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Is Economic Efficiency the Driving Force behind Mergers?

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Some economists routinely argue against government regulation that limits the number of mergers and acquisitions. They believe that, as a matter of empirical fact, almost all mergers enhance economic efficiency. The possibility that some mergers do not create wealth but merely redistribute it is ignored. We study all companies delisted from the New York Stock Exchange for reason of merger since 1926. We find that economic efficiency cannot easily explain merger waves. Contrary to the disciplinary hypothesis, acquisition targets are not, in large majority, poor stock market performers. We also report evidence consistent with stock market undervaluation as a merger motive.

INTRODUCTION: THE MERGER POLICY DEBATE

During the 1980s the United States has experienced 'takeover mania'. As one may expect, the rise in the number of mergers and acquisitions (M&A) and the economic and social consequences of these events have caused much public debate. At all levels, politicians have introduced legislation 'to do something' about takeovers. However, in spite of all the talk, little of a coherent merger policy was emerged. For better or for worse, the SEC, the Federal Reserve Board, the FTC, the IRS, the US Department of Justice, state legislatures and judges around the nation determine 'policy' pretty much in a piecemeal fashion, *ad hoc* as new cases and situations present themselves.

There are good reasons why this is happening. Too many issues have to be dealt with at once, it seems. A short list would include antitakeover provisions, tender-offer legislation, insider trading, greenmail, golden parachutes, management buyouts, corporate tax, voting and antitrust law.[1] A more important cause of the lack of coherence is that it is unclear which institutional set-up is better. Shubik (1988) argues at length that 'the theory of finance . . . is too simple, insufficiently institutional, and too incomplete to serve as more than a guide or method of reasoning' to problems that involve the control of large corporations (p. 40). In other words, we are not in a position to say anything conclusive about what constitutes 'optimal' merger policy.

The diverse patchwork of laws and regulations reflects the variety of motives that underlie M&A activity. Managers of bidding firms are motivated by synergy, by stock market undervaluation, by the desire to restrict competition in product markets, by corporate tax savings, by empire building and hubris, or by still other reasons. Which mergers are socially desirable and which are not? There is no answer that is generally correct. In principle, much depends on whether wealth is created or merely redistributed. In practice, motives are hard to discern and every situation is, to some extent, unique. Even straightforward M&A policies can be difficult to implement if the institutional framework and the court system have to withstand the creativity of corporate lawyers and investment bankers.

Merger policy may not be pretty, but surely it is unavoidable. That is, society needs a list of rules or guidelines which apply to corporate control transactions. In the continuing debate about the 'best' rules, at least one group of financial economists (e.g. Jensen, 1988; Jarrell *et al.*, 1988) sharply disagrees with Shubik's (and our own) agnosticism. These economists worry about the many proposals that would limit the number of M&A deals. Regulations

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that restrict voluntary exchanges of assets always reduce welfare, they say, and much of their research program develops the logic of 'market solutions' that justify insider trading, saleable voting rights, greenmail, etc. Perhaps even more concerns about 'over-regulating' M&A follow from the economists' belief that, as a matter of empirical fact, *the large majority of mergers enhance economic efficiency*. W. T. Grimm & Co. estimates that, between 1981 and 1986, the wealth gains of target shareholders amounted to $118.4 billion. Everyone recognizes that this is an impressive number. The expectation of even more M&A activity is often credited with the bull market of the 1980s.[2] The sheer magnitude of takeover premia also leads many observers to ask, rhethorically: If not with efficiency improvements, how are the premia paid for? Perhaps, it is said, there have been *too few* mergers in the 1980s, rather than too many (Jensen, 1988). Perhaps the main consequence of recent takeover policy has been to impose costs on society by blocking valuable corporate combinations.

Is the efficiency story sensible? That question is the topic of this paper. Our answer is: yes and no. We believe that, while efficiency motives account for a significant part of what goes on in the market for corporate control, these arguments carry too much weight in the policy debate. There are some obvious gaps in the chain of logic that starts at $118 billion and ends at social welfare. We discuss these shortcomings and, with a look at history, we list some empirical facts that make us doubt whether economic efficiency can really be the driving force behind most M&A activity.

The literature discusses two classes of efficiency improvements. One set of improvements is synergistic and creates value through the combination of businesses. There are numerous ways in which this happens. They range from the elimination of overlapping functions (which frees up resources and represents a social gain) to increased market power or a smaller tax bill (which are only private gains).

A second class of improvements is disciplinary and focuses on the target company only. The analytical perspective of Marris (1963), Manne (1965) and Jensen and Ruback (1983) interprets corporate takeovers as a market incentive mechanism that limits agency costs. The market for corporate control comes to the rescue where competition in product and input markets and internal control mechanisms (such as the Board of Directors or proxy contests) fail to ensure value maximization. The alienability and low-cost transfer of common stock are key. They allow outsiders to bypass lazy, misguided, or entrenched managers. Large takeover premiums are paid because bidder firms compete to buy-off target shareholders with part of the expected efficiency gains that accompany the removal of incumbent management.

Empirically, the efficiency arguments suffer from at least one major weakness: the periodic occurrence of merger waves. From an historical perspective it seems absurd to claim that the recent explosion in M&A activity could be linked to a sudden upsurge, across industries, in managerial incompetence or in worthwhile opportunities for synergy. Definitely, the US economy experienced major exogenous shocks during the 1980s and it is easy to remember the oil debacle or the advent of deregulation. However, anyone above 40 would reassure us that much the same can be said of earlier decades.

If not efficiency, what else helps to explain takeover booms? We discuss possible non-efficiency motives and their social welfare implications in the next section. At present, even the textbooks (Brealey and Myers, 1988) admit that there are few empirically identifiable causes of the wave aspect of aggregate merger activity. The only well-established empirical fact, it seems, is that M&A activity varies with the level of the stock market (Golbe and White, 1988). This suggests an important role for stock market misvaluation. To quote Keynes (1936):

> But the daily revaluations of the Stock Exchange, though they are primarily made to facilitate transfers of old investments between one individual and another, inevitably exert a decisive influence on the rate of current investment. For there is no sense in building up a new enterprise at a cost greater than that at which a similar enterprise can be purchased; whilst there is an inducement to spend on a new project what may seem an extravagant sum, if it can be floated off on the Stock Exchange at an immediate profit (p. 151).

Keynes recognizes possible arbitrage between financial markets and real-asset markets as a cause of the cyclicality of M&A and of new equity issues (as, infact, observed by Korajczyk *et al.*, 1989). But the theory seems contradicted by the observation that the number of mergers is *positively* related to the level of the stock market. From reading Keynes, we would expect the opposite. Nevertheless, if we

think about mergers as *exchanges of assets*, perceived relative misvaluation within financial markets could still matter. For instance, 'overvalued' bidder firms may systematically buy 'undervalued' target firms. The number of such opportunities may vary with the level of stock prices. Also, merger activity may influence financial market conditions if the onset of an apparent merger wave persuades investors to buy shares of likely targets, further hurrying bidders to 'act now'. Both explanations are consistent with Shiller's (1984) work on the role of fads and fashions in financial markets, or with theories based on some degree of individual irrationality, such as Roll's (1986) hubris hypothesis, where overoptimistic bidders face a winner's curse.

The empirical analysis of merger waves below uses data collected by the Center for Security Prices at the University of Chicago (CRSP). We study all companies that were delisted from the New York Stock Exchange for reason of merger between 1926 and 1988 and we classify them into industries. Our approach looks at the volume of M&A activity, the types of firms involved, and the associated long-term price swings in the stock market. This is quite different from past work, which focuses almost exclusively on short-term price movements around the announcement dates of mergers and acquisitions. Event study methods are built on the notion that the market prices assets rationally at all times, an heroic assumption that is increasingly under fire.

Contrary to the economic efficiency view of mergers, we find that (1) historically, mergers occur in waves that are to a large extent economy-wide; (2) over the five years prior to delisting, the stocks of successful merger targets do not, on average, underperform market indices; and (3) companies that closely match the profiles of poorly performing merger targets beat various stock market indices for several years after the merger has been completed. At the aggregate level, we also present new regression test that try to explain merger activity in terms of the level of the stock market and several proxies for 'relative misvaluation' and 'investor diversity of opinion'.

As already noted, the first empirical finding weakens the efficiency arguments. While merger activity is not always evenly spread across industries, there is a strong common component through time. The second finding suggests that targets of successful mergers are not, in large majority, mismanaged. As it turns out, the distribution of merger targets is skewed towards firms the shares of which outperform the averages. The third result suggests that at least some ostensibly disciplinary takeovers may be motiviated by undervaluation. If so, value is not created but merely redistributed from target to bidder shareholders. Overall, the results raise doubts about the validity of a policy perspective that suggests that, when it comes to mergers, 'more is almost surely better'.

We conclude that it would be a mistake to condemn all takeover regulation. The true challenge facing policy makers is to go beyond the present patchwork of precedent rulings and regulations and to develop a coherent institutional framework that promotes economic efficiency, yet maintains a balance of equity among the many stakeholders that constitute the modern corporation. While this ideal state of affairs may elude us for a long time to come, it seems unlikely that an unrestricted takeover environment set of maximizing the number of 'deals' should be part of it.

MERGER MOTIVES AND WEALTH TRANSFERS

Past research identifies distinct but not mutually exclusive hypotheses that may explain M&A activity. Excellent summaries appear in Jensen and Ruback (1983), Jensen (1988) and Roll (1988). Merger theories can be categorized according to whether value is created or merely redistributed among corporate stakeholders. It is important to focus on typical aggregate wealth changes since in almost every transaction there are some winners and some losers. From society's perspective, it would be a mistake to consider the gains of target shareholders only. If, however, aggregate wealth increases, then—at least in theory—all participants can be made better off and welfare improves (even though difficult tradeoffs between equity and efficiency remain). In practice, few studies of takeovers tally the financial consequences to all parties involved. There is agreement that M&A deals motivated by synergy or the removal of inept management create new wealth. Wealth redistribution can also occur in a variety of ways. Below, we list five merger motives in this category and we discuss their social welfare implications.

The first motive is *target firm undervaluation* in financial markets. Bidder-firm shareholders gain while target shareholders lose. This theory is a favorite among investment bankers and corporate

executives but much less so among economists (Lev, 1986; Foster, 1986). It assumes that security prices do not always rationally reflect all available information about the firm's fundamentals and that, as a consequence, the threat of a takeover forces executives 'to manage share prices', perhaps with accounting gimmicks. When combined with the view that financial markets are excessively volatile and overreact (De Bondt and Thaler, 1985), the suggestion is that myopic markets drive managers to become myopic also. If the allegation were true, 'it could be the most important implication of takeovers' (Scherer, 1988, p. 78).

On the basis of still preliminary evidence, Jarrell *et al.* (1988) and Jensen (1988) warn against the myopic markets view. For instance, Jensen cites research that observes that stock prices rise when increases in R&D spending are announced. Bange and De Bondt (1990), however, suggest that executives, concerned with reported earnings, change R&D as well as other expenditures charged against accounting earnings in response to past stock price movements.[3] Similarly, Stein (1988) shows analytically that, with asymmetric information and takeover threats, top management may rationally sacrifice long-term investment. Contrary to Stein, Meulbroek *et al.* (1990) find a decrease in R&D following the implementation of antitakeover amendments.

A second motive for merger is *bidder management self-interest and hubris*. Wealth is redistributed from bidder-firm shareholders to bidder management and target shareholders. The theory is the logical counterpart of the disciplinary hypothesis. It comes in several versions. M&A may be a valuable tool of managerial entrenchment, e.g. when executives make themselves indispensable by acquiring assets that complement their own special skills. Alternatively, if managers think they are already overinvested in the company, empire building and conglomerate diversification may shield their personal wealth and human capital. Further, managers may simply be overconfident, believing mistakenly that they can make the target firm more profitable. As a result, they overpay and face a winner's curse (Roll, 1986). Consistent with bidder mismanagement and hubris, certain specific types of acquisitions earn lower announcement returns to bidder firms (Morck *et al.*, 1990). Over longer periods also, the post-bid share-price performance of acquiring firms seems disappointing even though the debate is not closed (Jarrell and Poulsen, 1989; Magenheim and Mueller, 1988).

The above considerations raise serious doubts about the efficiency of takeovers as a corporate control mechanism (Shleifer and Vishny, 1988; Walsh and Seward, 1989). Manne's disciplinary hypothesis is built upon an illusory distinction between bad management (located in target firms) and good management (located in bidder firms). However, given the separation of ownership and control, the reverse logic seems equally plausible, with entrenched managers in mature firms overbidding for rapidly growing targets.

A third motive is *breach of trust* when a takeover comes as a surprise to stakeholders, e.g. labor unions that entered to some degree into implicit contracts with trustworthy managers but now find themselves expropriated by new owners (Shleifer and Summers, 1988). Target shareholders gain in the short run, but society loses because valuable 'corporate cultures' are destroyed, and also because the ability of all companies to contract efficiently diminishes, even in an *ex ante* sense.

A fourth theory is *monopoly power* in product markets. The danger is most obvious in the case of horizontal mergers, e.g. in the airline industry. Value is redistributed from customers and suppliers to corporate shareholders. Horizontal mergers were most prevalent around the turn of the century but now are subject to review under the antitrust laws.[4]

Finally, some mergers are motivated by *corporate tax savings*. For example, bidders may be willing to pay a takeover premium for the opportunity to 'step up' the basis of depreciated assets. Also, merged firms can make greater use of debt financing. In these examples, shareholders gain but taxpayers (and, possibly, bondholders) lose. As with breach of trust and monopoly power, there is still insufficient empirical evidence to judge the true importance of the tax argument. Gilson *et al.* (1988) remind us that taxation gains—from a stepped-up basis or from loss carryforwards—could be obtained with techniques other than mergers. Auerbach and Reishus (1988) conclude that corporate taxes matter in a significant minority of transactions but not to the overall level of M&A activity.

MERGERS ON THE NEW YORK STOCK EXCHANGE, 1926–88

We study all corporations delisted from the New York Stock Exchange for reason of merger between 1926 and 1988. The data are drawn from the CRSP

Monthly Master and Return Tapes (We consider all firms with a delisting code between 200 and 299). As far as we know, our data set is new.[5] It focuses our attention on merger activity among the largest publicly traded US companies. A good discussion of the advantages and drawbacks of other merger series is found in Golbe and White (1988). The series does not suffer from 'fixed lower limit dollar cutoff' problems, i.e. the recorded number of transactions does not automatically grow with inflation and the passage of time.

Are there Merger Waves?

Figure 1 plots the annual number of mergers (*# TOTAL*) and their combined value as a percentage of the end-of-year total value of all firms on the exchange (*% VALUE*). It seems that there were four distinct surges in merger activity: in the late 1920s, the mid-1950s, the late 1960s, and from the late 1970s onward through the 1980s.

We use SIC codes to classify the targets of successful mergers by industry. The industries are defined as in Fama and French (1988). Table 1 lists the number of mergers in each of 17 industries for subsequent five-year periods starting in 1926. As measures of merger intensity, we also express the number as a percentage of the total number of firms in the industry (at the end of the fifth year) (*PERCENT*) and we compute the value of the equity involved in mergers as a percentage of the worth of all shares in the industry. By comparing the *PERCENT* with the *% VALUE* rows in Table 1 we see that, generally, companies of below-average size are involved in mergers. Only during the 1980s are there some notable exceptions (Petroleum and Mining).

Previous work correctly points out that the merger wave of the 1980s was concentrated in particular industries. Jensen (1988) believes in management inertia. He explains that many executives are unable to ignore sunk costs. When new circumstances bring upheaval to an industry and require fundamental change they have difficulty adjusting, and effectively turn their companies into takeover targets. The argument is persuasive at the industry level. It combines Gort's (1969) disturbance theory of mergers with the disciplinary hypothesis. But, it also leaves out an important fact. While the intensity of M&A activity differs between industries, at times the number of mergers rises or falls across all of them. In other words, there is a strong economy-wide component to merger waves. This aspect of the data makes the efficiency explanation less plausible.

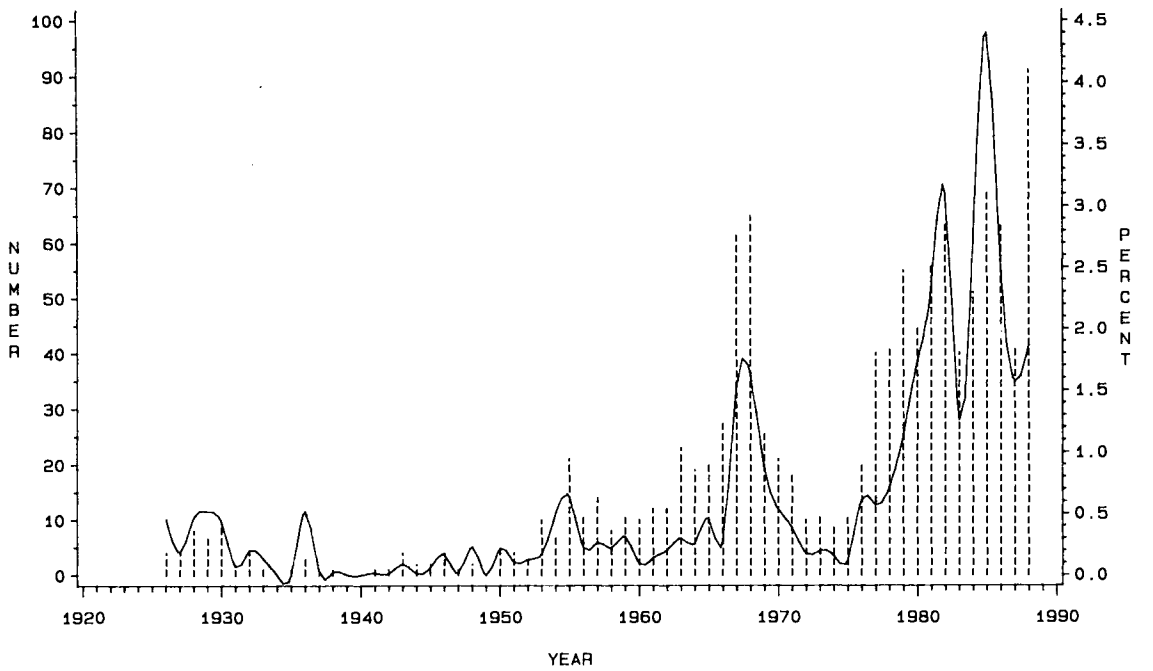

Figure 1. Merger activity on the NYSE, 1926–88. - - - Number of mergers each year: —— value of mergers as a percentage of value of all NYSE companies.

Table 1. Merger Activity on the New York Stock Exchange by Industry, 1926–88

Years	1926–30	1931–5	1936–40	1941–5	1946–50	1951–5	1956–60	1961–5	1966–70	1971–5	1976–80	1981–5	1986–8
	1	0	0	0	1	3	2	2	9	4	7	16	5
Apparel	3.0	0.0	0.0	0.0	2.1	6.7	4.5	3.4	13.4	6.1	11.7	36.4	11.9
	1.3	0.0	0.0	0.0	2.8	3.4	2.9	1.0	6.9	24.4	4.1	31.3	9.5
	1	0	0	1	1	6	0	1	8	1	12	4	5
Automobile	2.3	0.0	0.0	2.2	2.1	13.6	0.0	2.9	19.0	2.4	40.0	13.8	20.8
	0.3	0.0	0.0	0.1	0.5	1.6	0.0	0.0	2.7	0.5	4.6	7.2	2.0
	3	0	0	0	1	5	11	13	39	3	36	28	26
Bus. Equip.	5.6	0.0	0.0	0.0	1.1	5.0	8.8	7.7	21.5	1.6	18.8	15.5	16.8
	1.2	0.0	0.0	0.0	0.0	0.8	0.7	1.2	3.7	0.5	4.4	6.1	4.9
	1	0	0	0	1	2	3	7	8	2	7	3	4
Chemical	5.0	0.0	0.0	0.0	3.0	5.1	7.3	15.2	15.7	4.0	15.2	7.3	9.5
	0.0	0.0	0.0	0.0	0.4	0.5	0.3	1.9	5.8	0.9	3.9	1.2	5.9
Building	1	0	0	0	0	2	3	6	11	1	15	11	18
& Constr.	3.2	0.0	0.0	0.0	0.0	3.8	4.8	8.2	13.9	1.1	17.2	13.8	24.0
	12.6	0.0	0.0	0.0	0.0	0.6	0.8	1.7	4.1	1.2	6.8	6.3	13.0
	3	0	1	0	0	2	2	6	6	5	4	10	5
Drug	9.4	0.0	2.8	0.0	0.0	5.4	5.1	11.5	10.5	9.4	7.8	20.0	10.0
	6.1	0.0	0.1	0.0	0.0	3.6	0.9	1.1	4.0	1.6	1.2	7.0	1.6
	1	1	0	0	2	4	2	4	18	6	9	20	17
Durables	3.2	3.7	0.0	0.0	3.9	7.1	3.1	4.8	17.5	5.4	8.4	21.5	19.8
	0.1	0.2	0.0	0.0	3.3	6.4	2.7	0.6	2.8	0.7	2.5	4.9	9.2
	1	2	0	0	0	0	3	2	9	8	18	54	20
Financial	2.6	5.3	0.0	0.0	0.0	0.0	5.6	2.4	7.2	3.3	7.3	19.3	4.9
	0.1	1.7	0.0	0.0	0.0	0.0	5.8	0.1	4.7	2.1	4.0	10.6	3.8
	6	0	0	1	0	2	6	6	12	4	15	17	5
Food	10.3	0.0	0.0	1.4	0.0	2.4	7.1	7.2	14.5	4.7	20.3	32.1	9.6
	3.2	0.0	0.0	0.1	0.0	0.4	1.6	2.5	6.5	2.1	10.9	18.1	7.5
	3	1	2	2	0	4	3	6	14	7	7	5	9
Metal	4.9	1.8	2.9	2.9	0.0	5.3	3.9	10.0	22.2	12.7	13.0	11.1	22.5
	2.1	1.2	0.7	0.6	0.0	0.4	0.2	0.9	7.9	7.0	4.5	11.3	8.3
	1	0	0	0	0	0	1	1	7	3	7	6	4
Metal Prod.	6.3	0.0	0.0	0.0	0.0	0.0	4.5	3.1	17.9	7.5	17.9	16.2	10.8
	0.8	0.0	0.0	0.0	0.0	0.0	0.4	3.4	8.6	7.7	14.1	18.8	9.3
	0	1	0	1	0	3	3	4	2	0	5	3	2
Mining	0.0	3.2	0.0	3.1	0.0	9.4	10.7	12.1	5.9	0.0	17.9	10.0	5.1
	0.0	4.0	0.0	1.9	0.0	1.3	12.1	1.3	1.8	0.0	13.1	32.4	6.3
	4	0	0	1	0	2	8	10	23	4	24	38	26
Misc.	7.7	0.0	0.0	1.4	0.0	2.3	9.2	9.2	16.8	2.4	14.0	20.4	14.4
	3.2	0.0	0.0	0.1	0.0	0.7	1.1	0.6	4.6	0.5	7.5	10.8	4.6
	3	1	2	2	1	3	2	4	5	1	3	21	6
Petroleum	6.7	2.5	5.9	5.6	2.4	6.4	4.7	8.5	8.9	1.7	4.6	30.4	8.6
	1.0	0.1	5.1	0.3	1.2	2.0	0.6	2.3	5.4	0.1	0.9	43.9	9.5
	0	0	0	1	1	1	2	7	13	4	19	22	21
Retail	0.0	0.0	0.0	1.5	1.4	1.4	2.7	8.3	11.9	3.4	17.3	23.9	25.3
	0.0	0.0	0.0	0.1	0.4	0.1	0.4	2.1	2.9	1.4	7.9	6.3	13.1
	3	1	0.7	4	10	13	14	6	17	4	10	13	14
Transport.	2.9	1.0	0.0	0.9	2.5	2.5	2.5	6.1	17.9	4.7	12.2	18.6	24.6
	1.9	1.0	0.0	0.2	0.9	1.3	1.2	2.2	14.6	9.8	7.3	17.6	8.3
	0	0	0	0	1	3	0	1	1	2	3	9	8
Utilities	0.0	0.0	0.0	0.0	1.3	3.2	0.0	0.9	0.8	1.4	2.0	6.2	5.6
	0.0	0.0	0.0	0.0	2.0	1.3	0.0	0.1	2.5	0.7	0.8	4.4	3.1
All	32	7	5	10	12	45	54	86	202	59	201	280	195
industries	4.3	1.0	0.6	1.2	1.2	4.3	4.9	6.8	13.8	3.6	12.6	18.1	11.9
	1.7	0.3	0.6	0.2	0.6	1.2	0.8	1.2	4.5	1.4	4.3	12.4	5.7

Note: Industry classification is as in Fama and French (1988). For every industry, the first row in the table always lists the number of companies in that industry delisted from the NYSE for reason of merger. The second row expresses the number of firms delisted over each five-year period as a percentage of the number of firms in the industry at the end of the fifth year. The third row expresses the combined market value of the firms delisted over each five-year period as a percentage of the market value of all firms in the industry.

An easy way to document the economy-wide influence is to run regressions, with annual observations, of the number of companies delisted for reason of merger in one industry (*#DLMERG*) on the same aggregate statistic for all industries, with the first industry removed (*#TOTAL−#DLMERG*). If the slope coefficient is positive, there is a market component. We run 17 such bivariate OLS regressions, one for each industry. The slope is always significantly positive: 16 times at the 1% level and once at the 5% level! The average adjusted *R*-square is 0.403. It varies between 0.069 (Mining) and 0.803 (Miscellaneous). Using an alternative method, we can also regress each industry's *#DLMERG* on last year's *#TOTAL*. Again, all 17 slopes are positive, 14 of them significant at the 1% level. The average adjusted *R*-square is 0.350. Regressions with industry- *%VALUE* statistics as the dependent variable and last year's *%VALUE* as the predictor variable yield similar results.

Can we further improve upon the above regressions? For example, does *#DLMERG* rise if the industry underperforms stock market indices for the last couple years (as suggested by the disciplinary hypothesis)? This would address Jensen's observation that merger intensity varies greatly across industries. We try three variables: (1) the industry cumulative excess return relative to an equally weighted NYSE return index (provided by CRSP) over three years prior to the year (t) in which *#DLMERG* is measured ($CER_{t-3,t-1}$); (2) the same statistic for year t (CER_t); (3) the same statistic for years $t+1$ through $t+3$ ($CER_{t+1,t+3}$). It turns out that, in general, these variables add little or no explanatory power to the industry-by-industry regressions described earlier. For example, with *#DLMERG* on the left-hand side, only six out of $17 \times 3 = 51$ estimates are significant. The signs of the coefficients are mostly positive (32 cases).

Aggregate Determinants of Merger Waves

In Table 2 we regress annual observation of *% VALUE* on various determinants of merger waves. Among others, the following are considered:

(1) The Dow Jones Industrial Average, divided by 100 (*DJIA*);
(2) The average earnings-to-price ratio for companies that are part of the DJIA (*EP*);
(3) The average yield on Baa-rated corporate bonds (%), as reported by *Moody's* (*Baa*);

Table 2. Regressions with % *VALUE* as the Dependent Variable, Annual Data, 1931–85

Independent variables	Dependent variable: % *VALUE*									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Constant	−0.35	−0.76	−0.87	−1.04	−1.02	−1.06	−0.96	−0.86	−2.20	−1.06
	(0.4)	(−2.0)	(−3.7)	(−2.2)	(−2.8)	(−3.3)	(−2.2)	(−3.5)	(−2.6)	(−3.2)
DJIA	0.18	—	0.13	0.13	—	0.09	—	0.13	0.14	0.09
	(3.9)		(4.2)	(2.5)		(2.0)		(4.1)	(2.6)	(2.0)
EP	—	—	—	—	—	—	−0.74	—	—	—
							(−0.2)			
Baa	—	0.22	—	0.15	0.17	0.11	0.17	—	0.18	0.11
		(4.3)		(2.4)	(3.6)	(2.2)	(3.6)		(2.6)	(2.1)
INFL	—	—	—	—	—	—	—	0.00	—	—
								(0.0)		
TURN	—	—	3.22	—	2.37	1.91	2.32	3.20	—	1.90
			(3.4)		(2.2)	(1.8)	(2.1)	(3.2)		(1.8)
DIV	—	—	—	—	—	—	—	—	0.91	—
									(1.9)	
LIQ	—	—	—	—	—	—	—	—	—	−0.46
										(−0.3)
AR(1)	0.74	0.81	0.45	0.75	0.70	0.62	0.70	0.46	0.80	0.63
	(6.3)	(4.4)	(2.8)	(4.3)	(3.8)	(3.5)	(3.8)	(2.7)	(4.5)	(3.5)
AR(2)	—	−0.15	−0.06	−0.02	−0.06	−0.05	−0.07	−0.06	0.01	−0.06
		(−0.8)	(−0.4)	(−0.1)	(−0.4)	(−0.3)	(−0.4)	(0.4)	(0.0)	(−0.3)
DW	1.9	1.6	1.7	1.8	1.7	1.7	1.7	1.7	1.8	1.7
Adj. R^2	0.69	0.69	0.71	0.72	0.71	0.73	0.71	0.70	0.74	0.72

Notes: *t*-statistics in parentheses. Variables are defined in the main text.

(4) The annual turnover rate (stock volume divided by number of shares listed) for the NYSE, taken from various issues of the yearly *NYSE Fact Book* (*TURN*);
(5) The difference in prior five-year return between the 5% best and the 5% worst performing stocks on the NYSE at the end of each year (*DIV*);
(6) The annual number of firms delisted from the NYSE for reason of liquidation or bankruptcy (*LIQ*).

As we would expect with time-series data, the error terms in simple OLS regressions are serially correlated. Therefore the regressions in Table 2 always include first- and second-order autoregressive terms.

Before looking at the results, it is useful to explain the choice of these independent variables. Some factors, such as *DJIA* or *Baa*, make our study comparable with previous work. We realize there is dispute over their correct interpretation. Other variables, such as *TURN* or *DIV*, are specifically meant to test the theory that M&A activity is driven by the same economic factors that explain trading volume in other markets. Fashion, speculative frenzy, and diversity of opinion may play a role here. Surely, it is difficult to rationalize *TURN* and *DIV* in terms of economic efficiency. It is, however, easy to think of *LIQ* as a test of the disciplinary hypothesis.

For publicly held corporations, most M&A transactions are initiated by potential buyers. *DJIA*, and the inverse of *EP*, will have a positive relationship to %*VALUE* if these variables proxy for the (excessive?) enthusiasm and the 'deep pockets' of bidder-firm management. Alternatively, as a leading indicator, *DJIA* also predicts the outlook for the economy which, if it is positive, may suggest greater opportunities for valuable corporate combinations. *A priori* though, the opposite argument—that the number of profitable M&A opportunities varies inversely with the economy's prospects—seems equally plausible.[6]

Baa, the average required yield on junk bonds, is a proxy for the cost of capital. It is sensitive to the immediate outlook for the economy. We expect a positive relationship to %*VALUE* if a high *Baa*-yield signals bad times ahead and an increased overall need for corporate restructuring. Also, with higher interest rates, it may be particularly difficult for small firms to borrow, turning them into acquisition targets; but, higher rates make the financing of takeover deals more expensive (Becketti, 1986).

TURN measures the propensity of investors to exchange assets, a likely function of the diversity of opinion among the public. As far as we know, previous studies have not considered this variable. Interestingly, NYSE turnover rose significantly during each of the four major merger waves in this century: the early 1900s, the late 1920s, the late 1960s, and the mid-1980s. For example, the average annual turnover rate between 1900 and 1905 was 217%. In 1987, it reached 73% (the highest level since 1929) but this number ignores the growth of the options and futures markets. The actual or perceived misvaluation of assets relative to one another is also captured by *DIV*. We scale *DIV* by its average for the 1931–85 period. *DIV* varies between 0.72 (1964) and 2.05 (1936). For both *TURN* and *DIV*, we expect a positive link to %*VALUE*.

If the disciplinary hypothesis is correct, then the same exogenous events that require corporate restructuring and sometimes lead to bankruptcy and liquidation should also predict increased M&A activity. We predict a positive sign for *LIQ*, an annual series drawn from the CRSP Monthly Master and Return Tapes (delisting codes 300, 572, and 574).[7]

Table 2 shows that, in all cases, the most important predictors of %*VALUE* are the autoregressive terms. Their presence lifts the Durbin–Watson coefficients within an acceptable range. Three types of variables contribute further explanatory power: the level of the stock market, the level of interest rates, and turnover. All three variables carry a positive sign (see equations (1) through (6)). Contrary to the disciplinary hypothesis, *LIQ* never matters (see e.g. equation (10)). Even though we do not report these regressions, we experimented with the lagged values of *DJIA*, *Baa*, and *TURN*. The findings are similar but the *R*-squares decrease somewhat. In addition, we ran regressions with dependent variables other than %*VALUE*: (1) the annual number of mergers and (2) the number of mergers as a percentage of the total number of companies listed on the NYSE. Again, the results are similar.

In order to further check the robustness of the findings we also employed related but different independent variables. Apparently, the Dow Jones P/E ratio does not capture the same economic forces as does the DJIA (compare equations (6) and

(7)). The same holds true for an average Dow Jones dividend yield measure and for equally and value-weighted annual NYSE return indices, provided by CRSP. The statistical significance of *Baa* is probably not driven by the expected inflation component implicit in the interest rate. When we replace *Baa* with *INFL*, the percentage of actual CPI inflation (provided by Ibbotson Associates Chicago), *INFL* is insignificant (compare equations (6) and (8)). Various regressions with the *ex post* real interest rate (defined as *Baa-INFL*) on the right-hand side are equally disappointing.[8] *DIV* and *TURN* behave similarly—their correlation is 0.43—and both are significant (compare equations (6) and (9)).

Do Most Target Companies Perform Poorly prior to Acquisition?

Many readers of the corporate control literature may well be left with the impression that almost all merger targets perform poorly prior to acquisition.[9] The evidence below shows that this is not the case.

Again, we start from all NYSE companies delisted for reason of merger. Following standard methods, we find cumulative excess returns (CER) starting 66 months prior to delisting (month 0). The residual returns are defined relative to (1) an equally weighted return index for all NYSE firms, provided by CRSP; (2) the average returns on firms that belong to the same market value of equity decile; (3) the average returns of firms in the same industry. The market value decile is determined at the end of the year prior to delisting. As before, the industries are defined as in Fama and French (1988). There are no other adjustments for risk.

Figure 2 plots the average CERs for 1065 companies. Two features of the data stand out. First, target shareholders benefit considerably during the last few months that end with delisting. The wealth gain is in the order of 25%. Second, and more relevant here, during months -65 through -6 the average merger target does not underperform the market, its industry, or companies of comparable size (CERs are, respectively, $+3.1\%$, $+0.3\%$ and -0.8%). These results are comparable to Dodd and Ruback's (1977) study that examined returns to tender-offer targets (but did not control for company size or industry). One may suspect that these findings would be different for large companies, on the theory that they only become merger targets if they are clearly mismanaged; the evidence is not consistent with that presumption. Between months -65 and -6, the average CER for firms in the top

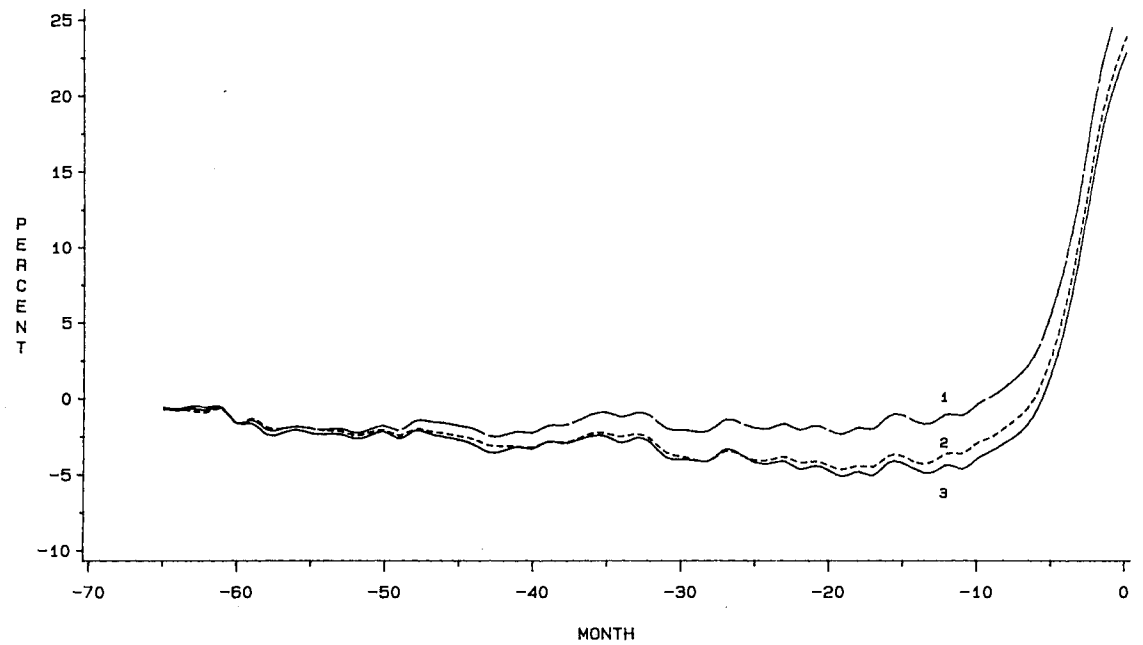

Figure 2. Cumulative residual return performance of successful merger targets (1065 NYSE-listed companies, 1931–87). 1 Market-adjusted excess returns; 2 size-adjusted excess returns; 3 industry-adjusted excess returns.

three size-deciles of all NYSE companies is +1.0%.

Table 3 expands on Fig. 2 by looking at the whole distribution of prior performance. Every month between July 1931 and December 1987 all companies on the NYSE are ranked according to their prior cumulative five-year returns and the performance of the 10, 20, . . . , 90 percentile stocks is recorded. By construction, 10% of the companies record a performance in the first decile, 10% in the second, and so on. The top panel of Table 3 lists the proportion of merger targets in each decile, six months prior to delisting. If the sample of merger targets were a random draw of all NYSE companies, we would expect a rectangular distribution with again 10% of the targets in each performance decile. In fact, over the whole period, the distribution is skewed towards better stock market performers.

The above results do not deny that poor return performance or a low Tobin's q contribute to the chances that a firm becomes a takeover target (as observed by Hasbrouck, 1985). But the explanatory power of statistical models that predict targets is quite low (Palepu, 1986) and the *typical* merger target is not characterized by poor performance.

Past studies repeatedly find that company size influences the likelihood of a takeover bid (see e.g. Palepu, 1986). The bottom panel of Table 3 also focuses on this issue. It is constructed in a way that is similar to the top panel. All 1065 merger targets are classified according to market value of equity at the end of the year prior to delisting. We see that small firms are more likely to be bought. Between 1931 and 1987, about 65% of merger targets were smaller than the median-sized firm. Prior to 1969, no top-decile-size company was ever delisted because of merger.

Undervaluation? A Matched Sample Approach

We already know that merger targets are not, in large majority, prior stock market underperformers. For those merger targets that *are*, managers often complain that 'the company is temporarily undervalued', perhaps because of a poor quarterly earnings report. The implication is that once the profit picture improves, stocks predictably bounce back up to their fundamental values. Perhaps market overreaction (De Bondt and Thaler, 1985) rather than poor management is the reason some companies are put into play. A related theory is that bidders are 'superior security analysts' who somehow know when a target firm is undervalued (Holderness and Sheehan, 1986).

It is difficult to establish what would have happened to a company had it not been taken over. Nevertheless, we want to examine this counterfactual. Our approach is to study the post-merger performance of a sample of companies that closely match the characteristics of successful merger targets. We deliberately focus on prior losers only. Do the share prices of companies that match the profile of 'disciplinary' takeover targets, on average, outperform stock index averages after the merger? If

Table 3. Successful Merger Targets Classified by Prior Performance and by Market Value, New York Stock Exchange, 1931–87

Decile portfolio	1	2	3	4	5	6	7	8	9	10
Prior performance decile										
7/31–12/49	0.0	0.0	5.3	5.3	5.3	0.0	21.0	36.8	15.8	10.5
1/50–12/68	10.5	8.0	9.1	13.0	8.0	10.5	13.0	8.7	10.1	9.1
1/69–12/87	6.1	8.0	9.6	8.3	8.3	12.8	12.3	10.7	11.5	12.4
7/31–12/87	7.4	7.8	9.3	8.8	8.2	11.7	12.9	10.7	11.1	11.3
Market value decile										
7/31–12/49	3.5	6.9	13.8	20.7	13.8	10.3	6.9	6.9	17.2	0.0
1/50–12/68	9.7	15.8	16.4	14.6	15.8	8.5	8.5	7.0	3.8	0.0
1/69–12/87	10.3	10.5	14.5	13.7	12.2	11.5	9.9	7.6	5.5	4.4
7/31–12/87	9.9	12.1	15.1	14.2	13.4	10.5	9.4	7.4	5.3	2.8

Note: Firms are classified in five-year performance deciles, six months prior to delisting for reason of merger. Firms are classified in market value deciles according to thier values at the end of the year prior to the year of delisting. The numbers in the table represent the percentage of all successful merger targets in a particular decile.

the answer is yes, the finding reduces the relevance of economic efficiency in understanding the disappearance of those firms where the motive is most likely to be operative.

As before, merger targets are assigned to five-year performance deciles six months prior to delisting. We study the bottom four deciles, a total of 287 companies. During months −65 to −6, the average CER of these firms (relative to an equally weighted NYSE index) is −55.5%. The matched sample consists of firms (1) in the same performance decile as the companies that merged, six months prior to delisting; (2) in the same industry (Fama and French, 1988); (3) in the same market value of equity decile. The matching criteria are stringent: Only 80 companies are successfully matched on all three characteristics.[10]

Figure 3 plots the CERs of the 80 merger targets and the matched companies. Between months 0 and 60 the CER for the matched sample is +16.8%. Most of the rebound (9.8%) happens between months 0 and 24. Over that time period, 58% of the stocks have positive CERs whereas, with prices equal to fundamental values at all times, we would expect that the CERs are as likely to be negative as to be positive. A non-parametric one-sample sign test (Daniel, 1978, pp. 27–31) indicates that $p = 0.03$.

The effect is stronger for more extreme losers. For example, if the matching is with losers in the bottom three (rather than bottom four) performance deciles, then the price rebound through month 60 amounts to +24.3% (62 companies).[11] If firms that themselves became takeover targets by month 60 are eliminated from this sample, the CER changes to +25.7% (three companies removed). We tried numerous other variations on the research design. For example, considering only losers in the bottom three deciles and matching on criteria (1) and (2) but not on market value of equity, we find that the rebound is +11.4%.

Overall, the above findings are consistent with the view that some M&A activity is explained by bidders' efforts to buy up firms that are undervalued in the capital markets.[12] From the previous section we already knew that excellent stock market performers have a better chance to become takeover targets. Now it appears that, when poor performers become attractive targets, it may not be because they are mismanaged but rather because the fundamentals are right and the price is wrong.

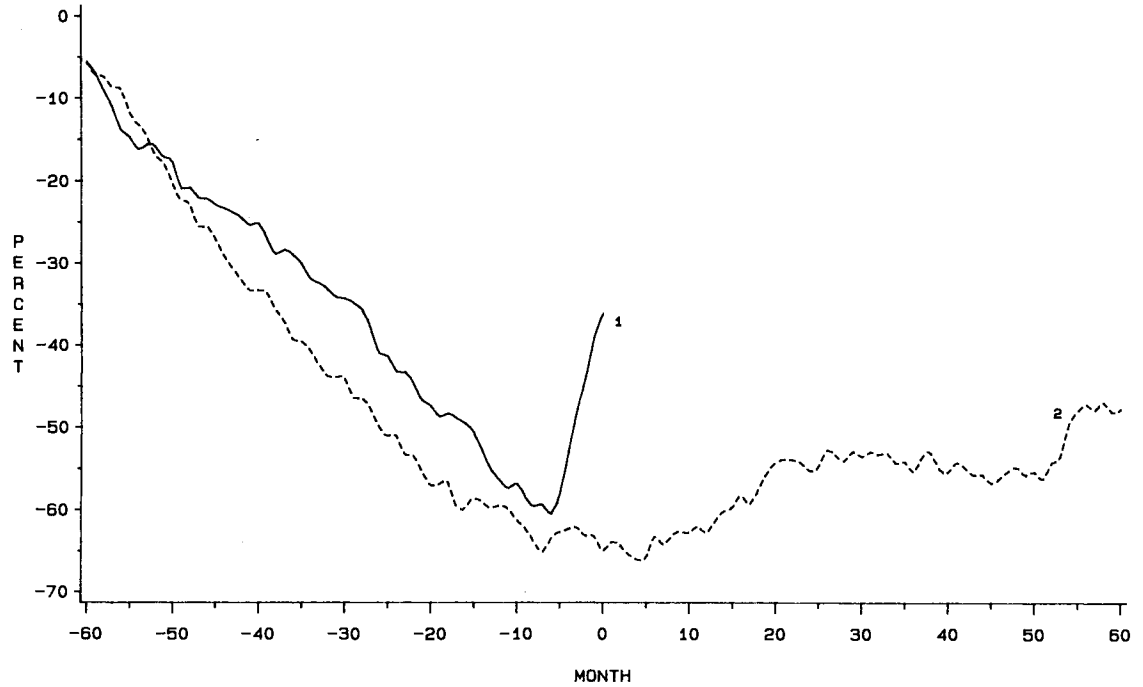

Figure 3. Return behaviour of poorly performing merger targets and a matched sample. 1 Poorly performing merger targets (80 companies); 2 sample matched by industry, prior performance and market value (80 companies).

CONCLUSIONS

Some academic research on M&A has concluded that 'the evidence is consistent with the notion that these corporate transactions reflect economically beneficial reshufflings of productive assets' (Jarrell *et al.*, 1988, p. 58). This paper finds that the evidence is equally consistent with a much less benign view. Interestingly, takeover booms span almost all industries. They are not associated with recession and bankruptcy but become more likely when the stock market is up, when the cost of capital is high, and when investors are generally more willing to trade, as evidenced by the turnover and diversity-of-opinion variables in our regression work. In sum, aggregate merger activity is not linked to macroeconomic variables that are easily interpretable in terms of economic efficiency.

Our company-by-company findings similarly suggest that efficiency motives play *less* of a role and other motives *more* of a role than is sometimes recognized. The results add to other disturbing facts: the long-term stock market losses of bidder firms and the now wide agreement that the conglomerate merger wave of the 1960s was a failure (Scherer, 1988). Equally discomforting are the still unsubstantiated claims that takeovers shorten managerial horizons and interfere with efficient long-term contracting.

In spite of its importance to the economic success of the nation, the institutional framework in which corporations operate is fragile and imperfect. It is also a social battleground. Numerous restrictive proposals for changes in merger laws and regulations are now pending. Some economists argue against any reduction in M&A. They favor an unregulated takeover environment based on the theory that 'more mergers are almost surely better' since they are efficiency improving. We think this extreme position is based more on faith than on fact. Definitely, not all regulation is socially desirable but neither is all regulation socially destructive. For example, the government may play a useful role in overcoming the collective action problems that are typical of complex multi-party multi-issue merger negotiations. We only know of one constituency, however, that unambiguously benefits from an unrestricted M&A market: corporate law firms and investment bankers. But it seems doubtful whether, in the long run, society is served by an economic system that is bent toward maximizing transaction fees.

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NOTES

1. Since corporate law is determined at the state level, there are also legal barriers to reaching a coherent nationwide policy on these matters. In fact, states compete to attract incorporations. See Netter and Poulsen (1989).
2. Conversely, the stock market crash of 1987 is sometimes blamed on antitakeover legislation in progress at the time. See Mitchell and Netter (1989).
3. In a provocative paper, Stein (1990) shows that, in equilibrium, the stock market may be efficient and yet corporate managers continue to be shortsighted, forsaking good investments in order to boost share prices. The market is not fooled but adjusts for the systematic earnings inflation.
4. There is only limited empirical evidence on the effects of horizontal mergers. For an introduction, see the Symposium on Horizontal Mergers and Antitrust in the Fall 1987 issue of the *Journal of Economic Perspectives.*
5. Palepu (1986) starts from the CRSP delistings to prepare a list of targets for the 1971–9 periods.
6. Golbe and White (1988) call the positive effect of the stock market and Tobin's q on mergers 'an unresolved puzzle' that is 'inconsistent with the predictions of economic theory' (p. 297).
7. A positive sign is also consistent with the tax hypothesis. In difficult times (say, recessions) many companies accumulate losses that are valuable tax shields for firms with sufficient earnings.
8. Becketti (1986), finds that increases in *ex post* real yields on 3-month Treasury bills 'have the greatest influence' (p. 26) and depress the number of mergers. He uses quarterly data compiled by the FTC (1960–79) and *Mergers and Acquisitions* magazine (1980–85).
9. Since Manne (1965), the literature generally takes poor stock market performance to be indicative of poor management. See e.g. Palepu (1986). For an exception, see Bradley and Jarrell (1988). Lev (1986, p. 364) states that the long-run performance of targets prior to takeover is negative but he does not provide any evidence to that effect. Dodd and Ruback (1977) examine 136 target firms receiving successful tender offers. The shares of these companies 'earn normal returns' in the period from 60 to 1 month before the first public announcement of the offer (p. 367). The review papers of Jensen and Ruback (1983) and Jarrell *et al.* (1988) do not summarize the evidence on target returns over long periods prior to acquisition.
10. If there are multiple firms that can be matched with

the merger target (a rare occurrence), we arbitrarily pick the company with the lowest CUSIP number.

11. The average CER is +15.3% relative to return indices for firms in the same market value decile. It is +18.9% relative to the matching industry return indices. The combined evidence suggests that the source of the excess returns is mean-reversion in returns after prior losses.
12. There are competing interpretations. Past takeovers may suggest to investors that the firms in the matched sample are more likely to become takeover targets themselves, resulting in a rise in share prices. For example, the market may come to believe that the matched firms are similarly 'undervalued'. Alternatively, the threat of takeover may convince the managers of the matched companies to 'clean up their act'. This last interpretation is consistent with the disciplinary hypothesis.

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