

Smart Mega-Merger Deals: Value Creation on a Massive Scale

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Abstract

Mega-M&A deals priced at least \$500mil create significant value for acquiring shareholders for the first time post-2009. The average mega-deal announcement fuels a \$62 mil increase in the market capitalisation of the acquiring company; a \$325 mil gain improvement compared to 1990-2009. The corresponding synergistic gains have also increased dramatically to more than \$542mil in the typical deal pointing to overall value creation from M&As on a massive scale. The striking upturn in acquisition performance is more pronounced among public target acquisitions and remains robust to a number of different measures and controls. Our results are consistent with a structural shift in the quality and drivers of M&As in the aftermath of the 2008 financial crisis which appears to be linked with profound improvements in the quality of corporate governance among acquiring firms.

JEL classification: G34

Keywords: Mergers and Acquisitions, Acquirer Returns, Mega-Deals, Synergy Gains, Value Creation, Financial Crisis

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1. Introduction

One of the most stylized facts in the corporate finance literature is that mergers and acquisitions (M&As) tend to destroy value for acquiring firm shareholders more often than they create. During the previous two decades this empirical observation has been recurrently highlighted by the business press as well as market and academic research.¹ This tendency of M&As to fail is more accentuated among large acquisitions with a number of recent studies pointing out that “mega-deals” priced over \$500mil or \$1bil end up costing shareholders since they tend to destroy value on a significant scale.² A plethora of sizeable mergers and acquisitions, from the frequently quoted landmark deals of AOL-Time Warner, Daimler-Chrysler and HP-Compaq to more recent ones such as Rio-Tinto-Alcan, Bank of America-Countrywide, eBay- Skype and Kmart-Sears to name a few, have all been branded as failures since they have resulted in sizable write-offs and shareholder losses.

Several explanations have been put forward for why large deals fail to pay off more frequently, with the most prevalent ones being overpayment (Loderer and Martin, 1990) emanating from hefty private benefits (Jensen, 1986, Grinstein and Hribar, 2004; Harford and Li, 2007) or adverse managerial traits such as overestimation of the top executives’ ability to extract acquisition gains (Roll, 1986 and Malmendier and Tate, 2008) and integration complexity, including cultural incompatibility, which can hamper post-merger integration (Shrivastava, 1986; Hayward, 2002; Ahern, 2010 and Alexandridis et al. 2013).³ Considering that large M&A deals are typically subject to extensive publicity and investor scrutiny, and that their high failure likelihood and associated challenges have been so extensively

¹ See for example Mueller (1997), Andrade, Mitchell and Stafford (2001), Damodaran (2005), Bruner (2002), Moeller, Schlingemann and Stulz (2005), Boston Consulting Group (2007), Betton et al. (2008), among others.

² A report by the Boston Consulting Group (2007) shows that “mega-deals” with a value of more than \$1 billion destroy nearly twice as much value as smaller deals, while Bloomberg (2002) reports that 61% of merger deals worth at least \$500 million end up costing shareholders. In a more recent study McKinsey (2012) finds that only large deals are on average subject to negative abnormal returns, especially among faster growing sectors. The Financial Times (2015) also posit that expensive mega-deals are damaging for everyone, except for top executives and financial advisors. Alexandridis et.al (2013) report a striking \$518 mil loss for acquiring shareholders in the average large deal between 1990 and 2007.

³ Given the well documented adverse effects of acquirer size on acquisition gains (Moeller, Schlingemann and Stulz, 2004), it is also possible that sizable deals are less likely to succeed merely because they are carried out by larger acquiring companies.

documented and deliberated, it is undeniably surprising that they still fail to create shareholder value at such rate and that top executives and corporate boards get it wrong so often. Notwithstanding the historical tendency of large deals to end up in disaster there is good reason to believe that value creation in M&As has recently reached a pivotal milestone.

One of the consequences of the worst financial crisis in recent history is that it put internal control mechanisms, corporate cultures, executive compensation and risk management processes on the spotlight (see e.g. Gupta and Leech, 2015; Ittner and Keusch, 2015). Accordingly, its aftermath has seen an unprecedented regulatory overhaul, a surge in shareholder activism and litigation cases, as well as government-driven reform efforts, initially focused on financial institutions, fuelling revisions targeted at all listed U.S. companies.⁴ In addition, the on-going evolution in corporate governance in the post-financial crisis era is not merely confined to mandatory reforms but characterised by a more pervasive shift towards the voluntary adoption of practices (e.g. more efficient incentive structures, greater director specialisation and diversity, increased emphasis on the risks associated with strategic goals, the rise of “stakeholder democracy”, and information technology governance) that aimed to enhance the value creation mechanism and convey more confidence to the public. Such extraordinary developments have the potential to positively influence the quality of corporate investment decision making associated with inorganic growth and, in particular, the strategic selection, synergy justification, deal implementation, and post-merger integration processes, implying the need for a thorough investigation of acquisition investments post-2009. Since mega-merger deals have been responsible for massive-scale value destruction for shareholders in the past, they should have been especially affected by this new environment, making them a natural starting point for our examination.

To that end, we study the characteristics and performance of M&As during this previously unexplored recent period and draw important comparisons with the two decades of the 90s and 00s. Our primary focus is on a sample of 3,150 completed M&A deals valued at least \$500mil (henceforth “mega-deals”) and carried out by U.S. acquiring firms between 1990 and 2015.⁵ During the last 25 years mega-deals comprised more than 85% of the total US

⁴ The Dodd-Frank reform act that passed in 2010, although aimed primarily at financial institutions, it also enhanced the effectiveness of monitoring and governance systems for all U.S. listed companies by introducing new mandatory disclosure rules, fine-tuning executive compensation, granting more powers to shareholders and bolstering the accountability of executives and directors.

⁵ The mega-deal classification was motivated by the fact that the breakpoint for the top deal value decile of all US M&As during our sample period is around \$500mil. It also does not affect the direction of our results or

M&A market value. Mega-deal activity remained upbeat during the post-financial crisis recovery with a new wave of deals emerging after 2009 and peaking in 2015, a landmark year for U.S and global M&A deal volumes.⁶ Such mega-deals represent the bulk of corporate investment and are an important part of the economy (more than 5% of U.S. GDP in 2015). From 2010 through 2015 U.S. acquirers announced 783 mega-deals valued at \$2.71tril, more than during the 6th merger wave of 2003-2007 documented by Alexandridis et al (2012). Among the drivers of the heightened activity in recent years has been the combination of the relatively challenging operating conditions with many companies struggling to increase sales on the one side, and historically low borrowing costs on the other, making acquisitions an attractive way to enhance top line growth.

Our findings point to striking changes in deal attributes and quality during the most recent period. Most notably, acquiring firms create discernible shareholder value through mega-deals post-2009 for the first time. Overall, they generate gains of \$42 bil or 2.5 cents per dollar spent around the acquisition announcement, while they lost \$530 bil or 13 cents per dollar spent during the previous decade. This corresponds to a \$62.3 mil gain to acquiring shareholders in the typical deal, a \$325 mil improvement relative to pre-2010. The average acquirer was subject to an abnormal return of 2.54% around the acquisition announcement. Compared to an average loss of -0.36% recorded from 1990 through 2009, this represents an extraordinary improvement. A compelling 62% of large deals are associated with positive acquirer abnormal returns compared to only 45% in the previous decade and 49% during the 90s. By any measure acquiring firms create more value for their shareholders during the most recent period and the differences are both economically and statistically significant. A number of common firm, deal, and market characteristics identified by previous research as pivotal acquisition-gain determinants could be driving the recent upturn in acquisition performance.

First, less than 40% of mega-deals involve a listed target compared to 54% in the 00s and 62% in the 90s. This reflects a tendency for more large private deals which have been historically associated with higher acquirer returns (e.g. Fuller et al. 2002; Moeller et al. 2004; Faccio et al. 2006). However, large deals involving private targets and carried out

main conclusions which are similar when the mega-deal threshold is set to \$750 mil., \$1bil. or higher although this reduces our sample accordingly.

⁶ According to Deloitte, M&A Index 2016 and the WSJ-Dealogic Investment Banking Scorecard the value of global and U.S. M&As surpassed \$4 tril. and \$2 tril respectively, the highest on record since at least 2007.

during 2010-15 exhibit a small (0.67%), though statistically insignificant, improvement in acquirer gains. Instead, the bulk of the documented increase in acquirer returns post-2009 is attributed to the sub-set of listed target acquisitions; they are subject to positive abnormal returns (2.01%) and outperform those in the previous decade by a resounding 5%. Public deals also generate similar gains to private ones, contradicting conventional wisdom that acquiring unlisted targets yields higher returns. Moreover, the overall synergistic gains have improved dramatically - more than five-fold- during the most recent period, with the average deal being subject to a 4.92% or \$542 mil combined gain for acquiring and target companies; to our knowledge the highest ever documented by any previous U.S. study. We also find that along with being able to piece together deals with superior strategic fit, manifested in significantly higher synergy gains, acquiring firms have managed to capture more of this added value for their own shareholders than before. Studying a sample of 21,222 transactions valued below \$500 mil for comparison also reveals improvements - albeit less pronounced - in acquirer and synergy gains post-2009 for the sub-set of public acquisitions. Conversely, small private deals consummated between 2010 and 2015 fare no better for acquiring shareholders. This additional analysis advocates that the documented upturn in acquisition performance is not confined only to mega-deals but it applies to all public acquisitions, a deal type primarily linked to large scale losses for acquiring shareholders by existing literature, and where a great deal of reputational exposure for firms, top executives, and the board of directors is at stake.

Second, acquirers have steered clear from equity financing with only 5.5% of large acquisitions (12% in public deals) being paid entirely with stock and less than 15% of the average offer value being equity consideration. This comes in stark contrast to the previous two decades where the practice of employing stock financing was notably more widespread. Since the equity issues encapsulated in stock offers have been linked to overvaluation signalling (Travlos, 1987) and agency costs of overvalued equity (Jensen 2005), the dearth of stock-financed deals, coupled with the more extensive use of cash offers capitalising on cheap borrowing post-financial crisis, may have induced more positive acquirer returns. However, acquisition gain differences remain robust after controlling for the medium of exchange. In particular, public deals financed entirely with cash generate positive and statistically significant returns (2.15%) for acquiring companies while those paid only with equity, although only 29, were also subject to positive abnormal returns (1.01%). Again, this

is the first time that a study documents non-value-destroying stock-for-stock deals for acquirers for a sample of U.S. acquisitions.

Third, the 2010-2015 period is characterised by a strong bull-market rally (the S&P500 recorded all an all-time high in 2015) while the 90s and 00s decades encompassed both high and low market valuation periods. Since booming markets have been linked to superior acquisition returns (Bouwman, et al. 2009) the documented improvement may be merely a manifestation of our sample split. Yet, the superior returns in the most recent period persist after accounting for aggregate market valuations; the significant differentials remain when comparing the recent period with other high valuation periods that coincide with merger wave peaks such as 1998-99 and 2005-2007.

Controlling for a number of additional acquirer-return determinants, as well as industry and company fixed effects, acquiring firms completing mega-deals consummated in 2010-2015 still outperform those in previous periods by a thumping 2.40% while the associated synergy gains are around 2.00% higher. Propensity score matching acquiring firms post-2009 with their pre-2010 counterparts based on a number of deal characteristics also corroborates the large divergence in inter-period deal performance.

Since mega-deals tend to attract media attention, they can take on an artificial lustre driving up the share-price of acquiring companies without good reason, especially during a period of sizable stock market appreciation. Nonetheless, large scale transactions come with significant implementation challenges that often emerge long after the initial hype, having a protracted impact on the value of the acquiring company. To address this, we also examine acquirer returns over longer term windows subject to data availability for the latter part of our sample. We find that the large return differential documented for post-2009 deals persists up to at least 30 days following the acquisition announcement and in fact further increases, indicating that the documented value creation is unlikely to be due to short-term market overreaction. Moreover, one-year post-acquisition buy-and-hold and calendar time portfolio alphas during the most recent period are also positive and statistically significant compared to negative in the previous decades. The superior long-run performance of acquirers post-2009 is indicative of more enduring value creation that might stem from possible improvements in deal implementation and integration practices post-2009 in addition to superior acquisition decisions.

Our results are consistent with a recent structural shift in the quality and drivers of M&A deals and point to value creation from large M&As on a massive scale, contradicting the status quo that such type of acquisitions destroy value more often than they create. A number of indicators suggest that this remarkable improvement in acquisition quality is concurrent to a more general change in the investment behaviour of firms and corporate executives. A measure of CEO over-optimism based on executive stock options exercise in acquiring firms, which has previously been associated with value-destroying acquisition investments (Malmendier and Tate, 2008), indicates that hubristic behaviour has diminished dramatically during the last few years. The fundamental change in M&A drivers and motives, as well as how top executives view acquisitions, is also evident from the fact that synergistic benefits are quoted by acquirers as part of M&A announcements more than twice as often relative to the past. Finally, a measure of overall investment efficiency that takes into account acquisitions, CAPEX, R&D, and asset disposals based on Richardson (2006) shows that the extent of over- and under-investment has significantly receded post-2009. This implies that corporate decision makers have aimed towards more optimal investment allocation in recent years, which bonds well with our main findings on value creation from M&As.

The fact that the documented improvement in corporate investment behaviour and quality occurred in the aftermath of the worst financial crisis since 1929 implies that our results are most likely triggered by this hefty shock. Ensuing changes at the corporate internal control and monitoring levels in response to the emerging of more shareholder-centric environment deserve special attention. Although some anecdotally reported developments (e.g. greater focus on director specialisation and experience, strategic risk management, and value creation) are not directly quantifiable due to the limited availability of information at the firm level, we consider the impact of more conventional dimensions of corporate governance that are likely to capture any broad trend for change.

We document surges in acquiring companies' board independence, the ownership of independent directors and equity based compensation of their top executives, along with a decline in anti-takeover provisions since the previous decade. To investigate whether the superior gains post-2009 can be attributed to improvements in the quality of corporate governance we isolate its exogenous pre-to-post financial crisis variation, by utilising a two-stage instrumental variable approach. The evidence is consistent with the conjecture that our

2010-15 time indicator is a strong predictor of changes in corporate governance, which, in turn, can explain acquirer returns. Thus, developments in observable dimensions of corporate governance appear to play a pivotal role in the improvement of acquisition quality. It is therefore possible that the documented developments at the corporate board level have fostered more accountability and restraint in the executive suite, leading to superior acquisition decisions that deliver larger synergistic benefits and also cater for more of the gains to be channelled to acquiring shareholders. Yet, concluding unreservedly that better refined governance systems singlehandedly drive the recent upsurge in M&A gains would be possibly arbitrary since our time indicator can in practice capture other shockwaves of the crisis, such as changes in the psychology of corporate leaders due to a sense of enhanced visibility that might reinforce restraint, expedite learning from prior mistakes, and foster a focus towards value creation.⁷

Our study marks a milestone for research on mergers and acquisitions, as well as the effects of the 2008 financial crisis on corporate decision making. The documented findings pose a challenge to the status quo in the acquisition gains literature and are consistent with a structural shift in the quality and efficacy of corporate investment, manifested in M&A decisions that deliver higher returns to shareholders than ever before. From the seminal work of Travlos (1987) and Loderer and Martin (1990) to the more recent evidence provided by Fuller et al. (2002), Moeller et al. (2004, 2005), Betton, et al. (2008) and Alexandridis et al. (2013), the general consensus has been that public acquisitions, and particularly large ones, destroyed value for acquiring shareholders more often than they created for more than 30 years. Our work brings to light for the first time that this trend may have come to an end and that acquiring firms consummating public acquisitions more recently increase shareholder value on a ubiquitous scale, in accordance with the predictions of the neoclassical theory of M&As (Ahern and Weston, 2007).⁸ Moreover, to the extent that the documented improvement in acquisition gains is associated with the recent developments in internal control mechanisms, our study offers significant contribution to existing literature on the

⁷ It is important to note that although we also observe improvements (albeit of lesser magnitude) in conventional corporate governance variables between the 90s and 00s decades, acquisition returns did not improve to such an extent in this case. This might suggest that either governance has more recently reached a certain focal threshold beyond which it makes no difference or that there are concurrent changes in other dimensions of governance not captured by our conventional measures or in forces entirely unrelated to it driving our results.

⁸ Along similar lines, some recent studies have also found evidence pointing to significant net economic benefits from M&As using non-traditional measures of value improvement (see Bhagat et al, 2005 and Humphery-Jenner et al., 2016).

quality-enhancing role of corporate governance in acquisition decisions (Masulis et al. 2007; Golubov, et al. 2016). To the best of our knowledge, it is also the first to provide evidence of the consequences of the 2008 financial crisis on corporate investments, which leads up to a broader intuition; large-scale financial shocks can ultimately have favourable ripple effects on focal aspects of corporate decision making, bolstering the value creation mechanism. The latter notion is consistent to the stylised argument on the benefits of “creative destruction” (Schumpeter, 1942), which highlights the ability of modern economic systems to reconfigure themselves via extraordinary events, so that value-destroying ventures and practises are abandoned in favour of novel, wealth-increasing ones.

The rest of the paper is organised as follows. Section 2 describes the data used and sample statistics. Section 3 reports the main empirical results. Finally, section 4 concludes the paper.

2. Data and Summary Statistics

The sample of mergers and acquisitions is from Thomson SDC and includes completed and withdrawn deals announced between 1990 and 2015. We exclude repurchases, recapitalisations, self-tenders, exchange offers, acquisitions of remaining interest, minority stake purchases and intra-corporate restructurings.⁹ Deals have an inflation adjusted value of at least \$5 mil in 2015 dollar terms, the transaction relative size is at least 1% and the acquirer owns no more than 20% of the target prior to the acquisition announcement and seeks to end up with more than 50% following completion. Acquiring firms are U.S. companies listed in NYSE, AMEX or NASDAQ with data on CRSP. Targets are public or private firms. There are 26,076 deals that satisfy these criteria, out of which 3,604 were worth \$500mil or more and are classified as mega-deals.

Table 1 and Figure 1 show the distribution of deals over time. Mega-deals comprise more than 85% of the total dollar value spent for M&As by U.S. acquirers during the last 26 years (\$14.6 tril) and 94% in 2015 (\$946.3 mil). Mega-deal activity decelerated in 2008 as a result of the financial crisis that brought the sixth merger wave to an end (see Alexandridis, et. al 2012) but recovered again in 2010 and has remained upbeat until at least 2015, which is the last year in our sample. The value of mega deals announced in 2015 reached \$891 bil, which is only comparable to M&A activity during the peak of the fifth merger wave in 1998-2000.

⁹ As part of the intra-corporate restructuring exclusion, we omit transactions where the acquirer and target have the same name or ultimate parent.

Annual mega-deal activity during 2010-2015 was generally similar to that recorded during the previous merger wave. To the contrary, both the number and value of smaller deals (Rest of Deals) for each year during the same period were consistently below the levels seen in the 2000s. This indicates a tendency towards larger acquisitions during the most recent period. Among them, a number of prominent transactions such as AT&T's \$48.1 bil acquisition of Direct TV, the \$25 bil Kinder Morgan and El Paso deal as well as the \$22 bil Facebook-WhatsApp acquisition (See Appendix 2).

The analysis in the paper is based on a sample split in three sub-periods; the 90s decade, the millennia decade, and the most recent and yet unexplored 2010-2015 period. This partition is prompted by the fact that the fifth and sixth merger waves took place during the 90s and 00s respectively while the latter came to an end as a result of the financial crisis in 2008-09. The post-2009 period thus encompasses the recovery in the M&A market documented in Figure 1. Alternative untabulated sample specifications or partitions (e.g. comparing 2010-15 with other high market valuation periods such as 1998-99 and 2005-07 or including year 2009 in the most recent period) are also explored for robustness and do not alter our main results and conclusions.

[Insert Table 1 and Figure 1 here]

Table 2 reports the distribution of deals by period and the target's business sector based on the Fama and French 12-industry classification. Although the differentials in the sectorial composition of targets between the three periods appear to be generally trivial in most cases, some patterns stand out. The share of financial mega-deals has declined through time, down to 10.1% in 2010-15 from 21.1% in the 90s. Since acquisition activity within a given sector tends to respond to industry specific shocks (Harford, 2005) or growth opportunities (Jovanovic and Rousseau, 2002), the outbreak of the financial crisis in 2008 can explain this pattern; the extensive losses incurred by financial institutions put a halt on significant investment projects. To the contrary, acquisition activity in the finance sector among smaller deals does not appear to have been affected. Another noteworthy change is the increase in acquisition activity within the healthcare and the pharmaceuticals segment, which is more pronounced among mega-deals. This can be to a great extent attributed to the fact that large pharmaceutical companies struggled to cope with expiring patents on a number of key drugs ("patent cliff"), thus turning their attention to M&As in order to meet investor growth

expectations (Fortune, 2015).¹⁰ The ultimately withdrawn \$160 bil Pfizer-Alergan deal in 2015 was the largest ever announced within the sector. Finally, the utilities and telecom industries have also recorded slight declines in mega-deal activity through time, which is not surprising given that they have progressively become more mature and saturated.

[Insert Table 2 here]

Table 3 reports the acquisition sample's summary statistics for the three periods under investigation as well as differentials between these periods. Statistics are segregated for acquirer, target and deal specific characteristics. Accounting ratios are winsorized at the top and bottom 1% level where relevant. Acquiring firm size has generally increased through time although firms carrying out mega deals in 2010-2015 have similar market capitalisation with those in the 2000-2009 decade. The size of target firms and deal size among periods is also comparable in mega-deals although they have both increased for smaller deals. The target-to-acquirer relative size has decreased significantly pointing to smaller deals during the most recent period. This may be explained by the decline in the share of listed target acquisitions during the 2010-15 period which is more pronounced in larger deals. More than 60% of mega-deals were for private companies compared to around 46% in the previous decade and 38% in the 90s which indicates a trend towards larger private deals.

Both acquirers and targets (to a lesser extent) are subject to lower valuations post-2009 as proxied by the market-to-book ratio. Given the evidence on the relation between firm valuation and payment method (see for example Dong et al., 2006; Faccio and Masulis, 2005), this may also partly explain the plunge in both pure stock-for-stock deals and share of equity consideration in acquisition offers during this period. Only around 5.5% of mega-deals in 2010-2015 are financed entirely with stock-swaps, which represents a remarkable decline from the 19% and 35% recorded in 00s and 90s respectively. The documented scarcity of equity financing during the most recent period can also be attributed to the availability of ample corporate liquidity bolstered by healthy profitability as well as the historic lows in interest rates which facilitated access to debt financing. The combination of these factors led to a dazzling increase in the cash component of acquisition offers during the most recent period, where the median mega-deal comprises of 88% cash financing.

[Insert Table 3 here]

¹⁰ "The real reasons for the pharma merger boom", July 2015, Fortune

Though the percentage of diversified deals has remained similar over time, cross-border deals have increased. This is not unexpected given the race for globalisation as well as the tendency of U.S. companies to expand more in emerging markets in order to enhance their growth prospects. Another important observation is that there are fewer failed deals during the more recent M&A period. Only 7.2% of mega-deals have been withdrawn following their announcement relative to 9.6% and 15% in the two previous decades respectively. Considering the more stringent regulatory environment affecting M&As, and in particular competition policy (Moshirian, 2011), one would have expected to see more deal cancellations during 2010-15. The lower withdrawal rate documented may relate to more efficient selection and planning of M&A deals or to more reluctance in cancelling announced transactions in order to avoid incurring hefty break-up fees (FT, 2016).¹¹ Alternatively, it may be attributed to the larger share of less complex private deals in the mix during the most recent period, which can also explain the fact that time to deal completion has somewhat diminished.

Information on deal motives available on SDC (deal purpose description) suggests that M&A drivers have evolved significantly post-2009. More specifically, synergistic benefits are mentioned as part of the deal announcement in more than 63% of mega-deals, relative to 25% during 2000-2009. If this trend reflects a genuine change in acquisition decision drivers then it should translate to greater benefits for shareholders. Along these lines, there is some evidence that target shareholders in mega-deals receive higher premia post-2009 than in the past, although only median differences are statistically significant at conventional levels. So if anything, target shareholders do not appear to be getting the lion's share of any additional synergistic value.

Several statistics point to sizeable improvements in acquiring firm attributes at the C-suite and corporate board level that may impact the quality of acquisition decisions. CEO overconfidence, a well-documented managerial trait responsible for value-destroying acquisitions (Malmendier and Tate, 2008 and Billett and Qian, 2008) appears to be less of a problem for acquiring companies during the most recent period. An overconfidence measure based on the timing of stock options exercise (Malmendier and Tate, 2005) reflects significantly lower levels of managerial hubris post-2009, with less than 35% of CEOs that

¹¹ Officer (2003) finds that the presence of a termination fee payable by the target increases the probability of deal completion by 20%. The probability of completion may be higher in recent years, as the typical termination fee of around 3% before the 2008 crisis has more than doubled after the crisis (Financial Times, 2016).

carry out mega-deals failing to exercise their options twice during their tenure although they are 67% in the money. Improvements in corporate governance are also quite compelling. The representation of independent directors on the board of the average acquiring firm has reached 82% in 2010-2015 relative to around 70% in the 00s and 62% in the 90s.¹² This signifies a remarkable milestone in the board independence regime; nearly the entire board is now typically comprised of independent directors. Moreover, the share of equity based compensation (EBC) (Chauvin and Shenoy, 2001) in the top executive's salary has increased significantly. Since EBC and acquisition performance tend to be positively associated (Datta et al. 2001), one might expect that the documented increase in EBC might have led to deals of superior quality.¹³ Finally, the stock ownership of independent directors (IDO), one of the most consistent predictors of corporate performance among other corporate governance indices and variables (Bhagat et. al, 2008), has also increased markedly. This metric is informative since independent directors are not typically rewarded for effective monitoring. A rise in independent directors' connectedness to the wealth the firm generates may thus be taken to imply stronger incentives for effective monitoring and more effective alignment of interests between directors and shareholders. Accordingly, Bhagat and Bolton (2008) find a positive relation between the stock ownership of board members and both, future operating performance as well as the probability of disciplinary management turnover. Overall, the trends in all conventional dimensions of corporate governance are consistent with remarkable improvements in internal control and incentive alignment mechanisms post-financial crisis. Such significant developments, along with the fundamental differences in M&A characteristics between the most recent period and the previous two decades, are likely to influence the quality of corporate investment decisions and value creation potential.

3. Empirical Results

3.1 Univariate analysis of acquisition gains

As a first step in the analysis of acquisition gains we study a comprehensive set of value creation metrics. Table 4 reports the univariate results partitioned by sample sub-periods and

¹² Data on the representation of independent directors is from ISS (ex-Risk Metrics).

¹³ The percentage of equity in managerial compensation increased from about 20% in early 1990s to about 60% in 2010s (Denning, 2014). Some research has also argued that equity based compensation can in fact lead to corporate short-termism if it counteracts the effect of stock price performance on executive compensation (Bolton et al., 2006).

target type (public or private), along with the respective differentials. Although the focus of the paper is on 3,150 mega-deals, results are also reported for the remaining 21,222 deals with acquirer return data in Panel B for comparison purposes. *ACAR3* is the acquirer cumulative abnormal return for a 3-day (-1,+1) announcement window based on the Brown and Warner (1985) market model, which is estimated over the window (-301, -46) relative to the acquisition announcement day. For mega-deals, although acquirer returns are typically negative and significant, or at best zero, during the previous two decades, this appears to have changed profoundly post-2009. The mean (median) *ACAR3* in 2010-15 is a resounding 2.54% (1.34%); an increase of 2.90 (1.72) percentage points relative 1990-2009.¹⁴ Appendix 2 reports details of the 10 largest deals for each of the three periods examined. Six out of ten deals in 2010-15 are subject to positive announcement CAR compared to zero out of ten in 00s and four out of ten in the 90s. The outperformance of acquirers in 2010-15 can be attributed to the fact that there are more deals with positive ACARs (*WINNERS3*) recently (61.54%) relative to the past (47.01%) and the difference is statistically significant. The observation that more than half of large M&A deals fail to create value for acquiring companies during the 90s and 00s appears to no longer apply for the most recent period where a large majority of acquirers are actually subject to positive abnormal returns. This represents a fundamental shift in the status quo.

[Insert Table 4 here]

Dollar gains (*\$GAIN3*), computed as the abnormal dollar increase in the market capitalisation of the acquiring firm, are also in the same direction. Post-2009, the median acquirer in mega deals realises a gain of \$86.71 mil in the three days surrounding the acquisition announcement. Prior to this, the equivalent loss reported was \$16.42 mil. This attests to a compelling improvement in acquiring firm shareholder gains during the most recent period. At the aggregate level acquiring firms generated gains of \$42 bil or 2.5 cents per dollar spent around the acquisition announcement from 2010 through 2015 whereas they lost \$530 bil or 13 cents per dollar spent during the previous decade.

¹⁴ In unreported tests we also estimate *ACAR32* for a (-30,+1) announcement window to capture part of the pre-announcement, opaque “merger talks” period. This measure of acquirer returns yields very similar results with *ACAR3*.

The fact that acquirers carried out more private deals and used significantly less stock financing in public acquisitions during the most recent period may be driving our results. For this reason the table also reports abnormal returns separately for public and private deals and also differentiates between different considerations offered. The bulk of the improvement in acquisition performance appears to be stemming from acquisition of listed targets. Private mega-deals also yield higher abnormal returns but the difference is not as pronounced or statistically significant. The *ACAR3* mean differential for public deals between 2010-2015 and 1990-2009 has reached a remarkable 4.45%. More importantly, public acquisitions during the post-2009 period are subject to positive and significant at the 1% level abnormal returns for acquiring companies (2.01%). In an unreported test we find that this is not significantly different to acquirer gains for private deals (2.84%). To the best of our knowledge this is the first study documenting that U.S. public acquisitions create value for acquiring shareholders to such extent. Moreover, the performance turnaround persists both for pure-cash and stock deals. In fact, stock-swap financed public acquisitions are subject to positive abnormal returns during the most recent period. Although this sub-set is relatively small and the positive CAR is not statistically significant, this is again the first time non-negative returns are reported for stock-financed public U.S. deals.

Synergy gains for public acquisitions (*SYNRGY3*) are estimated as the market-value-weighted average of acquirer and target CARs where data for the target is available on CRSP. The improvement in combined gains is striking; the average *SYNRGY3* for the 2010-15 period is 5.05%. Synergistic gains have increased by more than 5 times relative to the previous 20 years and more than 10 times from the previous decade (2000-2009). In dollar terms (*\$SYNRGY3*) this corresponds to a striking \$543 mil gain for the typical mega-deal post-2009 relative to a \$173 mil loss in the previous decade. A measure of deal value added (*\$VALUE+*), popularised by McKinsey (2015) and estimated as the ratio of total market capitalisation change for the acquirer and target around the acquisition announcement adjusted for market movements and scaled by the deal value, also points to large improvements in combined value creation during the most recent period.¹⁵ First, our findings are consistent with the surge in synergy related motives reported in Table 3 and suggest that acquirers carried out by and large superior deals, with better synergistic prospects during the most recent period. Secondly, since we do not observe a proportionally equivalent increase in acquisition premia,

¹⁵ “M&A 2014: Return of the big Deal”, April 2015, McKinsey&Company.

one might assume that a large part of the surge in synergistic gains is captured by acquiring companies.¹⁶

To further explore the share of synergies we employ a measure of the division of gains between bidders and targets as in Ahern (2012). $\Delta\$GAIN3$ is the difference in dollar gains between the target and bidder scaled by the sum of their market value 30 days prior to the acquisition announcement. This ratio indicates that during the most recent period in our sample targets gained on average 3.16 cents more on each dollar of total market value than acquirers as opposed to 5.13 cents more during the previous decade. Accordingly, not only have acquirers consummated better acquisition deals post-2009, but they have also managed to secure a larger share of the synergy pie for the benefit of their own shareholders. Overall these results mark a potential structural shift in value creation for large public acquisitions. The fact that this type of deals tended to more often destroy value, as widely reported in prior literature, is no longer true for the latest period in our sample. In the next section we attempt to establish whether this trend reflects genuine improvements in acquisition decisions rather than differences in other deal, firm or market characteristics not accounted for in the univariate analysis.

Finally, Table 4 also reports acquisition gains for the sample of 21,222 non-mega deals for comparison purposes. The acquisition performance turnaround reported for mega-deals is not evident for this sample as a whole. In fact, in some cases ACARs are lower in 2010-15 relative to the previous two decades. However, when differentiating between public and private deals it becomes clear that acquirer returns have improved even for the rest of the public deals, although to a lesser extent than for mega-deals. To the contrary, ACARs for non-mega private deals during the most recent period are at best similar to the 90s and 00s and even inferior in some cases. Our results indicate that acquiring firms have got better in acquisitions recently, though they seem to have improved more on deals that were previously more likely to destroy value; that is public acquisitions and especially larger ones. The fact that we only document an increase in M&A gains in this case is consistent with our hypothesis given that the reputational exposure of acquiring firms, top executives, and directors in such type of deals is more pronounced. Accordingly, if the developments that occurred in the aftermath of the financial crisis led to better acquisition decisions, then it is

¹⁶ Although target returns (TCAR3), have increased significantly in the post-2009 period, this may also reflect the higher probability of deal completion during this period considering the smaller share of failed deals.

not surprising that firms concentrated their efforts on improving in such type of deals. On the other hand, if the drivers of private deals and the associated benefits have been more optimal all along, then the same argument would not apply to the same extent, if at all, for this subset.

To ensure that the documented upturn in mega-deals' acquirer CARs is not attributed to specific years within the 2010-15 period Figure 2 illustrates annual CAR3, a fitted polynomial fitted line to account for the wide fluctuation in gains and losses and their 5-year moving average. The figure captures a progressive improvement in acquirer returns post-2010 beyond levels seen before. Figure 3 depicts the evolution in acquirer CARs from 30 days prior to the acquisition announcement to 30 days after. The difference in pattern between the post-2009 and pre-2010 period is extraordinary. For the 90s and 00s returns are marginally negative or fluctuate around zero up to the acquisition announcement day, at which point they sharply decline to between -2.5 and -4% until day +30. On the contrary, for the 2010-2015 period there is a sizable jump in CARs around the announcement day reaching almost 3%, down to around 2% on day +30. The implied acquisition gain differential 30 days following the acquisition announcement between the previous decade and 2010-15 increased to around 6%.

[Insert Figures 2 and 3 here]

As a result, it is unlikely that the documented return differentials are associated with short-term market over-reaction since they but appear to persist – and in fact further increase - up to one month following the acquisition announcement. In section 3.5 we conduct further tests for acquirer returns using an even longer window of one year.

3.2 Acquirer and synergy gain regressions

In this section we examine whether the documented improvement in acquisition returns during the most recent, post-2009 period can be attributed to any deal, firm, or market characteristics, other than those accounted for in the univariate section. We perform a series of cross-sectional regressions where the dependent variable is *ACAR3* and the main explanatory variables are indicators equal to one if the acquisition i) is announced between 2010-2015, ii) is a mega deal, and iii) the interaction of i and ii. We control for key variables that have been shown to affect acquirer returns. These are: i) the occurrence of a public deal

to account for the fact that acquisitions of listed targets tend to be associated with lower acquirer returns (Fuller et. al, 2002 and Faccio et. al, 2006); ii) an all-stock dummy to control for the negative abnormal returns associated with acquisitions of listed targets paid for entirely with stock (Travlos, 1987); iii) the natural logarithm of the transaction value since larger public deals are evidently subject to more negative abnormal returns (Alexandridis et. al, 2013);¹⁷ iv) the acquirer market-to-book value given the firm misvaluation implications for bidders (Moeller et. al, 2005 and Dong et. al, 2006), v) a competing bid variable to capture the potentially negative effect of competition on the gains to acquiring firms (Bradley et al., 1988); vi) a control for takeover hostility since it tends to be negatively associated with acquirer returns (Schwert, 2000); vii) a diversification dummy variable equal to one when the acquirer and target have different 2-digit SIC codes to account for the fact that diversifying acquisitions have been found to destroy shareholder value (Morck et al, 1990); viii) a cross-border indicator equal to one when the target is outside the U.S. since higher announcement returns are documented for acquisitions of foreign targets (Moeller and Schlingemann, 2005); ix) a serial acquirer control which accounts for the fact that multiple bidders tend to make worse acquisitions (Fuller et al, 2002 and Billett and Qian, 2008); x) the acquiring firm's leverage (Maloney et al., 1993) and FCF ratios (see e.g. Jensen, 1988; Lang et al., 1991); xi) a high market valuation indicator equal to one when the deal is announced during a month with an abnormally high de-trended market P/E ratio as in Bouwman et al. (2009); finally, we control for industry and company fixed effects where relevant. Table 5 reports the regression results.

[Insert Table 5 here]

In specifications 1 through 4 we run the regressions for mega deals only. The coefficient of the 2010-15 indicator variable is positive and statistically significant at the 1% level in regressions 1-3. In regression 2 deals carried out during the latest period are subject to a 1.69% higher *ACAR3* after controlling for other known acquirer return determinants, which corroborates the recent turnaround in acquisition gains reported as part of the univariate findings. This superior performance can be largely attributed to the striking improvement (by

¹⁷ Due to their high correlation (up to 71%) we do not simultaneously include acquirer and target size in the regressions. Alexandridis et al. (2013) find that the acquirer size effect documented by Moeller et al. (2004) is in fact primarily driven by target size. For this reason we have opted for target size as a control variable. Although including both does seem to introduce multicollinearity to the regression, it still does not alter our findings and conclusions with regards to the improvement in acquisition returns.

3.72%) in acquisitions of public targets as seen in regressions 3 (only public deals) and 4 (only private deals).¹⁸ In an unreported regression we re-run model 2 for deals consummated between 2010 and 2015 only and find that the indicator variable *Public* becomes statistically insignificant. This attests that public deals generate as much value for acquiring shareholders as private ones do during the most recent period, which is particularly compelling considering existing evidence on wealth creation via M&As.

In specifications 5-7 we run the regressions for the overall sample that includes both mega and non-mega deals to gain insight into the relative improvement of the former relative to the latter. The variable of interest here is the interaction between the 2010-15 period and the mega-deal indicator variables. We exclude deal value since the mega-deal dummy variable already captures transaction size.¹⁹ In regression 5 the negative coefficient for 2010-15 suggests that, in general, acquisition returns were lower during this period relative to the past. Moreover, mega-deals have a negative influence on ACARs, which is consistent with prior literature that acquirer returns decrease with the size of the target. However, the *2010-15 x Mega-Deal* interaction variable points to a 3.17% higher acquirer return for large deals carried out during the most recent period, relative to all remaining transactions. This result remains robust after all other control variables are introduced in regression 6. In specification 7 we include all deals post-2009 to examine whether mega-deals outperform the rest during this period and find that they do so by 1.45%, which is in line with our univariate findings. So it seems that not only have acquirers consummating mega-deals managed to create more value for their shareholders post-2009 relative to the two previous decades, but also that carrying out mega-deals during this latest period has been more beneficial for acquiring shareholders relative to pursuing smaller deals. This is an important result and it is consistent with a reversal of a conventional trend documented in M&A literature; the negative association between deal size and shareholder gains (Loderer and Martin, 1990; Alexandridis et al., 2013).

It is possible that the documented shift in the deal size - acquirer return relationship is associated with the fact that transactions involving listed targets are less prevalent post-2009 than in the past. Fuller et al. (2002) argue that a possible explanation for the positive relation

¹⁸ While the 2010-15 coefficient in specification 4 is statistically insignificant it becomes significant when excluding some of the control variables. Therefore, there is still some improvement for private-mega deals but this can be explained by other firm and deal characteristics.

¹⁹ The correlation between the two variables is 70.5%.

between size and acquirer returns in private deals is the liquidity discount pertinent to unlisted target acquisitions and Officer (2007) finds evidence consistent with such discounts.²⁰ To address this, regressions 8 and 9 examine more directly changes in the relationship between deal size and acquirer returns in public deals post-2009. The coefficient of deal size swings from negative and statistically significant pre-2010 to insignificant post-2009. This finding attests that larger deals no longer destroy value for acquirers during 2010-15 which is documented for the first time and is inconsistent with the perception that large acquisitions are more likely to end up in disaster. It also shows that acquiring companies have recently become better at tackling the challenges associated with larger public acquisitions either through attaining more strategic combinations and/or more efficiently managing their heightened complexity and cumbersome integration process.

In regressions 10 and 11 we examine whether the inclusion of company fixed effects has an impact on our results. Golubov et al. (2015) report that firm fixed effects alone explain at least as much of the variation in acquirer returns as all the firm- and deal-specific characteristics combined. Accordingly, it may be the case that the superior performance of acquirers post-2009 can be explained by unobserved, time-invariant firm characteristics. Although the inclusion of company dummy variables (1,440 companies for (10) and 6,102 companies for (11)) results in a very significant increase in the adj R^2 , the coefficient of the interaction variable *2010-15 x Mega Deal* in regression 11 remains almost unchanged relative to regression 6. Further, the time-indicator 2010-15 is still significant in regression 11, indicating that the documented turnaround in acquisition performance is not attributed to specific extraordinary acquiring firms.

The univariate results presented in Table 4 suggest that the improvement in acquirer returns post-2009 coincides with an unprecedented increase in synergistic gains. Acquiring firms have carried out deals with impressive economic benefits and also managed to channel more of the incremental combined value gains to their own shareholders. In this section we examine the magnitude of the increase in combined gains during the latest period relative to the previous two decades in a regression framework, whereby we include the same control variables as in Table 5. Table 6 reports the results from the regression analysis where the dependent variable is the value-weighted combined *SYNRGY3* to acquiring and target firms.

²⁰ After running regression 6 for the sample of private deals, we also confirm that acquirer gains increase with the size of the deal, a relationship which is significant at 1% level (untabulated).

Regressions include only acquisitions of listed targets since synergy gains can only be estimated for those deals.

[Insert Table 6 here]

In regression 2, mega-deals consummated in 2010-15 are subject to a 3.67% higher synergy gains relative to those carried out during the preceding 20 years, after controlling for a number of known acquisition return determinants. Considering that the typical mega-deal was subject to a combined gain of only 1.00% and 0.43% in 90s and 00s respectively, the recorded increase in synergies is remarkable. In regressions 3 and 4 we also include non-mega deals to explore if the documented improvement is a more widespread phenomenon among public acquisitions. In specification 4 the 2010-15 coefficient points to a 1.77% higher combined CAR for public deals during this period. Thus, acquiring firms have also got better in delivering synergistic benefits in non-mega public acquisitions – albeit to a lesser extent. Moreover, the mega-deal and the interaction variable 2010-15 x Mega Deal behave in a similar way as in the acquirer return regressions; synergy gains tend to be less in mega-deals but this is not the case for those consummated post-2009, which generate 1.81% higher combined CARs relative to all remaining deals. Therefore, again, the typical mega-deal carried out during the latest period truly stands out. Controlling for company fixed effects (808 companies for (6) and 1,783 companies for (7)) in regressions 6 and 7 cause the coefficients of the time indicator and interaction variable to decrease somewhat, although they still remain statistically significant. Overall, results from the synergy regressions point to superior synergistic benefit expectations post-2009 and are consistent with the acquirer return findings.

To ensure that the relationship documented in sections 3.2 and 3.3 is not driven by extreme CAR observations we also run quantile regressions estimated at the median and other percentiles (25th and 75th). The analysis is repeated for all mega-deals in Table 7 where the dependent variable is ACAR3 in specifications 1-3 and SYNRGY3 in specifications 4-6. The magnitude of the 2010-15 time indicator varies but it remains statistically significant at the 1% level in all 6 specifications, reiterating the superior performance of mega-deals during this period.

[Insert Table 7 here]

3.3 Acquisition gains based on propensity score matching

Although the positive relationship between the 2010-15 time indicator appears to be robust to a number of firm and deal-level return determinants, we also employ a propensity score matching (PSM) technique which can control more directly for observable differences in the deal characteristics between mega-deals consummated during the most recent sub-period and prior to this. Essentially, this approach produces close matches of post-2009 deals to pre-2010 counterpart transactions on the basis of their similarity and then compares their gains. As a first step we use a logit model to estimate the impact of all firm and deal characteristics we utilised in Tables 5-7 on the likelihood of a deal being part of the post-2009 sub-set. Panel A of Table 8 reports the regression results for the sample of 2,939 and 1,316 mega-deals for the *CAR3* and *SYNRGY3* samples used in Tables 5 and 6. Several variables appear to be important in differentiating 2010-15 deals from their counterparts. For instance, post-2009 deals are less likely to be public and financed entirely with equity as seen in specification 1. They also tend to be associated with less hostility and competition among bidders, and are more likely to be consummated during high valuation months, consistent with the summary statistics reported in Table 3. The *Public* coefficient in specification 1 implies that the probability of observing a public deal in 2010-15 is 43% less (83% less for a stock-for-stock deal).

[Insert Table 8 here]

Panel B reports the PSM results for both performance proxies (*CAR3* and *SYNRGY3*) based on two different techniques: i) the nearest-neighbor matching; and ii) the Gaussian kernel matching. Propensity scores are estimated from regressions 1 and 2 respectively. Deals are matched on the basis of their nearest (one-to-one), thirty, and fifty neighbors. *Treated* sample *CAR3* corresponds to post-2009 CARs and *Control CAR3* to the matched deals' CARs. Both acquirer and synergy gains for the treated samples are higher than the control sample ones, and the differentials range from 2.3-3% for *CAR3* and from 3.6% to 3.8% for *SYNRGY3*, all significant at the 1% level. Overall, our results on alternative nearest predicted probability matching approaches corroborate that mega-deals completed during the latest sample period outperform very similar deals from the previous two decades. So unless, there are important characteristics not captured in the first step of the approach, the outperformance of more recent deals seems to be largely robust.

3.4 Do developments in corporate governance drive the results?

Although we have reported a compelling pattern in the data pointing to unprecedented improvements in the quality of mega-mergers following the 2008 financial crisis, the ultimate driving force(s) that induced such a sharp structural shift on M&A decisions remain unclear. Our main hypothesis predicts that the developments that occurred in response to the crisis at the corporate governance level can potentially affect how directors and executives approach the selection and implementation of acquisition opportunities, as well as the degree of their accountability toward shareholders in carrying out value-increasing investments. The widespread collapse of trust among capital providers, the government, and the general public regarding the operation of financial institutions had ripple effects for non-financial institutions, putting corporate governance for all listed companies on the spotlight. The ensuing reforms, as part of the Dodd-Frank act passed in 2010, introduced new mandatory disclosure rules, re-aligned executive compensation, bolstered the accountability of corporate top executives and granted more powers to shareholders. However, these mandatory reforms, can account for less than half the story, with anecdotal evidence attesting to a much deeper and ubiquitous urge for change among listed companies, especially the most sizeable ones.

Accordingly, the aftermath of the crisis has seen a shift towards the voluntary adoption of practices such as more efficient incentive structures, greater director specialisation and diversity, increased emphasis on the risks associated with strategic goals and operations as well as the rise of “stakeholder democracy” and information technology governance, all aiming to enhance the value creation mechanism and convey more confidence to the public. Such profound changes in internal control mechanisms can potentially induce more shareholder-centric decision-making and - in view of the role corporate boards play in M&A decisions (Deutsch et al., 2007; Carpenter and Westphal, 2001) - exert a positive influence on the selection and justification of acquisition investments as well as the deal implementation and post-merger integration processes, thereby justifying the widespread improvements in acquisition gains we document in this study. Since some of the aforementioned developments in corporate governance are not directly measurable or quantifiable due to the limited availability of information at the firm level, we focus on some more conventional dimensions that are nonetheless likely to capture any broad trend for change. These are board

independence (Shivdasani and Yermack, 1999), the stock ownership of independent directors (Bhagat et al., 2008), and the BCF anti-takeover provisions index (Bebchuck et al., 2009).²¹

To examine whether the hefty improvements in corporate governance documented in Table 3 are to any extent associated with the positive relationship between acquisition gains and our post-financial-crisis indicator, we employ a two-stage regression approach as in Golubov et al., (2016). Although the crisis in itself may be seen as an exogenous source of variation in corporate governance, partly addressing potential endogeneity concerns, the two-stage approach is necessary in order to isolate the effect of this exogenous component and determine whether the ultimate source of acquisition gains is associated with the pre-to-post crisis variation in corporate governance. Table 9 presents the results from the instrumental variable estimation.

[Insert Table 9 here]

The positive and statistically significant coefficient of the post-2009 indicator in the first stage regressions suggests that this period is linked to higher independent director representation and stock ownership as well as less anti-takeover provisions among acquiring firms (regressions 1, 3 and 5 respectively), after controlling for the same set of deal characteristics as in our main regressions.²² We can also deduce that our 2010-15 variable is a credible instrument for the corporate governance variables employed, and especially the degree of board independence. The BI coefficient in the first stage implies a higher representation of independent directors on the board of acquiring companies by 14% (so about one additional independent director on a 7-seat board). In the second stage OLS where the dependent variable is *ACAR3*, we omit the time indicator and the corporate governance variables are based on their expected values from stage one. The results here indicate that variations in all three governance proxies are significant determinants of acquirer abnormal returns, confirming that the post-2009 turnaround in acquisition performance can be linked to improvements in corporate governance. In unreported tests we also repeat the same regressions using synergy gains instead of *ACAR3* and find similar results.

²¹ Although our board independence variable is continuous, in unreported tests we have also used an indicator equal to 1 when independent directors comprise more than 50% of the board as in Masulis et al. (2007) and obtain similar results. Alternative board independence thresholds, for instance 60%, also produce similar results.

²² Since our time indicator 2010-15 captures the difference in corporate governance between a 6-year period (2010-15) and a 20-year period (1990-2009) we re-run the test for the sub-sample starting in 2004 and obtain similar results.

There are of course other concurrent developments emerging at the same time which might be captured by our time indicator in the regressions. For instance, changes in the psychology of corporate leaders due to a sense of enhanced visibility that might reinforce restraint, expedite learning from prior mistakes and foster a focus towards value creation, along with a surge in shareholder activism and litigation associated with mergers and acquisitions, can all impinge on the quality of investment decisions.²³ Although these drivers may be seen as directly or indirectly related with the governance regime change discussed above, we recognise that if acquirer returns are affected by the time-indicator other than through its effect on governance then the exclusion restriction in our two-stage approach is violated. Consequently, our results on the effect of corporate governance need to be interpreted with caution.

To more directly quantify the impact of a change in board independence – our main governance proxy – on acquisition gains we employ a diff-in-diff approach for a sub-sample of 172 acquirers that have consummated at least one mega-deal both pre-2010 and post-2009. We rank these acquirers on the basis of their change in board independence from the fiscal year end prior to the year of their last deal in the pre-2010 period to the fiscal year end prior to the year of their first deal in 2010-15 (ΔBI). Then we also estimate a corresponding $\Delta CAR3$ for each pair. Acquirers in the top ΔBI quintile are subject to an average (median) increase in $CAR3$ of 3.03% (1.89%) and those in the bottom quintile experience a decrease in abnormal returns -2.03% (-2.47%), with the differences being significant at the 1% level. We can therefore conclude that firms with the highest increases in the representation of independent directors on their boards manage to improve their deal making. Conversely, those that experience no or small improvement in corporate governance make more value-destroying deals than before. The direction of our findings is also similar for the other two measures of corporate governance, *IDO* and *BCF*.

3.5 Do the gains persist in the long-run?

²³ The probability of directors being sued by investors for a major merger decision they made has reached 90% in the recent period (Lajoux, 2015), while about 97% of all deals larger than \$100 mil result in litigation battles (Gregory, 2014). Therefore, directors are more incentivised to perform their fiduciary duties to the best of their abilities, to avoid the negative publicity and other repercussions of an adverse decision in the court of law.

Our analysis so far suggests that the market is more optimistic about the announcement of mega-deals taking place during the latest period in our sample. Although the price reaction around a deal proposal tends to provide a good approximation of the actual value creation for shareholders, the question of whether the superior expectations documented are eventually attained is equally important, especially in large transactions that entail a high degree of complexity. In addition, if acquirers have got better at carrying out acquisition investments because focal aspects of the M&A process, including implementation and integration, have improved, then this would show up primarily in long-term post-acquisition value creation metrics. Since the latest sub-set of our sample comprises of deals announced between 2010 and 2015, it is not currently possible to assess the long-term impact of the majority of these deals using stock return or operating performance measures estimated over extensive post-acquisition windows. Since operating performance changes tend to be meaningful over at least 3-years (Barber and Lyon, 1996; Mikkelsen et al., 1997, Eberhart et al., 2004) we have opted for stock returns.²⁴

[Insert Table 10 here]

We employ two different measures to estimate long-run post acquisition stock performance; i) buy-and-hold abnormal returns (*BHAR*) using the Fama and French 25-Size and book-to-market portfolios and ii) calendar time portfolio regressions (*CTPR*) using the Fama and French three factors model augmented with Carhart's (1997) momentum factor.

Table 10 presents the results. In accordance with the announcement-window findings acquirers carrying out mega-deals in 2010-15 fare better in terms of abnormal returns. The average acquirer is subject to a 4.42% *BHAR* in the 12-months following the acquisition announcement, which is statistically significant at the 1% level. In contrast, the mean *BHAR* for all previous periods is negative and significant, suggesting that the majority of mega-deals have ultimately been value-destroying for acquirers prior to 2010. We also run a cross-sectional regression of the *BHAR* on the 2010-15 time indicator and other control variables utilised in our ACAR analysis.²⁵ Accounting for other return determinants the coefficient of the indicator implies a 3.5% higher *BHAR* for post-2009 deals. The *CTPR* results are similar

²⁴ We still lose 394 mega-deal observations and 4,863 non-mega deal ones in our long-run stock return analysis due to lack of data in Compustat (for the purpose of matching with size and B/M portfolios) or the announcement date being in 2015.

²⁵ We exclude acquirer M/B from the control variables since the dependent variable (*BHAR*) is already adjusted using the Fama and French firm size and book-to-market portfolios. We still include deal value since it is quite different from acquirer market value.

with only the 2010-15 sub-set showing signs of value creation; the monthly 4-factor regression alpha of 0.36% for this period corresponds to a 4.5% 12-month abnormal return. Conversely, the *CTPR* alpha is negative for the 90s and 00s. These findings provide support to the argument that acquirers have carried out superior acquisition investments during the latest sample period that delivered long-term benefits to their shareholders.

3.6 Has overall investment efficiency improved?

Our analysis so far has focused on the effects of M&As on share prices. Although this is a standard approach for assessing value creation from acquisitions, it offers little information on how efficiently firms allocate funds to M&A investment opportunities relative to their growth prospects. More importantly, if firms make better acquisition decisions they should have also become more efficient in other investments, such as CAPEX and R&D. To that end, we employ a measure of acquiring firms' residual investment, *RESINV*, which captures the investment that diverges from the expected level of investment, given a set of factors that have been shown to predict the optimal investment level (see e.g. Richardson, 2006; Biddle and Hilary, 2006). Specifically, we run the following regression for 20,970 acquiring firm-year observations for the entire sample period:²⁶

$$INV_{i,t} = \alpha + \beta_i Q_{i,t-1} + Leverage_{i,t-1} + Cash_{i,t-1} + Company\ Age_{i,t-1} + Size_{i,t-1} + Stock\ Return_{i,t-1} + INV_{i,t-1} + FE + \varepsilon_i$$

Following Richardson (2006) $INV_{i,t}$ is the sum of capital, R&D, plus acquisition expenditures minus sales of PPE and necessary maintenance for assets in place for firm i in year t from Compustat, scaled by prior-year book value of total assets. The independent variables are estimated at the end of the previous fiscal year $t-1$. Q is the market value of the firm (market value of equity and book value of debt) over total asset value. Leverage is the ratio of total debt over book value of equity. Cash is the log of total value of cash and equivalents. The company age is in logarithmic form and it is calculated by the incorporation date as displayed in Compustat. Size is the log of total asset value. Stock Return is the

²⁶ *INV* and all explanatory variables are estimated for each acquiring firm-year in our sample period. So a bidder completing a mega-deal in 2004 will be included in the regression for all 26 years subject to data availability. This is because the purpose of this test is to examine the efficiency of all firm's investments not just M&As. In addition focusing on M&A years only would produce inflated investment figures. Nonetheless, including acquiring firms in the test only once, at their acquisition announcement year, still produces similar results.

percentage change in the market value of equity for the past year. We also include the previous year's *INV* term. *FE* corresponds to industry fixed effects. The absolute value of the residual from the investment efficiency equation, ε_i , is the residual investment measure, *RESINV*, and it reflects the extent of managerial investment inefficiency.

[Insert Table 11 here]

A lower value of *RESINV* for acquiring companies post-2009 would provide a strong indication that firms have become more meticulous in the allocation of capital to investment opportunities. Table 11, Panel A shows the regression results and Panel B provides the univariate values of *RESINV* pre- and post-2010 as well as their differentials. The extent of investment inefficiency is significantly less post-2009 suggesting that corporate leaders have consistently aimed towards more optimal investment allocation in recent years. The turn towards more efficient investment strategies may have potentially laid the foundation for the documented improvement in acquisition performance and together attest to a structural shift in corporate decision making towards more value enhancing investment.

4. Conclusion

One of the most reiterated facts in the M&A literature is the tendency of acquiring firms to destroy value for their shareholders, especially when consummating large deals, which comprise the bulk of M&A activity. In stark contrast with the status quo, we show that this trend has been largely reversed for the first time post-2009. Acquisition gains during 2010-15 show signs of staggering improvement on a broad set of conventional measures, both around the deal announcement and in the long-run. The value creation turnaround documented is more pronounced among public deals which are generally known for destroying shareholder value. During the most recent period acquisitions of listed targets generate positive abnormal returns for acquiring shareholders, even in stock-for-stock deals, and as a result, they no longer fare worse than private deals. The associated synergistic gains have also increased dramatically, indicating overall value creation from M&As on a massive scale and acquirers have been able to secure more of those gains for their own shareholders. We also provide evidence of acquiring firms employing more efficient investment allocation strategies during the most recent period, manifested in lower degrees of over- and under-investment. These

changes in the aftermath of the 2008 financial crisis coincided with significant developments in the corporate governance environment, which have the potential to foster increasingly optimal investment decisions that cater for shareholder value creation more than ever before. Although the rather abrupt turnaround in acquisition performance may be also be driven by other unobserved changes that occurred as a result of the financial crisis, our evidence suggests that it can be at least partly explained by the variation in conventional governance characteristics.

The documented findings mark a milestone in existing knowledge about gains from acquisitions and, in accordance with the neoclassical theory of M&As, challenge conventional wisdom that acquiring firms destroy shareholder value more often than they create. They also imply that a financial crisis of grand scale and its after-effects can ultimately contribute towards the more effective monitoring of corporate investment decisions as well as the associated implementation process, bringing sizeable gains to shareholders. Since some of the shockwaves associated with such crises tend to dissipate with time it remains to be seen if the trends we report in this study persists in the future.

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Table 1. Sample distribution.

The table shows the annual number of deals and total consideration offered for mega and non-mega deals for 3,604 mega-deals and 22,472 non-mega deals. The sample is from SDC and includes completed and withdrawn deals announced between 1990 and 2015. Repurchases, recapitalisations, self-tenders, exchange offers, acquisitions of remaining interest, minority-stake purchases and intra-corporate restructuring are excluded. Transactions have an inflation-adjusted value of at least \$5 mil and the target-to-acquirer relative size is at least 1%. The acquirer owns no more than 20% of the target prior to the announcement and seeks to own more than 50% following completion. Acquiring firms are U.S companies listed in NYSE, AMEX or NASDAQ with data on CRSP. Targets are public or private firms.

Year	Mega Deals (n)	Total Value Mega Deals (\$bil)	Rest of Deals (n)	Total Value Non-mega Deals (\$bil)
1990	39	91.66	464	34.53
1991	45	56.65	502	38.08
1992	53	72.17	730	50.61
1993	72	203.29	945	62.36
1994	101	166.88	1164	84.84
1995	120	323.31	1220	96.36
1996	174	480.63	1494	122.99
1997	259	698.93	1807	159.18
1998	265	1358.90	1900	164.34
1999	292	1468.96	1388	138.06
2000	295	1105.90	1159	116.06
2001	150	590.16	849	86.21
2002	94	214.20	782	68.50
2003	101	203.75	731	70.66
2004	116	360.51	880	81.97
2005	135	528.87	847	82.43
2006	166	611.48	820	86.54
2007	166	454.19	791	82.36
2008	102	380.96	582	56.34
2009	76	386.90	391	39.80
2010	125	255.64	474	55.32
2011	111	396.32	520	63.61
2012	139	261.25	555	60.65
2013	115	261.30	466	56.23
2014	128	644.88	564	71.19
2015	165	891.44	447	54.81
All	3,604	12,469.10	22,472	2,084.00

Figure 1. Deal Activity through time.

The figure shows the annual number of transactions and total consideration offered for the sample of acquisitions described in Table 1.

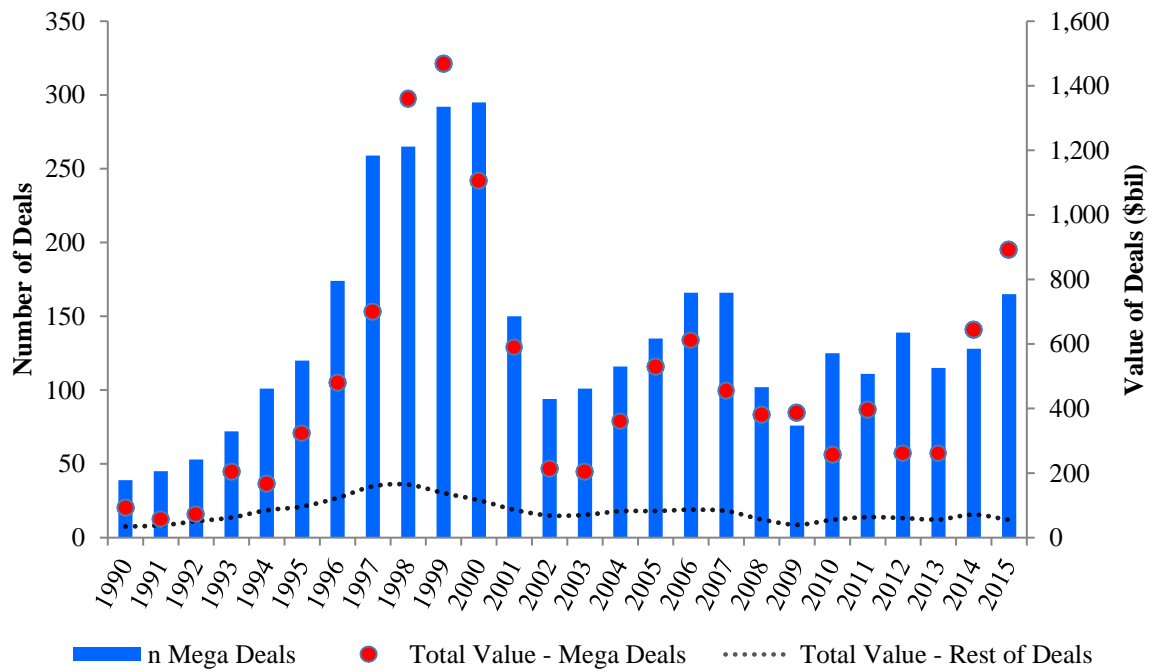


Table 2. Deal distribution by industry sector and time period.

The table reports the breakdown of deals by the industry classification of the target firm and the time period for the sample of mega-deals (Panel A) and non-mega deals (Panel B). The industry split follows Kenneth French's 12 industry classification. The percentage of the overall corresponding sample is displayed in parentheses next to the number of deals pertaining to each sector.

Industry of Target Firm	All		1990-1999		2000-2009		2010-2015	
Panel A - Mega Deals								
Business Equipment	633	(17.6%)	196	(13.8%)	305	(21.8%)	132	(16.9%)
Chemicals and Allied Products	107	(3.0%)	47	(3.3%)	25	(1.8%)	35	(4.5%)
Consumer Durables	58	(1.6%)	28	(2.0%)	20	(1.4%)	10	(1.3%)
Consumer Non-Durables	214	(5.9%)	83	(5.8%)	77	(5.5%)	54	(6.9%)
Finance	584	(16.2%)	299	(21.1%)	206	(14.7%)	79	(10.1%)
Healthcare, Medical Equipment, and Drugs	387	(10.7%)	117	(8.2%)	140	(10.0%)	130	(16.6%)
Manufacturing	307	(8.5%)	111	(7.8%)	122	(8.7%)	74	(9.5%)
Oil, Gas, and Coal Extraction and Products	232	(6.4%)	57	(4.0%)	119	(8.5%)	56	(7.2%)
Telephone and Television Transmission	289	(8.0%)	141	(9.9%)	100	(7.1%)	48	(6.1%)
Utilities	197	(5.5%)	87	(6.1%)	74	(5.3%)	36	(4.6%)
Wholesale, Retail, and Some Services	216	(6.0%)	97	(6.8%)	69	(4.9%)	50	(6.4%)
Other	380	(10.5%)	157	(11.1%)	144	(10.3%)	79	(10.1%)
Panel B – Non-mega deals								
Business Equipment	5,220	(23.2%)	2,113	(18.2%)	2,351	(30.0%)	756	(25.0%)
Chemicals and Allied Products	349	(1.6%)	179	(1.5%)	108	(1.4%)	62	(2.0%)
Consumer Durables	391	(1.7%)	212	(1.8%)	121	(1.5%)	58	(1.9%)
Consumer Non-Durables	854	(3.8%)	450	(3.9%)	301	(3.8%)	103	(3.4%)
Finance	3,982	(17.7%)	2,260	(19.5%)	1,195	(15.3%)	527	(17.4%)
Healthcare, Medical Equipment, and Drugs	2,079	(9.3%)	964	(8.3%)	772	(9.9%)	343	(11.3%)
Manufacturing	1,973	(8.8%)	1,069	(9.2%)	602	(7.7%)	302	(10.0%)
Oil, Gas, and Coal Extraction and Products	990	(4.4%)	548	(4.7%)	330	(4.2%)	112	(3.7%)
Telephone and Television Transmission	1,029	(4.6%)	619	(5.3%)	321	(4.1%)	89	(2.9%)
Utilities	195	(0.9%)	101	(0.9%)	67	(0.9%)	27	(0.9%)
Wholesale, Retail, and Some Services	1,864	(8.3%)	1,184	(10.2%)	526	(6.7%)	154	(5.1%)
Other	3,546	(15.8%)	1,915	(16.5%)	1,138	(14.5%)	493	(16.3%)

Table 3. Summary statistics.

The table presents means, medians, and sample size for a number of firm and deal characteristics for mega and non-mega deals and different sample periods along with differentials between sub-periods. The variable descriptions are reported in the Appendix. The notation *, **, *** corresponds to statistical significance levels of 10%, 5%, and 1% respectively.

		Mega Deals						Non-mega Deals					
		1990-99 (1)	2000-09 (2)	2010-15 (3)	(3) - (2)	Differences (3) - (1)	(2) - (1)	1990-99 (4)	2000-09 (5)	2010-15 (6)	(6) - (5)	Differences (6) - (4)	(5) - (4)
Acquirer characteristics													
Acquirer Market Cap (\$mil)	<i>mean</i>	14,229.35	24,888.78	23,762.13	-1126.65	9,532.78***	10,659.43***	1,219.48	1,812.56	2340.29	527.72***	1,120.81***	593.08***
	<i>median</i>	4,641.4	7,890.57	8051.26	160.68	3,409.86***	3,249.18***	357.79	637.36	863.98	226.62***	506.19***	279.57***
	<i>n</i>	1,420	1,401	727				11,614	7,832	2,920			
Acquirer Assets (\$mil)	<i>mean</i>	22,532.33	46,900.90	35,853.50	-11,047.4	13,321.18**	24,368.57**	3,260	2,823.55	3,190.63	367.08*	-69.44	-436.52**
	<i>median</i>	5,650.84	6,883.43	8,619.31	1,735.88***	2,968.47***	1,232.59***	415.66	694.90	1,011.34	316.43***	595.68***	279.24***
	<i>n</i>	1,294	1,300	715				8,879	6,735	2,807			
Acquirer Market-to-Book	<i>mean</i>	4.62	4.89	3.67	-1.23***	-0.96***	0.27	4.27	3.51	2.88	-0.63***	-1.39***	-0.76***
	<i>median</i>	2.64	2.60	2.35	-0.26***	-0.30***	-0.04	2.31	2.22	1.93	-0.28***	-0.38***	-0.09***
	<i>n</i>	1,292	1,301	715				8,805	6,738	2,806			
Acquirer FCF-to-Assets	<i>mean</i>	0.11	0.13	0.14	0.01	0.02***	0.02**	0.08	0.08	0.10	0.02***	0.03***	0.00
	<i>median</i>	0.09	0.12	0.12	0.00**	0.03***	0.03***	0.06	0.08	0.09	0.01***	0.03***	0.02***
	<i>n</i>	1,292	1,300	715				8,773	6,735	2,806			
Acquirer Leverage	<i>mean</i>	25.62	24.73	27.26	2.53***	1.65*	-0.89	22.02	19.34	19.55	0.22	-2.47***	-2.69***
	<i>median</i>	23.57	22.25	22.85	0.60**	-0.72	-1.31	16.59	15.17	14.51	-0.67	-2.09***	-1.42***
	<i>n</i>	1,292	1,300	715				8,773	6,735	2,806			
Serial Acquirer %	<i>mean</i>	38.94	48.75	39.48	-9.27***	0.53	9.81***	23.95	30.09	29.86	-0.23	5.92***	6.15***
	<i>n</i>	1,420	1,401	727				11,614	7,832	2,920			
Acquirer Hubris %	<i>mean</i>	46.85	41.50	34.55	-6.95**	-12.30***	-5.35**	47.01	47.38	42.37	-5.02***	-4.65**	0.37
	<i>n</i>	762	853	382				2,008	2,503	930			
	<i>mean</i>	39.37	45.76	55.82	10.07***	16.45***	6.39***	36.56	42.29	47.31	5.03***	10.76***	5.73***
EBC %	<i>median</i>	38.37	51.24	59.65	8.41***	21.28***	12.87***	34.03	44.74	51.32	6.58***	17.29***	10.71***
	<i>n</i>	465	682	425				987	1,809	1,073			
BCF Antitakeover Index	<i>mean</i>	1.49	2.15	1.58	-0.56***	0.09	0.65***	1.62	2.22	1.84	-0.37***	0.23***	0.60***
	<i>median</i>	1.00	2.00	1.00	-1.00***	0.00	1.00***	2.00	2.00	2.00	-0.00***	0.00***	0.00***
	<i>n</i>	372	687	379				1,270	1,956	943			
Board Independence %	<i>mean</i>	62.81	69.30	81.82	12.52***	19.01***	6.49***	58.67	67.11	78.44	11.33***	19.77***	8.44***
	<i>median</i>	66.67	72.73	85.71	12.99***	19.05***	6.06***	60.00	70.00	80.00	10.00***	20.00***	10.00***
	<i>n</i>	451	943	477				852	2,557	1,182			
Ind. Directors Ownership %	<i>mean</i>		0.57	0.76	0.19*				1.02	1.25	0.23***		
	<i>median</i>		0.15	0.19	0.04***				0.40	0.53	0.13***		
	<i>n</i>		935	472					2,552	1,182			

Table 3 Continued.

		Mega Deals					Non-mega Deals						
		1990-99 (1)	2000-09 (2)	2010-15 (3)	Differences (3) - (2)	Differences (3) - (1)	Differences (2) - (1)	1990-99 (4)	2000-09 (5)	2010-15 (6)	Differences (6) - (5)	Differences (6) - (4)	Differences (5) - (4)
Target characteristics													
Target Market Cap (\$mil)	<i>mean</i>	3,166.10	3,596.53	3,279.55	-316.98	113.45	430.42	108.66	115.49	133.37	17.88**	24.71***	6.83
	<i>median</i>	878.03	1,212.37	1,428.81	216.44	550.78***	334.34***	76.48	86.14	109.78	23.64***	33.30***	9.66
	<i>n</i>	793	634	235	.	.	.	1,502	806	207	.	.	.
Target Assets (\$mil)	<i>mean</i>	6,098.26	8,446.73	3,862.66	-4,584.07***	-2,235.60**	2,348.47	284.57	312.95	289.79	-23.16	5.22	28.38
	<i>median</i>	1,193.57	1,013.18	1,238.88	225.7	45.3	-180.4	81.82	60.73	72.95	12.22**	-8.87	-21.09***
	<i>n</i>	981	877	357	.	.	.	4,091	2,131	713	.	.	.
Target Market-to-Book	<i>mean</i>	3.67	3.79	2.98	-0.80**	-0.69*	0.12	2.38	1.94	1.89	-0.05	-0.49*	-0.43***
	<i>median</i>	2.31	2.38	2.19	-0.19**	-0.12*	0.07	1.45	1.38	1.11	-0.27***	-0.34***	-0.08**
	<i>n</i>	791	706	244	.	.	.	1,473	1,037	276	.	.	.
Deal characteristics													
Deal Value (\$mil)	<i>mean</i>	3,465.76	3,452.47	2,974.76	-477.71	-490.99	-13.29	81.91	98.42	118.58	20.15***	36.67***	16.51***
	<i>median</i>	1,135.70	1,230.31	1,291.31	61.00	155.61**	94.61**	37.81	51.74	66.78	15.04***	28.97***	13.93***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
Relative Size	<i>mean</i>	59.79	50.53	41.43	-9.10***	-18.36***	-9.26***	29.37	21.20	17.67	-3.53***	-11.70***	-8.17***
	<i>median</i>	32.82	20.48	20.88	0.40	-11.93***	-12.34***	10.56	7.78	6.89	-0.89***	-3.68***	-2.78***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
All Stock %	<i>mean</i>	35.21	18.99	5.50	-13.48***	-29.71***	-16.22***	28.27	12.18	5.62	-6.56***	-22.65***	-16.09***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
Stock Consideration %	<i>mean</i>	47.61	32.79	14.76	-18.03***	-32.85***	-14.82***	36.39	22.04	12.86	-9.18***	-23.53***	-14.35***
	<i>median</i>	44.56	0.00	0.00	0.00***	-44.56***	-44.56***	0.00	0.00	0.00	0.00***	0.00***	0.00***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
All Cash %	<i>mean</i>	18.66	30.48	45.94	15.46***	27.28***	11.82***	19.63	33.06	39.18	6.12***	19.55***	13.43***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
Cash Consideration %	<i>mean</i>	29.93	45.55	65.13	19.58***	35.20***	15.62***	29.85	47.76	53.86	6.10***	24.01***	17.91***
	<i>median</i>	0.00	38.22	88.22	50.00***	88.22***	38.22***	0.00	46.42	66.18	19.76***	66.18***	46.42***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
Synergy Motive %	<i>mean</i>	14.29	25.22	63.73	38.50***	49.44**	10.94	4.76	8.16	31.00	22.84***	26.24***	3.39
	<i>n</i>	7.00	1,237	714	.	.	.	21.00	5,052	2,413	.	.	.
Competition %	<i>mean</i>	8.80	7.14	4.13	-3.01***	-4.68***	-1.67	1.52	1.23	0.65	-0.58***	-0.87***	-0.30*
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
Public %	<i>mean</i>	62.18	53.60	39.20	-14.40***	-22.98***	-8.58***	18.03	15.93	12.77	-3.16***	-5.26***	-2.10***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
Hostile %	<i>mean</i>	5.00	1.78	0.83	-0.96**	-4.17***	-3.22***	0.62	0.15	0.10	-0.05	-0.52***	-0.47***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.
Withdrawn %	<i>mean</i>	15.00	9.56	7.15	-2.41*	-7.85***	-5.44***	6.44	4.32	1.95	-2.36***	-4.49***	-2.12***
	<i>n</i>	1,420	1,401	727	.	.	.	11,614	7,832	2,920	.	.	.

Table 3 Continued.

		Mega Deals						Non-mega Deals					
		1990-99	2000-09	2010-15	Differences		1990-99	2000-09	2010-15	Differences			
		(1)	(2)	(3)	(3) - (2)	(3) - (1)	(2) - (1)	(4)	(5)	(6)	(6) - (5)	(6) - (4)	(5) - (4)
Toehold %	mean	1.34	0.86	1.10	0.24	-0.24	-0.48	0.53	0.52	0.31	-0.22	-0.22*	0.00
	n	1,420	1,401	727				11,614	7,832	2,920			
Diversified %	mean	32.04	33.69	32.87	-0.82	0.83	1.65	37.83	37.69	37.81	0.12	-0.03	-0.14
	n	1,420	1,401	727				11,614	7,832	2,920			
Cross Border %	mean	10.21	16.20	19.39	3.19*	9.18***	5.99***	10.13	14.85	20.55	5.70***	10.42***	4.72***
	n	1,420	1,401	727				11,614	7,832	2,920			
Time to Completion	mean	133.19	117.44	115.56	-1.87	-17.63***	-15.76***	82.51	59.06	51.40	-7.66***	-31.11***	-23.45***
	median	112.00	92.00	86.00	-6.00**	-26.00***	-20.00***	52.00	34.00	25.50	-8.50***	-26.50***	-18.00***
	n	1,408	1,398	724				11,590	7,823	2,914			
Premium TCAR (-63,+126) %	mean	32.26	32.18	34.64	2.46	2.38	-0.08	37.23	46.16	38.58	-7.58**	1.36	8.93***
	median	23.25	21.90	28.34	6.44**	5.09*	-1.35	25.97	32.76	31.28	-1.48	5.32**	6.79***
	n	811	650	239				1,513	812	210			
Premium 4-week %	mean	42.80	38.27	40.99	2.71	-1.81	-4.53***	49.33	48.75	52.50	3.75	3.18	-0.58
	median	36.90	31.62	34.48	2.86*	-2.41	-5.27***	39.53	37.61	43.74	6.13**	4.20*	-1.92
	n	798	703	273				1,439	1,029	312			
High Market Valuation %	mean	59.58	25.27	48.14	22.88***	-11.43***	-34.31***	59.65	30.78	50.31	19.52***	-9.34***	-28.87***
	n	1,420	1,401	727				11,614	7,832	2,920			

Table 4. Acquisition Gains.

The table reports mean and median values on value-related measures for acquirer and target shareholders in a sample of completed acquisitions. Panels A through C report the results for mega-deals and Panel B. Variable definitions are reported in the Appendix. Differentials are based on t-tests for means and Wilcoxon test for medians. The indicators *, **, *** correspond to significance levels of 10%, 5%, and 1% respectively.

		All	1990-2009	1990-1999	2000-2009	2010-2015	(5) - (2)	(5) - (4)	(5) - (3)	(4) - (3)
		(1)	(2)	(3)	(4)	(5)				
Panel A: Mega Deals										
All										
ACAR3	<i>mean</i>	0.26*	-0.36**	-0.11	-0.60***	2.54***	2.90***	3.14***	2.65***	-0.49
	<i>median</i>	0.03	-0.38***	-0.14	-0.64***	1.34***	1.72***	1.98***	1.48***	-0.51*
WINNERS3	<i>mean</i>	50.13***	47.01***	49.21***	44.91***	61.54***	14.53***	16.63***	12.33***	-4.30**
\$GAIN3	<i>mean</i>	-193.00***	-262.77***	-99.57**	-418.24***	62.32	325.09***	480.56***	161.89**	-318.67***
	<i>median</i>	0.80*	-16.42***	-4.56**	-30.63***	86.71***	103.13***	117.34***	91.27***	-26.07**
LARGE LOSS	<i>mean</i>	9.84***	10.79***	7.46***	13.97***	6.36***	-4.43***	-7.61***	-1.10	6.51***
	<i>n</i>	3150	2474	1207	1267	676				
Private										
ACAR3	<i>mean</i>	2.36***	2.17***	2.51***	1.91***	2.84***	0.67	0.93*	0.33	-0.6
	<i>median</i>	1.14***	1.03***	1.18***	0.92***	1.52***	0.49	0.60*	0.35	-0.26
	<i>n</i>	1,542	1,112	491	621	430				
Public										
ACAR3	<i>All mean</i>	-1.75***	-2.43***	-1.91***	-3.02***	2.01***	4.45***	5.03***	3.92***	-1.11***
	<i>median</i>	-1.16***	-1.69***	-1.13***	-2.32***	0.82***	2.51***	3.14***	1.95***	-1.19***
	<i>n</i>	1,608	1,362	716	646	246				
	<i>Cash mean</i>	0.60**	-0.01	0.67	-0.34	2.15***	2.16***	2.49***	1.48*	-1.02
	<i>median</i>	0.40**	0.27	0.93*	-0.03	0.66***	0.39***	0.69***	-0.27	-0.96*
	<i>n</i>	388	278	92	186	110				
	<i>Stock mean</i>	-3.50***	-3.75***	-3.01***	-5.41***	1.01	4.76***	6.42***	4.02**	-2.40***
	<i>median</i>	-3.16***	-3.22***	-2.47***	-4.88***	1.84	5.06***	6.72***	4.31**	-2.40***
	<i>n</i>	556	527	363	164	29				
	<i>Mixed mean</i>	-1.66***	-2.39***	-1.28***	-3.37***	2.15**	4.54***	5.52***	3.43***	-2.09***
	<i>median</i>	-1.49***	-2.15***	-0.77***	-3.17***	0.97***	3.13***	4.15***	1.74***	-2.40***
	<i>n</i>	664	557	261	296	107				

Table 4 Continued.

		All (1)	1990-2009 (2)	1990-1999 (3)	2000-2009 (4)	2010-2015 (5)	(5) - (2)	(5) - (4)	(5) - (3)	(4) - (3)
Public – Synergy Gains										
TCAR3	<i>mean</i>	19.93***	19.08***	17.77***	20.61***	24.87***	5.78***	4.25***	7.10***	2.85***
	<i>median</i>	17.39***	15.89***	14.66***	16.81***	23.72***	7.84***	6.91***	9.06***	2.15**
	<i>n</i>	1436	1226	658	568	210	.	.	.	.
SYNRGY3	<i>mean</i>	1.37***	0.74***	1.00***	0.43	5.05***	4.31***	4.62***	4.05***	-0.57
	<i>median</i>	0.87***	0.42***	0.90***	-0.03	2.61***	2.19***	2.63***	1.71***	-0.92**
\$\$SYNRGY3	<i>mean</i>	15.15	-75.65	8.04	-172.87	542.69***	618.34***	715.55***	534.64***	-180.91
	<i>median</i>	59.61***	31.77	50.95***	-0.29	253.97***	222.21***	254.26***	203.02***	-51.24*
\$\$VALUE+	<i>mean</i>	-3.38	-7.05**	-2.85	-11.94**	18.21***	25.26***	30.16***	21.06***	-9.09
	<i>median</i>	-0.28	-3.32***	-0.06	-6.74***	21.79***	25.11***	28.53***	21.85***	-6.68**
Δ\$GAIN3	<i>mean</i>	4.49***	4.72***	4.37***	5.13***	3.16***	-1.56***	-1.97***	-1.21**	0.76**
	<i>median</i>	3.52***	3.68***	3.56***	4.03***	1.99***	-1.69***	-2.04***	-1.57**	0.47*
	<i>n</i>	1,396	1,191	640	551	205	.	.	.	.
Panel B: Non Mega-Deals										
All										
ACAR3	<i>mean</i>	1.38***	1.42***	1.68***	1.03***	1.16***	-0.26**	0.12	-0.53***	-0.65***
	<i>median</i>	0.53***	0.52***	0.63***	0.38***	0.58***	0.06	0.20**	-0.06	-0.25***
	<i>n</i>	21,222	18,360	10,866	7,494	2,862				
Public										
ACAR3	<i>mean</i>	-0.35***	-0.43***	-0.27*	-0.68***	0.34	0.77**	1.02**	0.61	-0.41
	<i>median</i>	-0.45***	-0.53***	-0.49***	-0.58***	0.03	0.56**	0.62***	0.52*	-0.09
	<i>n</i>	3,165	2,832	1,764	1,068	333				
SYNRGY3	<i>mean</i>	1.85***	1.65***	1.53***	1.88***	3.90***	2.24***	2.02***	2.37***	0.35
	<i>median</i>	1.04***	0.90***	0.77***	1.12***	2.87***	1.96***	1.75***	2.10***	0.35*
Private										
ACAR3	<i>mean</i>	1.68***	1.75***	2.06***	1.32***	1.26***	-0.49***	-0.06	-0.80***	-0.74***
	<i>median</i>	0.73***	0.74***	0.89***	0.58***	0.68***	-0.07	0.1	-0.21***	-0.31***
	<i>n</i>	18,057	15,528	9,102	6,426	2,529				

Figure 2. Annual Mean CAR (-1, +1) %.

The figure shows annual mean CARs estimated around the acquisition announcement, the corresponding 5-year moving average and polynomial fitted line to account for the y-o-y fluctuation in CARs.

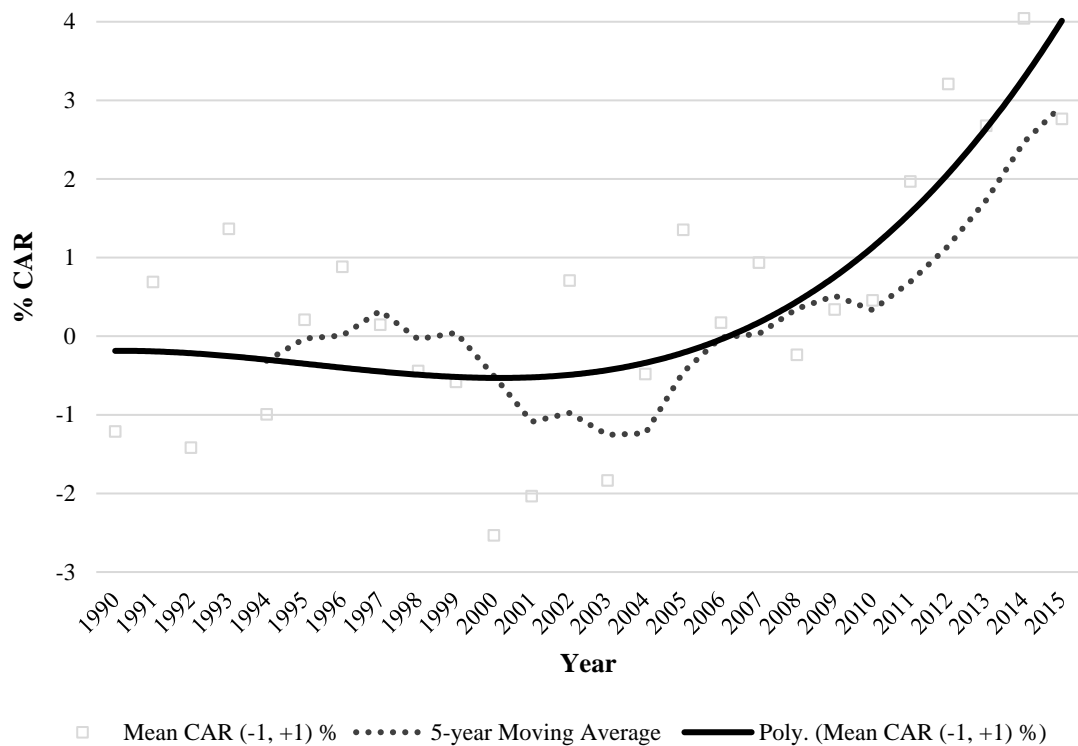


Figure 3. Acquirer CAR evolution around the announcement.

The figure shows the progression of CARs around the acquisition announcement for the three periods in our sample: 1990-1999, 2000-2009, and 2010-2015.

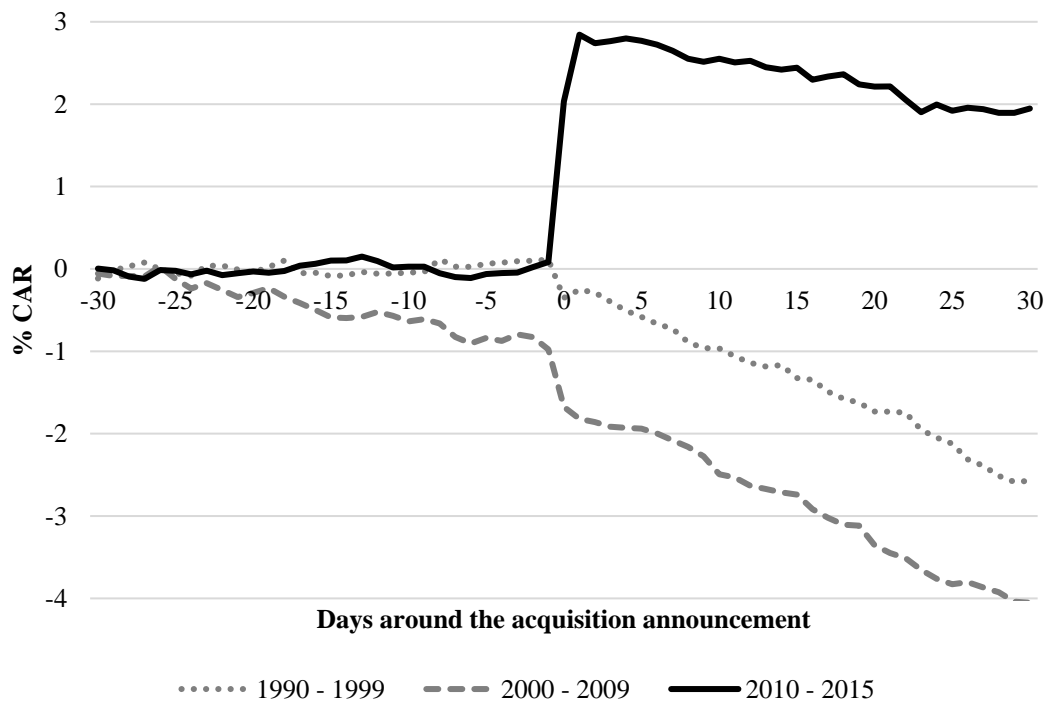


Table 5. Acquirer return regressions.

The table reports OLS regression coefficient estimates of ACAR3 on the 2010-2015 dummy variable, the mega-deal indicator variable, their interaction, and other control variables. The 2010-2015 variable takes the value of 1 if the deal was announced during the years 2010-2015 and 0 otherwise. The Mega Deal variable takes the value of 1 if the deal value is at least \$500 mil in 2015 terms and 0 otherwise. For sample criteria see Table 1 description. Detailed variable definitions are reported in the Appendix. Regressions (1)-(4) and (10) utilise the sample of mega-deals. Regressions (5)-(9) and (11) are performed on the sample of all deals (mega and non-mega). Regressions (8)-(9) examine the deal size effect, regressions (10) and (11) include company fixed effects, 1,439 and 6,101 additional variables respectively. The notation of *, **, *** corresponds to statistical significance levels of 10%, 5%, and 1% respectively. For detailed variable descriptions see Appendix.

	Mega Deals				All Deals			Deal Size Effect		Company FE	
	All	All	Public	Private	All	All	2010-15	All Public Deals	2010-15	Mega Deals	All Deals
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Intercept	-0.362**	5.897***	2.520*	4.970**	1.417***	2.262***	2.337***	3.001***	3.594*	4.587	2.915
2010 - 2015	2.902***	1.691***	3.724***	0.395	-0.262*	-0.136				1.010**	-0.182
Mega Deal					-1.779***	-0.505***	1.448***				-0.181
2010-15 x Mega Deal					3.170***	2.385***					2.396***
Public		-3.019***				-2.252***	-0.670**			-2.184***	-2.068***
All Stock		-1.553***	-1.535***	-0.146		-0.439***	-0.727	-1.614***	-0.774	-0.774	-0.285
Log Deal Value		-0.432***	-0.568***	-0.161				-0.668***	-0.08	-0.418**	
Acquirer M/B		-0.009	-0.024	-0.027		-0.022***	-0.030	-0.023	-0.038	-0.006	-0.024**
Competition		-1.154	-1.377*	-0.851		1.537***	-0.401	-0.079	-0.020	0.317	0.415
Hostile		0.903	0.635			0.043	1.582	0.377	1.897	0.501	-0.301
Diversification		-0.951***	-0.086	-1.631***		-0.038	-0.395*	-0.016	-0.85	-1.151**	-0.296**
Cross Border		-0.356	1.089*	-0.891*		-0.341**	-0.239	0.509	0.868	0.478	-0.011
Serial Acquirer		-0.703**	-0.177	-1.062**		-0.859***	-0.840***	0.106	-0.489	-0.658	-0.794***
Acquirer Leverage		0.023***	0.033***	0.021*		0.008***	0.022***	0.026***	0.043**	0.001	-0.004
High Market Valuation		0.395	0.705*	0.164		0.200**	-0.378*	0.458**	-1.454**	0.335	0.251**
Acquirer FCF		-0.851	1.627	-2.774*		-1.110***	-1.629**	2.221***	4.557**	-0.568	0.143
Industry FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R ² (%)	2.141	9.641	9.326	1.519	0.546	2.939	2.370	5.326	4.849	32.160	17.049
N	3,150	2,939	1,512	1,427	24,372	20,505	3,418	3,636	565	2,939	20,505

Table 6. Synergy gain regressions.

The table reports OLS regression coefficient estimates of SYNRGY3 on the 2010-2015 dummy variable, the mega-deal indicator variable, their interaction, and other control variables. Synergy gains are estimated as the market capitalisation weighted ACAR (-1,+1) of acquirer and target firms. The 2010-2015 variable takes the value of 1 if the deal was announced during the years 2010-2015 and 0 otherwise. The Mega Deal variable takes the value of 1 if the deal value is at least \$500 mil in 2015 terms and 0 otherwise. For sample criteria see Table 1 description. Detailed variable definitions are provided in the Appendix. Regressions (1)-(2) and (6) utilise the sample of mega-deals. Regressions (3)-(5) and (7) are performed on the sample of all deals (mega and non-mega). Regressions (6) and (7) include company fixed effects, 807 and 1,782 additional variables respectively. The notation of *, **, *** corresponds to statistical significance levels of 10%, 5%, and 1% respectively.

	Mega Public		All Public			Company FE	
	(1)	(2)	1990-2015	1990-2015	2010-2015	Mega Deals	All Public
			(3)	(4)	(5)	(6)	(7)
Intercept	0.738***	2.273	1.655***	3.250***	4.550**	5.822	6.376
2010 - 2015	4.315***	3.673***	2.243***	1.766***		1.579**	0.796
Mega Deal			-0.917***	-0.952***	0.842		0.150
2010-2015 x Mega Deal			2.072***	1.806**			2.004**
All Stock		-1.559***		-1.867***	0.298	-0.767	-0.647*
Log Deal Value		-0.033				0.139	
Acquirer M/B		-0.042		-0.077***	-0.120	-0.036	-0.055*
Competition		-1.197		-0.031	0.518	1.267	0.502
Hostile		2.933**		2.776**	0.000	2.007	2.453*
Diversification		-0.204		-0.387	-1.131	-0.064	-0.040
Cross Border		-1.389		-1.125	-1.285	-0.654	-2.266**
Serial Acquirer		-0.615		-0.933***	-1.575*		-0.440
Acquirer Leverage		0.040***		0.029***	0.063**	-0.007	-0.003
High Market Val		-0.005		-0.342	-0.383	0.488	-0.014
Acquirer FCF		1.653		1.308	2.246	3.060	3.019
Industry FE	<i>No</i>	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
Adj. R ² (%)	4.242	11.493	2.260	8.204	3.915	46.699	43.235
N	1,396	1,316	3,500	3,130	379	1,316	3,130

Table 7. Quantile Regressions.

The table reports quantile regression coefficient estimates of ACAR3 and SYNERGY3 on a 2010-2015 indicator and other control variables for the sample of mega-deals. The quantile regressions are performed on the 25th, 50th, and 75th percentiles corresponding to specification 2 in Tables 5 and 6 where the dependent variable is ACAR3 and SYNERGY3 respectively. For sample criteria see Table 1 description. The goodness of fit statistic for quantile regressions is the Akaike Information Criterion (AIC). For detailed variable descriptions see Appendix. The notation of *, **, *** corresponds to statistical significance levels of 10%, 5%, and 1% respectively.

	ACAR3			SYNERGY3		
	Quantile			Quantile		
	25 th	50 th	75 th	25 th	50 th	75 th
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	3.947***	5.975***	7.428***	-0.852	3.574***	8.321***
2010 - 2015	1.401***	1.061***	1.238***	1.875***	2.014***	3.766***
Public	-1.941***	-1.520***	-2.015***			
All Stock	-3.096***	-1.633***	-0.840***	-1.398***	-0.932***	-1.239***
Log Deal Value	-0.907***	-0.587***	-0.131	-0.087	-0.220	-0.031
Acquirer M/B	-1.521	-0.511	-0.456	-1.413	-1.279**	-0.493
Competition	-0.093***	-0.017	0.012	-0.164***	-0.081**	-0.053
Hostile	2.387***	-0.080	-0.863	1.925	0.776	1.045
Diversification	-0.239	-0.875***	-1.790***	0.397	-0.549**	-1.078***
Cross Border	0.220	-0.181	-0.730	-1.305	-0.301	-2.602**
Serial Acquirer	0.240	-0.174	-0.967***	0.022	-0.392	-1.180***
Acquirer Leverage	0.005	0.0250***	0.034***	0.018	0.033***	0.044***
High Market Val	0.886***	0.325	0.243	0.888***	0.204	-0.430
Acquirer FCF	2.410***	0.186	-3.200***	5.500***	0.434	-2.608
Industry FE	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
AIC	4456.46	5799.94	4982.56	1753.45	2406.75	1970.80
N	2,939	2,939	2,939	1,316	1,316	1,316

Table 8. Propensity Score Matching Adjusted Gains.

The table reports acquisition performance using propensity scores that are estimated from logit regressions of post-2009 deal occurrence on deal and firm-level characteristics. Panel A reports results from the logit estimation where the dependent variable equals 1 if the deal was announced during the 2010-15 period and zero otherwise. Panel B reports CAR3 and SYNRGY3 gains for 2010-15 deals (Treated sample) and propensity score matched returns from pre-2010 deals (Control sample). Difference is the return differential between the Control and Treated samples. N is the number of observations and pseudo R² (%) is the pseudo R-square. P-values are reported below regression estimates. For Panel B statistical significance is reported only for difference estimates. The notation of *, **, *** corresponds to statistical significance levels of 10%, 5%, and 1% respectively.

Panel A: Logit estimation results			CAR3	SYNRGY3
Post-2009=1			(1)	(2)
Intercept			-2.019***	-2.258***
Public			-0.559***	
AllStock			-1.777***	-1.604
Log Deal Value			0.172***	0.201***
Acquirer M/B			-0.011	-0.029
Competition			-1.002***	-0.686*
Hostile			-2.065**	-14.499
Diversification			-0.058	-0.45**
Cross Border			0.162	0.189
Serial Acquirer			-0.270***	-0.205
Acquirer leverage			0.003	0.001
High Market Val			0.308***	0.246
Acquirer FCF			-0.026	0.217
Industry FE			<i>Yes</i>	<i>Yes</i>
N			2,939	1,316
Pseudo R ² (%)			10.30	8.94

Panel B: Adjusted post-2009 CARs based on PSM			One-to-one	30 Nearest	50 Nearest	Gaussian Kernel
CAR3	Treated	<i>mean</i>	2.457	2.457	2.457	2.457
	Control	<i>mean</i>	0.192	-0.004	-0.205	-0.579
	Difference		2.265***	2.461***	2.662***	3.036***
SYNRGY3	Treated	<i>mean</i>	5.062	5.062	5.062	5.062
	Control	<i>mean</i>	1.245	1.434	1.389	1.295
	Difference		3.818***	3.628***	3.674***	3.768***

Table 9. Corporate Governance two stage regressions.

The table reports coefficients from 2-stage instrumental variable OLS regressions. In first stage regressions, the dependent variable in specifications 1,3 and 5 is the percentage of independent directors in the board (BI), the independent directors' share of ownership (IDO), and the index of antitakeover provisions (BCF), respectively. The main explanatory variable in a time indicator for deals occurring from 2010 through 2015. The dependent variable in the second stage regression is the acquirer cumulative abnormal return for a 3-day window surrounding the acquisition announcement (*ACAR3*). BI, IDO, and BCF correspond to predicted corporate governance values from stage-one. For detailed variable definitions see Appendix 1. The notation of *, **, *** corresponds to statistical significance levels of 10%, 5%, and 1% respectively.

	1 st Stage		2 nd Stage		1 st Stage		2 nd Stage	
	BI	CAR	IDO	CAR	BCF	CAR		
	(1)	(2)	(3)	(4)	(5)	(6)		
Intercept	61.752***	0.338	1.494**	-4.097	2.693***	12.677***		
2010 - 2015	13.985***		0.276**		-0.372***			
Public	0.071	-2.256***	-0.080	-1.790***	-0.090	-2.340***		
All Stock	-2.727**	-1.384***	0.143	-2.519***	-0.133	-2.623***		
Log Deal Value	0.894**	-1.028***	-0.121**	0.091	-0.070*	-0.697***		
Acquirer M/B	-0.091	0.008	-0.008	0.048	-0.029***	-0.069		
Competition	0.145	-0.441	0.073	-1.271	-0.145	-1.901		
Hostile	-5.321	1.935	0.136	0.614	-0.376	-0.034		
Diversification	1.256	-1.362***	-0.091	-0.476	-0.066	-0.855**		
Cross Border	0.585	-0.733	-0.056	-0.243	-0.034	-0.006		
Serial Acquirer	-0.684	0.038	-0.186*	1.607***	0.056	-0.207		
Acquirer Leverage	-0.059**	0.022*	0.010**	-0.067***	-0.005*	0.021		
High Market Val	-1.554*	0.318	-0.003	-0.385	-0.270***	0.004		
Acquirer FCF	3.207	0.248	-0.131	2.483*	0.383	2.554		
BI		0.130***						
IDO				7.959***				
BCF								-2.594**
Industry FE	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>		
Adj. R ² (%)	16.800	10.704	1.808	10.552	6.667	9.941		
N	1,619	1,619	1,388	1,388	1,236	1,236		

Table 10. Acquirer long-run returns.

The table reports long-run abnormal returns to acquiring firms consummating mega-deals for different sample periods. BHAR is the 1-year acquirer buy-and-hold monthly return adjusted for the corresponding “25 Size-B/M” portfolio (Loughran, 1997), starting at the month of the deal announcement. For any missing data, the abnormal return is replaced by that of the corresponding “25 Size-B/M” portfolio. For CTPR, the monthly alpha is estimated from a calendar time portfolio regression of the equally weighted monthly excess return as in Mitchell and Stafford (2000), on the Fama and French (1993) and Carhart (1997) 4 factors, BHAR differences are estimated using T-tests for means and Wilcoxon tests for medians. The indicators of *, **, *** correspond to significance levels of 10%, 5%, and 1% respectively.

		All	1990-2009	1990-1999	2000-2009	2010-2015	(5) - (2)	(5) - (4)	(5) - (3)	(4) - (3)
		(1)	(2)	(3)	(4)	(5)				
BHAR (25 Size-B/M)	mean	-0.096	-1.241	-1.346	-1.143	4.424***	5.665**	5.567**	5.770**	0.203
	median	-3.150***	-4.839***	-7.075***	-2.873***	1.877**	6.715**	4.749**	8.952**	4.203**
	n	2,754	2,197	1,062	1,135	557	.	.	.	.
BHAR Regression	2010-15 indicator	3.520*								
	Control variables	Yes								
	Adj. R ² (%)	1.230								
	n	2,754								
CTPR (4-factor model)	alpha	0.025	-0.075	-0.02	-0.063	0.364***				
	Rm - Rf	1.146***	1.172***	1.120***	1.217***	1.065***				
	SMB	0.283***	0.284***	0.323***	0.261***	0.403***				
	HML	0.018	0.050	0.187***	-0.058	-0.125				
	MOM	-0.059**	-0.035	0.069	-0.087**	-0.154***				
	n-months	307	235	115	120	72				
	Adj. R ² (%)	92.01	91.59	88.68	93.57	94.95				

Table 11 Acquirer Investment Efficiency.

The table reports estimates of investment inefficiency based on Richardson (2006) for acquiring firms. In Panel A, the coefficients are from a regression of Total New Investment, $INV_{i,t}$, which is the sum of capital expenditures, R&D expenditures, and acquisitions minus sales of PPE and necessary maintenance for assets in place for firm i in year t from Compustat, scaled by total assets. $Q_{i,t-1}$ is the book value of total assets minus the book value of equity plus the market value of equity divided by book value of total assets for firm i in year $t-1$. $Leverage_{i,t-1}$ is calculated as total debt over common equity for firm i in year $t-1$. $Cash_{i,t-1}$ is the logarithmic transformation of 1 plus the ratio cash and cash equivalents over total assets for firm i in year $t-1$. $Age_{i,t-1}$ is the log of the difference between the year of the observation and the incorporate date for firm i in year $t-1$. $Size_{i,t-1}$ is the logarithmic transformation of total assets for firm i in year $t-1$. $INV_{i,t-1}$ is the lagged term of the dependent variable. $Stock\ Return_{i,t-1}$ is the total annual change in the market capitalization of firm i in the year $t-1$. We trace each acquirer's investment for the entire sample period (1990-2015). Variables are winsorized at the 1% and 99% to remove outliers. Industry fixed effects are included in specification 2. Panel B reports mean and median residual investment (RESINV) which is the absolute value of the residuals from regression (2) in Panel A. n is the number of firm-year observations and $Adj. R^2$ (%) is the adjusted R-square. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

Panel A: Total new investment regressions ($INV_{i,t}$)			
	(1)	(2)	
Intercept	0.206***	0.219***	
Q (t-1)	0.021***	0.020***	
Leverage (t-1)	-0.002***	-0.001***	
Cash (t-1)	0.008***	0.007***	
Age (t-1)	-0.005***	-0.006***	
Size (t-1)	-0.024***	-0.022***	
INV (t-1)	0.119***	0.090***	
Stock Return (t-1)	0.012***	0.013***	
Industry FE	No	Yes	
Adj R^2 (%)	16.075	18.021	
n	20,970	20,908	

Panel B: Residual Investment (RESINV)			
	1990-2009	2010-2015	Diff.
mean	0.095	0.074	-0.021***
median	0.055	0.044	-0.011***
n	15,904	5,005	

Appendix 1. Variable Descriptions.

Variable	Definition
<i>Panel A: Acquisition Performance</i>	
ACAR3	Acquirer cumulative abnormal returns over the 3 days around the announcement day. The model parameters are estimated over the window (-255, -46) relative to the announcement.
BHAR (25 Size – B/M)	1-year Buy-and-Hold abnormal returns starting at the month of the announcement. The calculation involves monthly returns adjusted for the return of the corresponding 25 value-weighted Fama and French Size-B/M portfolios (information retrieved by Kenneth French’s website).
Δ\$GAIN3	The difference in dollar gains (\$GAIN3) between the target and bidder scaled by the sum of their market value 30 days prior to the acquisition announcement.
\$GAIN3	Acquirer cumulative abnormal dollar value creation (destruction) over the 3 days around the announcement day. The value is the product of ACAR (-1,+1) and the market capitalisation of the acquirer one month prior to the acquisition announcement.
Large Loss \$1 bil	Dummy variable takes the value of 1 if the variable “Dollar Gain (-1,+1)” indicates a loss equal to or greater than \$1 bill., following Moeller et al. (2005).
SYNRGY3	The market value-weighted 3-day cumulative abnormal returns of the acquirer and target combined where the value weights are measured one month prior to the acquisition announcement.
\$SYNERGY3	The synergy gain (SYNRGY3) multiplied by the sum of the market capitalisation of the acquirer and target firm 30 days prior to the acquisition announcement.
TCAR3	Target cumulative abnormal returns over the 3 days around the acquisition announcement day. The returns model parameters are estimated over the window (-255, -46) relative to the announcement.
\$VALUE+	The ratio of total market capitalisation change for the acquirer and target around the acquisition announcement adjusted for market movements and scaled by the deal value.
WINNERS3	Dummy variable takes the value of 1 if the ACAR (-1,+1) is positive and 0 otherwise.
<i>Panel B: Acquirer Characteristics</i>	
Acquirer Assets (\$mil)	Acquirer total asset value at the year-end of the fiscal year t-1. The values are denominated in 2015 dollar terms.
Acquirer FCF-to-Assets	The ratio of cash flow from operations over the book value of assets at the year-end of the fiscal year t-1.
Acquirer Hubris	Dummy that takes the value of 1 if the Acquirer CEO has not exercised 67% in-the-money options twice during her tenure and 0 otherwise based on Malmendier and Tate (2005).
Acquirer Leverage	Acquirer long- and short-term debt divided by total assets at the year-end of the fiscal year t-1.
Acquirer Market Cap (\$mil)	Acquirer market capitalisation in 2015 dollar terms 30 days prior to the deal announcement. For missing values, we retrieve information from next available day, up to 10 days from the announcement.
Acquirer Market-to-Book	Acquirer market cap over the total book value of equity. The latter is calculated as the sum of stockholders’ equity, deferred taxed and investment tax credit (if available),

and preferred stock, all denominated in 2015 dollar terms and taken at year-end of the fiscal year t-1. We use redemption, liquidation, or par value for the preferred stock estimation, depending on data availability. Stockholders' equity is as reported by Compustat; the sum of book value of common equity and preferred stock par value, or the book value of assets minus total liabilities, depending on data availability.

BCF Antitakeover Index	The number of antitakeover provisions available at the firm's disposal in the year of the acquisition as reported in IRRC. It has a minimum value of 1 and a maximum value of 6 (Bebchuk et al., 2009).
Board Independence	The percentage of outside directors in the Board of Directors in the year of the acquisition as reported in ISS.
Independent Board	Dummy variable that takes the value of 1 if the percentage of outside directors is higher than 50% in the Board of Directors of the acquirer and 0 otherwise (Masulis et al., 2007).
Equity Compensation %	The sum of stock- and option-based compensation as a percentage of total compensation in the fiscal year t-1. The construction is based on Chauvin and Shenoy (2001).
Ind. Directors Ownership %	The ownership % of all outside directors combined in the fiscal year t-1.
Serial Acquirer	Dummy variable that takes the value of 1 if the company has performed 3 deals within 5 years from the announcement and 0 otherwise.

Panel C: Target Characteristics

Target Assets (\$mil)	Target total asset value at the year-end of the fiscal year t-1, denominated in 2015 dollar terms.
Target Market Cap (\$mil)	Target market capitalisation in 2015 dollar terms 30 days prior to the deal announcement. For missing values, we retrieve information from the next available day up to 10 days from the announcement.
Target Market-to-Book	Target share price 4 weeks before the announcement over the book value per share as reported in SDC.

Panel D: Deal Characteristics

All Cash	Dummy variable that takes the value of 1 if the consideration was 100% in cash and 0 otherwise.
All Stock	Dummy variable that takes the value of 1 if the consideration was 100% in stock and 0 otherwise.
Cash Consideration %	The percentage of deal consideration paid in cash.
Competition	Dummy variable that takes the value of 1 if there were more than one bids for the target firm and 0 otherwise.
Cross Border	Dummy variable that takes the value of 1 if the target's country is not the U.S.
Deal Value	The deal value in 2015 dollar terms.
Diversified	Dummy variable that takes the value of 1 if the 2-digit SIC codes of the acquirer and target are different and 0 otherwise.
High Market Valuation month	Dummy variable that takes the value of 1 if deal announcement month is classified as a high market valuation period and 0 otherwise. The classification is based on a detrended P/E ratio as in Bouwman et al. (2009).
Hostile	Dummy variable that takes the value of 1 if the deal is labelled as hostile and 0 otherwise.
Premium 4-week %	The 4-week premium paid for the target company as given by SDC.

Premium TCAR (-63,+126)	The long-run abnormal return based premium attributed to target shareholders as estimated by Schwert (2000).
Public	Dummy variable that takes the value of 1 if the target is a public firm and 0 otherwise.
Relative Size	The ratio of deal value over the acquirer market capitalisation one month prior to the acquisition announcement.
Stock Consideration %	The percentage of deal consideration paid in stock.
Synergy Motive	Dummy that takes the value of 1 if SDC indicates synergistic gains (SYN) within the purpose code as stated by acquiring firm management, and 0 otherwise.
Time to completion	The number of days between deal announcement and completion.
Toehold	Dummy variable that takes the value of 1 if the acquirer owned more than 5% at deal announcement and 0 otherwise.
Withdrawn	Dummy takes the value of 1 if the deal was withdrawn and 0 otherwise.

Panel E: Investment Inefficiency Regression

Age	The logarithmic transformation of the difference between the year t-1 and the year of the incorporation.
Cash	The logarithmic transformation of 1 plus the ratio of company cash and cash equivalents over total assets in year t-1.
Leverage	The ratio of company total debt over the book value of common stock in year t-1.
Q	The company book value of total assets, minus the book value of equity, plus the market value of equity, all divided by the book value of total assets in year t-1.
Size	The logarithmic transformation of the company's total assets in year t-1 .
Stock Returns	The company year-on-year difference of year-end market capitalisation for the year t-1.
Total New Investment	The sum of company's capital expenditures, R&D expenditures, and acquisitions minus sales of PPE and necessary maintenance for assets in place scaled by total assets. The estimation of the variable is based on both year t and t-1.

Appendix 2. Top 10 Largest Deals per Period.

Period	#	Year Announced	Year Completed	Acquiring Company	Target Company	Deal Value \$ bil	CAR % (-1, 1)	CAR % (-20, 1)
1990-1999	1	1999	2000	Pfizer Inc	Warner-Lambert Co	126.87	-11.49	-14.77
	2	1998	1999	Exxon Corp	Mobil Corp	114.80	-3.08	-5.00
	3	1998	1998	Travelers Group Inc	Citicorp	105.51	14.76	13.61
	4	1998	1999	SBC Communications Inc	Ameritech Corp	91.02	-8.00	-5.84
	5	1998	1998	NationsBank Corp	BankAmerica Corp	89.63	6.94	9.77
	6	1999	2000	Qwest Commun Intl Inc	US WEST Inc	80.11	-18.87	-13.37
	7	1998	1999	AT&T Corp	Tele-Communications Inc	77.93	-9.67	-6.68
	8	1998	2000	Bell Atlantic Corp	GTE Corp	77.68	2.52	1.55
	9	1999	2000	AT&T Corp	MediaOne Group Inc	70.11	-6.65	-5.40
	10	1997	1998	WorldCom Inc	MCI Communications Corp	61.89	3.13	15.73
2000-2009	1	2001	2002	Comcast Corp	AT&T Broadband & Internet Svcs	96.42	-6.55	1.09
	2	2006	2006	AT&T Inc	BellSouth Corp	85.44	-5.35	0.56
	3	2002	2003	Pfizer Inc	Pharmacia Corp	78.43	-11.31	-13.64
	4	2009	2009	Pfizer Inc	Wyeth	74.34	-9.93	-7.20
	5	2005	2005	Procter & Gamble Co	Gillette Co	66.64	-4.51	-2.27
	6	2000	2001	Chevron Corp	Texaco Inc	59.01	-5.25	-6.48
	7	2000	2001	JDS Uniphase Corp	SDL Inc	56.63	-21.01	-32.54
	8	2008	2009	Bank of America Corp	Merrill Lynch & Co Inc	53.69	-3.77	18.06
	9	2000	2000	Chase Manhattan Corp,NY	JP Morgan & Co Inc	46.19	-12.62	-4.10
	10	2009	2010	Exxon Mobil Corp	XTO Energy Inc	44.52	-5.06	-5.31
2010-2015	1	2014	2015	AT&T Inc	DirecTV Inc	48.14	-2.62	0.26
	2	2014	2015	Medtronic Inc	Covidien PLC	42.78	0.51	-1.92
	3	2011	2012	Express Scripts Inc	Medco Health Solutions Inc	30.95	9.12	0.95
	4	2011	2012	Duke Energy Corp	Progress Energy Inc	27.21	-0.80	-1.55
	5	2011	2012	Kinder Morgan Inc	El Paso Corp	25.29	2.77	9.66
	6	2014	2015	Reynolds American Inc	Lorillard Inc	25.08	0.70	3.93
	7	2010	2011	CenturyLink Inc	Qwest Commun Intl Inc	24.22	-6.95	-6.92
	8	2011	2012	Johnson & Johnson	Synthes Inc	21.18	4.64	6.53
	9	2014	2014	Facebook Inc	WhatsApp Inc	19.49	2.94	18.40
	10	2011	2012	United Technologies Corp	Goodrich Corp	17.05	-3.05	0.91