

# *Value creation from M&As: new evidence*

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Accepted Version

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Alexandridis, G., Antypas, N. ORCID: <https://orcid.org/0000-0001-8046-4590> and Travlos, N. (2017) Value creation from M&As: new evidence. *Journal of Corporate Finance*, 45. pp. 632-650. ISSN 0929-1199 doi: <https://doi.org/10.1016/j.jcorpfin.2017.05.010> Available at <https://centaur.reading.ac.uk/70385/>

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To link to this article DOI: <http://dx.doi.org/10.1016/j.jcorpfin.2017.05.010>

Publisher: Elsevier

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# Value Creation from M&As: New Evidence

G. Alexandridis, N. Antypas and N. Travlos\*

*Forthcoming, Journal of Corporate Finance*

## Abstract

M&A deals create more value for acquiring firm shareholders post-2009 than ever before. Public acquisitions fuel positive and statistically significant abnormal returns for acquirers while stock-for-stock deals no longer destroy value. Mega deals, priced at least \$500 mil, typically associated with more pronounced agency problems, investor scrutiny and media attention, seem to be driving the documented upturn. Acquiring shareholders now gain \$62 mil around the announcement of such deals; a \$325 mil gain improvement compared to 1990-2009. The corresponding synergistic gains have also catapulted to more than \$542 mil pointing to overall value creation from M&As on a large scale. Our results are robust to different measures and controls and appear to be linked with profound improvements in the quality of corporate governance among acquiring firms in the aftermath of the 2008 financial crisis.

JEL classification: G34

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

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# Value Creation from M&As: New Evidence

## 1. Introduction

One of the most stylized facts in the corporate finance literature is that mergers and acquisitions (M&As) of listed companies 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 academic and market research as well as the business press.<sup>1</sup> Considering that deals involving listed firms are typically subject to extensive publicity and investor scrutiny, and that their high failure likelihood and associated challenges have been extensively documented and deliberated, it is puzzling that they regularly fall short of creating shareholder value. This paper aims to examine how value creation from acquisitions has evolved more recently in light of important developments that can potentially impinge on the quality of corporate investment decisions.

One of the consequences of the 2008 financial crisis – the worst 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.<sup>2</sup> 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

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<sup>1</sup> 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.

<sup>2</sup> 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.

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.

To that end, we study the characteristics and performance of M&As during a previously unexplored recent period and draw important comparisons with the two decades of the 90s and 00s. Our M&A sample comprises of 26,078 M&A deals announced between 1990 and 2015, out of which 5,694 involve listed target firms. M&A 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.<sup>3</sup> From 2010 through 2015 U.S. listed acquirers announced 3,811 deals valued at \$3.07tril, more than during the 6<sup>th</sup> 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 significant changes in deal attributes and quality during the most recent period. Acquiring firms create discernible shareholder value through public acquisitions post-2009 for the first time. The average acquirer was subject to an abnormal return of 1.05% around the acquisition announcement of a public deal. Compared to an average loss of -1.08% recorded from 1990 through 2009 this represents a rather discernible improvement. It corresponds to a \$30.2 mil gain to acquiring shareholders in the typical deal, a \$208 mil improvement relative to pre-2010. A compelling 54% of public deals are now associated with positive acquirer abnormal returns relative to only 39% in the previous decade and 43% during the 90s. The return differentials are prevalent among both cash and stock financed deals, while this is to our knowledge the first time a study documents non-value-destroying stock-for-stock deals for acquirers within a U.S. sample. By any measure, acquiring firms create more value for their shareholders post-2009. This performance turnaround seems to be associated with bidders piecing together deals with superior strategic fit. The overall synergistic benefit has improved markedly - more than three-fold- during the most recent

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<sup>3</sup> 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.

period, with the average deal being subject to a 4.51% or \$309 mil combined gain for acquiring and target companies; to our knowledge the highest ever documented by any recent U.S. study.

The documented shift in acquirer returns for public acquisitions is so significant that they now generate comparable gains to private ones, contradicting conventional wisdom that bidders in private deals outperform those acquiring public firms by a large margin. Although, transactions involving private targets continue to generate significant gains to acquirers during the most recent period, they do not benefit shareholders more on average than in previous decades. As a result, any improvement in deal quality is confined only to acquisitions of listed targets which tend to be substantially larger, subject to heightened media attention and have been historically more susceptible to value destruction. This is consistent with the fact that public acquisitions are likely to entail a greater degree of reputational exposure for corporate executives and directors, making them more susceptible to improvements or regime shifts in corporate governance (Dahya et al. 2016).

To gain further insight on this issue we also investigate a sub-set of 3,150 completed M&A deals valued at least \$500mil (henceforth “mega-deals”).<sup>4</sup> During the last 25 years mega-deals comprised more than 85% (94% in 2015) of our overall M&A sample’s market value representing the bulk of inorganic corporate investment and an important part of the U.S. economy (more than 5% of GDP in 2015). The historical 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 more.<sup>5</sup> 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

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<sup>4</sup> The mega-deal classification was motivated by the fact that the breakpoint for the top deal value quintile of all US M&As during our sample period is around \$500mil. It also does not affect the direction of our results or main conclusions which are similar when the mega-deal threshold is set to \$250mil, \$750 mil. Or \$1bil. although employing a higher threshold reduces the size of this sub-set substantially.

<sup>5</sup> 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.

branded as failures since they have resulted in sizable write-offs and shareholder losses.<sup>6</sup> Since mega-deals have been linked to large scale losses for acquiring shareholders, they tend to involve a higher degree of reputational exposure for firms, top executives, and the board of directors. We find that the improvement in gains to acquiring firms is significantly more pronounced in mega deals, with the average acquirer being subject to an abnormal return of 2.54% post-2009, corresponding to a \$62.3 mil gain for its shareholders. The synergistic gains in this case amount to a thumping \$542mil in the average deal. Moreover, the compelling shift in acquirer returns during the most recent period is not confined only to public mega-deals but also applies to private ones – albeit to a lesser extent- suggesting that it is driven primarily by the larger deals in general. Cross sectional regressions controlling for a range of pivotal acquisition gain determinants, as well as industry and company fixed effects confirm that the bulk of the improvement in acquisition gains post-2009 stems from mega-deals. A possible explanation for this result is that any positive developments in the aftermath of the financial crisis and especially in corporate governance has mainly impinged on sizable investment decisions where agency conflicts are more substantial given the larger value at stake and higher degree of reputational exposure for corporate executives and directors. This would result in larger deals being more reflective of an improvement in M&A quality.

Our results are consistent with a recent shift in the quality and drivers of M&A deals and point to value creation from large M&As on a great scale, contradicting the status quo that such type of acquisitions destroy value more often than they create. A number of indicators suggest that the documented turnaround is concurrent to a more widespread 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 significantly 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, as well

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<sup>6</sup> 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).

as 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 suggest that our results can in theory be driven by this hefty shock. Ensuing changes at the corporate internal control and monitoring levels in response to the emergence of a 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 examine the impact of more conventional dimensions of corporate governance that are likely to capture any broad trend for change. We document recent 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. To investigate whether and to what extent the superior performance of mega-deals post-2009 can be attributed to changes in these governance proxies we isolate their 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. This in turn corroborates that developments at the corporate board level have an important role to play through fostering 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.

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 sizable scale, in accordance with the predictions of the neoclassical theory of M&As (Ahern and Weston, 2007).<sup>7</sup> Most notably, the documented improvement in acquisition gains is for the most part concentrated in larger deals – both private and public – which tend to be associated with more pronounced agency problems, investor scrutiny, media attention and reputational exposure. Along these lines, to the extent that the turnaround in M&A performance is driven by the recent developments in internal control mechanisms, our study offers significant contribution to existing literature on the quality-enhancing role of corporate governance in acquisition decisions (Masulis et al. 2007; Dahya, et al. 2016). To the best of our knowledge, it is also the first study 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 practices 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 including a multivariate analysis of acquirer returns and synergy gains. Section 4 presents the results from a propensity score matching approach. Section 5 utilises a two-stage instrumental variable approach to examine the impact of corporate governance and Section 6 provides evidence on the overall investment efficiency of acquiring firms. Finally, section 7 concludes the paper.

## **2. Data and Summary Statistics**

The sample of M&As is from Thomson SDC and includes U.S. deals announced between 1990 and 2015. We exclude repurchases, recapitalisations, self-tenders, exchange offers,

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<sup>7</sup> 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).



acquisitions of remaining interest, minority stake purchases and intra-corporate restructurings.<sup>8</sup> Deals have an inflation adjusted value of at least \$5 mil in 2015 dollar terms, a relative size of 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 26,078 deals that satisfy these criteria, out of which of which 5,694 are public and 20,384 private.

Table 1 and Figure 1 show the distribution of deals over time. Deal activity decelerated as a result of the 2007-08 financial crisis that brought the sixth merger wave (see Alexandridis, et. al 2012) to an end but recovered again in 2010 and has remained upbeat until at least 2015. The rebound is significantly more pronounced in terms of the total dollar value spent during the last two years in the sample and reached \$947bil in 2015; a 15-year high. Mega-deals - worth at least \$500mil - comprise more than 85% of the total dollar value spent for M&As by U.S. acquirers in our sample during the last 25 years (\$12.5 tril) and 94% in 2015 (\$891.4 bil). This indicates a tendency towards larger acquisitions during the most recent period.

[Insert Table 1 and Figure 1 here]

To gain further insight into the sample's sectoral composition we also examine if there are any significant differentials in the industry classification of firms targeted in acquisition deals between the most recent period in our sample (2010-15) and the previous two decades. For brevity we have not tabulated the results since we find only trivial differences. One pattern that stands out is the increase in acquisition activity within the healthcare and pharmaceuticals segment (from 9.6% to 13.2% of the overall sample). This can be largely attributed to the fact that several 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).<sup>9</sup> The ultimately withdrawn \$160 bil Pfizer-Alergan deal in 2015 was the largest ever announced within the sector. Moreover, the utilities and telecom industries have also recorded slight declines in deal activity through time, which is not surprising given that they have progressively become more mature and saturated.

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<sup>8</sup> As part of the intra-corporate restructuring exclusion, we omit transactions where the acquirer and target have the same name or ultimate parent.

<sup>9</sup> "The real reasons for the pharma merger boom", July 2015, Fortune

Table 2 reports our sample's summary statistics for the two sub-periods; 1990-2009 and 2010-15 as well as differentials between these periods. The post-2009 period encompasses the recovery in the M&A market documented in Figure 1 and to our knowledge has not been the subject of extensive empirical investigation in prior literature. Alternative sample specifications or partitions (e.g. comparing 2010-15 with the 90s and 00s decades or 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 in untabulated tests and produce very similar differentials. Results are also segregated by target type (public and private). Accounting ratios are winsorized at the top and bottom 1% level where relevant. Acquiring firm size (*SIZE*) has increased significantly through time and the same is the case for target size and deal value (*DEAL VALUE*). The average deal size has increased from 1.7bil in 1990-2009 to 2.7bil in 2010-15. Acquirer size has increased at a faster pace than deal size leading to a decrease in deal relative size (*RELSIZE*). Further, the percentage of M&As priced at least 500mil (*Mega-Deals*) has also increased markedly during the most recent period. More than 60% of mega-deals involved private targets compared to 42% in the two preceding decades which indicates a more recent 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 (*M/B*). 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 the share of equity consideration (*STOCK*) in acquisition offers during this period. Only around 38.1% of public deal offers in 2010-2015 for instance comprise stock-swaps, which represents a remarkable decline from the 56.2% recorded pre-2010. The documented scarcity of equity financing during the most recent period can also be attributed to the availability of ample corporate liquidity (see *FCF*) 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 an equally significant increase in the cash component (*CASH*) of acquisition offers during the most recent period, where the median deal is sponsored with more than 55% cash.

[Insert Table 2 here]

Further, the percentage of diversified deals (*DIVERS*) has decreased only in public deals over time, while the share of cross-border deals (*CROSS BORDER*) has increased across the board. 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 interesting observation is that there are fewer failed deals (*WITHDRAWN*) during the more recent M&A period. Only 11% and 1% of public and private deals respectively have been withdrawn following their announcement relative to 15.7% and 3.8% during the previous two decades. 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).<sup>10</sup> The former explanation is also supported by the fact that time to deal completion has also diminished.

Information on deal motives mentioned in actual acquisition announcements available on SDC (Deal Purpose Code) suggests that M&A drivers have evolved significantly post-2009. More specifically, synergistic benefits are quoted as part of the deal announcement (*SYNRGY MOTIVE*) in more than 61% (33%) of public (private) deals, relative to 25.5% (7.1%) during 1990-2009. If this trend reflects a genuine change in acquisition decision drivers then it should translate to greater benefits for shareholders. Yet, there is no evidence that target shareholders receive higher premia (*PREMIUM*) post-2009 than in the past. Thus, 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 (*HUBRIS*) 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% (42%) of CEOs that carry out public (private) 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

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<sup>10</sup> 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).

average acquiring firm (*BI*) has reached around 80% in 2010-2015 relative to 65-66% prior to this.<sup>11</sup> This signifies a remarkable milestone in the board independence regime; with 8 in 10 directors being independent there isn't much more scope for further improvement. Moreover, the share of equity based compensation (*EBC*) in the top executive's salary as in Chauvin and Shenoy (2001) – which has been previously linked to acquisition quality (Datta et al. 2001) - has increased significantly.<sup>12</sup> Finally, the stock ownership of independent directors (*IDO*), one of the most consistent predictors of corporate performance among other corporate governance indices and variables, according to 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 significant improvements in internal control and incentive alignment mechanisms post-financial crisis. Such developments, along with shifts in other M&A characteristics between the most recent period and the previous two decades, can exert an influence on the quality of corporate investment decisions and their value creation potential.

### **3. Main 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 3 reports the univariate results partitioned by two sub-period and target type (private or public), along with the respective differentials. Panel A reports results for a sample of 24,372 completed deals with acquirer return data.<sup>13</sup> *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

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<sup>11</sup> Data on the representation of independent directors is from ISS (ex-Risk Metrics).

<sup>12</sup> Yet, there is also anecdotal evidence 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).

<sup>13</sup> The sample here is somewhat smaller in than in Table 2 because we examine acquisition gains only for completed deals.

the acquisition announcement day.<sup>14</sup> For all deals we report a statistically significant improvement (0.21%) in acquirer returns during the most recent (2010-15) period. Yet, this differential is driven exclusively by the sub-set of 4,773 public deals since the median private deal generates almost the same (0.75%) positive *ACAR* post-2015 relative to before. The pattern in public deals is particularly compelling; although acquirer returns are typically negative and significant during the previous two decades, this appears to have changed profoundly post-2009. The mean (median) *ACAR* in 2010-15 is positive and statistically significant 1.05% (0.29%); an increase of 2.13 (1.14) percentage points relative 1990-2009. To the best of our knowledge this is the first study in at least two and a half decades documenting statistically significant value creation for acquiring shareholders to such extent for a large sample of U.S. public acquisitions.

The outperformance of acquirers in 2010-15 can be attributed to the fact that there are more deals with positive *ACARs* (*ACAR+*) recently (54.2%) relative to the past (41.8%). 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 majority of acquirers completing public deals are subject to positive abnormal returns. One might suggest that this represents a rather significant shift in the status quo. Dollar gains (*\$GAIN*), computed as the abnormal dollar increase in the market capitalisation of the acquiring firm, are also in the same direction. In the post-2009 period the average acquirer realises a market cap gain of \$30.2 mil in the three days surrounding the acquisition announcement. Prior to this, acquiring shareholders typically lost \$178.1 mil which attests to a compelling improvement in shareholder gains during the most recent period. Further, *LARGE LOSS*, a dummy variable takes the value of 1 if the variable *\$GAIN* points to a loss equal to or greater than \$1 bil., following Moeller et al. (2005), shows that the fraction of deals resulting in large shareholder losses has decreased considerably.

The fact that acquirers used significantly less stock financing in public acquisitions during the most recent period may be driving our results. For this reason Panel A also differentiates between different financing sources in acquisition offers. The performance turnaround persists both for all-cash and all-stock deals. In fact, the highest turnaround is recorded for

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<sup>14</sup> 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*.

stock-swap financed public acquisitions (2.3%) which are no longer subject to negative abnormal returns during the most recent period. This is again to our knowledge the first time non-negative announcement returns are reported for stock-financed public U.S. deals. Across all payment methods abnormal returns change from negative and significant in 1990-2009 to zero or positive and significant in 2010-15.

Synergy gains for public acquisitions (*SYNRGY*) 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 *SYNRGY* for the 2010-15 period is 4.51%. Synergistic gains have increased by more than 3 times relative to the previous 20 years. In dollar terms (*\$SYNRGY*) this corresponds to a striking \$309 mil gain for the typical mega-deal post-2009 relative to a \$25.4 mil loss in the previous decade. A measure of deal value added (*\$VALUE ADDED*), 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.<sup>15</sup> First, our findings are consistent with the surge in synergy related motives reported in Table 2 and suggest that acquirers carried out by and large superior deals, with better synergistic prospects during the most recent period. Second, returns to target companies (*TCAR*) have also increased proportionately the additional synergistic gains seem to be captured by both acquiring and target firm shareholders.<sup>16</sup>

The fact that an improvement in M&A value creation is documented only for public acquisitions – and not for private - yields interesting implications. Deals involving listed targets tend to be larger and associated with a higher degree of reputational exposure given the heightened media attention they typically receive (Dahya, et al. 2016). Moreover, the value destruction reported in prior M&A literature primarily applies to this sub-set, rather than private deals– something we also confirm in this study. It is therefore possible that any greater effort or restraint among corporate executives and boards in response to shifts in governance quality might be concentrated in sizable investment decisions where the tendency to destroy value was more of a problem in the first place and agency conflicts are more

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

<sup>16</sup> In Table 2, the deal premium has not increased during the most recent period. Hence, the higher *TCAR* may also reflect a higher likelihood of deal completion during this period considering that less deals are being withdrawn.

substantial. In this case, larger deals would be more reflective of any significant shift in M&A quality and value creation, at least during its initial stage, due to the more material impact of a sizable consolidation on the acquiring firm and its share price.

To gain further insight on the impact of deal size in driving our results we repeat the univariate analysis in Panel B for a sub-set of 3,150 mega-deals priced at least \$500mil.<sup>17</sup> The differentials in Panel B between the two periods are significantly more pronounced. The mean (median) ACAR for mega-deals in 2010-15 is a resounding 2.54% (1.34%); an increase of 2.90 (1.72) percentage points relative 1990-2009.<sup>18</sup> Although, for brevity, results are reported for all mega-deals - private and public – together, in an untabulated test we also confirm that abnormal returns are higher for private mega-deals, although to a lesser extent (by 0.68%) than for public. The market reaction documented in panel B corresponds to a \$62.3 mil gain for acquiring shareholders relative to a loss of \$262.9mil recorded prior to 2010. The synergistic gain during the most recent period amounts to a thumping \$542mil in the average (public) mega-deal; a \$618.3mil improvement. The fact that large acquisitions typically destroyed more value in the past, as reported in prior literature, is no longer true for the latest period in our sample. This points to acquiring companies recently becoming better at tackling the challenges associated with larger acquisitions either through attaining more strategic combinations and/or more efficiently managing their heightened complexity and cumbersome integration process. Moreover, to the extent that more efficient M&A decisions post-2009 are attributed to developments that occurred in the aftermath of the financial crisis, it appears that this environment has primarily affected larger deals where the reputational exposure of acquiring firms, top executives, and directors is more pronounced.

[Insert Figures 2 and 3 here]

Figures 2 and 3 provide a more complete picture of ACARs around mega-deals. Figure 2 illustrates annual ACARs along with 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 in the early years of our sample. Figure 3 depicts the evolution in acquirer CARs from 30 days prior to the

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<sup>17</sup> Our results are similar for alternative mega-deal thresholds (including \$250mil, \$750mil or \$1bil).

<sup>18</sup> Appendix 2 reports details of the 10 largest deals in each of three distinct sample periods. 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.

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 start deteriorating to reach almost -3% until day +30. On the contrary, for the 2010-2015 period there is a sizable jump in CARs around the announcement day reaching more than 3%, down to around 2.7% on day +30. The implied acquisition gain differential 30 days following the acquisition announcement between the previous two decades and 2010-15 is to around 5.5%.

### 3.2 Acquirer and synergy gain regressions

In this section we examine the possibility that the documented improvement in acquisition gains during the most recent, post-2009 period is attributed to deal, firm, or market characteristics, not accounted for in the univariate analysis. We perform a series of cross-sectional regressions where the dependent variable is *ACAR* in Panel A and *SYNRGY* in Panel B while the main explanatory variable is an indicator equal to one if the acquisition is announced during 2010-2015, and zero otherwise.

We control for key variables that have been shown to affect acquirer returns. These are: i) the occurrence of a public deal (*PUBLIC*) 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 (*ALL STOCK*) 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 acquiring firm's market cap (*ASIZE*) to account for the negative effect of acquirer size on acquirer returns (Moeller et al., 2004), iv) the target-to-acquirer relative size (*RELSIZE*) since larger public deals are evidently subject to more negative abnormal returns (Alexandridis et. al, 2013); v) the acquirer market-to-book value (*M/B*) given the firm misvaluation implications for bidders (Moeller et. al, 2005 and Dong et. al, 2006), vi) a competing bid variable (*COMPET*) to capture the potentially negative effect of competition on the gains to acquiring firms (Bradley et al., 1988); vii) a control for takeover hostility (*HOSTILE*) since it tends to be negatively associated with acquirer returns (Schwert, 2000); viii) a diversification dummy variable (*DIVERS*) 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); ix) a cross-border indicator



(*CROSS BORDER*) 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); x) a serial acquirer control (*SERIAL*) which accounts for the fact that multiple bidders tend to make worse acquisitions (Fuller et al, 2002 and Billett and Qian, 2008); xi) the acquiring firm's leverage (Maloney et al., 1993) and FCF ratios (see e.g. Jensen, 1988; Lang et al., 1991); xii) a high market valuation indicator (*HIGH MKT VAL*) 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 4 here]

The coefficient of the 2010-15 indicator variable in regression 1 is positive and statistically significant at the 1% level. Deals carried out during the latest period are subject to a 0.45% higher *ACAR* after controlling for other known acquirer return determinants, which confirms the recent turnaround in acquisition gains reported in Section 3.1. This superior performance is largely attributed to the sizable improvement (by 1.86%) in acquisitions of public targets (regression 2) while returns for private deals are not significantly higher during the most recent period (regression 5). Moreover, the trend in public acquisitions seems to be driven in turn by the subset of mega deals (regression 6) where a much higher increase in CARs of 3.6% is recorded. Even private mega-deals fare significantly better post-2009 (regression 7) albeit the difference there is relatively smaller (0.84%). Overall, cross sectional regressions confirm that the tendency of M&As to generate more value for acquiring shareholders is significantly more pronounced among larger deals.

In regressions 2, 4 and 9 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 is possible that the superior performance of acquirers post-2009 can be explained by unobserved, time-invariant firm characteristics. Although the inclusion of company dummy variables (6,089 additional variables for regression 2 and 1,440 for specification 9) results in a very significant increase in the adj  $R^2$ , the coefficient of the main variable of interest *2010-15* remains positive and statistically

significant across the board. Thus, the documented turnaround in acquisition performance is unlikely attributed to specific extraordinary acquiring firms.<sup>19</sup>

The univariate results presented in Table 3 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 potentially channelling more of the incremental combined value gains to their own shareholders. In panel B 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 Panel A. In this case the dependent variable is the value-weighted combined return to acquiring and target firms (*SYNRGY GAIN*). In regression 10 public deals consummated in 2010-15 are subject to a 2.81% higher synergy gain relative to those carried out during the preceding 20 years, after including all controls. The improvement in synergistic gains is even more pronounced for mega deals (regression 12) as with acquirer returns. Therefore, in this case too, the typical mega-deal carried out during the latest period truly stands out. Controlling for company fixed effects (1,781 additional variables in regression 11 and 808 in specification 13) result in somewhat lower coefficients for the time indicator and interaction variable although they still remain statistically significant. Overall, results from the synergy regressions point to superior synergistic potential post-2009 and are consistent with the acquirer return findings.

[Insert Table 5 here]

To ensure that the relationships documented in Table 4 are not driven by extreme CAR observations we also run quantile regressions estimated at the median and other percentiles (25<sup>th</sup> and 75<sup>th</sup>). Table 5 reports the quantile analysis for mega deals for brevity, although we check that results are similar for the sample of all public deals as well. The magnitude of the 2010-15 time indicator varies but it remains statistically significant at the 1% level in all 6 specifications.

#### **4. Acquisition gains based on propensity score matching**

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<sup>19</sup> We note that while this analysis offers additional insights the inclusion of company fixed effects reduces degrees of freedom significantly in several regressions.

To control more directly for observable differences in the deal characteristics between deals consummated during the most recent period and prior to this we employ a propensity score matching (PSM) technique. 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 utilised in Table 4 on the likelihood of a deal being part of the post-2009 sub-set. Panel A of Table 6 reports the regression results for mega-deals since this sub-set in particular appears to be driving the documented improvement in acquisition gains. In untabulated results we confirm that results are similar for the sample of all public acquisitions. Several variables are 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 2. The *Public* coefficient in specification 1 implies that the probability of observing a public deal in 2010-15 is 39% less (82% less for a stock-for-stock deal).

[Insert Table 6 here]

Panel B reports the PSM results for both performance proxies (*CAR* and *SYNRGY*) 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 *CAR* corresponds to post-2009 *CAR*s and *Control CAR* to the matched deals' *CAR*s. Both acquirer and synergy gains for the treated samples are higher than the control sample ones, and the differentials range from 1.7-1.9% for *CAR* and from 2.9% to 3.9% for *SYNRGY*, 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.

## **5. Do developments in corporate governance drive the results?**

Although we report a compelling pattern in the data pointing to unprecedented improvements in the quality of M&A decisions following the 2008 financial crisis, questions remain on the ultimate driving force that induced such a sharp shift. One possibility is 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 also 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, might in fact 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 recent financial 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 bringing about widespread improvements in acquisition gains. 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 capable of capturing 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).<sup>20</sup>

To examine whether the hefty improvements in corporate governance documented in Table 3 with regards to mega-deals 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 Dahya 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 7 presents the results from the instrumental variable estimation.

[Insert Table 7 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.<sup>21</sup> This suggests that our 2010-15 variable is a credible instrument for the corporate governance proxies employed. 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 *ACAR*, 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 *SYNRGY* instead of *ACAR* and find similar results. Moreover, utilising the sample of all public deals, instead of the mega-deals, does not change the direction of results.

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<sup>20</sup> 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.

<sup>21</sup> 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.<sup>22</sup> 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 ( $\Delta BI$ ). Then we also estimate a corresponding  $\Delta ACAR$  for each pair. Acquirers in the top  $\Delta BI$  quintile are subject to an average (median) increase in  $\Delta ACAR$  of 3.03% (1.89%) and those in the bottom quintile experience a decrease in abnormal returns of -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 a deterioration in corporate governance continue to destroy value. The direction of our findings is also similar for the other two measures of corporate governance, *IDO* and *BCF*.

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<sup>22</sup> 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.

## 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 or divestitures. To that end, we employ a measure of acquiring firms' residual investment, *RESINV*, which captures the investment that diverges from its expected level, 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:<sup>23</sup>

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

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 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,  $\varepsilon_i$ , is the residual investment measure, *RESINV*, and it reflects the extent of managerial investment inefficiency.

[Insert Table 8 here]

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<sup>23</sup> *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.

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 8, 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 pronounced post-2009 suggesting that corporate leaders have consistently aimed towards more optimal investment allocation in recent years. The turn towards more efficient investment strategies is in line with the documented improvement in acquisition performance and together attest to a shift in corporate decision making towards more value enhancing investment during the most recent period.

## **7. Conclusion**

One of the most reiterated facts in the M&A literature is the tendency of acquiring firms to destroy value for their shareholders when consummating acquisitions of listed targets and especially in large deals which comprise the bulk of M&A market value. In stark contrast with the status quo, we show that this trend has been largely reversed post-2009. Acquisition gains during 2010-15 show signs of staggering improvement on a broad set of conventional measures estimated around the deal announcement. During the most recent period public acquisitions generate positive abnormal returns for acquiring shareholders, while stock-for-stock deals, are no longer subject to significantly negative market reaction. The associated synergistic gains have also increased dramatically, indicating overall value creation from M&As on a large scale. The improvement in the quality of acquisition decisions is more pronounced among mega-deals where even private target acquisitions are received better by the market during the most recent period. We also provide evidence of acquiring firms employing more efficient investment allocation strategies, 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. Our evidence suggests that the higher acquisition gains 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 shockwaves can ultimately contribute towards the more effective monitoring of corporate investment decisions as well as the associated implementation process, bringing sizeable gains to shareholders.

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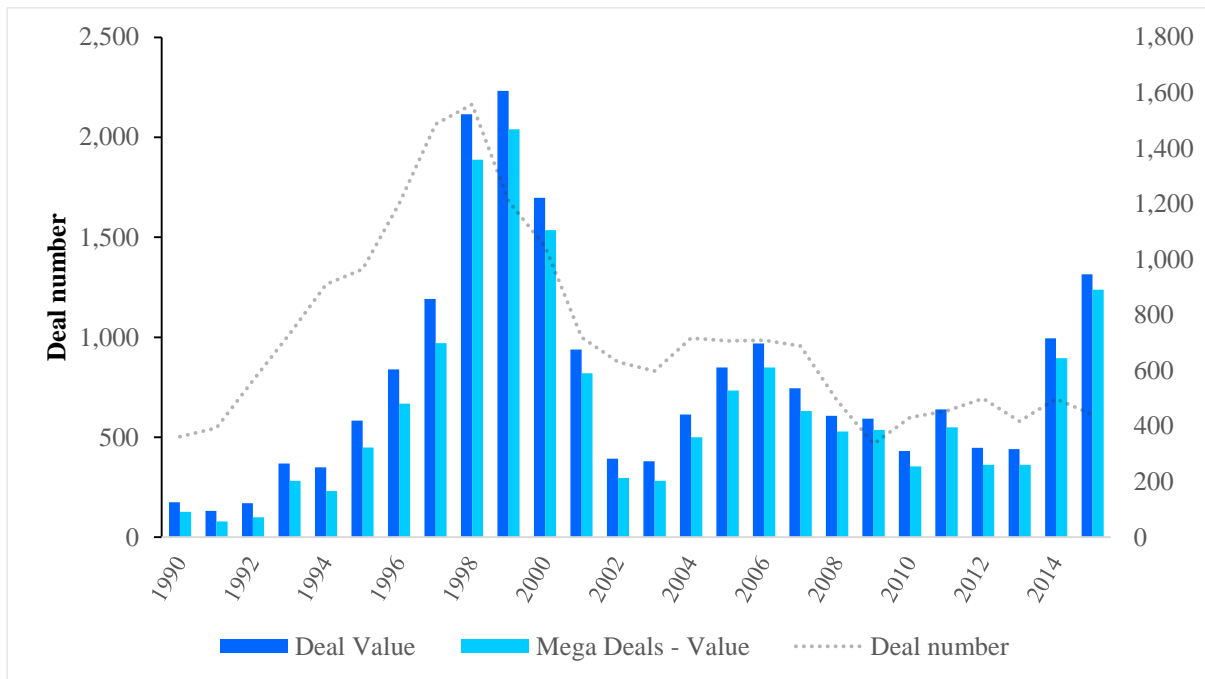
**Table 1.** Sample distribution.

The table shows the annual number of deals and total consideration offered for public and private M&A 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.

<b>Year</b>	<b>All Deals (n)</b>	<b>All Deals (\$bil)</b>	<b>Public Deals (n)</b>	<b>Public Deals (\$ bil)</b>	<b>Private Deals (n)</b>	<b>Private Deals (\$bil)</b>
1990	503	126.18	107	67.34	396	58.84
1991	547	94.73	132	51.82	415	42.91
1992	783	122.78	147	59.28	636	63.50
1993	1,017	265.65	194	193.18	823	72.47
1994	1,265	251.72	302	147.16	963	104.56
1995	1,340	419.67	344	303.06	996	116.61
1996	1,668	603.62	360	435.26	1,308	168.36
1997	2,066	858.11	464	599.19	1,602	258.92
1998	2,165	1,523.24	494	1,270.94	1,671	252.30
1999	1,680	1,607.03	433	1,307.71	1,247	299.32
2000	1,454	1,221.96	368	905.96	1,086	316.01
2001	999	676.37	267	427.68	732	248.68
2002	876	282.70	173	155.40	703	127.30
2003	832	274.42	187	161.53	645	112.89
2004	996	442.48	192	317.87	804	124.62
2005	982	611.29	170	406.71	812	204.59
2006	986	698.01	197	525.26	789	172.75
2007	957	536.55	193	305.38	764	231.17
2008	684	437.30	136	320.86	548	116.44
2009	467	426.70	116	289.62	351	137.08
2010	599	310.96	126	153.11	473	157.85
2011	631	459.93	92	249.85	539	210.08
2012	694	321.90	118	141.49	576	180.41
2013	581	317.53	114	158.03	467	159.50
2014	692	716.08	130	504.21	562	211.87
2015	614	947.25	138	697.88	476	249.36
<b>All</b>	<b>26,078</b>	<b>14,554.16</b>	<b>5,694</b>	<b>10,155.78</b>	<b>20,384</b>	<b>4,398.36</b>

**Figure 1.** Deal Activity through time.

The figure shows the annual number of transactions and the aggregate dollar value for the M&A sample described in Table 1.



**Table 2.** Summary statistics.

The table presents means, medians, and sample size for a number of firm and deal characteristics for public and private deals and different sample periods along with differentials between sub-periods. The sample of M&As is described in Table 1 and variable descriptions are reported in Appendix 1. The notation \*, \*\*, \*\*\* corresponds to statistical significance levels of 10%, 5%, and 1% respectively.

		Public Deals			Private Deals		
		1990-2009 (1)	2010-15 (2)	(2) - (1)	1990-2009 (3)	2010-15 (4)	(3) - (4)
<b>Acquirer characteristics</b>							
SIZE (\$mil)	<i>mean</i>	8,475.92	13,030.18	4,554.26***	2,386.08	5,282.29	2,896.20***
	<i>median</i>	1,287.49	1,977.43	689.93***	504.77	1,204.75	699.97***
	<i>n</i>	4,976	718		17,291	3,093	
M/B	<i>mean</i>	3.8	2.74	-1.06***	4.14	3.13	-1.01***
	<i>median</i>	2.27	1.76	-0.51***	2.33	2.08	-0.25***
	<i>n</i>	4,238	699		13,881	2,975	
FCF	<i>mean</i>	0.08	0.1	0.02***	0.09	0.11	0.03***
	<i>median</i>	0.05	0.08	0.03***	0.08	0.1	0.02***
	<i>n</i>	4,236	699		13,847	2,975	
SERIAL %	<i>mean</i>	34.32	32.03	-2.29	26.99	31.72	4.73***
	<i>n</i>	4,976	718		17,291	3,093	
HUBRIS %	<i>mean</i>	44.5	34.51	-9.99***	47.21	41.32	-5.89***
	<i>n</i>	1,890	255		4,236	1,060	
EBC %	<i>mean</i>	42.84	50.53	7.69***	40.27	49.58	9.30***
	<i>median</i>	44.92	54.17	9.25***	41.51	53.67	12.16***
	<i>n</i>	1,287	313		2,660	1,226	
BCF INDEX	<i>mean</i>	1.9	1.65	-0.25***	1.99	1.8	-0.19***
	<i>median</i>	2	2	-0.00**	2	2	-0.00***
	<i>n</i>	1,246	274		3,039	1,048	
BI %	<i>mean</i>	66.18	80.07	13.89***	65.4	79.24	13.84***
	<i>median</i>	69.23	83.33	14.10***	66.67	81.82	15.15***
	<i>n</i>	1,448	339		3,355	1,320	
IDO %	<i>mean</i>	0.71	0.96	0.24*	0.97	1.15	0.18**
	<i>median</i>	0.22	0.33	0.11***	0.34	0.43	0.08***
	<i>n</i>	1,124	336		2,825	1,304	
<b>Target/Deal Characteristics</b>							
SIZE (\$mil)	<i>mean</i>	1,352.01	2,181.61	829.60***			
	<i>median</i>	179.92	405.1	225.18***			
	<i>n</i>	3,733	478				
M/B	<i>mean</i>	2.77	2.4	-0.36*			
	<i>median</i>	1.72	1.53	-0.19***			
	<i>n</i>	4,000	521				
DEAL VALUE (\$mil)	<i>mean</i>	1,658.2	2,652.61	994.42***	186.76	377.97	191.21***
	<i>median</i>	211.74	359.93	148.19***	41.55	90.81	49.27***
	<i>n</i>	4,976	718		17,291	3,093	
RELSIZE	<i>mean</i>	43.38	39.48	-3.90*	25.85	19.2	-6.65***
	<i>median</i>	20.11	22.12	2.02	8.88	7.09	-1.79***
	<i>n</i>	4,976	718		17,291	3,093	
MEGA DEAL %	<i>mean</i>	32.84	44.29	11.45***	6.86	15.03	8.17***
	<i>n</i>	4,976	718		17,291	3,093	
STOCK %	<i>mean</i>	56.2	38.09	-18.11***	24.82	8.22	-16.60***
	<i>median</i>	70.96	12.26	-58.70***	0	0	-0.00***
	<i>n</i>	4,976	718		17,291	3,093	
CASH %	<i>mean</i>	33.09	56.08	22.99***	38.31	54.93	16.62***
	<i>median</i>	0	60.09	60.09***	0	71.33	71.33***
	<i>n</i>	4,976	718		17,291	3,093	
SYNERGY MOTIVE %	<i>mean</i>	25.5	61.04	35.54***	7.08	33.7	26.62***
	<i>n</i>	1,514	675		4,803	2,555	



Table 3 Continued.

		Public Deals			Private Deals		
		1990-2009 (1)	2010-15 (2)	(2) - (1)	1990-2009 (3)	2010-15 (4)	(3) - (4)
COMPETITION %	<i>mean</i>	7.82	6.55	-1.27	0.63	0.16	-0.47***
	<i>median</i>	0	0	0	0	0	-0.00***
	<i>n</i>	4,976	718		17,291	3,093	
HOSTILE %	<i>mean</i>	3.42	1.39	-2.02***	0.06	0	-0.06***
	<i>median</i>	0	0	-0.00***	0	0	0
	<i>n</i>	4,976	718		17,291	3,093	
WITHDRAWN%	<i>mean</i>	15.72	11	-4.71***	3.76	0.97	-2.80***
	<i>median</i>	0	0	0.00***	0	0	-0.00***
	<i>n</i>	4,976	718		17,291	3,093	
DIVERS %	<i>mean</i>	30.95	24.51	-6.44***	38.94	39.15	0.21
	<i>median</i>	0	0	-0.00***	0	0	0
	<i>n</i>	4,976	718		17,291	3,093	
CROSS BORDER %	<i>mean</i>	9.2	14.76	5.56***	13.03	21.53	8.50***
	<i>median</i>	0	0	-0.00***	0	0	-0.00***
	<i>n</i>	4,976	718		17,291	3,093	
TIME TO COMPLET.	<i>mean</i>	137.5	132.61	-4.89	63.06	49.09	-13.97***
	<i>median</i>	122	111	-11.00*	36	25	-11.00***
	<i>n</i>	4,957	657		17,262	2,981	
PREMIUM %	<i>mean</i>	45.91	46.44	0.53			
	<i>median</i>	36.69	37.48	0.79			
	<i>n</i>	3965	638				
HIGH MKT VAL %	<i>mean</i>	45.82	46.1	0.28	47.76	48.11	0.34
	<i>median</i>	0	0	0	0	0	0
	<i>n</i>	4,976	718		17,291	3,093	

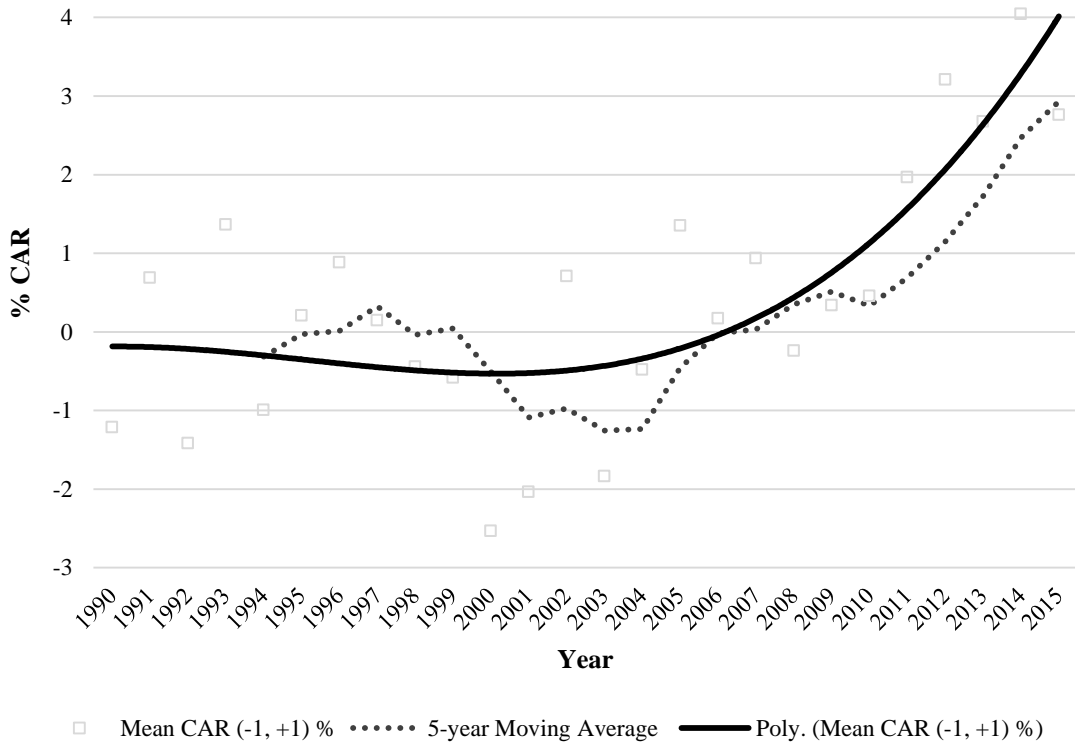
**Table 3.** Acquisition Gains.

The table reports mean and median values of M&A gain measures for a sample of 20,834 completed acquisitions. Panel A reports the results for all deals and Panel B for mega-deals, priced at least \$500mil. Variable definitions are reported in Appendix 1. 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.

		1990-2009	2010-2015	(5) - (2)
		(2)	(5)	
<b>Panel A: All Deals</b>				
n		20,834	3,538	.
ACAR	<i>mean</i>	1.21***	1.42***	0.21**
	<i>median</i>	0.44***	0.68***	0.25***
<b>Private Deals</b>				
n		16640	2959	
ACAR	<i>mean</i>	1.78***	1.49***	-0.29*
	<i>median</i>	0.77***	0.75***	-0.03
<b>Public Deals</b>				
n		4,194	579	
ACAR				
	<i>mean</i>	-1.08***	1.05***	2.13***
	<i>median</i>	-0.84***	0.29***	1.14***
ALL CASH	<i>mean</i>	0.59***	1.85***	1.26***
	<i>median</i>	0.30***	0.60***	0.29***
ALL STOCK	<i>mean</i>	-2.11***	0.19	2.30***
	<i>median</i>	-1.55***	-0.3	1.25***
OTHER	<i>mean</i>	-0.86***	0.64	1.50***
	<i>median</i>	-0.87***	0.22	1.09***
ACAR+	<i>mean</i>	41.80***	54.23***	12.43***
\$GAIN	<i>mean</i>	-178.14***	30.22	208.37***
	<i>median</i>	-4.56***	2.27**	6.82***
LARGE LOSS %	<i>mean</i>	33.05***	19.52***	-13.53***
TCAR3	<i>mean</i>	20.73***	29.32***	8.59***
	<i>median</i>	16.94***	26.39***	9.44***
SYNRGY	<i>mean</i>	1.30***	4.51***	3.21***
	<i>median</i>	0.76***	2.66***	1.89***
\$SYNRGY	<i>mean</i>	-25.44	308.59***	334.03***
	<i>median</i>	5.66***	55.78***	50.12***
\$VALUE ADDED	<i>mean</i>	-2.38	20.95***	23.33***
	<i>median</i>	0.13	21.01***	20.87***
<b>Panel B: Mega- Deals</b>				
n		2,474	676	
PUBLIC %	<i>mean</i>	55.05	36.39	
ACAR	<i>mean</i>	-0.36**	2.54***	2.90***
	<i>median</i>	-0.38***	1.34***	1.72***
ACAR+	<i>mean</i>	47.01***	61.54***	14.53***
\$GAIN	<i>mean</i>	-262.77***	62.32	325.09***
	<i>median</i>	-16.42***	86.71***	103.13***
LARGE LOSS %	<i>mean</i>	10.79***	6.36***	-4.43***
TCAR3	<i>mean</i>	19.93***	24.87***	5.78***
	<i>median</i>	17.39***	23.72***	7.84***
n		1,436	210	.
SYNRGY	<i>mean</i>	0.74***	5.05***	4.31***
	<i>median</i>	0.42***	2.61***	2.19***
\$SYNRGY	<i>mean</i>	-75.65	542.69***	618.34***
	<i>median</i>	31.77	253.97***	222.21***
\$VALUE ADDED	<i>mean</i>	-7.05**	18.21***	25.26***
	<i>median</i>	-3.32***	21.79***	25.11***

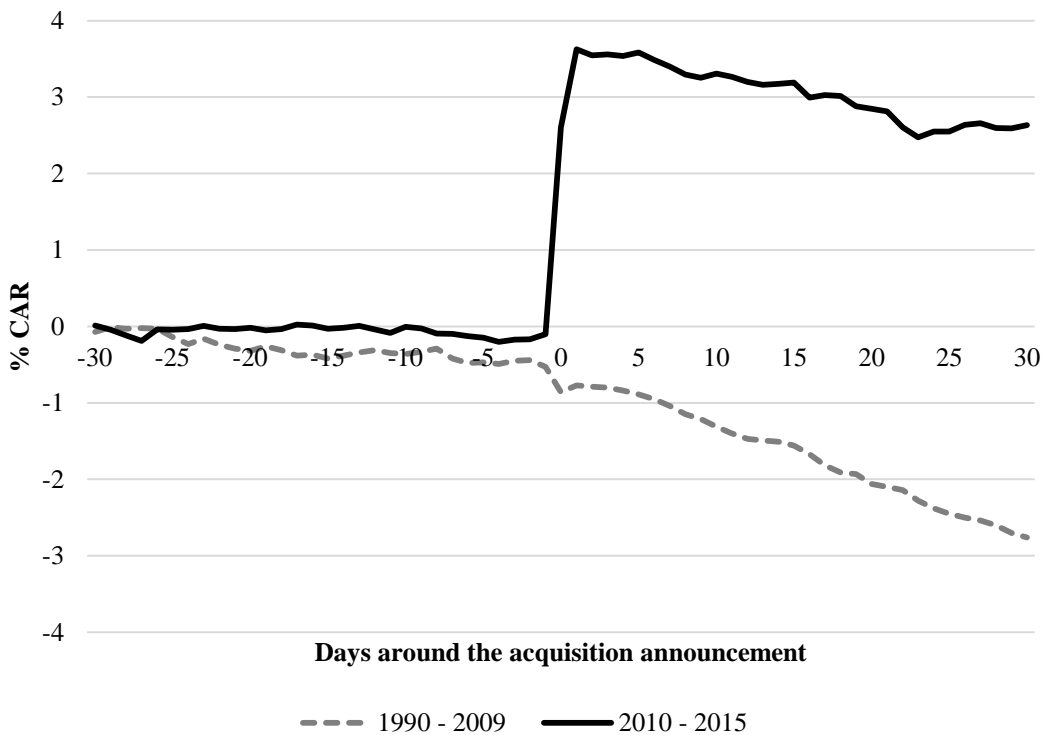
**Figure 2.** Mega-Deal CARs through time

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.** Evolution in acquirer CARs around mega-deal announcements.

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



**Table 4.** Acquirer return regressions.

The table reports OLS regression coefficient estimates of ACAR and SYNRGY on the 2010-2015 dummy variable 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. Mega Deals are least \$500 mil in 2015 terms. For sample criteria see Table 1 description. Detailed variable definitions are reported in Appendix 1. All regressions include industry fixed effects based on the Fama and French 12 industry specification and regressions 2,4, 9, 11 and 13 include company fixed effects. The notation of \*, \*\*, \*\*\* corresponds to statistical significance levels of 10%, 5%, and 1% respectively.

	Panel A: ACAR									Panel B: SYNRGY			
	All	All	Public	Public	Private	Public Mega	Private Mega	All Mega	All Mega	Public	Public	Public Mega	Public Mega
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Intercept	3.378***	8.827*	2.657***	12.395**	2.914***	-0.198	8.578***	5.820***	6.734	6.141***	14.128**	5.351***	14.060*
2010 - 2015	0.449***	0.713***	1.857***	1.777***	0.208	3.596***	0.842**	1.779***	1.249**	2.810***	2.312***	3.828***	1.916**
PUBLIC	-2.406***	-2.285***						-3.221***	-2.463***				
ALL STOCK	-0.559***	-0.404**	-1.594***	-0.551*	0.081	-1.518***	-0.683	-1.688***	-0.877	-2.047***	-0.905**	-1.750***	-0.923
ASIZE	-0.292***	-0.709***	-0.378***	-0.672***	-0.255***	-0.068	-0.703***	-0.373***	-0.613*	-0.606***	-0.854***	-0.489***	-0.846*
RELSIZE	2.270***	1.688***	-0.729***	-2.005***	3.510***	-1.443***	1.874***	0.526*	0.268	2.398***	2.555***	1.670***	1.884**
M/B	-0.006	-0.005	-0.029*	-0.028	-0.004	-0.036	0.007	0.002	0.008	-0.046**	-0.034	-0.024	-0.01
COMPET	1.293***	0.115	-0.246	0.334	5.877***	-1.380*	-0.528	-1.293	0.262	-0.331	0.002	-1.376	1.191
HOSTILE	-0.25	-0.798	0.008	-0.059	-4.322	0.417	-1.756	0.732	0.26	2.469**	1.583	3.007**	1.313
DIVERS	-0.006	-0.223	-0.13	-0.549	-0.013	-0.214	-1.266***	-0.783**	-0.984**	-0.154	0.085	0.128	0.056
CROSS BORDER	-0.106	0.08	0.687*	0.671	-0.179	1.115*	-0.28	-0.153	0.654	-0.951	-2.088**	-1.255	-0.571
SERIAL	-0.255**	-0.340**	0.036	0.014	-0.307**	-0.468	-0.142	-0.377	-0.483	0.126	0.191	-0.003	0.266
LEVERAGE	0.006**	-0.006	0.031***	0.001	0.003	0.039***	0.01	0.017**	-0.004	0.021***	-0.003	0.025**	-0.011
HIGH MKT VAL	0.164*	0.185	0.172	0.228	0.171	0.799**	-0.106	0.299	0.189	-0.382	0.003	-0.129	0.42
FCF	-0.131	0.277	2.215***	-0.402	-0.567	0.652	-1.123	-0.188	-1.037	3.555***	3.772*	3.463**	3.296
IND FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
COMP FE	No	Yes	No	Yes	No	No	No	No	Yes	No	Yes	No	Yes
Adj. R <sup>2</sup> (%)	5.10	18.00	4.75	35.32	5.08	9.63	7.08	10.26	32.74	13.86	45.36	14.73	48.11
N	20,481	20,481	4,196	4,196	16,285	1,511	1,427	2,938	2,938	3,126	3,126	1,315	1,315

**Table 5.** 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 25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup> percentiles corresponding to specifications 8 and 12 in Table 4 where the dependent variable is ACAR and SYNERGY 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.

	ACAR			SYNERGY		
	Quantile			Quantile		
	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>	25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.459	5.307***	11.157***	-0.3962	7.291***	11.975***
2010 - 2015	0.957***	1.071***	1.179***	1.918***	2.049***	3.595***
PUBLIC	-2.144***	-1.837***	-1.821***			
ALL STOCK	-2.713***	-1.787***	-1.207***	-1.381***	-1.286***	-1.373***
ASIZE	-0.013	-0.359***	-0.718***	-0.113	-0.604***	-0.805***
RELSIZE	-2.432***	-0.042	3.068***	-0.161	1.229**	3.102***
M/B	-0.121***	-0.003	0.056	-0.164**	-0.058	0.029
COMPET	-1.671	-0.351	-1.140	-1.302	-1.291	-0.899
HOSTILE	1.007	-0.223	-1.601	1.802	1.339	1.179
DIVERS	-0.323	-0.769***	-1.258***	0.420	-0.003	-0.501
CROSS BORDER	-0.220	-0.124	-0.367	-1.271	-0.412	-0.890
SERIAL	-0.050	-0.120	0.218	0.062	0.221	-0.224
LEVERAGE	0.009	0.017**	0.011	0.020	0.024**	0.023
HIGH MKT VAL	0.901***	0.224	-0.084	0.923***	-0.118	-0.470
FCF	0.678	0.407	-0.942	5.337***	2.627**	1.814
IND FE	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
AIC	6,187.19	7,820.88	6,532.89	2,504.72	3,133.76	2,542.50
N	2,938	2,938	2,938	1,315	1,315	1,315

**Table 6.** 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 CAR and SYNRGY 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 R<sup>2</sup> (%) 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			ACAR	SYNRGY
Post-2009=1			(1)	(2)
Intercept			-1.916***	-2.329***
PUBLIC			-0.491***	
ALL STOCK			-1.726***	-1.542***
ASIZE			0.132***	0.172**
RELSIZE			-0.067	0.121
M/B			-0.015*	-0.035
COMPET			-0.969***	-0.663
HOSTILE			-1.999*	-14.411
DIVERS			-0.123	-0.516***
CROSS BORDER			0.097	0.186
SERIAL			-0.360***	-0.0264
LEVERAGE			0.006**	0.004
HIGH MKT VAL			0.319***	0.254
FCF			-0.233	-0.030
Industry FE			Yes	Yes
N			2,939	1,316
Pseudo R <sup>2</sup> (%)			10.62	8.93

Panel B: Adjusted post-2009 CARs based on PSM			One-to-one	30 Nearest	50 Nearest	Gaussian Kernel
ACAR	Treated	<i>mean</i>	2.424	2.424	2.424	2.424
	Control	<i>mean</i>	0.487	0.755	0.744	0.478
	Difference		<b>1.937***</b>	<b>1.669***</b>	<b>1.679***</b>	<b>1.946***</b>
SYNRGY	Treated	<i>mean</i>	5.074	5.074	5.074	5.074
	Control	<i>mean</i>	2.212	1.308	1.137	1.177
	Difference		<b>2.861***</b>	<b>3.766***</b>	<b>3.936***</b>	<b>3.896***</b>

**Table 7.** 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 (ACAR). 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 <sup>st</sup> Stage		2 <sup>nd</sup> Stage		1 <sup>st</sup> Stage		2 <sup>nd</sup> Stage	
	BI	CAR	IDO	CAR	BCF	CAR		
	(1)	(2)	(3)	(4)	(5)	(6)		
Intercept	54.350***	1.62	2.230***	-9.336**	3.631***	18.362***		
2010 - 2015	0.139***		0.274**		-0.350***			
PUBLIC	0.318	-2.551***	-0.108	-1.844***	-0.095	-2.509***		
ALL STOCK	-2.501**	-1.495***	0.126	-2.459***	-0.151	-2.869***		
ASIZE	1.602***	-0.922***	-0.180***	0.726**	-0.161***	-1.071***		
RELSIZE	-0.853	-1.156**	-0.065	-0.708	-0.161*	-1.199**		
M/B	-0.169**	0.03	-0.002	0.008	-0.025***	-0.058		
COMPET	0.042	-0.467	0.096	-1.478	-0.084	-1.643		
HOSTILE	-4.467	1.438	0.045	0.948	-0.339	-0.149		
DIVERS	0.516	-1.086***	-0.023	-0.859**	-0.011	-0.536		
CROSS BORDER	-0.025	-0.541	-0.005	-0.543	-0.009	0.139		
SERIAL	-1.717**	0.326	-0.096	1.040**	0.135*	0.299		
LEVERAGE	-0.036	0.018	0.009***	-0.054***	-0.005*	0.017		
HIGH MKT VAL	-1.632**	0.328	0.013	-0.478	-0.313***	-0.343		
FCF	1.923	0.533	-0.069	1.958	0.491*	3.265**		
BI		0.130***						
IDO				7.846***				
BCF								-3.022**
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes		
Adj. R <sup>2</sup> (%)	18.111	10.502	2.873	10.377	8.609	10.224		
N	1616	1616	1385	1385	1234	1234		

**Table 8** Acquirer Investment Efficiency.

The table reports estimates of investment inefficiency based on Richardson (2006) for the sample of acquiring firms involved in mega-deals. 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	0.133***	0.158***	
Q (t-1)	0.024***	0.023***	
Leverage (t-1)	-0.001**	-0.001**	
Cash (t-1)	0.007***	0.008***	
Age (t-1)	-0.006***	-0.007***	
Size (t-1)	-0.016***	-0.015***	
INV (t-1)	0.087***	0.062***	
Stock Return (t-1)	0.008***	0.008***	
Industry FE	No	Yes	
Adj $R^2$ (%)	10.157	12.157	
n	17,568	17,568	
Panel B: Residual Investment (RESINV)			
	1990-2009	2010-2015	Diff.
mean	0.088	0.071	-0.017***
median	0.048	0.041	-0.007***
n	13,332	4,237	



## Appendix 1. Variable Descriptions.

Variable	Definition
<i>Panel A: Acquisition Performance</i>	
ACAR	Acquirer cumulative abnormal returns over the 3 days around the acquisition announcement day. The model parameters are estimated over a window (-255, -46) relative to the announcement.
\$GAIN	The product of ACAR (-1,+1) and the market capitalisation of the acquirer one month prior to the acquisition announcement.
LARGE LOSS	Dummy variable that takes the value of 1 if \$GAIN indicates a loss equal to or greater than \$1 bill., following Moeller et al. (2005).
SYNRGY	The market value-weighted 3-day cumulative abnormal returns of the acquirer and target combined where the value weights are from one month prior to the acquisition announcement.
SSYNERGY	The synergy gain (SYNRGY) multiplied by the sum of the market capitalisation of the acquirer and target 30 days prior to the acquisition announcement.
TCAR3	Target cumulative abnormal returns over the 3 days around the acquisition announcement. The model's parameters are estimated over the window (-255, -46) relative to the announcement.
\$VALUE ADDED	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.
ACAR+	Dummy variable that takes the value of 1 if the ACAR is positive and 0 otherwise.
<i>Panel B: Acquirer Characteristics</i>	
FCF	The ratio of cash flow from operations over the book value of assets at the year-end of the fiscal year t-1.
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).
LEVERAGE	Acquirer's long- and short-term debt divided by total assets at the year-end of the fiscal year t-1.
SIZE	Acquirer market capitalisation in 2015 dollar terms 30 days prior to the deal announcement.
M/B	Acquirer market cap over the total book value of equity. The latter is the sum of stockholders' equity, deferred taxed and investment tax credit (if available), and preferred stock, all at fiscal year-end t-1 and denominated in 2015 dollar terms. 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, or the book value of assets minus total liabilities, depending on data availability.
BCF 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 (see Bebchuk et al., 2009).
BI	The percentage of independent directors in the Board of Directors in the year of the acquisition as reported in ISS.
EBC	The sum of stock- and option-based compensation as a percentage of total

compensation in the fiscal year t-1. (see Chauvin and Shenoy, 2001).

IDO	The ownership % of all independent directors combined in the fiscal year t-1.
SERIAL %	Dummy variable that takes the value of 1 if an acquirer has consummated at least 3 deals within 5 years and 0 otherwise.

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*Panel C: Target and Deal Characteristics*

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SIZE (\$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.
M/B	Target share price 4 weeks before the announcement over the book value of equity from Compustat.
ALL STOCK	Dummy variable that takes the value of 1 if the consideration was 100% stock and 0 otherwise.
STOCK %	The percentage of deal consideration paid in stock.
CASH %	The percentage of deal consideration paid in cash.
COMPETE	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.
DIVERS	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 MKT VAL	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 de-trended 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	The 4-week premium paid for the target company as given by SDC.
PUBLIC	Dummy variable that takes the value of 1 if the target is a publicly listed firm and 0 otherwise.
RELSIZE	The ratio of deal value over the acquirer market capitalisation one month prior to the acquisition announcement.
SYNRGY MOTIVE	Indicator that takes the value of 1 if the Deal Purpose Code in SDC which is derived from actual acquisition announcements includes synergistic gains (Code: SYN), and 0 otherwise.
TIME	The number of days between deal announcement and completion.
WITHDRAWN	Dummy takes the value of 1 if the deal was eventually withdrawn and 0 otherwise.

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*Panel E: Investment Inefficiency Regression*

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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.
INV	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.

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**Appendix 2.** Largest 10 Deals per sub-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