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Too big to merge? Evidence from the US banking sector

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Too big to merge? Evidence from the US banking sector

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This article tries to cast light on the main determinants of the merger waves reported in the banking sector. For this reason, we investigate the recently developed merger wave theories by estimating an empirical model covering the US for the period 1987 to 2013. The empirical results, based on four alternative methodologies, are robust, claiming that merger waves in the banking sector are driven by stock market booms, a finding that is consistent with the behavioural hypothesis about the causes of merger waves.

Keywords: merger waves; banking sector; merger theories; US

JEL Classification: L10; C50; C52

I. Introduction

There is a general consensus about the cyclical patterns of mergers and acquisitions (M&A). During the last decades, periods of intense merger activity have been followed by intervening periods of limited consolidation. This situation reveals that M&A come in waves (Gugler *et al*., 2012). The researchers have identified six merger waves during the last two centuries in the US (Andrade *et al*., 2001; Holmstrom and Kaplan, 2001). Merger waves have also hit other industrialized countries as well. However, their impact is limited to several months or even 1 year (Rhodes-Kropf *et al*., 2005).

During the last decades, many banking regulatory restrictions have been removed. On the one hand, this development triggered the consolidation among banks, enhancing the level of integration of the US financial system. On the other hand, certain financial institutions are so large and so interconnected that their failure would be disastrous to the economy. Governments considered many of these institutions to be 'too big to fail'. In the absence of any alternative mechanism to restore their viability, governments either recapitalized these entities or facilitated a merger. During the period 1978 to 2013, about 5500 M&A in the US concerning solely the banking sector were recorded, while the number of banking institutions declined by about 50% (from 12 000 in 1980 to 6000 in 2009).

While some research has been done on the causes and effects of the aggregate merger waves, little evidence exists on the main drivers of banking consolidation. However, none of the existing studies tries to link the main drivers of banking consolidation with the recent merger wave theories. This study seeks to cover this lacuna by examining the M&A activity targeted at the banking industry in the US over the period 1987 to 2013. This article contributes to the literature both by extending the analysis of the existence of merger waves in the banking sector and by empirically testing the underlying theories.

II. Theoretical Background and Empirical Studies

Despite the fact that many researchers have assessed the causes and effects of M&A, surprisingly little evidence exists on the drivers of merger waves. However, during

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the last years, a few theories accounting for merger waves have appeared. These can fall into two categories: neoclassical and behavioural merger wave theories.[1] The neoclassical theories which assume that capital markets are efficient claim that merger waves result from certain shocks to an industry's economic, technological or regulatory environment (Mitchell and Mulherin, 1996).

The behavioural theories (managerial and overvalued shares theory) relax the neoclassical hypothesis of capital market efficiency. According to the managerial discretion theory, there is an inverse relationship between the merger activity and the fraction of shares held by the largest shareholders, while according to the overvalued shares theory, the merger activity depends on the degree of optimism in the stock market (Shleifer and Vishny, 2003). As a consequence, during stock market booms, firm's share prices become overvalued and the managers in order to protect their stakeholder's interests, exchange their overvalued shares for the real assets of another company generating a merger wave.

From the empirical perspective, Harford (2005) identified two distinct merger waves that hit the US banking sector lasting 24 months each (August 1985 and October 1996). The main causes were attributed to the deregulation of the financial system that took place in many states allowing the interstate banking. On the other hand, the growth of the information technology in the sector allowed many banking institutions to merge.

In another empirical study, Gärtner and Halbheer (2009) investigated the merger wave hypothesis for the US and the UK employing a Markov regime switching model. Using quarterly data covering the period 1973 to 2003, they identify the beginning of a merger wave in the US during the mid-1990s. As opposed to the US, mergers in the UK exhibit multiple waves, with activity surging in the early 1970s and 1980s, respectively.

Kastrinaki and Stoneman (2012) employed a reduced-form hazard rate model in order to explore the existence of merger cyclical patterns in the UK for the period 1990 to 2004. Their findings indicate correlations between the wave-like pattern of merger activity and both exogenous and endogenous drivers such as the firm size, the elasticity of time to acquisition, the liquidity and the leverage of the acquiring firms.

Finally, Gugler *et al*. (2012) used data on M&A for the period 1991 to 2004 for listed and unlisted companies to test the different theories of merger waves. The authors used the switching model (Town, 1992; Gärtner and Halbheer, 2009) to test for the existence of aggregate merger waves. Based on their findings, merger waves for listed companies occurred in the US, UK and Continental Europe (Austria, Germany, France, Italy) at the end of the 1990s. In all three areas, the peaks of the waves coincided more or less with the peaks of stock market booms.

[1] See Gugler *et al*. (2012) for more details.

III. Data and Methodology

The information on merging activity comes from Thomson ONE (TO) database. It includes all corporate transactions involving at least 5% of the ownership of a company with a transaction (deal) value of at least US$1 million. To obtain financial information for our sample, we combined TO data with the Bloomberg database.

Figure 1 presents the numbers of completed mergers and the ratio of deal value to sales for the US. It is readily apparent that the US has experienced two main merger waves. The first and larger in its impact wave seems to have hit the US at the beginning of the 1990s, while the second merger wave is evident at the mid-2000s.

Following Gugler *et al*. (2012), we estimate the following reduced-form equation:

$$A_t = a + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \gamma_1 Y_{1t} + \gamma_2 Y_{2t} + \gamma_3 Y_{3t} + \varepsilon_t \quad (1)$$

where α and ε_t are the constant and the error term, respectively. A_t is the assets acquired relative to the acquirer's total assets in year t, X_{1t} is the weighted average price to earnings ratio (P/E) as a proxy for optimism in the stock market, X_{2t} is the spread between the federal fund rate and the commercial and industrial loan rate, X_{3t} is the fraction of outstanding shares held by the acquiring firm's largest shareholder, Y_{1t} is lagged cash flows over total assets of the acquiring firm, Y_{2t} is the natural log of total assets of the acquiring firm as a proxy for size and finally Y_{3t} is the financial leverage of the acquiring firm.

We first run two-stage least squares (2SLS) and then employ the generalized method of moments (GMM) estimator (Hansen, 1982) that was designed to overcome some of the limitations of the OLS methodology in which the lagged levels of the regressors are instruments for the estimated equation. Our model then has been estimated twice, once as a Probit regression to determine the probability that a company undertakes an acquisition and a second time as a Tobit regression to take into account differences in target sizes (Tobin, 1958).

IV. Results

Table 1 presents the regression results. Nearly all the coefficients are statistically significant, with the sign pattern in all of the four estimation methods being consistent with the overvalued shares theory.

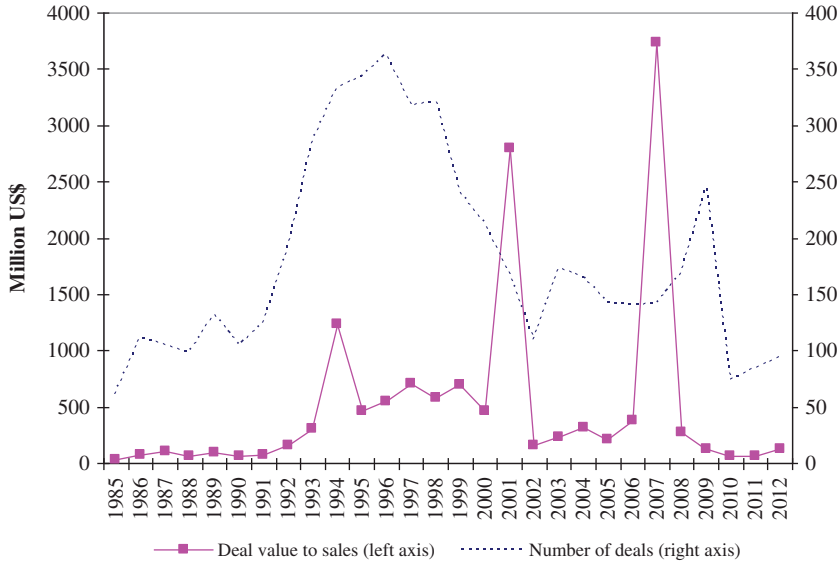

Fig. 1. Number of mergers and deal value to sales (1985–2012)
Source: Thomson ONE.

Table 1. Empirical findings

Control variables	(1) 2SLS	(2) GMM	(3) Probit	(4) Tobit
Intercept	0.142*** (9.14)	−0.413*** (–4.48)	−1.685** (–2.14)	0.108*** (12.09)
X_1	0.057** (2.42)	0.038*** (2.93)	−0.001** (–2.46)	0.067** (2.35)
X_2	−0.072*** (–2.97)	0.003*** (5.53)	−0.013 (–0.94)	−0.046*** (–2.58)
X_3	0.010* (1.52)	0.002** (2.11)	0.002** (1.87)	0.032*** (2.37)
Y_1	0.032** (2.21)	1.827*** (4.88)	0.003* (1.76)	−0.362*** (–9.17)
Y_2	0.176*** (4.77)	0.419*** (3.90)	0.153* (1.61)	−0.106*** (–11.56)
Y_3	−0.003 (–0.160)	0.001*** (5.06)	0.015*** (2.67)	−0.004 (–0.576)
Diagnostics				
Adjusted R^2	0.83	0.94	0.45	0.38
F-statistic	11.75*** [0.00]	n/a	27.47*** [0.00]	31.21*** [0.00]
LM-test	0.03 [0.85]	n/a	n/a	0.11 [0.73]

Source: Authors' elaboration.
Notes: Figures in parentheses for the 2SLS and GMM denote *t*-ratios, otherwise *z*-statistic. Figures in square brackets denote *p*-values. LM test is for first-order serial correlations.
*** Significant at 1%, ** significant at 5% and * significant at 10%.

More specifically, the coefficient on the interest rate spread (β_2) is negative in almost all of the cases, where size (Y_2) has a positive influence on assets acquired reflecting the 'too big to fail' theory. Cash flow (Y_1) coefficient has also a positive and statistically significant impact on assets acquired in the US, while financial leverage (Y_3) has a positive and in two cases significant coefficient implying that in the US where access to equity markets is not limited compared to the European countries high leverage facilitates merger activity (Gugler *et al*., 2012). These results are consistent with the overvaluation theory, suggesting that the US companies are characterized by aggressive managers who are more prone to issue debt than other managers.

The coefficients (β_1 and β_3) of the two key variables (*P*/*E* ratio, largest shareholder's holdings) are positive and quite similar in their magnitude. This evidence, which is in alignment with similar studies (Gugler *et al*., 2012), gives further support to the overvaluation behavioural hypotheses' claim that merger waves are driven by stock market booms (Shleifer and Vishny, 2003). According to this theory, the optimism associated with stock market booms explains both the increase in merger activity during these periods and the subsequent positive effects of the mergers on shareholder returns.

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V. Conclusions

This study investigated the existence and the causes of merger waves in the banking sector of the US using four different econometric methodologies. Our results do indicate that the merger activity of banking institutions is positively related to the fraction of shares held by the largest shareholder. As a consequence, merger waves are driven by stock market booms, a finding that is consistent with the overvaluation hypothesis about the causes of merger waves. This happens because the number of overvalued companies increases during a stock market boom. Finally, higher cash flows and market optimism lead to the acquisition of more assets fostering merger activity.

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