When we separate the post-merger sample into related and unrelated mergers, we find that excess values differ across the two subsamples. It is positive and significant in related mergers but negative and significant in unrelated mergers. When we analyze the annual evolution of Q and excess value, we find that both worsen in the first year after the merger, but show a systematic improvement thereafter. This improvement is higher in unrelated mergers than in related mergers, a finding consistent with the implications in Fulghieri and Sevilir (2012).

Controlling for the self-selection biases and endogeneities inherent in the merger decision, we document a difference in the impact of synergies on Q and excess value between related and unrelated mergers. Annual changes in market power, economies of scale and scope, and internal capital market activity significantly affect changes in Q and excess value *only* in unrelated mergers. Moreover, focus improvements also positively affect Q and excess value only in unrelated mergers. Our results suggest that despite the many costs inherent in unrelated mergers, the extent to which these mergers enhance market power, generate cost economies, facilitate efficient capital allocation, and improve focus does improve performance and value. Related mergers are perhaps intended to serve predominantly as conduits for liquidity, and innovation and technology transfers, and so do not show material operational synergies in the five years post-merger.

Our paper contributes to the literature along the following lines. First, earlier studies treat mergers as stand-alone events rather than as strategic opportunities to redraw boundaries, reconfigure their assets, and collaborate on synergy generation as Maksimovic et al. (2011) and Fulghieri and Sevilir (2012) argue. By studying synergies in a five-year window following mergers, we are able to better analyze the collective impact of the activities surrounding a typical merger. Second, extant research on merger synergies either pools all mergers, related and unrelated, as similar transactions driven by similar motives (Bhagat, Dong, Hirshleifer, and Noah, 2005), or studies different types of mergers separately to isolate specific synergies (Almeida, Campello, and Hackbarth, 2011; Fan and Goyal, 2006). We meld these lines by separating the mergers into related and unrelated, but analyzing them in one framework using multinomial regressions. Because they are estimated as one unit in a multinomial framework, it allows us to control for any similarities, while allowing for any differences between related and unrelated mergers.

Finally, extant literature (see Matsusaka, 2001; Graham et al., 2002; Campa and Kedia, 2002) has identified and controlled for an endogeneity in the merger decision that biases down the excess values post-merger. However, the literature has largely ignored another self-selection problem that biases post-merger Q upward for all firms undertaking mergers (see Jovanovic and Rousseau, 2002). By examining both Q and excess value as our primary metrics of analysis, we are able to control for multiple self-selection biases. While earlier papers have studied longer-term impact of mergers and documented biases, the combination of our metrics of analysis, along with our long-term window and methodology provides a more cohesive way to analyze mergers.

2. Impact of mergers on firm performance and value

Merger synergies are projected to emerge from operating economies of scale and scope, market power enhancements, financial efficiencies and improved capital access through expanded internal capital availability, focus improvements, and risk reduction through diversification. But these enhancements are not without downside. In this section, we discuss our performance and value metrics, relatedness measures, endogeneity biases, the different sources of synergies, and their predicted impact on performance and value.

2.1. Measures of performance and value

As in Montgomery and Wernerfelt (1988a,1988b), Lang and Stulz (1994), Servaes (1996), and Steiner (1996), we use Tobin's Q as our measure of performance. As Lang and Stulz (1994) argue, "since q is the present value of future cash flows divided by the replacement cost of tangible assets, no risk adjustment or normalization is required to compare q across firms, in contrast to comparisons of stock returns or accounting performance measures." Because Q incorporates a measure of the market value of assets, it reflects investors' perspective and is thus reflective of current and expected future performance. Also, Montgomery and Wernerfelt (1988b) contend that Q better reflects any Ricardian rents[5] firms can extract from their diversification strategies than other accounting measures of performance. We measure Tobin's Q as the ratio of market value of assets to book value of assets of the firm. Market value of assets is measured as (total assets–book value of equity + market value of equity).[6]

reflects the impact of any synergies from the multiple divisions operating together, and any erosion in value because of the disparateness of the divisions.

[5] Montgomery and Wernerfelt (1988b) define Ricardian rents as rents that a firm may be able to extract due to unique factors they possess. These rents are in excess of rents that can be generated from collusive relationships with competitors and from disequilibrium effects.

[6] Lang and Stulz (1994), and Comment and Jarrell (1995) use a measure of excess Q to capture performance. They measure it as the difference between Q and a benchmark portfolio of focused firms that represent the divisions of the firm. However, Custodio (2013) documents that this excess Q is biased down for firms undertaking mergers relative to focused firms. To avoid this bias, we simply measure Q to capture performance. We separately add the average industry Q in our regressions to benchmark the Q.